Board characteristics and the financial performance and risk management of companies listed on the Johannesburg Stock Exchange

by

GERRIT STEFANUS KOK

Submitted in fulfilment of the requirements for the degree

PHILOSOPHIAE DOCTOR (FINANCIAL MANAGEMENT SCIENCES)

in the

DEPARTMENT OF FINANCIAL MANAGEMENT

in the

FACULTY OF ECONOMIC AND MANAGEMENT SCIENCES

at the

UNIVERSITY OF PRETORIA

Supervisor: Professor E du Toit

Co-supervisor: Professor CH van Schalkwyk

September 2020

ABSTRACT

The concept of company value creation has evolved from the traditional view of only the financial benefit to the ultimate beneficiaries, typically the shareholder, to a far more all-encompassing view to deliver benefit to all stakeholders. Literature and regulators call for sustainability and consequently value creation needs to include items such as a long-term strategic focus and risk management. In addition, various stakeholders have different expectations from a company. Shareholders, for example, are looking to achieve superior returns on their investments while accounting for their risk preferences, whereas governments require companies to implement transformation initiatives to achieve inclusive and sustainable development, especially in South Africa. Furthermore, shareholders, employees and lenders are concerned with the sustainability of a company, which is largely impacted by the ability of a company to manage its operational risks. The literature points out that the board of a company is ultimately responsible for delivering on these expectations by developing company strategy, overseeing company performance and managing company risk.

Literature and various regulatory documents in South Africa recommend diversity on the board, which includes characteristics such as knowledge, experience, age, race, gender and independence. However, literature, especially in South Africa, has not yet been able to determine which of these characteristics actually benefit the various components of company value creation.

Consequently, this study identified four elements that form part of the overall value creation of a company to determine how each of these measures are associated with the individual board characteristics. These elements are shareholder return, share price volatility (market risk), risk-adjusted return, and liquidity (one of the internal company risks). Even though board composition forms part of the overall corporate governance of a company, the aim of the study was not to determine the impact of good corporate governance on company performance, but to determine how each individual characteristic, promoted by literature and regulations, relates to the different aspects of a company's value creation. For example, does the presence of females contribute to improve share returns or improves a company's ability to manage its market risk or certain internal risks (such as liquidity risk)?

Research in this field has largely focussed on testing for linear relationships. Social scientists are becoming increasingly critical of this practice. Binary logistic regression was therefore used to determine which board characteristics are statistically significant predictors of the odds that a company is categorised as a top performer in terms of the chosen financial performance and risk management measures. Furthermore, to achieve the study's objectives the researcher considered a comprehensive list of board characteristics and used market-based measures to assess company performance, including the risk-adjusted return of a company. In addition, the researcher compiled a unique and comprehensive database to serve as the basis of the analyses.

The study makes a number of contributions to the field of corporate decision-making, by filling the gaps in the literature highlighted above. The study tested the validity of criticism against looking for linear associations in corporate relationships. It used binary logistic regression to determine the association between the board characteristics and the odds of a company being categorised as a top performer based on performance and risk management measures, thereby moving away from what the vast majority of literature have done to date. The rigorous inferential statistical analysis adds to the understanding of the association between each of the various board characteristics and company performance and risk management in a South African context. Furthermore, the study considered how these characteristics are related to the management of the risk associated with a company's performance and liquidity risk. Finally, the study introduced novel approaches to assessing diversity.

A number of board characteristics showed a statistically significant relationship with the various performance and risk management measures. These findings is useful to a number of interested parties. Firstly, companies are provided with the impetus to effect the changes required by government's transformation objectives. For example, the results showed that the percentage of black persons did not have a material relationship with any of the externally focused performance and market risk indicators (shareholder return, volatility and risk-adjusted return), which may indicate that there is neither a difference in ability between the various race groups nor in the market's perception of appointments from various race

groups. Consequently, companies are encouraged to appoint candidates from all races based on their abilities and skills.

Secondly, the findings will assist policy-makers and regulators in determining the effectiveness of the proposed regulations. One of the findings was that chief executive officer (CEO) remuneration movement relative to shareholder return displayed a negative relationship to shareholder return and the risk-adjusted return. This indicates to shareholders that a stricter implementation of the principle that executive management's remuneration should be fair and responsible is justified, especially with the aim of reducing inequality in the country. Thirdly, investors will be assisted in selecting companies to invest in. For example, the study found that chairman remuneration as a percentage of the CEO's guaranteed remuneration and the average other NED remuneration as a percentage of the CEO's guaranteed remuneration either revealed positive relationships or statistically insignificant relationships to all the metrics. Investors may therefore consider investing in companies where these board members are properly remunerated.

Fourthly, the knowledge will assist shareholders and other role players with the composition of their boards. In this regard a number of characteristics had a positive relationship with respective aspects of a company's valuation process. For example, shareholder return with level of education and chairman remuneration, share price movement volatility with percentage of females, diversity of tenure and average board experience and current ratio with professional experience diversity These diversity considerations should be kept in mind when developing and appointing new board members. Fifthly, nomination committees will be encouraged to target a wider pool of contenders, in their search for new board members. For example, the positive relationship between level of education and shareholder return, between professional experience diversity and managing the current ratio and between managing the cash conversion cycle and board experience diversity and the percentage of black persons showed that the search for new members by nomination committees could be expanded to also consider candidates from different races or candidates from different fields such as academics, depending on the needs of a company.

Keywords: Board characteristics; board diversity; market-based performance; risk management; King IV Report; South Africa.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
#	Number/ quantity
%	Percentage
ACI	Audit Committee Institute
ADF	Augmented Dickey-Fuller
AGM	Annual general meeting
AICD	Australian Institute of Company Directors
ANC	African National Congress
AR1	Auto regressive coefficient with a lag of one
B-BBEE	Broad-Based Black Economic Empowerment
BC	Before Christ
BEE	Black economic empowerment
BRICS	Brazil-Russia-India-China-South Africa
CAPM	Capital asset pricing model
CCC	Cash conversion cycle
CEO	Chief executive officer
COSATU	Congress of South African Trade Unions
CRISA	Code for responsible investing in South Africa
Deloitte	Deloitte Touche Tohmatsu
DTI	Department of Trade and Industry
EBITDA	Earnings before interest, tax, depreciation and amortisation
EPS	Earnings per share
Et al	Et alia (and others)
EVA	Economic value-added
EViews	Econometric Views
FRC	Financial Reporting Council
FTSE	Financial Times Stock Exchange

Abbreviation	Meaning
FTSE 100	Share index of the 100 companies listed on the LSE with the highest market capitalisation
GLM	Generalised linear model
GLS	General least squares
H_0	Null hypothesis
H_a	Alternative hypothesis
HEPS	Headline earnings per share
HIV/AIDS	Human immunodeficiency virus infection and acquired immune deficiency syndrome
IFRS	International financial reporting standards
Inc	Incorporated
IoDSA	Institute of Directors in Southern Africa
IR	Interquartile range
IRESS	IRESS database
JSE	Johannesburg Stock Exchange
LM	Lagrange multiplier
Log	Logarithm
LR	Likelihood ratio
LSE	London Stock Exchange
MVA	Market value added
NED	Non-executive director
Neg	Negative
No	Number
NQF	National Qualifications Framework
NUMSA	National Union of Metalworkers of South Africa
Obs	Observations
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary least squares
p	Probability
PC	Pearson’s correlation

Abbreviation	Meaning
PCSE	Panel-corrected standard error
Pos	Positive
Q1	First quartile
Q3	Third quartile
REIT	Real estate investment trust
ROA	Return on Assets
ROE	Return on Equity
SAICA	South African Institute of Chartered Accountants
SAQA	South African Qualifications Authority
Sig	Significance
SOE	State-owned enterprise
SPSS	Statistical Package for the Social Sciences
Std Dev	Standard deviation
SUR	Seemingly unrelated regression
WACC	Weighted average cost of capital

LIST OF DEFINITIONS

Momentum traders	Traders that are looking for acceleration (up or down) in a share's price, earnings, or revenues, or so-called trend chasers. The traders will then take a long or short position in the share hoping that the detected momentum will continue. This is a speculative strategy that relies on short-term price movements with little concern for the fundamental particulars of the companies (Badrinath & Wahal, 2002; Menkhoff, 2011).
Financial herding	This occurs when individual investors make decisions based on the fact that other investors are doing the same thing. The reasons may be the fear of regret of missing out on an opportunity, the pressure to conform or the belief that the bigger group knows something the individual does not (Devenow & Welch, 1996; Drehmann, Oechssler & Roider, 2005).
Financial contagion	This is a phenomenon where disturbances in a market, normally reflected in significant price movements, are caused by a market shock in another market, for example the 2008 financial crisis in the United States affected markets in other jurisdictions, including South Africa (Rao, 2018).
Rude capitalism	This is where individuals/ companies seek their own gain by seizing any opportunity to maximise profit (greed). This often stimulates risk taking, frequently to the detriment of a company and its stakeholders (Doti, 1982; Hutton, 2014).

CHAPTER 1: INTRODUCTION

1.1 BACKGROUND

The board of directors is the pinnacle of authority within a company, responsible for developing company strategy, overseeing company performance, managing company risk. It should also ensure that management acts in the best interests of a company's stakeholders, such as its shareholders (Barlow, 2016; Mans-Kemp, Viviers, Staal & Van Schalkwyk, 2018a). Corporate governance in South Africa, including the composition of boards of directors, is guided by a number of regulations, of which the most prominent are the Companies Act (71 of 2008), the Johannesburg Stock Exchange (JSE) Listings Requirements and the King Report on Corporate Governance. The fourth revision of the King Report on Corporate Governance is currently in effect, also known as King IV (Institute of Directors in Southern Africa [IoDSA], 2016; Johannesburg Stock Exchange [JSE], 2017). A close relationship exists between the guidelines in King IV and the JSE Listings Requirements. While the practices promoted by King IV are to be implemented on a voluntary, *apply and explain* basis, the JSE Listings Requirements incorporate a number of King IV principles, which makes the implementation thereof compulsory.

Views regarding company value creation has transformed in recent times from the traditional view of only referring to the financial benefit to the ultimate beneficiaries of a company, typically shareholders, to a far more all-encompassing view of delivering superior, long-term, risk-adjusted benefits to all the stakeholders of a company (Dos Santos, Lima, Gatsios & De Almeida, 2017; IoDSA, 2011; IoDSA, 2016). Literature and regulators call for sustainability and consequently, value creation needs to include items such as a long-term strategic focus, risk management (all risks not just financial risks), a company's natural environment, social factors and greater transparency (Clarke, 2014; Dilling & Harris, 2018; Dos Santos*, et al.*, 2017; IoDSA, 2011; IoDSA, 2016).

Literature and various regulatory documents in South Africa recommend diversity on the board, to enable the board to effectively fulfil its duties (Arzubiaga, Kotlar,

De Massis, Maseda & Iturralde, 2018; Bhagat & Black, 1999; Ferreira, 2010; Mans-Kemp, Viviers & Collins, 2018b; Simons & Pelled, 1999). For example, King IV highlights fields of knowledge, experience, age, culture, independence, race and gender as contributors to a board's diversity (IoDSA, 2016). King IV, furthermore, specifically requires disclosure of the progress made towards targets for race and gender diversity, which is also required by the JSE Listings Requirements. The importance of race and gender requirements needs to be understood within the transformation objectives of the post-apartheid South African government, namely to empower people from previously disadvantaged demographic profiles such as people of colour and females (Nyirenda, 2010). King IV draws a distinct line between the composition of the board and the performance and risk management of the board. King IV stipulates that diversity of board membership promotes better decision-making within the board, ultimately leading to improved performance at many levels(IoDSA, 2016).

Literature to date has been unable to provide a clear indication as to the association between the various board composition elements and the underlying components that contribute to the value creation of a company, in other words whether the various characteristics provide the benefits as speculated in the literature. Even though a fair number of studies exist that consider the relationship between some board composition elements and the performance of companies, the results were inconclusive and did not isolate all the characteristics. In addition, studies considering the relationship with the risk management ability of a company are virtually non-existent. Furthermore, historically studies, and specifically those conducted in South Africa, on the link between company performance and corporate governance, including elements of board composition, typically tested for linear relationships between the various elements. (Kirsten & Du Toit, 2018; Morris, 2018; Muchemwa, 2014; Muchemwa, Padia & Callaghan, 2016; Ntim, 2013; Ntim, 2015; Pandian, Thomas, Furrer & Bogner, 2006; Scholtz & Kieviet, 2018a; Scholtz & Kieviet, 2018b; Scholtz & Smit, 2012; Semosa, 2012). However, social scientists are progressively questioning the expectation of linear relationships in this field of study (Basimov, 2019; Canarella & Nourayi, 2008; Lee, 2019; Paniagua, Rivelles & Sapena, 2018; Rasoava, 2019).

This study therefore aimed to address these gaps by identifying the key characteristics promoted by literature and selecting key components that contribute to a company's value creation. The operation of a company is a vast and complex topic with many elements to it. Literature also cites the different measures of company performance as a major cause of inconclusive results in terms of the relationship between corporate governance elements and company performance (Li & Chen, 2018). This study, consequently, selected four different perspectives of a company's operation, namely shareholder return, share price volatility (market risk), risk-adjusted return, and liquidity management (one of the internal company risks). Using binary logistic regression, the study therefore aimed to determine the association between each of the board characteristics and the different components that contribute to a company's value creation. As an example, do higher levels of independent directors contribute to the financial performance of a company or the management of a company's market risk or the management of its liquidity risk?

The findings of the study are useful to a range of stakeholders such as shareholders, nomination committees, governments and policy-makers and a company itself. Investors will be assisted in selecting companies that are more likely to meet their return expectations and risk profiles, if they know which characteristic promotes the element(s) they are most concerned with. Nomination committees have been accused of only sourcing candidates from a very limited pool of contenders, namely their interpersonal networks, which generally leads to little or no board diversification (Perrault, 2015; Viviers, Mans-Kemp & Fawcett, 2017). This knowledge may give them the confidence to explore a wider range of candidates, with the assistance of recruitment agencies specialising in the recruitment of directors (Perrault, 2015). Government will be able to enforce its transformation objectives, such as the inclusion of black persons, where the required characteristics show a positive or neutral relationship to company performance and/ or risk management, or devise remedial programmes where the business case for a particular characteristic is poor. Policymakers will be able gauge whether their guidelines achieve the desired results and refine it accordingly. For example, do the board composition guidelines contained in King IV promote the performance

and risk management objectives stipulated by the report? Companies will be equipped to better justify their adherence or not to regulations, such as King IV, which requires an appropriate level of diversity on the board. This includes diversity in terms of field of knowledge, experience, age, race and gender (IoDSA, 2016).

1.2 PROBLEM STATEMENT

A significant number of studies have been conducted globally to investigate the possible relationship between various corporate governance elements, including some components of board composition and company performance (Brenner & Schwalbach, 2009; Deysel & Kruger, 2015; Florackis, Aguilera & Kim, 2016; Hillman & Dalziel, 2003; Nyirenda, 2010; Payne, Benson & Finegold, 2009; Semosa, 2012). However, a number of gaps have been identified in the existing literature.

Firstly, the majority of studies have produced inconclusive results or come to contradicting conclusions (Aguilera, 2005; De Andres, Azofra & Lopez, 2005; Fanto, Solan & Darley, 2011; Hillman & Dalziel, 2003) and have failed to provide a clear indication as to whether the board characteristics promoted by literature and regulations really contribute to the performance and risk management ability of a company as speculated by literature.

Secondly, the direct applicability of the findings from developed countries to developing countries, such as South Africa with its unique socio-economic dynamics, remains questionable and largely untested (Bhana, 2010; Mangena & Chamisa, 2008; Muchemwa, 2014; Ntim, 2013; Nyirenda, 2010; Rashid, De Zoysa, Lodh & Rudkin, 2010). This is highlighted, for instance, by the findings in literature, which indicate that the potential for increases in company value, as a result of good governance, is greater in developing economies than in mature economies. The reason is that the governance gap between companies that are governed well and those that are not is greater in developing countries (Scholtz & Kieviet, 2018a). In addition, the premium that institutional investors are willing to pay for good

governance vary noticeably between countries (Abdo & Fisher, 2007; Kakabadse & Korac-Kakabadse, 2002; Rossouw, Van der Watt & Malan, 2002).

Thirdly, research in South Africa regarding the connection between various elements of corporate governance, especially the various board characteristics, and company performance remains scarce (Deysel & Kruger, 2015; Mangena & Chamisa, 2008; Mans-Kemp, Erasmus & Viviers, 2016a; Mans-Kemp & Viviers, 2015; Ntim, 2015; Sayari & Marcum, 2018). Moreover, current research has mainly focused on corporate governance as an aggregated score through a scorecard approach. Only a small number of studies have considered the association of a select few board characteristics with company performance. Even though board composition is a component of corporate governance, the aim of this study is not to consider the impact of good governance on company performance, but to determine the association between the individual board characteristics. that make up a board's composition, and the performance and risk management ability of a company.

Fourthly, hardly any studies could be found which investigated the relationship between board characteristics and the risk, both internal and external, associated with a company, a shortcoming confirmed the literature (De Wet, 2012; Mans-Kemp, Erasmus & Viviers, 2017).

Fifthly, the vast majority of literature in this field, especially in South Africa, have focussed on testing for linear relationships between the various elements studied (Kirsten & Du Toit, 2018; Morris, 2018; Muchemwa, 2014; Muchemwa*, et al.*, 2016; Ntim, 2013; Ntim, 2015; Pandian*, et al.*, 2006; Scholtz & Kieviet, 2018a; Scholtz & Kieviet, 2018b; Scholtz & Smit, 2012; Semosa, 2012). This practice is increasingly questioned by social scientists (Basimov, 2019; Canarella & Nourayi, 2008; Lee, 2019; Paniagua*, et al.*, 2018; Rasoava, 2019).

Consequently, this study aims to redress the scarcity of South African research on this subject and address the gaps identified in literature. This is done by using binary logistic regression to determine which of the comprehensive list of board

characteristics have a significant association with the odds that a company's performance and a company's ability to manage risk ranks as a top performing company. Elements from both the external, or market risk, and internal risk of a company are considered.

1.3 PURPOSE STATEMENT

The study focused on the 13 largest sectors or subsectors on the JSE. Subsectors were selected where the sectors were large and contained a variety of companies that were subject to significantly different macroeconomic and industry-related factors to ensure that the selected groups were more homogeneous in terms of these factors. Henceforth, the references to sectors include both the selected sectors and subsectors.

The purpose of the study is to determine whether the various board characteristic promoted by regulation and literature actually contribute to a company's success as claimed by literature. This was achieved by using binary logistic regression to determine the associations between the board characteristics and the financial performance and risk management measures, which social scientists do not expect to be linear relationships. In addition, the study focuses on the South African market with its unique socio-economic background. The study also aimed to find a more robust measure of diversity within characteristics, such as age diversity and experience diversity.

As mentioned in Section 1.1 company value creation is a wide and complex matter, which cannot possibly be condensed into a single measure. The various disciplines and elements that make up the value creation process of the company, each require different skills, experience and knowledge. Just as the workforce of any company constitutes many different types of people, each with different skillsets, backgrounds and knowledge to execute the various functions of a company, so too does the board require different characteristics to execute all its functions (Arzubiaga*, et al.*, 2018; Bhagat & Black, 1999; Ferreira, 2010). It is therefore imprudent to look for a "one-size-fits-all" answer when it comes to board

composition to meet certain requirements. In fact, the board composition of a company requires constant revision as the needs, goals and strategy of the company change. This study therefore aimed to determine which board characteristics contributed to each of the following measures, which represent different disciplines or areas of focus within a company:

- from a company's financial performance perspective (level of performance), the total return to shareholders;
- from a market risk point of view (the volatility of a company's performance), the extent to which a company is able to manage shareholder risk as measured by the volatility in the share price movement of a company;
- from an overall investment perspective, the risk-adjusted investment performance of a company as measured by the Sharpe ratio; and
- from a company's internal risk management perspective, the extent to which a company is able to manage the risks inherent to the operation of a company as measured by the liquidity ratio and the cash conversion cycle of a company (both relates to the liquidity risk of a company, which is a subset of the overall internal risk).

Even though the selected performance categories mainly focus on issues of interest to the investors as stakeholders of a company, the results will also be useful to other stakeholders such as employees and creditors. The interests of all stakeholders are generally served only when a company is able to deliver a stable and sustainable financial performance and adequately manages its risks.

1.4 SIGNIFICANCE OF THE STUDY

The study makes a unique contribution to the field of corporate decision-making through empirical research. The study investigated, within a South African context, whether a relationship exists between various board characteristics and a company's performance, in terms of adding value to shareholders and managing shareholder and company risk. This is done by determining which board characteristics have a statistically significant association with the financial and risk

management performance of companies, whether positive or negative. The contributions of the study are manifold.

First, the study used binary logistic regression to determine the association between the board characteristics and the odds of a company being categorised as a top performer, as opposed to testing for linear relationships as most studies in the past have done. This was prompted by mounting criticism from social scientists against the expectation to find linear relationships between corporate governance components, including elements of board composition and company performance. Linear regression and correlation analysis were only used to test the validity of this view.

Second, the study provides a South African focus. The importance of a South African perspective is that a number of board characteristics have added nuances to it than are encountered in most other countries. For example, South Africa is one of the world's most ethnically diverse countries, in terms of culture, language and race. Ethnic diversity is further overlaid by the aftermath of apartheid and government's effort to bring about transformation (Ntim, 2015; Scholtz & Kieviet, 2018b). A significant number of studies have been conducted globally to investigate the possible relationship between numerous board characteristics and various elements of company performance. Not only have these studies produced inconclusive or contradicting findings, but they have mainly focused on developed countries and the applicability of the findings to the South African context remains debateable and unproven (Muchemwa, 2014; Nyirenda, 2010; Rashid*, et al.*, 2010).

Third, the study expanded the number of board characteristics assessed by considering a comprehensive list of board characteristics. Many research studies typically assess the impact of corporate governance by developing an overall corporate governance score or index for each company, which typically looks at the combined impact of a range of board characteristics and functions. Through rigorous inferential statistical analyses, the study contributes to the understanding of the relationship between each of the board characteristics and the respective performance and risk management measures. Studies that do consider individual

board characteristics, especially in South Africa, focussed on a small number of characteristics as shown in Table 1-1. Table 1-1 reflects the time frames, board characteristics and performance measures used in previous South African studies.

Table 1-1: Elements included in previous South African studies

Author ***Time frame covered***	**Characteristic/ Independent variable**	**Performance measure/ Dependent variable**
Mangena and Chamisa (2008) *1999 - 2005*	Board size, percentage of NEDs, CEO/ chairman duality, audit committee presence, directors' share ownership, block-share ownership	Listing suspensions
De Wet (2012) *2006 - 2010*	Return on assets (ROA), ROE, economic value-added (EVA), market value-added (MVA), weighted average cost of capital (WACC)	Executive compensation
Scholtz and Smit (2012) *2003 - 2010*	Total assets, turnover, earnings before interest, tax, depreciation and amortisation (EBITDA), share price	Short-term executive remuneration
Semosa (2012) *2002 - 2011*	Board size, percentage of independent NEDs, NEDs with industry experience	ROA, total assets, Tobin's Q, ROE, EVA
Ntim (2013) *2002 - 2007*	Corporate governance index	Tobin's Q
Chiranga and Chiwira (2014) *2006 - 2012*	Number of board seats (overboardedness)	Current ratio, debt:equity ratio, earnings per share (EPS), ROE, ROA, price earnings ratio
Muchemwa (2014) *2006 - 2012*	Percentage of independent NEDs, board size	ROA, total assets, Tobin's Q, ROE
Deysel and Kruger (2015) *2006 - 2012*	Chief executive remuneration	Headline earnings per share (HEPS), ROE, EBITDA, share price
Mans-Kemp and Viviers (2015) *2002 - 2012*	Gender diversity, race diversity	Net profit margin, ROE, ROA, EPS, total shareholder return, MVA, dividend yield
Ntim (2015) *2002 - 2007*	Ethnic diversity, gender diversity, percentage of black women	ROA, Tobin's Q, total shareholder return

Table 1 1: Elements included in previous South African studies (continued)

Author ***Time frame covered***	**Characteristic/ Independent variable**	**Performance measure/ Dependent variable**
Muchemwa*, et al.* (2016) *2006 - 2012*	Board size, percentage of NEDs	ROA, total assets, Tobin's Q, ROE
Mans-Kemp*, et al.* (2016a) *2002 - 2010*	Corporate governance score	
Mans-Kemp*, et al.* (2017) *2002 - 2010*	Corporate governance score	Risk-adjusted return, ROA, ROE, EPS, total shareholder return
Viviers*, et al.* (2017)	Promotion of gender diversity	
Kirsten and Du Toit (2018) *2006 - 2015*	ROA, ROE, EPS, turnover, price per share	Total executive director remuneration
Scholtz and Kieviet (2018a) *2013 - 2015*	Board size, percentage of NEDs, percentage of independent NEDs	ROA, Tobin's Q
Scholtz and Kieviet (2018b) *2013 - 2015*	Gender diversity, ethnic diversity, directors with business qualification, board size	HEPS, ROE, ROA, Tobin's Q
Rasoava (2019) *2005 - 2016*	ROE, ROA, market return	CEO and director pay

Fourth, the study introduced novel approaches to assessing diversity. For a number of categorical variables, the study employed the formulae for biodiversity, used in biological sciences, to establish diversity. In turn, for a number of numerical variables, the study used standard deviation to ascertain diversity.

Fifth, the study considered the risk attached to company performance. The study used annualised standard deviation of daily share price movements to calculate the share price volatility, which is used as a proxy for the risk related to a company's performance (Mathew, Ibrahim & Archbold, 2018; Sayari & Marcum, 2018). No South African- based study in this field considering the riskiness of a company's performance by using share price volatility has been found.

Sixth, the study contemplated the internal risk management of companies. Boards are increasingly held responsible for managing company risks (Barlow, 2016). King IV stipulates that, as part of its oversight function, the board needs to be watchful

of the liquidity and solvency of a company and its status as a going concern. Liu, Xu, Yang and Zhang (2017) describe *liquidity* as being of the utmost importance to a company's strategy. As far as could be established, limited research has been conducted on the relationship between board characteristics or corporate governance and the internal risk management ability of a company. This study uses the current ratio and the cash conversion cycle to measure a company's ability to control operational risk.

In conclusion, while making an academic contribution, the findings of this study also have the following practical applications for a range of interested parties:

- providing companies with a business case to implement changes required by government's transformation initiatives and to adhere to the applicable regulations, such as achieving the required diversity in terms of field of knowledge, experience, age, race and gender, within its board;
- assisting policy-makers in assessing the effectiveness of the regulations imposed, in other words do the characteristics proposed in the various regulations make a real contribution to the performance and risk management ability of a company;
- assisting boards in the development of their succession plans. If board members and other stakeholders know which characteristics have a positive association with a specific area of concern or focus, they would be able to search for and develop candidates with the particular characteristics; and
- assisting nomination committees in identifying more diverse pools of candidates to target for appointment to the boards. If characteristics are known that will benefit a company or at least not harm a company these groups of candidates could be included in the recruitment process, such academics or younger candidates.

1.5 RESEARCH QUESTIONS AND HYPOTHESES

The study sought to answer the following research questions to achieve the primary goal as set out in its purpose statement. The research questions are answered

through the testing of the research hypotheses, which are derived from the research questions. The research questions and hypotheses include elements identified in the detailed literature review.

1.5.1 Research questions

The following research questions are derived from the problem statement and purpose statement provided in the preceding sections:

Research Question 1: Is there a relationship between board characteristics and the total return to shareholders of companies in South Africa, listed in the 13 largest sectors of the JSE, over the period 2009 to 2015?

Research Question 2: Is there a relationship between board characteristics and the share price volatility of companies in South Africa, listed in the 13 largest sectors of the JSE, over the period 2009 to 2015?

Research Question 3: Is there a relationship between board characteristics and the risk-adjusted market performance of companies in South Africa, listed in the 13 largest sectors of the JSE, over the period 2009 to 2015?

Research Question 4: Is there a relationship between board characteristics and the ability of companies in South Africa, listed in the 13 largest sectors of the JSE, to manage liquidity risk, over the period 2009 to 2015?

1.5.2 Research hypotheses

Five pairs of research hypotheses were formulated from the research questions in the foregoing section, which will be tested through the statistical analysis described in Chapters 5 and 6.

Due to the intricate nature of a company's value creation process, only using financial performance is not sufficient to measure the success of this process

(IoDSA, 2016). Long-term sustainable value creation requires the productive management of all company resources and risks (Labrey, 2015). Consequently, five different measures were identified from literature and regulations, covering some of the key elements of this process. The first measure is shareholder return, a market-based measure of the level of financial performance of a company (Abrams, Cohen & Suzman, 2006; Burgman & Van Clieaf, 2012; Mans-Kemp & Viviers, 2015). The second is share price volatility, which is an indication of the market risk faced by a company and a market-based measure of the riskiness of a company's performance (Farmer, Archbold & Alexandrou, 2013; Jemison, 1987; Koorts & Smit, 2002; Mathew*, et al.*, 2018). The third is the risk-adjusted return of a company, as measured by the Sharpe ratio, which is a market-based measure of a company's performance per unit of risk that literature feels provides better longer-term prediction ability than pure returns alone (Berkelaar, Coche & Nyholm, 2010; Castano & Del Campo, 2018; Elton, Gruber & Blake, 1996; Hodoshima, 2018). The fourth is the current ratio, which represents an element of a company's internal risk, namely liquidity risk. This is a balance sheet-based measure which provides an indication of a company's ability to manage its liquidity risk (Fleming, 1986; Richards & Laughlin, 1980; Tauringana & Clarke, 2000). The fifth is the cash conversion cycle, which represents a different angle on the ability of a company to manage its liquidity risk. This is an activity-based measure and the management of the components of this measure is expected to require different skills and experience than the current ratio (Cagle, Campbell & Jones, 2013; John, 2001; Lyroudi & McCarty, 1993; Zeidan & Shapir, 2017).

Based on the views and recommendations from literature and regulations that several board characteristics are anticipated to have some form of association with these value creation components, 19 characteristics were identified. Since literature has not been able to find conclusive empirical evidence of these associations it would not be prudent to eliminate any of these characteristics from each of the initial regression models. The absence of a clear indication of an association between any of the characteristics and the five measures may be the result of the fact that the majority of the relationships have not been analysed to date. Also, studies that have considered some of these relationships found either conflicting or inconclusive

results (Dah, Jizi & Sbeity, 2018; Fahlenbrach, Low & Stulz, 2017; Mans-Kemp & Viviers, 2015; Paniagua*, et al.*, 2018; Viviers*, et al.*, 2017). Furthermore, the bulk of these studies were performed in developed countries and the findings may not be transferable to the South African market (Bhana, 2010; Mangena & Chamisa, 2008; Muchemwa, 2014; Ntim, 2013; Nyirenda, 2010; Rashid*, et al.*, 2010). Moreover, most of the research in this area focussed on finding linear relationships, which is frowned upon by social scientists (Basimov, 2019; Kirsten & Du Toit, 2018; Lee, 2019; Morris, 2018; Muchemwa*, et al.*, 2016; Paniagua*, et al.*, 2018; Rasoava, 2019; Scholtz & Kieviet, 2018a; Scholtz & Kieviet, 2018b).

Consequently, the five research hypotheses below were developed. In addition, a statistical hypothesis was developed for each dependent/ independent variable combination as recorded in Section 1.5.3 from these research hypotheses. These statistical hypotheses also provide indications of the expected directionality of the relationships. As a result, all the characteristics were included in each of the five initial regression models in Section 6.3.3. These models were each optimised to distil the final list of characteristics for each performance and risk management measure into a final refined regression model. From these five best fit models the statistically significant characteristics were determined for each dependent variable.

H_{aA} There is a relationship in the expected direction between each of the board characteristics and the odds of companies being classified as top performing companies based on the return to shareholders of companies in South Africa, listed in the 13 largest sectors of the JSE, over the period 2009 to 2015.

H_{aB} There is a relationship in the expected direction between each of the board characteristics and the odds of companies being classified as top performing companies based on the share price volatility of companies in South Africa, listed in the 13 largest sectors of the JSE, over the period 2009 to 2015.

H_{aC} There is a relationship in the expected direction between each of the board characteristics and the odds of companies being classified as top performing companies based on the risk-adjusted return of companies in South Africa, listed in the 13 largest sectors of the JSE, over the period 2009 to 2015.

$H_{aD:}$ There is a relationship in the expected direction between each of the board characteristics and the odds of companies being classified as top performing companies based on the ability of companies in South Africa, listed in the 13 largest sectors of the JSE, to manage their current ratio, over the period 2009 to 2015.

H_{aE} There is a relationship in the expected direction between each of the board characteristics and the odds of companies being classified as top performing companies based on the ability of companies in South Africa, listed in the 13 largest sectors of the JSE, to manage their cash conversion cycle, over the period 2009 to 2015.

1.5.3 Statistical hypotheses

To test the overall research hypotheses listed in the previous section the following statistical hypotheses were formulated based on the literature research:

Table 1-2: Statistical hypotheses

Table 1-2 shows the alternative statistical hypotheses with directionality. A grid reference system is used to label the hypotheses. For example, the first alternative hypothesis is $H_{aA1:}$ There is a negative relationship between board size and the odds that a company is ranked as a top performing company based on its shareholder return.
The null hypotheses will be as follows: If the alternative hypothesis indicates a positive relationship, the null hypothesis expects a negative relationship or no relationship. If the alternative hypothesis indicates a negative relationship the null hypothesis expects a positive relationship or no relationship. If the alternative hypothesis indicates a non-directional relationship the null hypothesis expects that no relationship exists. The notation use for null hypotheses is H_{0A1} for example.

			A	B	C	D	E
	Code[1]	**Variable**	**Shareholder Return**	**Volatility**	**Sharpe ratio**	**Current Ratio**	**CCC[2]**
1	BS	Board size (Section 4.2.1)	Negative	Non directional[3]	Negative	Negative	Positive
Independence							
2	PN	% NEDs (Section 4.2.4)	Positive	Positive	Positive	Positive	Negative
3	PI	% Independent NEDs (Section 4.2.4)	Positive	Positive	Positive	Positive	Negative
Attributes							
4	PB	% Black persons (Section 4.2.2)	Negative	Positive	Negative	Negative	Positive
5	PF	% Females (Section 4.2.3)	Negative	Positive	Negative	Positive	Negative
6	PS	% South Africans (Section 4.2.6.5)	Negative	Positive	Negative	Positive	Negative

Table 1 2: Statistical hypotheses (continued)

	Code[1]	Variable	A Shareholder Return	B Volatility	C Sharpe ratio	D Current Ratio	E CCC[2]
Remuneration							
7	RC	Relative CEO remuneration movement (Section 3.4.2)	Negative	Negative	Negative	Positive	Negative
8	PG	Payment gap (Section 3.4.1)	Non directional	Non directional	Non directional	Non directional	Non directional
9	CR	Chairman remuneration as a percentage of CEO guaranteed remuneration (Section 4.2.5)	Positive	Positive	Positive	Negative	Positive
10	NR	Average other NED remuneration as a percentage of CEO guaranteed remuneration (Section 4.2.5)	Positive	Positive	Positive	Negative	Positive
Time based							
11	AA	Average age (Section 4.2.6.4)	Negative	Positive	Negative	Positive	Negative
12	AD	Age diversity (Section 4.2.6.4)	Positive	Positive	Positive	Positive	Negative
13	DT	Diversity of tenure (Section 4.2.6.3)	Positive	Positive	Positive	Positive	Positive
Background							
14	AF	Academic diversity (per field) (Section 4.2.6.1)	Positive	Positive	Positive	Negative	Positive
15	DP	Diversity of professional experience (Section 4.2.6.2)	Positive	Positive	Positive	Negative	Positive
Education							
16	AT	Academic diversity (qualification type) (Section 4.2.6.1)	Negative	Positive	Negative	Positive	Negative
17	EL	Relative education level of board (Section 4.2.6.1)	Positive	Positive	Positive	Positive	Positive
Experience							
18	BE	Average board experience (Section 4.2.6.6)	Positive	Positive	Positive	Positive	Positive
19	ED	Diversity of board experience (Section 4.2.6.6)	Positive	Positive	Positive	Positive	Positive

[1] The code indicates the abbreviation used for each board characteristic in the various regression models in Chapter 6.

[2] Cash conversion cycle

[3] No prediction is made as to the direction of the relationship

1.6 RESEARCH METHOD

This section provides a high-level overview of the research method and sample selection. These elements are discussed in detail in Chapter 5.

1.6.1 Description of the research design

The study is mainly based on a positivistic research paradigm in that the study was conducted independent of the researcher's experience (Welman & Kruger, 1999). However, the results and conclusions are determined bearing in mind the validity of elements of the post-positivistic and critical theory, which respectively dictate that the various relationships cannot be perfectly measured and that the results are also a function of the various frameworks (for example, political or ethnic) within which the companies operate (Creswell, 2007; Ponterotto, 2005).

The study qualifies as basic and empirical research due to its general application using data that is verifiable through observation (Hale, 2015; Zikmund, 2013). Moreover, the study employed quantitative research to formulate its findings (Garbarino & Holland, 2009). The study used non-experimental data with all data being obtained from secondary sources such as online searches and accounting reports (Emory & Cooper, 1991), leaving the researcher with no ability to control any part of the data (Zikmund, 2013).

1.6.2 Population and sample

The population from which the sample was obtained constitutes all the companies listed on the JSE. The sample selected is all companies listed in the 13 largest sectors on the main board of the JSE (as measured by the number of companies in the sector) for the period 2009 to 2015. The period commences post the 2007 - 2008 crisis to eliminate abnormalities that may have been prevalent during that period. Furthermore, it covers a seven-year period, which is recommended by literature to eliminate some of the macroeconomic factors that may be included in financial performance indicators (Deysel & Kruger, 2015).

The sample includes 181 companies, which provides a coverage of about 58% of the 313 companies listed on the JSE, as per the Business Report section of the Star newspaper (a local daily newspaper) of 29 April 2016. To qualify for inclusion, a company had to be listed during at least one of the years under review, thereby

including companies that were suspended or delisted. This is to avoid survivor bias in the sample (Shugan, 2007).

1.6.3 Analysis technique and study variables

Binary logistic regression was used to determine the board characteristics that have a statistically significant association with the odds that a company is categorised as a top performer based on the various performance and risk management measures (Mensah, 2008; Tranmer & Elliot, 2008).The dependent variables that the study used are total shareholder return (Section 5.5.1.1), share price volatility (Section 5.5.1.2), Sharpe ratio (Section 5.5.1.3), current ratio (Section 5.5.1.4) and the cash conversion cycle (Section 5.5.1.5). To create the two categories for each variable, that is the top-performing companies and bottom-performing companies, the performance and risk management measures are first calculated relative to the sector within which a company operated. The relative measures are then compared across the sample to determine which companies emerge as top- and bottom-performing companies. To ensure that a clear distinction is made between the two groups, only companies that performed in the top quartile and bottom quartile of companies are considered. The use of relative measures is supported by a number of studies (Erasmus, 2008; McDonald, Khanna & Westphal, 2008). The use of industry-adjusted dependent variables serves to remove industry-related factors when analysing the performance of the individual companies and these variables are often used in financial research (Brown & Caylor, 2006; Cremers & Nair, 2005; Giroud & Mueller, 2011; Gompers, Ishii & Metrick, 2003; Johnson, Moorman & Sorescu, 2009). Based on the literature review, the following board characteristics are considered for each of the statistical hypotheses:

Table 1-3: Independent variables

Variable	Calculation
Board size (Section 4.2.1)	Number of directors at the financial year end (Section 5.5.2.1).
Independence	
Percentage of NEDs (Section 4.2.4)	Percentage of directors that are classified as NEDs (Section 5.5.2.4).
Percentage of independent NEDs (Section 4.2.4)	Percentage of NEDs classified as independent (Section 5.5.2.5).
Attributes	
Ethnic diversity (Section 4.2.2)	Percentage black persons (as defined the Broad-Based Black Economic Empowerment Amendment Act (46 of 2013) on the board (Section 5.5.2.3).
Gender diversity (Section 4.2.3)	Percentage females on the board (Section 5.5.2.2).
Percentage of South Africans (Section 4.2.6.5)	Percentage directors classified as South African citizens (Section 5.5.2.21).
Remuneration	
Relative CEO remuneration movement (Section 3.4.2)	Percentage movement in total CEO remuneration from year to year expressed relative to the shareholder return in the same period (Section 5.5.2.6).
Payment gap (Section 3.4.1)	Payment gap is calculated by expressing the CEO's total remuneration as a multiple of the average employee's salary (Section 5.5.2.7).
Chairman remuneration as a percentage of CEO guaranteed remuneration (Section 4.2.5)	Chairman's relative remuneration is calculated by expressing it as a percentage of the CEO's guaranteed remuneration (Section 5.5.2.8).
Average other NED remuneration as a percentage of CEO guaranteed remuneration (Section 4.2.5)	Average remuneration of the NEDs (excluding the chairman) is expressed as a percentage of the CEO's guaranteed remuneration (Section 5.5.2.9).
Time based	
Average age (Section 4.2.6.4)	Average age of the directors for a specific year (Section 5.5.2.15).
Age diversity (Section 4.2.6.4)	Standard deviation of the ages of directors for a specific financial year. The higher the standard deviation, the higher the diversity of age (Section 5.5.2.16).
Diversity of tenure (Section 4.2.6.3)	Standard deviation of the tenures of the board members. The higher the standard deviation, the higher the diversity of tenure (Section 5.5.2.18).
Background	
Academic diversity (per field) (Section 4.2.6.1)	Director education is divided into 4 categories, namely financial, legal, technical and social. The Simpson diversity index formula is used to determine the diversity of fields of education. (Section 5.5.2.13)
Diversity of professional experience (Section 4.2.6.2)	Director experience is divided into 7 categories, for example financial, legal and industry related technical. The Simpson diversity index formula is used to determine the diversity of experience (Section 5.5.2.14).

Table 1 3: Independent variables (continued)

Variable	Calculation
Education	
Academic diversity (qualification type) (Section 4.2.6.1)	Director education is divided into 7 categories, for example bachelor's degree, master's degree and no tertiary education. The Simpson diversity index formula is used to determine the diversity of education (Section 5.5.2.12).
Relative education level of board (Section 4.2.6.1)Age diversity	Each qualification of the directors is rated according to the South African Qualification Authority's NQF (National Qualifications Framework) rating system. The academic qualification level of the board is calculated as the weighted average of the NQF ratings (Section 5.5.2.10).Standard deviation of the ages of directors for a specific financial year. The higher the standard deviation, the higher the diversity of age.
Experience	
Average board experience (Section 4.2.6.6)	Board experience is recorded as a 1 if the director has no other experience, a 2 if their experience includes up to two other boards and a 3 if they have experience of 3 and more other boards. The average of the categories of all board members is determined. The higher the average the greater the board's experience (Section 5.5.2.19).
Diversity of board experience (Section 4.2.6.6)	As before the experience is divided into three categories. Diversity is determined by calculating the standard deviation of the experience categories of the board members (Section 5.5.2.20).

1.7 DELIMITATIONS AND ASSUMPTIONS

This study aims to determine whether there is an association between board characteristics and a company's performance and risk management. The performance and risk management measures investigated are limited to five measures, which emerged from the literature review. These criteria are total shareholder return, the share price movement volatility, the risk-adjusted return, the current ratio and the cash conversion cycle of the companies selected. The study does not claim that these factors are able to fully measure a company's value creation ability or even its performance and risk management ability or that the selected factors are only associated with the board characteristics observed. The performance of a company, the risk associated with the performance and the internal risk management of a company are complex and interrelated concepts with many market, political and socio-economic factors having an impact, some of which are influenced by a company's board and some that are totally outside the control of management or the board. Although there is no consensus among researchers on the most accurate measure of company performance or company risk, the measures used in this study are considered valid, and have been used in previous

studies and are advocated by the literature (Cagle*, et al.*, 2013; Da Costa, 2014; Fleming, 1986; Hörnmark, 2015; Mans-Kemp*, et al.*, 2017; Mans-Kemp & Viviers, 2015; Mathew*, et al.*, 2018; Perryman, Fernando & Tripathy, 2016; Simpson, 2013; Zeidan & Shapir, 2017).

Even though a reasonable coverage of the JSE is achieved by the sample, care should be taken when attempting to extrapolate the findings across the full spectrum of companies listed in South Africa. In terms of the board characteristics, this study does not look into the motives behind the appointment or non-appointment of board members with certain characteristics; for example, discriminating barriers against certain characteristics, unavailability of suitable individuals with specific characteristics, affirmative action, tokenism and mandatory quotas (Mans-Kemp & Viviers, 2015; Mathur-Helm, 2006; Nyirenda, 2010).

1.8 OUTLINE OF THE THESIS

Following on from this chapter, the rest of the study follows the format set out below.

Chapter 2 contains a literature review of the importance of corporate governance and why the emphasis on good governance has increased over the past few decades. The chapter explores the development of corporate governance in the United States and the United Kingdom as well as the development of corporate governance in South Africa over the past two to three decades. Next the chapter investigates the corporate governance theories that have emerged over the years to describe the interaction between a company and its various stakeholders and to describe the behaviour of the board and the various roles the boards are expected to play.

Chapter 3 investigates the governance issues and demands faced by companies operating in South Africa. The chapter provides an overview of studies undertaken around the world and in South Africa, focusing on the issues pertinent to the South African environment. This chapter also commences the development of the statistical hypotheses.

Chapter 4 reviews the literature on the possible association between board composition and company performance and risk management from South Africa and around the globe. The chapter explores the various board characteristics considered in the literature and gives an overview of the findings regarding the potential association between these characteristics and company performance. This informs the development of the statistical hypotheses, the bulk of which is contained in in this chapter. The chapter further considers the various measures recommended by the literature to measure company performance and risk management.

Chapter 5 describes the research method and research design. The chapter further provides an overview of the data required and the processing necessary to develop the variables used in the final analyses. Moreover, the chapter provides an indication of the source of the data, the collection methods employed and the data analysis techniques used.

Chapter 6 provides the descriptive statistics for all the data used in the linear and binary logistic analyses. The chapter further depicts the initial regression models for each identified performance and risk management measure and describes how these were refined to arrive at the best fitting regression models. The chapter also reports the results of the data analyses and indicates the acceptance or rejection of each statistical hypothesis to establish whether the research hypotheses can be supported or not.

Chapter 7 summarises the conclusions reached in the study. It sets out the process followed to develop the hypotheses, to determine the initial and best fit regression models and why binary logistic regression is used for the analyses. The chapter summarises the main findings from the literature review and the analyses. It further provides the possible impact of the conclusions, the study's contribution to the body of knowledge, as well as the limitations of the study and potential future research areas.

CHAPTER 2: IMPORTANCE AND DEVELOPMENT OF CORPORATE GOVERNANCE AND CORPORATE GOVERNANCE THEORIES

2.1 INTRODUCTION AND BACKGROUND

Over the last few decades, corporate governance has moved into the spotlight both from an academic and industry point of view, mainly due to organisational delinquency of management (Aguilera, Desender, Bednar & Lee, 2015). The financial scandals in the 1980s and 1990s reignited debate on the most appropriate mechanisms for improving board efficacy. However, Aguilera (2005) points out that corporate failures are not the only reason for the increase in corporate governance reforms. As an example, reform may be fuelled by the escalation in investor activism and rising pressure on companies to increase their social responsibility. Bebchuk, Cohen and Hirst (2017) point out that in 1950, institutional investors accounted for only 6.1% of shareholding in the United States, while this figure has since increased to about 63% in 2016. This increase in concentrated shareholding improved shareholders' ability to more effectively monitor management.

Choudhury and Petrin (2018) state that, while corporate governance initially served to reduce the agency cost between the interests of shareholders and management, it has recently been employed as a tool to promote public responsibility by companies. For example, in the United Kingdom, the previous Prime Minister, Theresa May, commissioned a review to develop policies to ensure a "fairer economy" (Choudhury & Petrin, 2018, p. 382), which included aspects such as the reduction of wealth inequality and improving equality in the labour force through greater board diversity.

Corporate governance is a complex and interwoven system of relationships and mechanisms explain Börsch-Supan and Köke (2002) and Aguilera*, et al.* (2015). This complexity renders the task of directors equally multifaceted, according to Mans-Kemp*, et al.* (2018a). The aim of these systems and mechanisms is to regulate the roles, responsibilities and interactions of the various role players in a

company, which include both internal and external stakeholders of a company (Garas & ElMassah, 2018).

Over the years, a number of theories on the governance of companies have evolved to describe the interaction between the board, company and its shareholders; for example, stakeholder theory, stewardship theory, social contract theory and legitimacy theory (Hung, 1998; Kiel & Nicholson, 2002; Young & Roberts, 2008; Yusoff & Alhaji, 2012). However, the two most influential and widely lauded theories that observe the association between the board and the performance of a company and its management are agency theory and resource dependency theory (Bhana, 2010; Chari, David, Duru & Zhao, 2018; De Andres*, et al.*, 2005; Hillman & Dalziel, 2003; Maestrini, Luzzini, Caniato & Ronchi, 2018; Young & Roberts, 2008).

The chapter consists of a literature review and commences by considering the importance of corporate governance. The chapter then provides an overview of corporate governance developments in the United Kingdom and United States, as the most prominent influences on South Africa's corporate governance development, as well as the development of South Africa's regulations. The chapter concludes by giving a high-level overview of each of the corporate governance theories and some of the findings from previous research to highlight how company behaviour and the characteristics of company boards are influenced by the interaction between various role players.

2.2 IMPORTANCE OF CORPORATE GOVERNANCE

Mans-Kemp*, et al.* (2017, p. 34) define *corporate governance* as "the system by which companies are directed and controlled". According to Shleifer and Vishny (1997, p. 737), "corporate governance is of enormous practical importance". Increased global competition and affiliations have caused shareholders to increasingly demand improved shareholder return through improved governance in the boardroom, in mature and developing markets alike (Kakabadse & Korac-Kakabadse, 2002). Muchemwa*, et al.* (2016) declare that when a company is well governed, its performance inevitably improves. As Chiranga and Chiwira (2014)

contend, an effectively functioning board is one of the key requirements for a company to deliver superior performance. (Mans-Kemp*, et al.*, 2018b) add that it is the directors' duty to determine a company's strategy and to make sure that management implement this strategy.

Good governance improves an organisation's economic efficiency and competitiveness, whether it is a state-owned enterprise (SOE) or a public company (Organisation for Economic Co-operation and Development [OECD], 2015). Garas and ElMassah (2018) argue that, over time, a wider definition of *corporate governance* has developed, namely that companies are managed with the aim to optimise the efficient and effective use of societal resources. Licht (2002) and Florackis*, et al.* (2016) explain that the reforms in terms of the social responsibility of a company can be achieved by ensuring that the rights of all stakeholders are considered and protected. These stakeholders may include staff, creditors, taxpayers, the environment and the community. For example, corporate governance encompasses the ways in which providers of funds reassure themselves that they will obtain a return on their investments. In other words to make sure that management invests in reasonable projects or that management does not fraudulently use the funds for their own benefit, according to Shleifer and Vishny (1997), Mans-Kemp*, et al.* (2017) and Subramanian (2018). However, Mans-Kemp*, et al.* (2017) state that many investors see corporate governance as an unnecessary cost, which jeopardises a company's ability to pursue lucrative opportunities. However, they warn that investors need to realise that poor corporate governance implementation increases the risk exposure of companies and their investors, which may lead to reduced investment returns over the long term. This concurs with the point raised by Bhunia (2013) and Lundqvist (2015), namely that poor governance could lead to a company's failure to manage its liquidity, which could lead to inadequate financial performance and a company's ability to seize growth opportunities.

All around the world, companies obtain large amounts of funds on a daily basis, which are allocated at the discretion of management (Shleifer & Vishny, 1997). It is not intuitively clear what causes investors to entrust their funds to a company and

how they can be sure that they will get anything back, much less receive an acceptable return on their investment. They also point out that the providers of these funds in fact often do not have the skills or experience to assist management once the funds have changed hands. Grossman and Van Huyck (1988) claim that the providers of funding largely rely on management's realisation that they need to build a *trustworthy reputation* to ensure that the company will continue to have access to the necessary funding to ensure the liquidity and solvency of the company (IoDSA, 2016). Worrall (1988) states that in the absence of some form of legal recourse, finance providers may only be able to revert to the withdrawal of future financing. Even in the absence of a proper corporate governance regime, management can provide an implicit guarantee through constant, reliable conduct that they will endeavour to use the funds entrusted to them responsibly (Gomes, 2000). Poor governance is considered to be one of the main factors that create an environment where companies struggle to obtain external funds (Shleifer & Vishny, 1997). Bhana (2010) similarly reports that companies demonstrating good governance generally find it easier to attract funding, and at much lower cost. Boycko, Shleifer, Vishny, Fischer and Sachs (1993) and Pagano, Panetta and Zingales (1998) hold similar views by respectively reporting that, due to underdeveloped governance policies, Italian companies find it more difficult to win investors' trust and that the weak governance mechanism prevalent in Russia has led to the virtual non-existence of external capital and low company valuations.

De Long, Schleifer, Summers and Waldman (1989) speculate that a second reason for investors to make funding available to companies is investors' expectation of a company. However, this expectation may be either realistic or over-optimistic, warn De Long*, et al.* (1989). Unrealistic expectations could be fuelled by investors' misreading of company performance and risk signals, management's efforts to paint a rosier picture than what is actually the case, or short-term market noise that causes a hype among investors (Ritter, 1991).

Kakabadse and Korac-Kakabadse (2002) explain that good governance defines what is acceptable behaviour for companies, and the communities within which they operate, that creates an environment conducive to value-creating opportunities.

Good governance resolves a number of the challenges faced by companies. For example, clear lines of responsibility may prevent efficiency losses through improved transparency and accountability. This improved transparency and accountability, in turn, may inspire staff and management to act in the best interests of the shareholders, rather than their own self-interest, often to the demise of the company (OECD, 2015). Good corporate governance is what "forces management to internalise the welfare of stakeholders", assert Aguilera*, et al.* (2015, p. 484).

Rossouw*, et al.* (2002) point out that the King Reports highlighted that the board of directors is responsible for good corporate governance within listed entities. Gibbs (1993) also holds the same view regarding the responsibility of the board as the highest managing group of a company, by explaining that because the ownership of a company is usually spread over a large shareholder base, it becomes impractical for individual shareholders to be directly involved in the monitoring of management. Therefore, it is up to the board of directors to make sure that the interests of top management are aligned with those of the shareholders, which ultimately should translate into sustained, market-related returns (Deysel & Kruger, 2015; Ferreira, 2010; Rossouw*, et al.*, 2002; Wu, 2009). This separation of the ownership and management of a company and the alignment of shareholder and management interests are the basis of agency theory (Berle & Means, 2009), which is discussed in more detail in Section 2.5.1.

Licht (2002) perceives corporate governance as the rules and structures to direct and control the exercising of power over the interests of other parties. These rules and structures are based on economic and legal conventions that can be amended through political processes (Shleifer & Vishny, 1997). Aguilera*, et al.* (2015) see the function of corporate governance as even wider and provide four essential goals of corporate governance. Corporate governance must do the following:

- protect and enforce shareholders' rights by holding management accountable through monitoring;
- referee the relationship between the various stakeholders, internal and external to a company;

- provide transparency by ensuring proper distribution of required information; and
- provide guidance to a company in terms of policy and moral principles.

These elements should ensure effective corporate governance, which, in turn, underlies the success of the business in maintaining healthy stakeholder interaction and maintainable economic prosperity.

However, literature speculates that there may not be a need to actively review and transform corporate governance. This is because normal market forces, such as market competition, would automatically compel management to be more cost effective and adhere to rules, including corporate governance, according to Stigler (1958), Alchian and Demsetz (1972), Chou, Ng, Sibilkov and Wang (2011) and Ammann, Oesch and Schmid (2013). For example, as part of their focus on cost minimisation, management aims to obtain the most cost-efficient financing, which, as discussed earlier, is to a large degree influenced by a company's adherence to good governance. Chou*, et al.* (2011) believe that a competitive market is a strong force to align the objectives of management and shareholders, as described by agency theory. It forces management to improve performance and decision-making, since failing to do so may lead to corporate failure and job losses. Ammann*, et al.* (2013) argue that competition may serve as a substitute for corporate governance, as it compels management to increase company value.

Bauer, Guenster and Otten (2004) report that a fair number of European institutional investors rate corporate governance issues above a company's financial issues and these institutional investors are willing to pay a premium for a company that implements good corporate governance. They say the premium is about 19%, on average. Not only is this good for the companies in question, but also for their countries, as it contributes to economic growth and stability in the countries (Abdo & Fisher, 2007). Bhana (2010) claims that good governance promotes investor goodwill and confidence and makes companies less vulnerable to economic catastrophes. Investors in emerging markets, for example, institutional investors and pension fund managers, are willing to pay up to 28% more for companies that embrace good corporate governance principles, while this premium is about 18%

in developed countries, according to Kakabadse and Korac-Kakabadse (2002), Rossouw*, et al.* (2002), Abdo and Fisher (2007) and Chiranga and Chiwira (2014).

Apart from a willingness to pay more for well-governed companies, the market is constantly searching for companies that are undervalued due to poor management performance, whether this poor performance is a result of a lack of skills, negligence or own interest (Aguilera*, et al.*, 2015). Bebchuk and Fried (2005) are of the opinion that poor company performance may well be an indication that top management has unjust influence over the board, or that management incentives are not appropriate to align management's objectives with those of shareholders, as propagated by agency theory. This type of value destruction may lead to a number of market actions. For example, these companies tend to become the target of takeovers where an opportunity to make investment returns by implementing operational and managerial improvements is perceived (Bebchuk, Cohen & Ferrell, 2008; Dalton, Hitt, Certo & Dalton, 2007). Other actions could include leveraged buyouts, liquidations and asset sales. Most of these are undesirable for shareholders, because they signify loss of investment value; for example, when shareholders are forced to sell their shares at depressed prices as part of a hostile takeover. However, according to Cowen and Marcel (2011) and Bednar, Love and Kraatz (2015), this is often also to the detriment of managers who may face a loss of reputation, which, in turn, may lead to poor promotion prospects, poor salary increases or possible termination of employment. Once unemployed the possibility of finding another position becomes more difficult due to their impaired reputation.

As a result board composition is under pressure to evolve to include the right skills and expertise to fulfil its role in an effective and efficient manner, state Loop, Keller and DeNicola (2015). This pressure is increasing because companies have realised that good governance contributes to attracting investors and influencing what they are willing to pay for investments, according to Abdo and Fisher (2007).

2.3 DEVELOPMENT OF CORPORATE GOVERNANCE GUIDELINES

The financial scandals in the 1980s and 1990s, such as Enron, WorldCom, Parmalat, Maxwell, Daewoo and HIH, ignited the drive to improve corporate governance throughout industrialised countries around the world (Abdo & Fisher, 2007; Aguilera, 2005; Bauer*, et al.*, 2004; Bhana, 2010; Cowen & Marcel, 2011; Mangena & Chamisa, 2008; Mans-Kemp, Erasmus & Viviers, 2016b; Mcube, 2008; Muchemwa, 2014; Nyirenda, 2010; Rashid*, et al.*, 2010; Semosa, 2012). Kakabadse and Korac-Kakabadse (2002), Abdo and Fisher (2007), Mangena and Chamisa (2008), Redelinghuys (2009), Nyirenda (2010) and Naudé, Hamilton, Ungerer, Malan and de Klerk (2018a), remind readers that South Africa was not spared, if one considers corporate scandals such as Steinhoff, Leisurenet, Fidentia, JCI-Randgold, MacMed, Regal Treasury Bank, Masterbond and Saambou. According to Mangena and Chamisa (2008), the World Bank blames these events on weaknesses in corporate governance structures.

Redelinghuys (2009) argues that the dramatic collapse of companies involved in corporate scandals was not only caused by greed and rude capitalism, but by a critical lack of governance and proper oversight, where individual CEOs have made far-reaching decisions, often without the knowledge of their boards. This led to corporate governance reforms being initiated around the world to restore the power balance within a company and particularly to rein in *over-mighty chief executives* (Aguilera, 2005; Mans-Kemp*, et al.*, 2016b). Aguilera (2005) suggests that the balance of power may, to some degree, be restored by promoting a higher degree of objectivity within the boards of companies. Westphal and Milton (2000) claim that the objectivity and effectiveness of a board may be improved through greater diversity of background, experience, gender and race. Kroll, Walters and Wright (2008) state that it is dubious that due care without pertinent experience will improve a board's effectiveness.

Abu-Tapanjeh (2009) states that the term *corporate governance* only became prominent during this time. Countries became compelled to publish corporate governance guidelines and codes of best practice. Bhana (2010) claims that, apart

from these financial calamities, the momentum for corporate governance reforms was further fuelled by the global trend towards privatisation, the increase in private savings, pension fund reforms, and the exponential increase in takeovers in the 1980s. This holds true for both developed and developing countries (Mangena & Chamisa, 2008). *Corporate governance* is described as a mechanism for monitoring and control put in place to successfully direct and control a company and maximise stakeholder value according to Aguilera (2005), Abu-Tapanjeh (2009) and Sayari and Marcum (2018).

Abu-Tapanjeh (2009) cautions that corporate governance cannot be viewed as a set of rigid rules applicable to all countries, but that it should rather be approached on a principle basis according to the needs of individual countries. This notion and the international importance thereof are underlined by the establishment of the Organisation for Economic Co-operation and Development (OECD) principles in 1999, which have become the international benchmark for corporate governance policy-makers and protection of stakeholders around the globe.

The approach to corporate governance can be divided into two broad categories, namely a legislative approach and a softer regulation-based approach (Aguilera, 2005; Andreasson, 2011). The legal-based or more prescriptive regulatory approach relies on formal legislation, enforceable in court, to ensure that acceptable governance measures are implemented. The United States is an advocate of this approach (Aguilera, 2005). In contrast, the soft regulation or principle-based approach, that is the *comply or explain* approach, relies on companies to determine their own approach to implement proper governance within governmental frameworks that indicate what should be done. The United Kingdom follows this approach, while elements of both approaches are found in the South African regime. On the one hand, the Companies Act (71 of 2008) stipulates the duties and accountability of the directors (Levenstein, Brown, du Preez, Walker & Watson, 2008a), while the JSE Listings Requirements provide a number of specific governance practices, including compliance with the King IV, which a company has to comply with (JSE, 2017). On the other hand, the stipulations of King IV are

principle- and outcomes-based as opposed to rules-based, which are to be implemented on an *apply and explain* basis (Le Riche & Erasmus, 2017).

Semosa (2012) justifies South Africa's softer approach by stating that a stringent rules-based, mandatory governance regime may discourage companies from corporate listing in South Africa. This justification is given by Andreasson (2011), who describes London as a *magnet* for companies all over the world due to its *light touch,* that is the regulation-based *comply or explain* approach, and risk-based approach to corporate governance. Furthermore, Andreasson (2011) states that New York has become less competitive as a listing destination since the introduction of the Sarbanes-Oxley legislation and has in fact lost listings to London since its enactment. A further concern about the legislative-based approach adopted by the United States is the additional burden placed on government, which South Africa can ill afford, given the strain that the South African government already experiences. Officials have too many responsibilities and are over-stretched to the extent that they are unable to devote adequate time to enforce compliance.

Aguilera (2005) maintains that there is a balance to be found between the hard legislative approach and the softer regulatory approach. Overregulating could undermine flexibility and risk-taking, to the extent that companies no longer wish to list on a particular exchange, but rather choose to remain private companies or avoid a specific country. However, if investor confidence is improved by greater accountability, market values of companies may increase, which supports higher levels of governance in the long run (Abdo & Fisher, 2007; Kakabadse & Korac-Kakabadse, 2002). Institutional investors especially support moves to greater accountability (Aguilera, 2005). However, Mangena and Chamisa (2008) state that the JSE Listings Requirements direct listed companies to report in their annual reports their level of compliance with the King Report and provide reasons for non-compliance (JSE, 2017).

Under both regimes, investors require power to enforce their rights, expound Shleifer and Vishny (1997). There are, under normal circumstances, two general

sources of power present in most companies. The first is full legal protection of rights; for example, minority shareholders' rights (Banerjee, 2018; Chen, Chen & Wei, 2009). The second source is through large investments, such as large bank loans or large shareholdings, which result in significant rights to the investor. In the case of a loan, the rights are embodied in a contract or series of contracts and in the case of shareholding, the rights includes voting rights, which can be used, for example, to remove management or to initiate some corporate action (Chen*, et al.*, 2009; Fodor, 2010). Even though large investors also rely on the legal system to enforce their rights, they need a less comprehensive legal regime to ensure their wishes are respected, in that they can implement their requirements through their voting rights (Rickard, 2019).

However, Shleifer and Vishny (1997) warn that the development of corporate governance regimes is by no means a finite exercise. In fact, there is often strong disagreement over the effectiveness of the current governance mechanism in a specific country. For example, Jensen (1993) is of the view that the corporate governance system has failed business in the United States and has led to companies being overly geared and focused on short-term profit. This seriously jeopardises companies' ability to compete in the global market. In contrast, Von Haller Groenbaek (1994) reports positive views on the governance system in the United States, which is said to have greatly promoted competition within the economy.

It is also clear that corporate governance policy is not developed in national isolation but is highly diffusional between countries. A good example of this is the catastrophic corporate events in one country which inspired governance reforms in another, as was the case with the United Kingdom after the United States scandals in the early 2000s (Aguilera, 2005). Aguilera (2005) points to the United Kingdom as one of the most influential countries in terms of the development of codes of good conduct and provides three reasons for this phenomenon. Firstly, the strong protection of minority shareholders' rights, which stems from common law, underlying corporate governance in the United Kingdom, appeals to most countries and is especially favoured by the United States. Secondly, British regulators have

been leaders in the development of corporate governance reforms and innovations that have extended across the industrialised countries of the world. Thirdly, the London Stock Exchange (LSE) hosts the largest number of foreign-listed shares of any exchange in the world with the consequence that any new corporate governance regulation or standard sanctioned by the LSE becomes a benchmark for the country of origin of the foreign companies listed on the LSE. The United Kingdom may thus be seen as the global corporate governance regulator.

2.3.1 Corporate governance developments in the United Kingdom

One of the primary motivators for corporate governance stems from the global nature of large companies listed on the LSE, according to Cheffins and Bank (2007). Large companies are characterised by greatly dispersed shareholder bases as opposed to most other jurisdictions where concentrated or block shareholding is more common. This leads to a much lower level of shareholder activism in terms of monitoring company managers and calling them to task when necessary. In this situation, shareholders' main course of action is to sell their shareholding when the situation or events are not to their liking, explain Dalton*, et al.* (2007). Consequently, managers have a high degree of leeway to act in their own interests or to make poor decisions, whether wilful or as a result of incompetence. This lack of accountability and the meteoric rise of executive remuneration led to increasingly serious concerns among investors, to the extent that the market realised that governance transformation had become an absolute necessity. These reforms emerged through the establishment of three committees, namely the Cadbury Committee, the Greenbury Committee and the Hampel Committee. The Cadbury Report, published in 1992, led the way in the reform of corporate governance in the United Kingdom (Nordberg, 2018). This was followed by the Greenbury Report and the Hampel Report, which were consolidated with the principles of the Cadbury Code in 2003 to form the Combined Code on Corporate Governance (Cheffins & Bank, 2007; IoDSA, 2009).

When the United Kingdom removed most of the obstacles for foreign financial institutions to operate in the United Kingdom, these companies adopted the

approach that anything that was not specifically prohibited was lawful. The consequence of this tendency was that companies pursued immediate profits instead of building and maintaining sustainable corporate reputations, observes Calder (2008). The Cadbury Committee was established with the task of considering director roles and responsibilities, external auditor responsibilities and the link between these parties and shareholders from a financial reporting and accountability point of view (Mellor, 2007). The Cadbury Report was therefore mainly concerned with the harmonisation of the economic and social objectives of companies and the general public in an effort to align the interests of individuals, companies and society, construes Botha (2009). The stance of Stiles and Taylor (1993) is that the Cadbury Report was most influential in reforming corporate governance in the United Kingdom and further afield. The Cadbury Report pushed the board of a company into the limelight as main decision-maker of a company and, moreover, introduced the *comply or explain* approach to corporate governance as part of the United Kingdom's listing requirements (Calder, 2008).

According to Hughes (1996), the uproar about director remuneration and bonuses, especially in privatised utilities, led to the publication of the Greenbury Report, which recommended a best practice approach to director remuneration based on the principles of transparency, accountability and performance. This was followed by the Hampel Report, which reviewed the success of the principles established by Cadbury and Greenbury and added a number of recommendations. The most prominent addition was the suggestion that corporate governance is a set of principles to be followed by applying common sense, given a company's unique circumstances, instead of a *box-ticking* exercise. In addition, the Hampel Report found that boards should be solely accountable to shareholders to ensure they have a proper benchmark to measure their performance (Choudhury & Petrin, 2018). The Combined Code of Corporate Governance that flowed from this is a non-statutory code with which all companies listed on the LSE have to comply. In the event that they do not fully comply, they have to explain why not (Calder, 2008; Mellor, 2007).

The following aims and provisions stand out in the United Kingdom Corporate Governance Code (the Code) (Audit Committee Institute [ACI], 2003; Financial Reporting Council [FRC], 2016; Mellor, 2007; Rossouw*, et al.*, 2002):

- Corporate governance of a company is the responsibility of the board.
- Shareholders are responsible to appoint the board and external auditors and to make sure that appropriate governance structures are in place.
- The board has to determine a company's strategic goals, ensure the execution of the strategy and monitor management.
- The Code promotes independence of NEDs and prefers the segregation of the roles of CEO and chairman.
- The board must embrace sufficient diversity (including skills, experience, gender, race, tenure and age) to eradicate groupthink.
- The Code sets out best practice for the appointment, rotation and roles of directors.
- The Code provides guidance on best practice in terms of the level and composition of executive remuneration as well as the development of a remuneration policy.
- The Code sets out best practice guidelines for transparency and accountability, which include financial reporting guidelines, internal control measures and best practice for the appointment and role of the external auditors and audit committees.
- The Code also makes recommendations for the board's relationship with shareholders.

It is clear that far-reaching interaction between the board, company and its shareholders underlies the efficiency of corporate governance, and ultimately the success of a company (ACI, 2003; FRC, 2016; Mellor, 2007; Rossouw*, et al.*, 2002). However, Choudhury and Petrin (2018) point out that the Code sees the financial interests of shareholders as the focal point for United Kingdom companies. In fact, shareholder wealth maximisation is more entrenched in United Kingdom law than in that of the United States. However, this has been increasingly challenged since the corporate scandals at the turn of the millennium and the financial crisis of 2008.

2.3.2 Corporate governance developments in the United States

The United States adopted a different approach to the *comply or explain* approach of the United Kingdom by implementing a more far-reaching and harsh *comply or die* approach, embedding their corporate governance principles in federal laws reveal Calder (2008) and Andreasson (2011). According to Choudhury and Petrin (2018), social contracts theory, as described in Section 2.5.5, is the dominant approach by which to conceptualise companies under United States law. The Public Company Accounting Reform and Investor Protection Act of 2002, popularly referred to as the Sarbanes-Oxley legislation, embodies the corporate governance legislation in the United States. Romano (2004) goes into more detail about the establishment of the Sarbanes-Oxley Act by opining that the enactment of this act was an emergency measure in reaction to downward spiralling share prices, the bursting of the internet bubble and the financial debacles and bankruptcies of a number of major companies. Furthermore, accounting restatements as a result of corrections of past accounts, with potentially significant impacts on the markets, were on the increase during this time (Calder, 2008; Hochberg, Sapienza & Vissing-Jørgensen, 2008; Romano, 2004). However, the Sarbanes-Oxley legislation has been criticised as being a costly overreaction by the government, with the benefits to be gained outweighed by the cost of implementation, according to Coates (2007). Nevertheless, Sayari and Marcum (2018) claim that significant support is found in the literature that the corporate governance environment in the United Stated has improved since the Sarbanes-Oxley Act was passed.

The Sarbanes-Oxley Act has a number of benefits such as a reduction in shareholders' exposure to fraud, more accurate financial reporting, and increased transparency and accountability (Coates, 2007). Furthermore, markets should benefit from more efficient allocation of resources, and consequently more rapid growth. Moat (2017) endorses this synopsis. Hochberg*, et al.* (2008), Calder (2008), Moat (2017) and Bar-Hava, Huang, Segal and Segal (2018), highlight the following aims and provisions that stand out in the United States' Sarbanes-Oxley Act:

- A company's senior management (typically the CEO and the chief financial officer) is made directly responsible for the quality, completeness and accuracy of a company's financial reporting and disclosure.
- Audit committees need to be more independent of a company by ensuring that they consist mainly of independent directors.
- External auditors are limited in the services that they may provide to their listed clients. For example, they may not provide actuarial services, human resource functions, internal audit functions, legal or expert services, investment banking services, investment advisory services or bookkeeping services.
- The senior external audit partner needs to be rotated every five years.

The principal objective of the Sarbanes-Oxley legislation was to reinstate audit quality and to decrease fraudulent activity, explains Coates (2007). Coates (2007) further states that in the lead-up to the implementation of the Sarbanes-Oxley Act, the audit profession lost its reputation to uphold accounting reporting standards as an independent authority. At its core, this legislation aimed to revamp the audit profession and to provide companies with a new impetus to improve internal controls. Good quality internal controls may deter management from misallocating resources which, in turn, may lead to improved shareholder value (Coates, 2007; Hochberg*, et al.*, 2008; Romano, 2004)

2.4 CORPORATE GOVERNANCE DEVELOPMENTS IN SOUTH AFRICA

Due to the benefits of and the demand for corporate governance, developing countries, including South Africa, increasingly embrace the concept of *good governance*, knowing that it leads to sustainable growth, reports Bhana (2010). Abdo and Fisher (2007) point out that foreign investors returning to South Africa after 1994 insisted on reform in both corporate structures and in governance practices before they were willing to invest. Among developing and emerging countries, South Africa has emerged as one of the leaders in terms of corporate governance and codes of good practice (Mangena & Chamisa, 2008; Mans-Kemp*, et al.*, 2016b; Mans-Kemp*, et al.*, 2017; Padayachee, 2013). South Africa initiated its corporate governance reform through the publication of the King Report in 1994

(Mans-Kemp*, et al.*, 2017), which serves as the main source of corporate governance in the country. South Africa's *colonial legacy* and consequential links with the United Kingdom have ensured that corporate governance regulations are firmly based on English Law, explain Botha (2009) and Andreasson (2011). One of the pertinent differences of King IV, compared with governance guidelines in other countries, is that the focus of most countries is on shareholder value maximisation. King IV by comparison encourages a broader focus to include a wider group of stakeholders, thus a more *inclusive approach* (Mangena & Chamisa, 2008; Mans-Kemp*, et al.*, 2016b; Mans-Kemp*, et al.*, 2018a).

2.4.1 The first King Report

The first King Report drew extensively on the United Kingdom's Cadbury Code of 1992 (Padayachee, 2013). Andreasson (2011) claims that the King Report has the means of creating a *hybrid African* corporate governance model that accommodates shareholder requirements while it also deals with stakeholder issues. This model could be a suitable solution for other emerging or ex-colonial markets with similar problems such as extreme inequalities. In the first King Report, two broad goals were dealt with, according to Andreasson (2011). In the first instance, the King Committee aimed to embrace government's emphasis on economic transformation and secondly, the Committee endeavoured to demonstrate to global investors that South Africa recommitted itself to corporate governance best practice. Rossouw*, et al.* (2002) surmise that the development of corporate governance standards was mainly driven by international pressure from foreign investors, as well as pressure that resulted from the culture shift flowing from the introduction of an *African Renaissance*. This initiative was meant as a rejection of the European influence in Africa and to inspire the recovery of the African culture and moral values through the development of a people-centred economic growth strategy.

According to Rossouw*, et al.* (2002) and Padayachee (2013), the first King Report contained the following noteworthy features:

- A company must be under the full and effective control of the board.

- Directors have a duty of care to the shareholders both individually and collectively.
- The board must monitor management and retain the decision-making function in terms of all material issues.
- A good balance should be maintained between executive and NEDs, but in any event, a company should have at least two NEDs.
- NEDs need to be of adequate stature to ensure they will be heard in the board's caucus.
- The chairman and CEO should be different people.
- No instruction was given on the level of directors' remuneration except that remuneration levels should be recommended by a remuneration committee, which consists of a majority of NEDs.
- Remuneration should be disclosed in detail.
- The King Report further provided no input in the involvement of shareholders in setting directors' remuneration.
- Shareholders should receive a summary of all material issues to be raised at the Annual General Meeting (AGM) and that the AGM be used by shareholders to raise questions on the financial statements and other matters of interest.
- The directors are required to report to all stakeholders on financial and non-financial matters, both positive and negative, and that such a report needs to focus on substance over form.
- The board needs to commit a company to the highest ethical standards by developing a detailed, unambiguous code of ethics for the company to guide the company.
- The code of ethics should be developed through a participatory process which will ensure buy-in at all levels in a company.
- Companies are required to indicate in their annual financial statements the degree to which they adhere to the King Report.

Companies are urged to implement best business and ethical practices, maintain the independence of the board and its committees and to continually strive for transparency (Garas & ElMassah, 2018). The King Report strongly promotes the ethical conduct of not only management, but all other stakeholders in a company,

such as employees, suppliers, lenders, customers and society (Choudhury & Petrin, 2018). However, the ultimate responsibility for the moral climate of a company resides with a company's board of directors. The board should create an environment of compliance that ensures that the exposure of unethical conduct will occur without fear of retribution (Rossouw*, et al.*, 2002).

Given the recommendations of the first King Report the study determined whether the higher levels of NEDs will benefit the performance and risk management ability of a company (see Section 4.2.4). In addition, the study assessed whether a relationship exists between the remuneration levels of the CEO (see Section 3.4.2) and board members (see Section 4.2.5) and the performance and risk management ability of the company. These aims contributes to the development of the statistical hypotheses H_{aA2} - H_{aE2}, H_{aA7} - H_{aE7}, H_{aA9} - H_{aE9} and H_{aA10} - H_{aE10} shown in Table 1-2 in Section 1.5.3.

2.4.2 King II Report

Andreasson (2011) argues that a number of corporate debacles, causing billions of Rands' worth of damage, led to the revision of the first King Report. Padayachee (2013) elaborates by mentioning two examples, namely the collapse of Regal Treasury Bank, where highly unethical behaviour of the CEO and chairman was exposed, and Saambou, where a number of executives were accused of criminal behaviour. The King Report was revised in 2002 with the publication of King II (Mans-Kemp*, et al.*, 2016a). As a result of King II, the World Bank rated South Africa among the top countries in the world in terms of corporate governance best practice. In fact, King II was viewed as a global benchmark (Padayachee, 2013). The revision brought together input from a wide range of private sector stakeholders and a number of political goals to develop, as Mervyn King (previous chairman of the King Committee) puts it, an "inclusive approach to governance in the interest of South Africa Inc". Input included local and international consultation with investor groups, civil organisations, government officials and regulators, conveys Andreasson (2011).

An outstanding feature of King II was the establishment of the Code of Corporate Practices and Conduct (the Code), which applied to all companies listed on the JSE (Aka, 2007). Even though the World Bank applauded the King Report as promoting international best practice, the Department of Trade and Industry (DTI) of the South African government expressed its scepticism over whether a voluntary system would ensure the continuous implementation of good governance measures. In the light of this, a new Companies Bill was released to the DTI for comment. The aim was to replace the Companies Act (61 of 1973). Corporate governance up until King II was still developed on the basis of the Companies Act (61 of 1973) (Andreasson, 2011). The range of comments received on the Bill gives a flavour of the complexities that the committee had to contend with. On the one hand, the Bill was praised for its attempts to balance a wide range of stakeholders' interests and rights and not only those of companies. On the other hand, international criticism suggested that shareholder rights are not adequately protected, thereby reducing the attractiveness of the country as an investment destination, claims Aka (2007). However, Padayachee (2013) concedes that the 2007 fiasco at the Cape-based asset management company, Fidentia, which lost about R680 million of mineworker pensions, reignited concerns about corporate governance issues. Directors, executive and non-executive, came under renewed scrutiny.

King II significantly contributed to bridging the divide between good corporate governance and social responsibility by resolving the perception that social and environmental matters and financial performance were not linked (Aka, 2007; Andreasson, 2011). This was accomplished through the introduction of the *triple-bottom line* reporting framework, which requires companies to report on environmental and social sustainability over and above the financial reporting (Hussain, Rigoni & Orij, 2018; Mans-Kemp*, et al.*, 2016b; Padayachee, 2013).

Delaurentis (2002) and Vettori (2005) emphasise the following features of King II in addition to the principles from King I, included in King II:

- The board and individual directors are mainly responsible for adhering to corporate governance rules and regulations, which is intended to create a kind of *peer-pressure* system.

- The role of internal and external stakeholders in the monitoring of a company's compliance to corporate governance is highlighted.
- The importance of corporate reputation and citizenship is underlined.
- Balance is a central theme of the report; for example, to maintain a balance between risk and reward, and achievement and conformance.
- The distinction between executive and NEDs is clarified and the concept of an independent director is introduced.
- It is recommended that companies audit their risk profiles annually and report to shareholders.
- The board needs to develop a charter and a code of ethics to direct the daily operations of a company.

A company's sustainability is impacted by its reputation, which, in turn, is impacted by its relationship with each and every stakeholder it interacts with, directly or indirectly. These relationships must demonstrate integrity, transparency and trust to ensure the support of all stakeholders, including staff, especially when challenges arise (Deloitte Touche Tohmatsu [Deloitte], 2009; Vettori, 2005).

The call for companies to audit their risk profiles annually and the fact that a company's sustainability is ultimately impacted by its relationship with its stakeholders provides motivation for the selection of the dependent variables. As per stakeholder theory the success of a company is dependent on how well its various stakeholders work together to create value (see Section 2.5.2). The variables, namely shareholder return, share price volatility (market risk), risk-adjusted return, current ratio (internal risk) and cash conversion cycle (internal risk) are all components of a company's value creation and impacted by the cooperation between a company's stakeholders (see Section 4.3 and Section 4.4). These are captured in the statistical hypotheses shown in Table 1-2 in Section 1.5.3 as the dependent variables.

2.4.3 King III Report

In 2009, the King Report was amended for a second time with the publication of King III (Mans-Kemp*, et al.*, 2016a). The revision came in anticipation of the expected revision of the Companies Act (61 of 1973) and after the DTI's policy paper calling for the promotion of competitiveness and economic growth. The new Companies Act (71 of 2008) incorporates a number of elements previously included in the King Report (Abdo & Fisher, 2007; Botha, 2009). King II focused on corporate citizenship and sustainability. King III continued to make directors accountable to all stakeholders. Directors are responsible for ensuring the overall sustainability of a company for all stakeholders (Mans-Kemp*, et al.*, 2018a). This can be achieved by the directors making sure that a company's resources are used in an optimal fashion in terms of the environment, the impact of a company on the community in which it operates, the management of relationships with its stakeholders, and respect for human rights (Deloitte, 2009).

The following items in King III stand out (Deloitte, 2009; IoDSA, 2012):

- The board should consist of a majority of independent NEDs.
- The chairperson and the CEO's proposed characteristics and duties are highlighted.
- Recommendations are made on the process of appointing new board members and how existing directors should be developed.
- Guidance on director remuneration and performance assessment is provided.
- The composition and function of the audit committee is spelt out.
- The report provides insights into how companies should approach risk management and explains how this impacts on a company's strategy and business processes.
- A main focus of the report is stakeholder relationships and further facilitation of stakeholder management. Alternative dispute resolution processes are proposed to effectively and efficiently mediate any conflicts with stakeholders.
- The report also gives guidance on information technology governance, information technology risk management, compliance with laws and regulations, integrated reporting and disclosure.

King III states that a company's value is no longer purely balance sheet-based, but is a product of financial and non-financial elements including brand, reputation, stakeholder relations, strategy, environmental sustainability, social responsibility and quality of governance (Deloitte, 2009; IoDSA, 2012).

Given the recommendations of King III the study aimed to determine whether the higher levels of independent NEDs will benefit the performance and risk management ability of a company (see Section 4.2.4). In addition, the study assessed whether any relationship exists between the remuneration levels of the CEO (see Section 3.4.2) and board members (see Section 4.2.5) and the performance and risk management ability of a company. These aims contributes to the development of the statistical hypotheses H_{aA3} - H_{aE3}, H_{aA7} - H_{aE7}, H_{aA9} - H_{aE9} and H_{aA10} - H_{aE10} shown in Table 1-2 in Section 1.5.3. In addition, the recommendations around risk management motivates the inclusion of risk management components (internal and external) as independent variables for the study (see Section 4.3 and Section 4.4).

2.4.4 Companies Act (No. 71 of 2008)

The revised South African Companies Act (71 of 2008) was enacted in May 2011 after a decade of debate, according to Padayachee (2013). This replaced the Companies Act (61 of 1973). The new Companies Act (71 of 2008) codifies some standards of conduct that are expected from directors. For example, directors are required to act honestly, in good faith and in the best interests of their company. Incorporating some of the King Report corporate governance measures into the Companies Act (71 of 2008) has moved the South African corporate governance regime some way towards the legislative approach of the American model, argue Levenstein*, et al.* (2008a) and Padayachee (2013). However, the King Reports soften the approach in that they favour a self-governance approach by the provision of a list of best practice principles to assist and guide directors, counter Deegan, Van Wyk, Ramsden, Newsome, Bauristhene and Roberts (2009).

The Companies Act (71 of 2008) was developed with two main goals in mind, namely to encourage entrepreneurship and to enable the creation of employment opportunities by facilitating company formation through less complicated procedures and lower costs, elucidate Kaindl and Botha (2011). This reflects government's aim to encourage competition, investment and privatisation (Miles & Jones, 2009). Kaindl and Botha (2011) further state that the Companies Act (71 of 2008), together with the King Report, aims to promote transparency and high standards of corporate governance and contributes to balancing the rights and obligations of shareholders and directors.

Levenstein and Van Vuuren (2008b), Mnyatheli and Vimba (2008) and Stephenson (2011) highlight the following prominent features of the Companies Act (71 of 2008):

- The Companies Act (71 of 2008) attempts to balance accountability and transparency obligations with a company's social and economic impact.
- All companies are required to prepare annual financial statements in terms of International Financial Reporting Standards (IFRS).
- Public companies and SOEs are obligated to appoint an audit committee and a company secretary.
- Shareholders must approve any issuance of shares or share options to directors as well as approve the provision of any financial assistance to any director.
- The duties of directors are partly stipulated in the Act, which highlights fiduciary duties and the duty of reasonable care.
- Directors are required to act in good faith in the best interests of a company, applying just skill and diligence.
- Directors may not act beyond their capacity and need to ensure that they are able to exercise their discretion in an unrestricted manner.
- Directors must at all cost avoid situations that may cause a conflict of interests and must declare any financial interest they may have in the company including incidental profits.
- Directors and certain other officials such as prescribed officers are personally liable for losses incurred while operating *recklessly*.
- Directors could be criminally charged if an act of fraud is committed.

- Directors continuing to abuse their position may be declared delinquent.

The new Companies Act (71 of 2008) includes some of the provisions of the previous King Reports and increased the requirement for director competence and level of director liability, with directors' common law duties and liabilities being codified (Levenstein & Van Vuuren, 2008b; Mnyatheli & Vimba, 2008).

The reference in the Companies Act that shareholders should approve the issuing of shares and share options to directors motivated for the study to determine whether an association exists between the remuneration levels of the CEO (see Section 3.4.2) and board members (see Section 4.2.5) and the performance and risk management ability of the company. Also, the provisions around the conflict of interest led to the study determining whether higher levels of NEDs and independent NEDs will benefit the performance and risk management ability of a company (see Section 4.2.4). These aims contributes to the development of the statistical hypotheses H_{aA2} - H_{aE2}, H_{aA3} - H_{aE3}, H_{aA7} - H_{aE7}, H_{aA9} - H_{aE9} and H_{aA10} - H_{aE10} shown in Table 1-2 in Section 1.5.3.

2.4.5 King IV Report

The King Report was revised for a third time with the publication of King IV at the end of 2016. The report aims to streamline the codes of good corporate governance by reducing the overarching principles from 75 to 17 and making it more all-encompassing by the inclusion of all *organisations* despite their manner of incorporation; for example, retirement funds, trusts and state-owned entities (Myburgh & De Costa, 2017).

Harduth and Sampson (2016), Le Riche and Erasmus (2017) and Myburgh and De Costa (2017) highlight the following noteworthy features of King IV:

- The *apply or explain* concept is revised to *apply and explain* with the intension to provide stakeholders with a better insight into the corporate governance regime implemented by a company, which should lead to better stakeholder

participation. The concept is that a company should explain the measures implemented as well as the results thereof.

- Guidance on remuneration is improved with the aim of ensuring that executive management remuneration is fair and responsible in relation to total employee remuneration within an organisation.
- Additional disclosure provisions with regard to executive remuneration are also included.
- A list of indicators is provided to assist in determining whether a director is independent or not, with the main emphasis on substance over form.
- Wider disclosure requirements than in the previous King Reports are included to promote transparency.
- The report also calls for improved and proactive interaction with stakeholders, especially shareholders, to ensure that shareholders who do not have access to all information understand the reasons for management's decisions.
- The report also requires the board of an organisation, for example, a company or institutional investor to develop a policy to promote responsible investing and to better incorporate environmental, social and governance issues in decision-making and ownership practices.
- The report furthermore promotes risk management and performance as inseparable elements of value creation.
- The report stipulates that as part of its oversight function, the board needs to be watchful of the liquidity and solvency of a company and its status as a going concern.
- In addition, the report expresses the need to ensure that the board is knowledgeable, skilled, experienced, diverse and independent enough to fulfil its role and responsibility.

King IV provides for enhanced corporate governance through improved stakeholder involvement, greater disclosure requirements, improved director independence and alignment of group companies. King IV is principle and outcomes based rather than rules based.

King IV gives guidance around remuneration of executive management and recommends that executive management's remuneration should be fair and responsible in relationship to total employee remuneration within an organisation. Consequently, the study determined whether a relationship exists between the remuneration levels of the CEO (see Section 3.4.2) and the payment gap (see Section 3.4.1) and the performance and risk management ability of the company. These aims contributes to the development of the statistical hypotheses H_{aA7} - H_{aE7} and H_{aA8} - H_{aE8} shown in Table 1-2 in Section 1.5.3.

2.5 CORPORATE GOVERNANCE THEORIES

Various theories have been developed over the years to explain the governance mechanisms that control the behaviour of directors and management. These theories aim to identify the relevant stakeholders in companies and to describe the relationships between them. Furthermore, the theories endeavour to shed some light on the different expectations that these role players have of a company and how these expectations influence the actions of management and the behaviour of directors. The characteristics of a board are the product of various forces that impact on a company; for example, the socio-political environment, the community within which a company operates and the composition of its ownership structures.

2.5.1 Agency theory

As early as 1930, Berle and Means formulated the view, akin to agency theory, that ownership and control over the use of assets are separated through the formation of a company (Berle & Means, 2009; Charreaux, 2004; Styhre, 2018). In the late 1970s, agency theory was refined, to state that the shareholders (principal) engage management (agent) to perform some service on their behalf (run the company) (Eisenhardt, 1989; Jensen & Meckling, 1976). Shareholders appoint directors to look after their interests by monitoring management actions on their behalf (Chari*, et al.*, 2018; Mans-Kemp*, et al.*, 2018a).

Coase (1937) and Fontrodona and Sison (2006) state that individuals cannot operate within the market instead of companies. As Coase (1937) explains, a company is better able to efficiently collate resources to deliver economic value. Large infrastructure, for example, would not be possible without large companies to build it, such as railroads, tunnels and power generation and distribution systems. The management of a company consist of specialist or professional managers to whom the owner surrenders specific rights in return for specific expectations (Choudhury & Petrin, 2018; Clarke, 2014). This is done to enable management to create greater economic benefit than the individual owners of the resources would be able to do. Another reason for the formation of companies, especially public companies, is a company's ability to meet the increasing need of businesses to raise capital (Mans-Kemp*, et al.*, 2016a).

The benefits of a company are mainly achieved through what is referred to as agency relationships, which come about in the form of implicit or explicit contracts between the owner (principal) and management (agent) (Fontrodona & Sison, 2006; Mans-Kemp*, et al.*, 2016a). It stands to reason that companies would be most efficient if they are managed by their owners (Jassim, Dexter & Sidhu, 1988). However, since the Second World War, ownership and management have become increasingly diffused. Even though a company has proved its ability to attract and use resources more effectively than individual entrepreneurs, this benefit may be eroded by the agency cost required to monitor management. However, good corporate governance will ensure that this cost is kept at reasonable levels (Choudhury & Petrin, 2018; De Andres*, et al.*, 2005). Choudhury and Petrin (2018) assert that profit maximisation is essential to reduce agency cost. Profit maximisation as a unitary goal limits managers' preference to pursue their own interests because it provides clear goals, thereby eliminating the possibility for conflicting interests. However, the 2008 financial crises raised doubts whether wealth maximisation was justified as a corporate principle.

A *company* is a collection of contractual arrangements that set the decision-making boundaries within which entrepreneurs (management) should operate, according to Coase (1937) and Choudhury and Petrin (2018). Fama (1980), Davis (2005) and

Clarke (2016) believe that it is more accurate to look at a company as a nexus of power, since management is able to unilaterally promote the cause of any one stakeholder at the cost of all others despite the contractual relationships that may exist.

The main phenomenon described by agency theory is in essence the separation of ownership and control and the fact that the interests of the directors and managers can diverge from those of the owners of a company and, in fact, often do (Berle & Means, 2009; Shleifer & Vishny, 1997; Tirole, 2001). Maestrini*, et al.* (2018) ascribe this to *management opportunism*, which they define as management seeking its own interests with deviousness. Styhre (2018) claims that this enables management to attract a more than competitive return for its efforts. Sonza and Kloeckner (2013) and Tirole (2001) provide the following four main reasons for the conflict of interests of management with that of shareholders:

- a lack of commitment from management;
- the pursuance of extravagant investments;
- management's attempt to entrench its position in a company in a manner that is not in the best interests of the company; and
- the search for increasing benefits, which places an undue burden on a company.

These *moral hazards* fit in with the earlier view of Eisenhardt (1989) on the main two issues that agency theory aims to resolve. Firstly, the conflicting objectives of shareholder and managers need to be dealt with, as well as the difficulty for shareholders to know when management behaves inappropriately. The second issue is the difference in views between management and shareholders in terms of risk-sharing. These conflicts between principal and agent can be resolved through the establishment of incentives and/or through monitoring, suggest Sonza and Kloeckner (2013) and Chari*, et al.* (2018).

If both parties aim to maximise their own position, warn Jensen and Meckling (1976), a real risk still exists that the agent will not act in a way that the principal would wish or expect. To limit this divergence, appropriate incentives need to be

established that will encourage management to behave in the required manner. The incentives may be explicit incentives such as share options or long-term bonus or profit-sharing mechanisms, according to Roberts (2004) and Sonza and Kloeckner (2013). However, incentives may be implicit; for example, where executives are removed as a result of poor performance, argues Roberts (2004), but for the incentives and monitoring to work, the board must consist of independent members who are willing and able to monitor executive performance. Given the incentive mechanisms proposed to align management's objectives with that of the shareholders, further review is warranted to determine whether literature have found that these incentives are effective. This led to the development of hypotheses H_{aA7} - H_{aE7}. In addition, the recommendation that directors need to be independent led to the development of hypotheses H_{aA2} - H_{aE2} and H_{aA3} - H_{aE3}. Furthermore, the recommendation that the board should consist of members that are able to monitor executive management motivates the further review of literature in Section 4.2, to determine the qualities that enables directors to fulfil their tasks, which in turn led to the development of the statistical hypotheses in Table 1-2 of Section 1.5.3.

In companies, especially large listed companies, it becomes increasingly difficult for shareholders to know how management behaves, what it does, and what it has been doing (Eisenhardt, 1989; George, 2012). This tendency to either not disclose to shareholders the necessary information or to operate contrary to the information disclosed is mainly due to the difference in goals and risk appetite of shareholders and management (Eisenhardt, 1989). Therefore, it is up to the board to collect and use accurate and timely information (Van Ees, Gabrielsson & Huse, 2009). Fama and Jensen (1983) describe the *board* as an information system. However, Mans-Kemp*, et al.* (2018a) highlight the fact that the 2008 global financial crisis raised concerns over the lack of enabling information available to directors and how this may influence their ability to fulfil their responsibilities. Nordberg (2018), in turn, states that the increase in disclosure rules has led to investors receiving more information on the internal workings of the companies they invest in.

Shareholders also implicitly rely on markets to obtain information with regard to the performance of management. For example, a reduction in share price or, even more

dramatic, a takeover bid, may be an indication that all is not well in a company. This goes back to how risk-sharing within a company can cause pursuits after different goals. Management may be far more focused on short-term objectives, which may stem from the risk of losing their jobs or not getting a bonus or promotion. However, shareholders have a longer-term horizon in that they would typically seek to grow their investment (Zhang, Yang, Xu & Zhu, 2018a). Shareholders maintain control over management via their control over the board. Through their voting rights, they can remove board members that are not performing adequately, or put pressure on boards to remove underperforming managers (Fama & Jensen, 1983). Agency theory highlights that the objectives in terms of financial performance, sustainability and risk profiles may differ between management and shareholders and the board is expected to align these. This confirms the importance of financial performance, market-risk management and internal risk management of a company as components of the overall value creation of a company. Further assessment is therefore warranted to determine whether the various board characteristics have an association with the performance of a company, the management of a company's market risk and the management of a company's internal risk.

However, Florackis*, et al.* (2016) caution that research on corporate governance, based on agency theory, has discovered a number of new insights that challenge some of the underlying assumptions of the theory. For example, the establishment of new collective and institutional investors, such as private equity funds, hedge funds and pension funds, has given rise to investor activism, which increases the interaction between the *owners* of the businesses and management (McNulty & Nordberg, 2016). In addition, the interest in a company's performance extends beyond that of the shareholders. In fact, there is a diverse myriad of stakeholders that have an interest in the operation and performance of a company and these interests are *often* not aligned (Choudhury & Petrin, 2018; Florackis*, et al.*, 2016).

2.5.2 Stakeholder theory

Freeman, Phillips and Sisodia (2018) explain that a shareholder focus equates to a value chain where there is one desired outcome focused on financial value. In contrast, a stakeholder approach can be seen as a value network with shared values and purposes. Each stakeholder contributes to ensuring that the collective thriving of all stakeholders must benefit to ensure continued thriving. Even though agency theory succeeded in describing the situation where managers can be persuaded to act in the best interests of the owners (shareholders) of a company by aligning management's incentives with the interests of shareholders, this led to an excessive focus on financial performance. The consequence of such a significant focus on financial performance was that management tended to promote short-term profits, which, in turn, increased the intensity of *boom-bust* cycles, that is the expansion and contraction cycles of the economy. This short-term focus, in many instances, jeopardises the sustainable, productive future of a company (Clarke, 2014). The disillusionment with shareholder value maximisation, caused by various global financial debacles, paved the way for an enlightened view of value maximisation, which is instrumental in developing a more stakeholder-oriented approach that goes beyond the interests of shareholders alone (Nordberg, 2018).

Fontrodona and Sison (2006) explain that agency theory's view of a company's ownership is too narrow in that this theory only acknowledges one principal, namely shareholders, as owners of a company. They state that there are multiple owner relationships at play in a company. For example, Drucker (2001) believes that two of the major resources required for production are knowledge and labour, which are owned by employees. The contribution of these resources is as important as the contribution of capital by shareholders. In fact, Handy (2001) is of the opinion that the concept of shareholders owning a business may well be abandoned and that shareholders should be seen as merely another source of funding, receiving a return dependent on profits, but with no further rights such as being able to sell a company or close it down.

Mygind (2009) and Valentinov, Roth and Will (2018) delineate *stakeholders* as all parties that participate in and are impacted by a company's activities. Sharpe (1996) gives the example of employees who have gained knowledge and experience through service at a company who are stakeholders similar to shareholders, because they have both invested in the company. Employees provide a company with important skills for which they expect to be compensated appropriately. Other examples of stakeholders are suppliers, creditors, various social groups and government (Bundy, Shropshire & Buchholtz, 2013; Freeman*, et al.*, 2018; Mygind, 2009). Based on the fact that various stakeholders, apart from shareholders, are highlighted with an interest in the company further study is undertaken into the internal risk and specifically the liquidity risk of a company, which is of direct concern to stakeholders such as creditors, suppliers, funding provider and debtors. Furthermore, since government is highlighted as a stakeholder the study considered characteristics that are impacted by government's reform agenda to determine if the promotion of these characteristics on a board has any benefit to a company, apart from legitimacy benefits. These include gender and ethnic diversity, which contributes to the development of the statistical hypotheses H_{aA4} - H_{aE4} and H_{aA5} - H_{aE5} shown in Table 1-2 in Section 1.5.3.

The success of a company is concerned with how well its customers, funders, employees and other stakeholders cooperate to create value maintain Valentinov*, et al.* (2018). Many social groups also resort under a company's stakeholders, such as the community that provides the location and local infrastructure needed by a company to operate in. In return, the community expects a company to improve their quality of life. Furthermore, the disclosure of stakeholder practices contributes to the transparency of a company, which illustrates a company's conformance to social norms and expectations. This could ensure a company's good standing with government. All of these factors contribute to ensuring that a company focuses on the maximisation of long-term value (Freeman*, et al.*, 2018; Jensen, 2002). However, Bundy*, et al.* (2013) hypothesise that companies and management do not respond to issues per se, for example, environmental impact issues. Therefore, stakeholders play an important role to advocate issues that need to be resolved by a company; for example, reforms promoted by government.

The preference of stakeholder theory over agency theory is more pertinent in developing economies such as South Africa, according to Ntim, Opong and Danbolt (2012). The inclusion of all stakeholders is necessary to protect stakeholders' interests as a result of social and economic problems, such as mass unemployment and the legacy of inequality in the case of South Africa. Barney and Harrison (2018) point out that, due to its nature, a stakeholder approach is complex and comprehensive, but proponents of this theory often fall into the trap that they only focus on one type of stakeholder, more often than not the employees of a company.

Stakeholder theory's highlights the wide range of stakeholders and the fact that these stakeholders must all work together to ensure the success of a company's value creation process. This underlines the multifaceted nature of a company's operations and confirms the need to assess the performance of a company from a number of angles. The various underlying components of a company's value creation process are impacted in different ways by several elements including the various attributes of the board.

Despite all arguments in favour of stakeholder theory, Jensen (2002) warns that stakeholder theory fails to provide a measure of success against which managers can be held accountable. It also does not provide any indication of how management should prioritise between the various stakeholders to maximise the long-term value of a company. This leaves a company and the various stakeholders vulnerable to malicious managers whose only goal is to promote their own interests. According to Ambler and Wilson (1995), it is virtually impossible for a company to recognise and acknowledge all its stakeholders. Moreover, the size of each stake is unmeasurable and, more importantly, companies that attempt to be all things to all stakeholders are at a significant disadvantage and frankly unmanageable (Ambler & Wilson, 1995).

2.5.3 Resource dependency theory

According to Hillman, Withers and Collins (2009) and Kholmuminov, Kholmuminov and Wright (2018), resource dependency theory was developed by Pfeffer and

Salancik in 1978 and has over the years become one of the most influential in describing the behaviour of company boards. Hillman*, et al.* (2009) explain that the theory sees a company as an open organisation, exposed to its environment. It is within this environment that a company and its management have to function to survive uncertainties and risks. *Survival* can also be described as the effort to effectively maximise a company's power, claim Ulrich and Barney (1984). Some of these risks and uncertainties come in the form of competition or dependency on other role players in the market, such as the suppliers of critical resources (Kholmuminov*, et al.*, 2018).

Dill (1981) argues that, to understand the behaviour of management and the board, it is necessary to understand the environment within which a company operates. This environment can be viewed to contain scarce resources that are critical for a company's survival. This scarcity environment causes uncertainty within a company over how resources can be acquired (Ali, Ng & Kulik, 2013; Kholmuminov*, et al.*, 2018; Ulrich & Barney, 1984).

One of the key aspects of resource dependency theory is its contribution to understanding board behaviour, according to Pearce and Zahra (1991), Hillman*, et al.* (2009) and Kholmuminov*, et al.* (2018). The authors further assert that the board contributes to a company's ability to reduce its dependency and to attract vital resources. These resources may be market contacts, or skills and experience that a company may not be able to afford or does not need on a full-time basis; for example, legal and corporate finance skills (Arzubiaga*, et al.*, 2018; Community Business, 2013; Ferreira, 2010; Hillman & Dalziel, 2003; Marlin & Geiger, 2012; Young & Roberts, 2008). The board combines to form a unit that matches a company to the demands of its environment. In other words, the demands on a company has a significant impact on the composition of the board, affirm Sanders and Carpenter (1998). Pearce and Zahra (1991) assert that a board's composition is not only impacted by external factors, but by a company's strategy and historical performance. They believe that different board compositions will result in different contributions by the board. For example, where the board is dominated by executive directors, the board's ability to provide objective oversight and strategic direction

may be limited. However, for a board to be able to act as a true instrument of corporate governance, with the ability to overrule executive management and provide strategic direction, a board requires a high degree of independence and an increased level of skills and experience (Pearce & Zahra, 1991). Boyd (1990) advocates that the aim of composing a board should be to establish a *resource-rich* board.

Hillman*, et al.* (2009) highlight four contributions a board can make to a company. In the first instance, the board provides a company with critical resources; for example, the board members may provide council, knowledge and advice or access to strategic relationships, according to Arzubiaga*, et al.* (2018), Kor and Misangyi (2008) and Wang, Chen, Fang and Tian (2018). This benefit tends to be even more valuable in new companies or entrepreneurial companies that lack market experience, continue Kor and Misangyi (2008) and Arzubiaga*, et al.* (2018). For these companies, the directors could provide insights into market trends, historic tendencies, opportunities, threats and competitor action. Secondly, the board could provide access to information channels. For example, board members may have industry or strategic relationships that may benefit a company in terms of goodwill or industry knowledge and opportunities, assert Carpenter and Westphal (2001) and Wang*, et al.* (2018).

Thirdly, the board members will be in a position to give a company access to critical resources. For example, board members from certain stakeholder groupings will be able to attract resources, such as quality labour, from the grouping they represent. Stearns and Mizruchi (1993) claim that a company's funding is affected by board members appointed from financial institutions. In other words, a director interlock enables both the company and the director to solicit business from each other. In the fourth instance, directors can contribute to the legitimacy of a company. For example, Johnson and Greening (1999) explain that stakeholder directors contribute to companies' responsiveness to the environment and the community within which they operate, thereby improving a company's corporate social performance.

Furthermore, Young and Roberts (2008) argue that the board plays an important role in managing company risks, especially those caused by external factors, and thereby contributes to diminishing uncertainty. These sentiments are echoed by Marlin and Geiger (2012); Yusoff and Alhaji (2012).

Resource dependency theory is the single biggest motivation for this study. Resources dependency theory describes the board as a key interface between the company and its market, which contributes greatly to the management of the market risk of a company. It, furthermore, describes the board as a critical source of resources to a company, such as experience, knowledge and skill, and that different board compositions will result in different contributions. This theory also propagates board independence as a key contributor to the board's effectiveness. Consequently, the study focussed on the market risk of a company as a major area in its value creation process. Market risk often manifests itself as uncertainty and volatility, hence the share price volatility was investigated as a measure of a company's market risk together with the risk-adjusted returns of a company. Moreover, further research is warranted in the role that the various board characteristics play in the management of a company's market risk. These attributes are included in the statistical hypotheses reflected in Table 1-2 in Section 1.5.3 and include board size (H_{aB1} and H_{aC1}), board independence (H_{aB2} - H_{aC3}), ethnic diversity (H_{aB4} and Ha_{C4}), gender diversity (H_{aB5} and Ha_{C5}), geographic diversity (H_{aB6} and H_{aC6}), board age and age diversity (H_{aB11} - H_{aC12}), tenure diversity (H_{aB13} and Ha_{C13}), academic and professional diversity and level of education (H_{aB14} - H_{aC17}) and a board's experience (H_{aB18} - H_{aC19}).

2.5.4 Stewardship theory

Kota and Charumathi (2018) describe *stewardship theory* as a relatively new theory that clarifies the rational conduct of management. According to Donaldson and Davis (1991), stewardship theory is almost in direct contrast to agency theory. Agency theory states that the objectives of the managers (agents) and shareholders (principals) are significantly misaligned to the extent that management will not spontaneously act in the best interests of the shareholders. Agency theory is mainly

concerned with mechanisms that will anticipate management's opportunistic behaviour and incentivise management to act in the best interests of shareholders (Eisenhardt, 1989; Zhang*, et al.*, 2018a). These typically include monitoring and control mechanisms, which are mainly the responsibility of the board in keeping management accountable. In addition, incentive schemes are designed to encourage management to maximise shareholder value (Aguilera, 2005; Mans-Kemp*, et al.*, 2018a).

One of the cornerstones of agency theory is the independence of the board. For example, the concept of segregation between chairman and CEO is strongly promoted, declare Donaldson and Davis (1991) and Mathew*, et al.* (2018). According to McGregor (2000), agency theory is predicated on the basic assumption that people are self-serving creatures who constantly calculate the cost and benefit of proposed actions. They would then choose the course of action which brings the highest benefit or which avoids punishment. McGregor (2000) elaborates that, without the *carrot and stick* motivation, people would do as little as possible, would have no ambition and would act totally self-centred. In stark contrast, Glinkowska and Kaczmarek (2015) observe that stewardship theory is based on the assumption that the average person is motivated by higher-level desires. These desires include the need to achieve, the need for progress and the need for self-actualisation. Donaldson and Davis (1991) assert that employees and management are more concerned with being challenged by their tasks, and consequently are motivated by the ability to exercise responsibility and authority and to gain the recognition and respect of their colleagues and superiors.

Dicke (2002) believes that, even though a certain level of contractual arrangement and monitoring is required to efficiently run a company, the assumptions of stewardship theory serve to fill many of the gaps left by agency theory. According to stewardship theory, Glinkowska and Kaczmarek (2015) and Subramanian (2018) maintain that there is no need to devise costly incentive schemes to coax management into pro-company behaviour. Eddleston and Kellermanns (2007) state that reasonable remuneration, coupled with an involvement-oriented environment, is enough encouragement to promote pro-company behaviour with the aim to

maximise company performance. According to Donaldson and Davis (1991), the tendency of directors to be incentivised by adequate remuneration and involvement in the business of a company is directly related to the tenure of management and board members, in that managers and directors' self-esteem tend to become more and more intertwined with the prestige of a company.

Nevertheless, Dicke (2002) argues that stewardship theory does not propose to render agency theory obsolete. For example, Donaldson and Davis (1991) state that it is not suggested that managers never calculate the cost and benefit of their actions. However, in the event that an action is determined to not offer any personal reward, management would still, from a sense of duty, perform the necessary tasks. This sense of duty is nurtured by the perception of management that their future is bound to that of the company through continued employment and retirement benefits, even if there are no direct ownership prospects. Under this theory, the manager wants to be a good steward of a company's assets (Arzubiaga*, et al.*, 2018; Donaldson & Davis, 1991; Subramanian, 2018).

For the desired behaviour of management to manifest itself, an empowering environment is required, surmise Glinkowska and Kaczmarek (2015). This environment is based on situational factors such as trust, engagement, collectivism, authority and the ability to exercise powers. It is especially important that managers and board members have at least the perceived power and ability to affect the performance of a company and that they have, or at least are part of, a grouping that has control over key decisions, declares Provan (1980). People are motivated when power is shared (Eddleston & Kellermanns, 2007).

Donaldson and Davis (1991) point out that, according to stewardship theory, the best structure for CEOs to deliver optimal company performance is one where they have complete authority over a company and where their role is unambiguous and unchallenged. This is achieved where the CEO is also the chairman of the board, in other words, authority and power is concentrated in one person. This leaves no doubt about who is responsible and accountable in any given situation. Stewardship

theory shifts the focus from the motivation of managers to the creation of an enabling environment.

Stewardship theory removes the inherent distrust between the board and management, which is the undertone of agency theory, imply Glinkowska and Kaczmarek (2015) and Kota and Charumathi (2018). The role of the board is seen as supervision, consultation, co-operation, and information exchange and co-ordination. The main function of the board is to share skills and experience with a company (Arzubiaga*, et al.*, 2018). Velte (2010) describes the role of the board as simultaneously being the principal of management and the agent of the shareholders. However, according to Glinkowska and Kaczmarek (2015), board members will always prioritise the interests of a company for the sake of their reputation, as it is linked to the standing of the company. The board also co-ordinates and provide information to the shareholders. For example, the board may assist external auditors to report their findings (Velte, 2010). Stewardship theory places little or no premium on the independence of board members.

Stewardship theory believes that reasonable remuneration for top management, without the need for excessive incentive schemes, is adequate to motivate management. The theory also philosophises that directors' motivation increases with their tenures. In addition, the theory is not a proponent of a board's independence and that the board's function is to share skills and experience. Therefore, further consideration of the following characteristics is warranted and are included in the statistical hypotheses in Table 1-2 in Section 1.5.3: board independence (H_{aA2} - H_{aE3}), geographic diversity (H_{aA6} - H_{aE6}), CEO's remuneration (H_{aA7} - H_{aE7}), payment gap (H_{aA8} - H_{aE8}), director remuneration (H_{aA9} - H_{aE10}), tenure diversity (H_{aA13} - H_{aE13}), academic and professional diversity and level of education (H_{aA14} - H_{aE17}) and a board's experience (H_{aA18} - H_{aE19}).

2.5.5 Social contract theory

Bradely (2017) proclaims that social contract theory has existed since the beginning of time, even though Thompson (2017) rightly points out that it has only been used

to describe the behaviour of business stakeholders relatively recently. The theory is a philosophical idea where an agreement exists between each person and all aspects of the community within which he or she finds him- or herself. These agreements may be in the form of written contracts, legal laws or implied agreements as a result of the norms and traditions of society (Choudhury & Petrin, 2018).

Jos (2006) proposes that, for a company to exist, it is not enough that a number of individuals get together to form a group of like-minded people with compatible skills. They need to form a corporate identity and organise themselves in such a way that the organisation is in a position to control itself without abusing its rights. Social contract theory dictates that all companies function under an implied contract with the community as a whole, according to Thompson (2017). According to this *contract*, the community permits a company to operate, as long as its conduct is to the benefit of the community. A company's decisions are thus determined by the business theory applied. For example, from a stakeholder point of view, all decisions need to be taken in the best interests of the stakeholders of a company. However, social contract theory dictates that the community as a whole should be considered and not only those parties directly influenced.

Olsen (1990) is of the view that a company can be described as a temporary set of agreements or rules of conduct, which is based on concepts such as justice, duties and voluntariness. However, these agreements are constantly *renegotiated* and the rules can change at any time. This has had the effect that companies have become more aware of the implicit non-legal expectation from the community (Bradely, 2017). This, in turn, led to a greater focus on corporate social responsibility, where companies attempt to determine the wants and needs of the community at large and to put mechanisms in place to meet these needs. Leonard (2018) and Scilly (2017) highlight a number of areas or responsibilities of corporate social behaviour, as follows:

- Economic: a company needs to be profitable to ensure sustainability, without which it will not be able to retain jobs and continue to benefit society.

- Legal: in addition, to profitability, it is also very important that a company obeys all the laws applicable to the society it operates in, such as labour laws, environmental laws and criminal laws.
- Ethics or voluntariness: this relates to actions that a company undertakes not because it is required to, but because the company believes that it is the right thing to do; for example, not doing business in oppressive countries.
- Environmental: this entails the impact that a company has on the environment; for example, recycling the grey water of its building.
- Stakeholders: a company needs to consider its impact on all parties that are affected by the company; for example, when considering extra shifts to increase output, a company needs to consider the impact on its workers and not only the economic impact thereof.
- Social or philanthropic: this includes the impact that a company has on society as a whole and goes beyond merely doing what one believes is right, examples are participation in charity events or donating money and/or services.

Michelon, Boesso and Kumar (2013) postulate that a haphazard approach to corporate social activity will not have a positive effect on a company's financial and socio-economic performance. The board of a company is seen as the driving force to ensure that social contract theory holds true and especially female directors are fundamental in developing social contractual aspects (Hussain*, et al.*, 2018; Setó-Pamies, 2015; Viviers*, et al.*, 2017). Setó-Pamies (2015) states that changes to a board's composition can provide the market with significant signals about its intention, which has the potential to improve a company's financial performance. Porter and Kramer (2006) maintain that social responsibility could improve a company's long-term competitiveness, as well as increase the prosperity of the community. The importance of the inclusion of female directors is highlighted by Setó-Pamies (2015), who states that, due to behavioural and cognitive differences between men and women, a more balanced gender mix will positively contribute to the board's decision-making and governance.

Fernández-Gago, Cabeza-García and Nieto (2016) state that independent directors have a material and positive association with the social interaction within a

company. They also claim that companies that are serious about assuming their social responsibility should ensure the presence of independent directors on their boards. The heightened sensitivity, created by the presence of independent directors, to the social contracts that management and the company as a whole are party to, will reduce conflicts of interests between the various stakeholders. This, in turn, will lead to increased company value (Fernández-Gago*, et al.*, 2016). Shaukat, Qiu and Trojanowski (2016) contend that a properly constituted, appropriately diversified board provides a company with a socially competitive resource, which will promote the development and implementation of a corporate social responsibility strategy. Such a strategy may enhance the environmental and social performance of a company, thereby improving the legitimacy of a company. Zahra (1989) states that diverse director backgrounds are one of the most important characteristics in enhancing corporate social responsibility.

Social contract theory puts strong emphasis on the company's interaction with its community and its corporate social responsibility. It highlights profitability and sustainability as key to fulfilling its social responsibility. This supports the motivation to include a company's financial performance as well as its risk management ability as key factors to consider as part of its value creation process. Moreover, literature on the theory promotes female directors and director independence as important catalysts in meeting a company's corporate social responsibilities. In addition, it opines that board composition provide signals to the market about a company's intension, which impacts on financial performance. These signals will also affect the market's reaction to the company as typically reflected in a company's share price movements. Consequently, the theory warrants research into the various diversity characteristics and specifically board independence (H_{aA2} - H_{aE3}) and gender diversity (H_{aA5} - H_{aE5}), which were included in the statistical hypotheses in Table 1-2 in Section 1.5.3.

2.5.6 Legitimacy theory

Legitimacy theory fundamentally deals with a company's legitimacy strategy, in other words, the strategies and efforts employed by a company to achieve and maintain credibility through corporate disclosures, as Mobus (2005) and De Luca

and Prather-Kinsey (2018) explain. Suchman (1995) explains that the corporate environment is mainly formed by cultural norms, beliefs and rituals. Suchman (1995) describes *legitimacy* as the anchor point for determining the standards and theories around the boundaries and motivation for the actions of a company and its management and staff.

Campbell (2000) explains that legitimacy theory is concerned with management's disclosure of a company's reality as management sees it. It therefore follows that this *reality* would change as management changes. These realities are also dependent on the audience to whom the disclosure is made, according to Mobus (2005). Therefore, a company's disclosure of its reality is dependent on a company's legitimacy needs.

Legitimacy theory links closely with stakeholder theory in that external political, social and economic pressures influence management's strategy with regard to its social disclosure (De Luca & Prather-Kinsey, 2018; Mobus, 2005). Legitimacy theory originally considered companies' reaction to environmental disclosure requirements. However, this has expanded over the years to cover a broad spectrum of corporate social disclosures. Mobus (2005) states that corporate legitimacy, and consequently corporate social disclosure are more closely related to public policy and public pressure than it is to economic pressures. According to Garas and ElMassah (2018), legitimacy theory defines the interrelation between a company and its internal and external socio-political environment.

Hillman, Cannella and Paetzold (2000) report that one of the main actions companies undertake as part of their legitimacy strategy is to change the composition of their boards. The composition of the board fulfils a substantive, as well as a symbolic, function in a company's pursuit of legitimacy. On the one hand, a company's legitimacy is closely linked with the image of its leaders, to the extent that the community and other stakeholders prefer ties with companies whose directors present a more appropriate image, that is who represent the profile of the community it operates in and display the characteristics that the stakeholders look for (Arthaud-Day, Certo, Dalton & Dalton, 2006). On the other hand, companies can

benefit from formal network links with relevant external stakeholders (Zimmerman & Zeitz, 2002). In a similar vein, directors with the right profile, that is directors with the required experience and diversity in terms of gender and/ or race, will promote legitimacy to investors when these companies aim to list on the stock exchange and such directors will provide credibility to the value projections provided to external investors (Higgins & Gulati, 2006).

Perrault and McHugh (2015) conclude that directors with various characteristics need to be appointed at various stages of a company's lifecycle to substantively resolve the changing challenges faced by a company and to symbolically indicate a company's compliance with society's expectation of the company. According to Zimmerman and Zeitz (2002), the pressure on the board's composition changes as a company grows and enters into new phases of its development. For example, after listing on the JSE, a company is expected to adhere to the listing rules and the principles of relevant governance regulations in terms of its board composition. In addition, Zimmerman and Zeitz (2002) maintain that boards are under pressure to conform to regulatory, cultural and socio-political aspects. This is especially true in South Africa with its government's reform initiatives. In this case, transformation of board characteristics is symbolic of a company's willingness to conform to social pressures.

Perrault and McHugh (2015) highlight three characteristics which may be associated with a company's quest for legitimacy, namely board size, independent directors and board diversity (gender and race). Coles, Naveen and Naveen (2008) indicate that large, complex companies have a greater need for directors in an advisory capacity, which may result in larger boards and boards with a wider variety of backgrounds. Goodstein, Gautam and Boeker (1994) stress that young entrepreneurial companies have less need for independent directors, because the internal directors are usually well aligned with the financial well-being of a company and this hands-on knowledge of the workings of the company can be greatly beneficial. Once a company lists on the JSE, a greater need for legitimacy with the market develops and shareholders that tend to be more remote from the operation of the company require greater monitoring of management.

Perrault and McHugh (2015) and McDonald*, et al.* (2008) indicate that 92% of companies are founded by men, and consequently the initial boards of these companies tend to be dominated by males. However, as the companies grow, the board's diversity changes in line with a company's legitimacy strategy to achieve and maintain credibility and as a result of the benefits that may be obtained through gender and race diversity; for example, different approaches to problem-solving or improved socio-political connectivity. A second reason is that, as a company grows in socio-economic prominence, more stakeholders take interest in the activities and conduct of the company and the pressure increases for more diverse representation in terms of gender and race. However, as a company matures, the opportunity for real practical change diminishes, which results in the changes to board diversity being largely ceremonial conformity resulting in visual changes without any operational changes in a company's pursuit of legitimacy (Meyer & Rowan, 1977).

The theory is concerned with the credibility of a company to its various stakeholders and with the fact that the board is a key constituent in this process. The theory promotes the interaction between a company and its environment and therefore justifies further consideration of a company's market risk management and how this is impacted by the board. The theory also refers to the challenges that the complexity of the company brings and advocates the need to change a board's composition as the company evolves or changes its strategy and focus. This underscores the importance of determining the association between the various characteristics of board members and the different aspects of a company's value creation process. This led to the identification of financial performance, external risk management and internal risk management as key and diverse aspects of a company's operation. The board's composition is highlighted as important in the a company's quest for legitimacy and specific characteristics are highlighted such as board size (H_{aA1} - H_{aE1}), board independence (H_{aA2} - H_{aE3}), ethnic diversity (H_{aA4} - H_{aE4}), gender diversity (H_{aA5} - H_{aE5}), director experience (H_{aA18} - H_{aE19}). These were all included in the statistical hypotheses in Table 1-2 in Section 1.5.3.

2.6 SUMMARY AND CONCLUSION

Since the focus on corporate governance transformation was instigated by the financial debacles of the last decade or two of the previous century, two main reform themes have emerged. The first is the role of the board as custodian of a company's governance and the second is the inclusion of a wider audience of stakeholders. The corporate governance rules and regulations around the globe provide guidance on which characteristics a board should possess, as well as the roles and functions that a board should fulfil.

Companies consist of a complex and intertwined array of relationships between a variety of stakeholders. On the one end of the spectrum are shareholders, who look towards a company to manage their capital and provide them with a return on their investment. On the other end are employees and the community, who are directly and indirectly impacted by the behaviour of management and the board. The operation of a company is largely determined by management, whose actions, and the reasons for these actions, are not always clear to the other role-players. An intricate set of corporate governance systems and mechanisms is employed to control and guide management and to create adequate levels of transparency and accountability. Over the years, many theories have been developed to explain the behaviour of companies and identify the various stakeholders and role-players of companies. The theories attempt to determine how the forces that impact on a company, and the roles that the boards are expected to play, affect the characteristics of the board. The following theories were explored:

- Agency theory, which states that the separation of ownership and management over assets results in a misalignment between the goals and risk appetite of management as the agents, and that of shareholders as the principals. Agency theory states that management, as the agent, will always seek ways to optimise its own benefits, with little or no regard to the well-being of the shareholders as principals. Furthermore, shareholders often do not have access to adequate information to assess whether management is behaving as expected. Shareholders attempt to resolve this misalignment through appropriate incentive schemes and monitoring. Literature indicates that the board of

directors stand central to the monitoring of management and to providing shareholders with adequate information.

- Stakeholder theory, which is largely developed from agency theory, but recognises that the ownership of a company and its resources reside in a wider group of stakeholders than just the shareholders. Literature indicates that the narrow focus on shareholders results in a focus on short-term financial performance, which is to the detriment of a companies' long-term sustainability.
- Resource dependency theory propagates that the board provides a company with key resources, which assist the company in its reaction to its environment, such as legal skills or a range of financial expertise. Ineffective boards, in terms of control over management or in terms of interaction with the companies' environments, often manifest themselves through share price volatility.
- Stewardship theory assumes that people and therefore management are motivated by a desire to achieve success and by self-actualisation. This theory does not see the board as a watchdog, but sees the board's role as one of supervision, consultation and co-ordination. Consequently, the theory places little emphasis on board independence.
- Social contract theory is based on the premise that an agreement, explicit or implicit, exists between each company and all aspects of its environment, which results from laws, regulations, social norms and social protocols. According to this theory, consideration is given to economic, environmental and ethical aspects as well as all stakeholders and the community at large. Such a holistic approach has been found to improve financial performance, increase company value and improve the legitimacy of a company. Research suggests that the inclusion of female and independent directors may promote a company's adherence to its social contracts, improve decision-making and governance.
- Legitimacy theory predicts that the characteristics of a board are mainly determined by a company's endeavours to obtain, restore and maintain legitimacy within its community and with other stakeholders. These efforts may be practical measures to gain legitimacy through effective and efficient operational practices. However, the composition of the board may well be adjusted as a ceremonial measure to signal a company's willingness to conform to social and other protocols without much change to its operation.

A number of board characteristics and performance and risk management measures that stood out from the literature review in this chapter, which informs the formulation of the research and statistical hypotheses, to answer the research questions of the study. Literature indicates that company performance and risk management, can be improved by greater diversity in the composition its board. King IV requires the board to be knowledgeable, skilled, experienced, diverse and independent enough to fulfil its role and responsibility. The study therefore aimed to test whether there is a relationship between certain board characteristics that contribute to the diversity of the board, such as director background, experience, gender and race, and a company's performance and risk management ability.

Literature advocates that knowledge and professional experience equip directors to give better strategic guidance. Literature also shows a positive relationship between the age of directors and their efficiency. Furthermore, the literature states that a board is able to provide a company with skills and experience that it may not need or cannot afford to have on a full-time basis. Consequently, the study determined whether a relationship exists between the following board characteristics and a company's performance and risk management ability:

- academic qualification;
- professional experience;
- length of tenure as a director;
- age; and
- director experience (as measured by the number of other directorships).

Global competition caused increasing demand for improved shareholder return through enhanced corporate governance. Investor confidence is improved by higher levels of corporate governance, which contributes to the increase in company values. Therefore, the study determined whether a relationship exists between various board characteristics and a company's total shareholder return.

Good corporate governance promotes increased investor prosperity and reduces the impact of risk on a company's performance. This study thus determines whether an association exists between various board characteristics and a company's risk-managing ability. In addition, King IV requires the board to consider the solvency and liquidity of a company as part of the board's oversight function. Consequently, the study determined whether a relationship exists between various board characteristics and a company's ability to manage its liquidity.

Literature indicates that a good balance should be maintained between executive and NEDs, that is the majority of the board should be NEDs, and that the majority of the NEDs should consist of independent directors, that is NEDs who have no other links with the company. These directors are said to be more willing and able to monitor the executive management's performance. However, research does not always find evidence to support this expected situation. This study therefore aims to test whether there is a relationship between the percentage of NEDs and the percentage of independent NEDs on the board and a company's performance, in terms of the various performance and risk management measures identified in the literature and developed further, later in the study.

King IV aims to ensure that top executive management remuneration is fair and responsible in relation to total employee remuneration within an organisation. In terms of stewardship theory, there is no need for costly incentive schemes to coax management into pro-company behaviour. In addition, resource dependency theory states that management greed, in the form of excessive remuneration, may reduce company value, which could leave a company vulnerable to market action. Agency theory, in turn, holds that the establishment of adequate incentives is necessary to align the objectives of the principal (shareholder) and the agent (management). Therefore, this study aims to determine whether an association exists between the size of the payment gap (Lord, 2018), and a company's performance and risk management ability.

Share price volatility, or rather the volatility in capital gains or losses on the shares, may be caused by the inefficiency of the board, especially in its interaction with the

environment within which a company operates. Therefore, the study determined whether an association exists between the various board characteristics and a company's share price volatility.

Moreover, the chapter indicated that even though developing countries could learn much from developed countries and, in fact, adopted many of their governance provisions from developed countries, each of these countries had their own unique circumstances. Consequently, any study of the composition of boards, and how they should function, would therefore be incomplete if it only focuses on developed countries, hence the South African focus of this study.

Chapter 3 continues to review the literature by investigating the governance issues and demands faced by companies operating in South Africa. The chapter provides an overview of studies undertaken around the world and in South Africa, focusing on the issues pertinent to the South African environment.

CHAPTER 3: COMPANIES FUNCTIONING IN THE SOUTH AFRICAN ENVIRONMENT

3.1 INTRODUCTION AND BACKGROUND

This chapter continues the literature review and explores various aspects that companies functioning in South Africa have to deal with. Some of these aspects are unique to the South African environment, while others are common among emerging economies around the globe.

As described in previous chapters, it is in the best interest of companies in South Africa to implement good corporate governance measures, according to Nyirenda (2010). However, South African companies are also required to implement the political, social and moral transformational proposals and programmes initiated by government. One of the main objectives of these initiatives is to ensure that companies represent the societies they operate in. Furthermore, increased globalisation of markets, greater global competition, higher levels of global interdependencies, and more prominent shareholder involvement in various jurisdictions place ever-increasing demands for higher returns and improved corporate governance on developed and emerging markets alike (Kakabadse & Korac-Kakabadse, 2002).

Even though South Africa has made some strides in adhering to international best practice, its unique socio-political landscape requires careful balancing and navigation to ensure that the disruption and disorder seen in other African countries are not replicated (Kakabadse & Korac-Kakabadse, 2002). Nyirenda (2010) and Cassim (2015) further explain that disorder may easily occur due to contrasting expectations. The change in the political landscape in South Africa, since its transfer to democracy, has led to an expectation for socio-economic transformation to eliminate distortions and imbalances in the economy. However, this often directly conflicts with the expectation of foreign and local investors to maximise returns, as the changes required do not always intuitively make economic sense and are seen as unproductive expenditure.

Even though extensive research has been conducted globally on various aspects of corporate governance and its potential relationship to the performance of companies, more research in emerging economies, especially in the South African environment, is needed (Bhana, 2010; Mans-Kemp & Viviers, 2015; Semosa, 2012). Deysel and Kruger (2015) support the fact that very few studies, on isolated aspects of corporate governance, have focused on South Africa.

The chapter commences by considering the backdrop against which companies operate in the South African landscape. The chapter then considers the transformation goals of the country and how these are potentially associated with the performance of the companies. This is followed by an overview of the requirement for inclusive development and how lessons learnt from other jurisdictions may apply to the South African context. The chapter ends by looking at the challenges that South Africa faces as a participant in the global market and how these challenges, together with the socio-economic objectives of the country, may affect South African companies. The chapter also contain the development of some of the statistical hypotheses listed in Section 1.5.3.

3.2 SOUTH AFRICAN LANDSCAPE

South Africa's quest for transformation is embodied in government's National Development Plan and several new pieces of legislation. Over the years, a number of Acts and other regulations have been introduced, which have contributed to the corporate governance framework of South Africa and widened the decision-making horizon beyond the mere maximisation of shareholder value. These acts and regulations include the Banks Act (94 of 1990), the Labour Relations Act (42 of 1996), the Basic Conditions of Employment Act (75 of 1997), the Employment Equity Act (55 of 1998), Insider Trading Act (135 of 1998), the Public Finance Management Act (29 of 1999), the Broad-Based Black Economic Empowerment Act (53 of 2003), the DTI Code, revisions to the JSE Listings Requirements, and the Constitution itself (Cassim, 2015; Delaurentis, 2002; Kakabadse & Korac-Kakabadse, 2002; Mans-Kemp & Viviers, 2015; Nyirenda, 2010; Padayachee,

2013). Moreover, inclusive development has become a recurring theme expressed by political leaders.

3.2.1 South Africa's tainted history

Black (2002) is of the opinion that many of the issues faced by South Africa stem from its peculiar history of discrimination, especially in terms of economic disempowerment and education. Rushin (2006) supports the notion that South Africa's history caused challenges by stating that, over and above the obvious irregularities of apartheid, other anomalies occurred that stifled the *normal* development of the economy. For example, diversification in South Africa is in many respects unique, due to the economic sanctions imposed on the country. As a result of these sanctions, companies were forced to look inward for growth and to find suitable candidates for board positions. Consequently, as Nyirenda (2010) points out, the South African landscape was, and to a large degree still is, dominated by middle-aged white males appointed to the boards of companies. According to Mans-Kemp and Viviers (2015), this can be partly ascribed topre-1994 legislation, such as the Labour Relations Act (28 of 1956), which did not allow for ethnic diversity on the boards of South African companies. These views expressed by literature warrants further investigation to determine if ethnic diversity provide benefit to a company or is at least not to the detriment of a company.

In addition, Rossouw (1997) makes a serious and rather condemning accusation by stating that the morals of the business community have not always been above board. This is evidenced by high levels of corruption and white-collar crime in the country. A possible cause of this situation is the sanctions during the apartheid era. These sanctions forced businesses to find alternative ways to gain access to international markets, which often led to immoral practices. Consequently, these practices were praised, rather than repudiated and unfortunately did not stop when the sanctions were lifted (Rossouw, 1997). Nonetheless, Nicolaides (2009) points out that it has been recognised that South African businesses need to dispense with this selfish behaviour, based on self-preservation, if they want to become self-sustaining. To this end, the increased transparency achieved by improved

corporate governance has greatly contributed to obtain buy-in from businesses into maintaining higher ethical standards to the benefit of all.

Rossouw (1997) and Swartz (2006) offers a second possible cause for the historical tendency towards unethical behaviour by explaining that the majority of the population considered the socio-economic dispensation of the apartheid era to be illegitimate, which led to significant disagreement and struggle over morality and justice. Consequently, turning this tide is described as one of the biggest challenges facing business and society in South Africa. Erasmus and Wordsworth (2004) assert that a shared understanding of ethical behaviour serves to improve the unity of society in their realisation that business ethics can create a sustainable competitive advantage in the global market. Price and Van der Walt (2013) further state that education and transformation play a significant role in effecting the change. An encouraging sign is the marked increase in course material on the topic of business ethics within leading business schools around the country. Consequently, further investigation is warranted into the association between the education of board members and elements that impact on a company's sustainability, such as financial performance and risk management.

3.2.2 Regulatory development

Abdo and Fisher (2007) claim that the post-apartheid period saw dramatic political change. This caused intense market pressure and attracted high levels of global scrutiny, as a result of foreign investors looking to return to the South African market. This led to the South African government and businesses appreciating the fact that high-quality corporate governance was crucial for sustainable development, especially in an emerging economy such as South Africa. King IV, as discussed in Section 2.4.5, is testimony to this. Furthermore, the JSE Listings Requirements were totally overhauled in 2003 to urge companies to adhere to the recommendations of King II (Mangena & Chamisa, 2008). In addition, the new Companies Act (71 of 2008), enacted in 2011, added renewed impetus to the role of directors and to facilitating business in South Africa (Padayachee, 2013).

Botha (2009) draws attention to government's thinking leading up to the revision of the Companies Act (71 of 2008), by indicating that the DTI issued a policy paper that ultimately informed the revision of the Companies Act (71 of 2008). This policy paper called for the new law to promote competitiveness and to develop the South African economy by doing the following:

- promoting innovation and investment through a predictable and effective regulatory environment;
- encouraging efficiency of companies and the management thereof;
- promoting transparency and good corporate governance standards; and
- making sure that South Africa is compatible and in line with international best practice.

Kakabadse and Korac-Kakabadse (2002) assert that South Africa's challenge to achieve the four basic pillars of corporate governance on a sustainable basis remains. The four pillars are legitimacy, transparency, accountability, and morality. The importance of this is underlined by Ashbaugh-Skaife, Collins and LaFond (2004), who state that the ratings agency Standard & Poor's has introduced a new service where they now also assess the corporate governance performance of a company. Their review includes the following key measures:

- ownership structure and influence: this measure looks at ownership transparency and the influence of major shareholders on a company;
- shareholder rights and stakeholder relations: this measure assesses the quality of a company's interaction with its financial stakeholders and the rights of these stakeholders;
- financial transparency and information disclosure: this measure considers the quality, accessibility and timeliness of disclosures to stakeholders, including the independence and integrity of the audit process; and
- board structure and process: this measure reviews the effectiveness of the board structure in executing its responsibilities, including board succession and remuneration.

3.2.3 Corporate governance landscape

Vettori (2005) and Andreasson (2011) explain that the development of a corporate governance regime in South Africa needs a careful compromise between the requirements of local and international financial markets and the African (non-Western) culture. On the one hand these markets are constantly pushing for adherence to international best practice in emerging markets and investors typically require more sophisticated accounting, monitoring and reporting. On the other hand the *African value system*, also referred to as *ubuntu*, is more focused on empathy, mutuality, harmony and co-operation. It therefore becomes clear that an exclusive emphasis on shareholders' rights is in direct opposition to the African value system.

Rossouw*, et al.* (2002) describe African values as looking after elements that are often not considered within a company's *normal* strategy; for example, considering the disadvantaged, developing an environmental strategy or reflecting on the potential needs of future generations. This resulted in a number of challenges posed to the King Committee in drafting the corporate governance regulations. For example, the committee was tasked to consider the admission of business leaders from historically disadvantaged communities as one of the socio-economic developments (Padayachee, 2013; Rossouw*, et al.*, 2002). Chaka (2018), Dawkins and Ngunjiri (2008) and Visser and Tolhurst (2017) state that as a result it is noticeable that corporate social reporting in South Africa is generally superior to that in countries such as the United States, Germany and Japan, both in terms of frequency and quality.

As discussed in earlier chapters, two approaches to corporate governance have emerged globally, namely the shareholder approach; for example, generally used in the United States and the United Kingdom, and the stakeholder approach, as is used in countries such as South Africa, Japan and Germany (Andreasson, 2011; Padayachee, 2013). The shareholder approach views the owners or shareholders as having the sole right to determine a company's goals and to determine how profits are used, meaning that a company does not pay much attention to issues beyond the *financial bottom line*. In contrast, the stakeholder approach as promoted

by the African value system prevalent in South Africa, views companies as responsible and accountable to a wider community, including employees, creditors, government, owners and local communities (Rossouw*, et al.*, 2002). This underlines the complexity of a company and the different angles from which a company's operations need to be assessed to meet the interests of the various stakeholders.

However, Andreasson (2011) and Padayachee (2013) point out that the South African corporate governance regime displays a number of features that are more affiliated with the United States/United Kingdom model. Rossouw*, et al.* (2002) and Andreasson (2011) highlight the following outstanding features of the South African corporate governance system, which illustrate this notion:

- It has a single-layer board configuration, which only accommodates shareholder representation.
- An active stock exchange underlies corporate governance measures, which ensure that the financial market plays a dominant role.
- The role of banks is ancillary to the financial markets with banks maintaining a high degree of independence from clients, that is banks do not exercise any control over their clients. In other words, banks maintain an "*arms-length"* relationship with their clients and do not participate in the day to day operation or decision making of their clients.
- There is an in-principle commitment to a market-driven economy. However, some government policies tend to detract from this, for example, policies with regard to affirmative action, which requires further investigation to determine whether ethnic diversity has any association with company performance.

3.3 TRANSFORMATION

Rogerson and Rogerson (2011, p. 994) describe the business environment, in general, as the "nexus of policies, institutions, physical infrastructure and geographic features", with the reformation of this business environment being seen as the "*magic bullet"* to achieve socio-economic reform, while catalysing economic growth. However, countries cannot make this happen in isolation. According to

Rodríguez-Pose and Tijmstra (2009), globalisation has a significant impact on the success of local economic development in every jurisdiction in the world. Lawrence (2013) supports this finding by explaining that the South African government's increased focus on the globalisation of the economy has in many ways detracted from its local and regional initiatives. As a result, this global focus has diminished the opportunities to explore the potential gains to be obtained from a local development perspective. To this end, South Africa joined the so called BRICS (Brazil-Russia-India-China-South Africa) alliance to promote access to better technologies, investment in infrastructure, production efficiencies and access to foreign markets (Mazenda, Masiya & Nhede, 2018).

Despite these initiatives and calls for transformation, changes in terms of board composition have been slow. In fact, much of the change that has occurred is, arguably, the result of companies attempting to be politically correct, rather than based on the expected contribution that the new board members can potentially make (Mans-Kemp & Viviers, 2015; Nyirenda, 2010). The end of apartheid in South Africa did not necessarily mean the end of the struggle for fairness and the abolition of social and economic inequality, both in terms of ethnicity and gender (Hassim, 1999; McEwan, 2005). The first democratic election in 1994 brought about a significant political turnaround in South Africa, and ignited an expectation of socio-economic change (Nyirenda, 2010; Venter, 2018). Nevertheless, Kakabadse and Korac-Kakabadse (2002) stress that the unique history and context of South Africa call for sensitive navigation and resolution to ensure that transformation happens in a co-ordinated and sustainable fashion, while promoting economic growth. However, Cornia and Court (2001) say that the higher the levels of inequality in a country, the less impact economic growth has on alleviating poverty. In other words, increasing inequality makes it much harder to eradicate poverty. Van Der Westhuizen (2012) highlights South Africa as a prime example of where a track-record of economic growth has not improved the economic well-being of a large segment of the population as a result of the country's high and increasing inequality. Based on these findings further research is merited into the relationship between the payment gap within companies, ethnic diversity and gender diversity and the operation of a company.

3.3.1 Resolving inequality

Black (2002) speculates that the most outstanding feature of the South African landscape is perhaps the degree of inequality that exists among different communities and individuals. According to Hassim (1999, p. 10), the Constitution of South Africa considers equality of all citizens “a foundational value and organising principle of the democracy of the country”. The Constitution therefore provides an enabling framework to redress inequality (Venter, 2018). Bentley (2005) notes that the Constitution recognises political, social and economic rights (at an individual level) and cultural rights (at corporate or group level). McEwan (2005) argues that formal political rights are not enough to guarantee equality. In reality, equal integration is based on rights exercised through social, economic and political structures.

Furthermore, Kakabadse and Korac-Kakabadse (2002) are of the opinion that the shareholder-oriented corporate governance model, as discussed earlier, promotes a rapid generation of wealth, but it also increases the divide between rich and poor. To solve this problem, a strategy of black economic empowerment was introduced as the basis of implementing economic transformation in South Africa. It has become the mechanism with which government aims to eradicate a history of 350 years of economic and social degradation in the country (Rossouw, 1997). Black economic empowerment was designed to overcome the racial and social divide in the country and usher historically disadvantaged individuals into the mainstream economy through ownership and investment. However, for these efforts to succeed, the entire economy needs to be transformed (Haddock, 1999). To date, the South African government has made some progress towards the creation of a notable black middle class, which is considered a direct consequence of black economic empowerment (Korhonen, 2018; Sanchez, 2006; Zwane, 2019).

Masito (2010) observes that black economic empowerment was introduced by initially relying on industry to act in good faith to uphold agreed transformation principles. However, Arya and Bassi (2009) point out that progress was rather

pedestrian, and consequently the Broad-Based Black Economic Empowerment (B-BBEE) Act (53 of 2003) was introduced, which required the DTI to develop the Black Economic Empowerment Codes of Good Practice (Codes). The Codes include formal verification procedures to ensure that companies achieve the set Black Economic Empowerment (BEE) targets. This led to the development of industry-specific transformation charters, which contain industry-specific scorecards setting out transformation targets (Ponte, Roberts & Van Sittert, 2007). Government initiated the first two industry charters, for the mining and petroleum and liquid fuels industries, expand Ponte*, et al.* (2007). However, according to Arya and Bassi (2009), other industries realised that it may be better to control the transformation process rather than to be forced by government to adhere to standards over which they had no control. These industries were therefore inspired to develop self-regulatory charters, which set the standards their members had to adhere to. These industries included for example financial services, tourism, construction and agriculture. Sanchez (2006) points out that black economic empowerment was increasingly seen by many as a too narrowly based strategy, which was mainly focused on transferring ownership to black hands. Consequently, only a small number of individuals seemed to benefit. This led to the introduction of legislation, such as the Broad-Based Black Economic Empowerment Act (53 of 2003), with the aim to make black economic empowerment more broad based and inclusive and to ensure that it is guided by good governance and linked to sustainable growth.

Ngcobo (2010) and Masito (2010) are further of the opinion that black economic empowerment can only be sustainable and effective if the focus of all parties is to obtain actual transfer of skills, to develop intellectual capital and to stimulate innovation. This may also serve to counter a number of issues that have marred the success and reputation of black empowerment. According to Coomey (2007), Osode and Warikandwa (2017) and Morris (2018), these issues include:

- opportunism, which is where a non-black economic empowered entity uses an entity with superior black economic empowerment credentials as an intermediary to leverage off its black economic empowerment status to win contracts or attract business;

- fronting, which typically involves circumvention of the Broad-Based Black Economic Empowerment Act (53 of 2003) and the Codes through claims of compliance based on misrepresentations of facts; and
- tokenism, which is the result of the superficial appointment of historically disadvantaged individuals.

These practices often occur to allow companies to bolster their social responsibility and value-added reporting. Unfortunately, some companies which issue positive value-added and social responsibility reports do so only to gain legitimacy, according to Cahan and Van Staden (2009). Consequently, the reported changes are often only symbolic, without the company making any actual and credible changes. Furthermore, Cahan and Van Staden (2009) state that the importance of making real changes lies in the fact that these companies' ability to promote the employment of black South Africans and females establishes legitimacy with their employees, as well as all other stakeholders of a company. However, there is currently no obligation on entities listed on the JSE to disclose information on their BBBEE, states Morris (2018).

Furthermore, Masito (2010) argues that it is important for the various *previously disadvantaged* groupings to be able to identify with role models who could serve to enhance their confidence in the possibility of achieving career goals, career choices and opportunities. To this end, some success stories did emerge with the implementation of black economic empowerment. A number of individuals, classified as previously disadvantaged, have managed to establish themselves in the mining, media and telecommunications sectors. Unfortunately, most of these individuals were prominent political figures in the ruling African National Congress (ANC) party (Economist, 2001). Masito (2010) claims that this contributed to the criticism that only a few politically connected people were being enriched with very limited redistribution of economic factors, very limited skills transfer and limited development of intellectual capital. It appears that few entrepreneurs from disadvantaged backgrounds have been able to succeed without political connections. Morris (2018) agrees and states that, for South Africa to benefit from the improvement of racial inequality, the perception that BBBEE only benefits a few

elite politically connected individuals needs to be resolved. South Africa is in need of more examples that ordinary black people, and females for that matter, succeed and to whom the youth of South Africa can look up to (Economist, 2001).

Based on the findings and views from literature it is essential to further research the association between ethnic diversity, gender diversity and inequality and the operations and performance of a company within the South African environment. Gender diversity is included as it forms part of the South African government's transformation objectives.

3.3.2 Introduction of diversity into South African company boards

Given South Africa's history, corporate governance reforms have to give strong consideration to socio-economic development and stakeholder issues (Andreasson, 2011). Ntim (2015) and Scholtz and Kieviet (2018b) view South Africa as one of the world's most ethnically diverse countries. Since 1994, a number of regulatory affirmative action and organisational governance reforms have been implemented in an effort to undo the impact that apartheid had on board compositions and to introduce diversity into the boards of South African companies. Kakabadse and Korac-Kakabadse (2002) postulate that good governance should embrace diversity, promote inclusive decision-making, empower all sections of society and promote the common good of all stakeholders. Nyirenda (2010) emphasises that it is important for companies to understand corporate governance in the context of the transformation requirements of South Africa. This will enable them to play their part in levelling the playing field, to enable more black people and white females, who are included in the definition of "designated groups" in the Employment Equity Act (55 of 1998) that stand to benefit from affirmative action, to develop and fulfil their potential to become company directors.

Nyirenda (2010) describes companies as each being a *microcosm of society* and believes that the composition of company boards is the main indicator of the effectiveness of government's transformation initiatives. In other words, the board's composition is an indication of a company's stance on transformation. The

Employment Equity Act 55 (1998) includes in its objectives: to “achieve a diverse workforce broadly representative of our people” and to “achieve equitable representation in all occupational categories and levels in the workforce”. In addition, the Employment Equity Act (55 of 1998) calls for the elimination of unfair remuneration practices and for companies to take positive and affirmative action to attract, develop and retain individuals from previously disadvantaged groups, according to Burger and Jafta (2010). These groups include Africans, Coloureds, Indians, Chinese, women, and people with disabilities per the Employment Equity Act (55 of 1998). Florackis*, et al.* (2016) conclude that when aspects of corporate governance are studied, they should not be limited to economic and legal aspects, but need to take cognisance of the societal, cultural and ethical situation at the time. It is clear that transformation is not only focused on ethnic diversity, but also on gender diversity (Viviers*, et al.*, 2017). Despite many initiatives from government through legislation and voluntary initiatives, such as the King Reports, Nyirenda (2010) and Morris (2018) claim that, many female and black people were appointed as a result of tokenism. Carrim (2018), Mans-Kemp and Viviers (2015) and Seegers, Keke, Horak, Ebrahimi and Robinson (2019) state that very little has changed in terms of ethnic and gender diversity in South African companies and specifically their boards.

A further issue which was considered by the King Committee and is unique to emerging countries and prevalent in South Africa’s development state is whether there are adequate skilled individuals to act as NEDs (Padayachee, 2013; Rossouw*, et al.*, 2002). A potential solution devised by the King Committee was to propose that all new directors undergo an induction period to familiarise themselves with the company’s business, management structures and operating systems, according to Rossouw*, et al.* (2002) and Mans-Kemp*, et al.* (2018a). Nevertheless, Mans-Kemp and Viviers (2015) are of the opinion that the lack of diversity is mainly caused by the fact that there are just too few candidates available from the various groupings in the economy. Mans-Kemp*, et al.* (2018a) ascribe the cause of the challenge faced by local companies to source and appoint qualified candidates to the country’s unique political history. However, Mtshali (2013) is of the view that this situation is improving and reports that, even though the pass rate of university

students is alarmingly low, the Department of Higher Education found that the racial composition across all universities reflected the demographics of the country and that more than 50% of all students were female (Lehohla, 2016; Smith, 2019).

A further cause of the equality and diversity problem, especially at higher levels of the organisation, is the phenomenon generally referred to as the *glass-ceiling-effect*, according to Mathur-Helm (2006) and Viviers*, et al.* (2017). This effect represents the situation where women are not being appointed in senior positions, even though they are qualified and have the required experience for the positions. Currently, many companies claim to have eliminated discriminating practices in terms of women, which is evidenced by more and more qualified and talented females working alongside male counterparts as actuaries, chartered accountants and senior managers (Cameron, 2019; Mathur-Helm, 2006). Nevertheless, females in top management positions and on the boards of companies are still trailing their male counterparts. Currently there are no female CEOs in any listed South African company (Mans-Kemp, 2019). Cotter, Hermsen, Ovadia and Vanneman (2001) and Omran, Alizadeh and Esmaeeli (2015) are of the opinion that the discrimination against females grow stronger the higher they progress within a company, a pattern which appears to be more applicable to female employees than any other disadvantaged groupings. Cotter*, et al.* (2001) believe that any discrimination against individuals that cannot be explained by their job-related characteristics, represents a form of glass-ceiling. They emphasise that this should not be seen as a labour inequality but as a deep-rooted discriminatory barrier.

The observations from the literature motivates further study into the gender and ethnic diversity within companies and specifically their boards, as well as the inequality within the country and how this relates to the performance and management of a company.

3.3.3 Business case for diversity

Bradley (2004) and Morris (2018) emphasise that, for companies to fully subscribe to transformation and especially to the introduction of diversity throughout the

company as well as on its board, concrete motivation is required. Companies need evidence that the required transformation will contribute to improving the performance and/ or risk profile of the company, or would at least not cause it to worsen. Consequently, while a company's share price remains unaffected, the company may have little motivation to improve its transformation effort and enhance diversity at all levels within the company. The opposite shows from the findings of a new Stanford study that companies that announce better-than-expected levels of gender diversity saw a marked increase in their share price (Wink, 2019). Therefore, even though South Africa may have world-class governance principles and good transformation initiatives in place, it remains relatively easy to adhere to the letter of the rules, but not the spirit. For example, a company may appoint directors from a diverse range of backgrounds, but some of these directors may be unable or not trusted to assume their full responsibilities as directors, in a word, tokenism (Bianchi & Iatridis, 2014; Bradley, 2004; Morris, 2018).

The mere fact that laws exist does not necessarily inspire people or companies to pursue the desired goals or behave in the required manner. Many years ago (402 BC), the Greek philosopher Plato stated that people (or companies) who did not want to adhere to laws would always find ways around the laws (Mans-Kemp & Viviers, 2015). Robinson and Dechant (1997) observe that, even though most companies recognise the importance of diversity, it is rarely a top business priority. This is probably because the benefits to be gained from diversity is less tangible, predictable, systematically measured and documented, compared with other business initiatives. Consequently, it becomes necessary to develop a compelling, fact-based business case to gain the necessary commitment from top management and shareholders (Morris, 2018). The stakeholders need to be convinced of the competitive edge that may be gained from optimising the diversity of staff, management and the board (Robinson & Dechant, 1997; Smith, Smith & Verner, 2006). Ali*, et al.* (2013) maintain that board diversity will be improved at a greater pace if it brings economic returns, in other words, if a business case can be made.

Smith*, et al.* (2006) summarise a number of factors, which are globally accepted and were discussed in earlier chapters, to consider from a business case perspective:

- A diverse board may be able to make more informed decisions based on the evaluation of more alternatives than a homogeneous board.
- A company may improve its access to different targeted market segments.
- A diverse board may improve the image of a company, which may lead to better customer relations and may enable a company to attract a higher-calibre employee.
- Targeting all segments of the population increases the pool of candidates to choose from, which, in turn, will increase the distribution of qualifications and experience to select from.
- Diversifying the board in terms of ethnicity and gender may lead to improved career development in lower levels of a company through the availability of more identifiable role models and opportunities for promotion.

All of the above factors should lead to higher levels of productivity, and consequently improve company performance (Adams, De Haan, Terjesen & Van Ees, 2015; Choudhury & Petrin, 2018; Doidge, Karolyi & Stulz, 2004; IoDSA, 2016; Miller & Triana, 2009; Ntim, 2015; Paniagua*, et al.*, 2018; Scholtz & Kieviet, 2018b; Trautman, 2012). However, Robinson and Dechant (1997) argue that it may be harder to develop a business case for diversity than for other business initiatives. Consequently, transformation can only really happen if stakeholders are convinced that financial benefits are associated with the proposed action (Broome, 2008; Fanto*, et al.*, 2011; Mans-Kemp & Viviers, 2015; Morris, 2018).

Directors are inherently more comfortable to nominate acquaintances, who often resemble the background and characteristics of the incumbent directors. According to Broome (2008), board transformation to include a greater level of diversity therefore serves as an inspiration to company employees with diverse backgrounds, because they look up to the board of directors as the lead indicator of whether transformation initiatives are taken seriously by the company. Diversity

on the board should indicate a company's willingness to bring about meaningful change in the company, and even in the broader society, providing employees with the comfort that equal opportunities exist for all (Nyirenda, 2010).

Against these views from literature it essential to consider the association of various diversity characteristics of the board with the various elements of a company's operations. This could contribute to making a business case for characteristics that relate to transformation such as gender and ethnic diversity. This could also open up new avenues to find suitable candidates with characteristics such as different age groups, different academic achievements (both in terms of background and level) and professional backgrounds.

3.4 INCLUSIVE ECONOMIC DEVELOPMENT

Inclusive economic development is concerned with the broad-based participation of all citizens in the market economy and the eradication of inequalities through the reduction of poverty (Ismail, 2015). However, the plague of inequality is continuing in South Africa (Collier, Idensohn & Adkins, 2010). Workers strike at regular intervals as unions push for higher wages in the wake of disproportional increases in the salaries of top executives. Lundahl and Petersson (2013) pronounce that, since the end of apartheid, the government has had two main issues to contend with, namely stimulating economic growth and improving the distribution of income, wealth and social services. Even though some modest success was achieved in economic growth, the reduction in inequality has been sluggish. In fact, Wittenberg (2017) asserts that wage inequality has actually increased in recent times, depending on the measures used.

3.4.1 Managing the payment gap

Pontusson, Rueda and Way (2002) explain that because wage income from employment is the main source of income for most people, the wage difference, or *payment gap*, is the biggest cause of inequality in the country. Collier*, et al.* (2010) state that, in spite of the efforts of the post-apartheid government, South Africa

retains its pre-democratic status as one of the most unequal countries in the world. In fact, Coomey (2007) reports that in 2007, South Africa officially became the country with the highest inequality in the world, as measured by the Gini coefficient, and to this day, South Africa remains one of the countries with the highest inequality, confirms Wittenberg (2017). The Gini coefficient is a measure of statistical distribution, calculated periodically, to determine a country's income or wealth distribution, and is most commonly used to measure inequality (Assaad, Krafft, Roemer & Salehi-Isfahani, 2018; Zhang, Wang, Chen, Chu & Chen, 2018b). For example, a Gini coefficient of zero indicates total equality while a coefficient of one represents total inequality (Deysel & Kruger, 2015; OECD, 2016; Rycroft, 2003; Zhang*, et al.*, 2018b). South Africa's Gini coefficient for 2017 is reported to be about .63 (Barr, 2017).

The payment gap issue is not a recent development. Leibbrandt, Bhorat and Woolard (2001) explain that, in the period from the mid-1970s to the early 1990s, the South African economy showed very little growth and, in some instances, even negative growth. Yet, during this time, the top 10% of income earners enjoyed an approximately 4% increase in income share, or the proportion of the population's wealth distributed to them, while the bottom 40% suffered a reduction of 25% in income share. One would expect that government's transformation drive since democracy would have gone some way to turn this tide. However, Deysel and Kruger (2015) report that the payment gap between top management remuneration and lower-paid employees has in fact continued to increase since 1994.

Oberholzer and Theunissen (2012) illustrate the problem of increasing inequality between the salaries of top executives and those of average workers. They record that, for example, in 2011, the salaries of top executives from the top 40 JSE-listed companies increased by about 23%, with their short-term incentives increasing by about 56%. In the same period, the National Union of Metalworkers of South Africa (NUMSA) struggled, using strike action, to secure a 13% increase on their workers' already low wages. In 2018, the top 25% of executive earners received an average increase of 11% from the previous year, compared with the inflationary increase of 6% for average workers. This contributed to the pay ratio of worker pay to CEO pay

to increase to 65:1 in 2018 from 62:1 in 2017 (Businesstech, 2018). The Congress of South African Trade Unions (COSATU) asserts that the excessive pay increases of top executives are unacceptable while low-level workers battle to earn a living wage. Choudhury and Petrin (2018) highlight that this issue is not unique to South Africa. In 2014, the remuneration of the average United Kingdom CEO was estimated to be 125 times that of the average employee. This capture of wealth by a small elite group has prompted the call to introduce the aim for redistribution.

CEO salaries at companies listed on the JSE are coming under increasing criticism, especially in comparison with average employee salaries (Morton & Blair, 2018). Collier*, et al.* (2010) provide some perspective on the magnitude of this vertical remuneration inequality, that is the wage differential between all levels of employees, in other words from the lowest to the highest paid. They report that, in 2008 (at the beginning of the period included in this study), the average low-wage worker had to work respectively about 16 years, 203 years and 330 years to earn what a NED, executive director and a CEO were paid on average for that year. Trevor Manuel, a previous finance minister of South Africa, warned that the transformation challenges of creating a non-racial and equitable future for all South Africans will not be met unless remuneration incentives are appropriate to encourage leadership excellence. Excessive remuneration of executives puts social justice and the cohesion of the transformation process at risk (Crotty & Bonorchis, 2006).

The importance of inclusive development is underlined by the National Development Plan 2030 (National Planning Commission, 2011), which expresses the goal of developing a non-racial, non-sexist South Africa, based on the principle of inclusivity. The plan expresses the need to sharply reduce inequality by 2030. It further states that the two main challenges for meeting these objectives are job creation and the improvement of education. Wittenberg (2017) states that the South African government's National Development Plan includes the reduction of South Africa's Gini coefficient as one of its main goals. This notion is also supported by King IV, which states that the remuneration of executive management should be fair and responsible in the context of overall employee remuneration and that there

is a need to resolve the gap between the remuneration of executives and that of other employees (IoDSA, 2016)

Cornia and Court (2001) caution that the aim should not be to totally eliminate inequality, but rather to achieve an acceptable inequality range. At very low and very high levels of inequality, economic growth may be depressed. For example, where income inequality is too low, it may remove the incentives that are necessary to stimulate productivity. At the other end of the scale, where the inequality is too high, it may lead to political and social impacts, such as political instability and crime. Wittenberg (2017) explains that wage inequalities frequently lead to compounding social inequalities, because higher-income earners generally live with other high earners, while low-income earning individuals typically live in basic conditions and often have to share their wages with unemployed individuals. However, this remains a largely unexplored topic, especially in South Africa. Even though a number of studies are available in the United States on the relationship between CEO remuneration, as a multiple of average salaries, and the market performance of companies, very few similar studies exist in South Africa (Deysel & Kruger, 2015; Mans-Kemp & Viviers, 2018; Morton & Blair, 2014; Morton & Blair, 2018; Viviers, Mans-Kemp, Kallis & Mckenzie, 2019).

Research on the relationship between the payment gap and company performance shows differing views. On the one hand literature supports the so-called “tournament theory”, which states that a big payment gap motivates employees to work for promotion. Furthermore, a bigger gap results in greater enthusiasm amongst top management, which improves overall company performance (Chen, Ma & Bu, 2014; Faleye, Reis & Venkateswaran, 2013; Gao, 2019). On the other hand, proponents of the “behavioural theory” believe that employees form views on their remuneration based on comparison to others and a big payment gap leads to a feeling of exploitation and unfairness, which leads to reduced enthusiasm among employees (Gao, 2019). In fact, this may lead to employees shirking their responsibilities or high staff turnover in an attempt to resolve the apparent injustice (Faleye*, et al.*, 2013) This could also lead to a disconnect between employees and the CEO, which jeopardises cohesion within the company (Sabina, 2013). When

the gap extends beyond a reasonable point it could indicate, the abuse of executive power where CEOs attempt to influence their pay to the detriment of company performance and shareholder value, a phenomenon explained by agency theory (Bebchuk, Cremers & Peyer, 2011; Chen*, et al.*, 2014) A third view that came to the fore states that the payment gap has no impact on employees since they are either not aware of the facts or do not have the ability or motivation to act on this knowledge (Faleye*, et al.*, 2013).

Given the inequality issues in South Africa, it is warranted to further investigate the relationship between the management of inequality, as measured by the payment gap, and the performance and risk management of a company. Based on the inconclusiveness of speculation and views found in literature the following statistical hypotheses are proposed:

H_{0A8}: There is no relationship between the payment gap and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA8}: There is a relationship between the payment gap and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B8}: There is no relationship between the payment gap and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB8}: There is a relationship between the payment gap and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C8}: There is no relationship between the payment gap and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC8}: There is a relationship between the payment gap and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D8}: There is no relationship between the payment gap and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD8}: There is a relationship between the payment gap and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E8}: There is a relationship between the payment gap and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE8}: There is a relationship between the payment gap and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

3.4.2 Excessive top management remuneration

One of the issues that continually surfaces in the literature when inequality is contemplated is the issue of excessive CEO remuneration packages. Oberholzer and Theunissen (2012) report that governments around the globe generally hold a dim view of excessive top executive remuneration packages, which they label as a "disease at the centre of economic misfortunes". Carpenter and Sanders (2002) and Dalton*, et al.* (2007) state that corporate governance reformists are also turning their focus to the remuneration of top management. Their concern is both with the level of remuneration and the make-up of the remuneration, because this may greatly contribute to alignment of the objectives of management and external shareholders; for example, by giving top management a certain level of ownership in a company. Mathew*, et al.* (2018) state that director ownership in a company is closely related to the risk profile of the company and its performance.

Collier*, et al.* (2010) highlight that excessive executive remuneration is not a new concern. Already in 1945, it was observed that executive directors absorb a disproportionate share of the company's profits to the extent that not much is left for distribution to the shareholders by way of dividends. This becomes even more alarming where executive directors continue to receive excessive remuneration when the company experiences significant financial difficulty and the risk arises that staff may be retrenched (Collier*, et al.*, 2010).

Dorff (2014) claims that CEOs' remuneration has really begun to spiral out of control since the 1970s, when the principle of performance incentives was introduced. As described in Section 2.5.1 of this study, agency theory dictates that the main aim of investors is to align the remuneration and incentives of top executives with the performance of a company (Cooper, Gulen & Rau, 2009; Deysel & Kruger, 2015;

Frydman & Jenter, 2010; Kirsten & Du Toit, 2018; Rasoava, 2019). This should create a link between manager wealth and company performance and provide management with a financial incentive to improve the return of investors (Kirsten & Du Toit, 2018). Colpan and Yoshikawa (2012) explain that executive compensation is meant to be one of the significant governance mechanisms for monitoring, motivating and disciplining executive management.

Choudhury and Petrin (2018) further highlight the problem arising from agency theory in terms of excessive chief executive remuneration. They report that between 1998 and 2010, the average pay increase for Financial Times Stock Exchange (FTSE) 100 CEOs was 13.6% per annum, while the average increase for the FTSE 100 index over this period was only 1.7%. Even though this is clearly excessive reward relative to performance, it goes beyond the interests of shareholders. It is said to emphasise class division and frustrate employees at the lower end of the remuneration spectrum (Choudhury & Petrin, 2018). This inevitably spills over into the political economy, which is reported to be one of the main motivations for the *Brexit* vote in the United Kingdom.

Dorff (2014) states that it is a flawed belief that the introduction of performance incentives would align the interests of top management, and specifically the CEO, with those of the shareholders. De Wet (2012) and Kirsten and Du Toit (2018) emphasise that the literature reports increasing occurrences of misalignment of executive remuneration and company performance, and that in many instances, there is no relationship whatsoever. However, Bebchuk and Fried (2005) are of the view that the exaggeration of executive compensation is a widespread phenomenon that is not caused by a temporary mistake or misjudgement by the boards of companies. Rasoava (2019) concurs that this is rather the result of a structural flaw in the underlying governance structure that allowed executives to significantly influence boards in this regard. Choudhury and Petrin (2018) comment that excessive executive remuneration may be jeopardising the long-term sustainability of companies. Financial crises have been attributed to the focus of management on short-term results, which leads to overly risky behaviour (Kirsten & Du Toit, 2018; Madlela, 2018; Rasoava, 2019; Scholtz & Smit, 2012).

However, this poses the question whether current compensation levels are based on merit (Bhagat & Black, 1999; Deysel & Kruger, 2015; Ferreira, 2010; Seegers, Hopkins, Crous & Fourie, 2013). Fisher (2005), Chamorro-Premuzic (2013), Dorff (2014) and Rasoava (2019) dispute the effectiveness of increased remuneration incentives insofar as it should motivate CEOs, because business and psychological research have found that increased reward does not motivate increased performance. In fact, excessive reward may even erode motivation. In addition, CEOs, for example, have limited direct influence over share price performance, and consequently incentive schemes generally result in overpayment for general market and economic trends, or even pure luck, rather than own contributions. Furthermore, the risk exists that CEOs who are driven by personal gain and monetary incentives can be lured into deceptive actions (Kirsten & Du Toit, 2018; Madlela, 2018).

Cooper*, et al.* (2009) and Deysel and Kruger (2015) also question the merit of high CEO remuneration packages. They also refer to *lucky* CEOs who receive excessive remuneration packages that they may not have earned. Madlela (2018) claims that CEOs often receive excessive incentive packages as a result of *mismeasurement* of performance parameters, which may even be a result of the deceptive practices of top management. According to Madlela (2018), some countries, such as the United States, the United Kingdom and the Netherlands, have now implemented *clawback* provisions, which allow companies to recover payments made incorrectly to directors in certain circumstances.

Eisenhardt (1989) and Lashgari (2004) state that executives are often measured on accounting earnings or share performance, which inevitably tracks economic and market trends, causing executives to be overpaid for trends rather than their own contribution. Executives should rather be measured on incremental achievement over and above the general level of the market (Hillman & Dalziel, 2003; Hung, 1998; Jensen & Meckling, 1976; Lashgari, 2004; Young & Roberts, 2008; Yusoff & Alhaji, 2012). Clarke (2014) cites the time leading up to the 2008 financial crisis as a case in point, where managers were ruthlessly chasing short-

term financial profits and the consequential personal gains with little or no regard for the long-term well-being of the companies. This financial crisis also led to an in-depth rethink of how managers should be incentivised (George, 2012).

Cooper*, et al.* (2009) speculate that excessive remuneration packages may be the result of companies attempting to keep up appearances. Companies do not want to be seen as having below-average CEOs, with remuneration packages below the market average. What CEOs earn is typically published in the popular press. For example, Fortune Magazine has an annual ranking of the highest-paid CEOs. Oberholzer and Theunissen (2012) further state that the share market is generally sensitive to information regarding the salaries of CEOs. Information regarding CEO remuneration sends strong signals to the market. Companies are therefore enticed to signal to the market that their top executives are above average, with the consequence that these excessive packages continue to spiral upwards.

Even though a significant amount of research has been conducted on the topic of top management remuneration, most of it has focused on the United States and there is a need to expand this research to developing countries, especially South Africa (Boyd, Santos & Shen, 2012; Brenner & Schwalbach, 2009; Kirsten & Du Toit, 2018). Sun, Wei and Huang (2013) believe that, even though previous research focused on the relationship between CEO remuneration and company performance, certain board characteristics may contribute to control the remuneration packages paid. According to Brenner and Schwalbach (2009), United States data has revealed that a number of board characteristics have had an impact on top management's pay levels, such as director independence and the merging of the CEO and chairman roles.

Studies seeking a relationship between CEO remuneration and company performance have generally found weak or no association (Deysel & Kruger, 2015; Frydman & Jenter, 2010; Schiehll & Bellavance, 2009). Kirsten and Du Toit (2018) report evidence that showed an association between underperformance and excessive director remuneration. De Wet (2012) advises that companies and boards should move away from traditional accounting-based measures such as

ROA or ROE. Executive remuneration in fact showed a significant relationship to these traditional measures, but not so much to market-based measures such as value-add to investors. Cooper*, et al.* (2009) discovered a significant negative relationship between the future earnings of a company and its CEO's remuneration. They found that companies with the highest remuneration levels experienced the highest negative return over the five years that followed the year in which the remuneration was agreed upon. Deysel and Kruger (2015) also promote market-based performance measures, such as growth in share price, as a good indicator of how future expected earnings are factored into a company's performance. Therefore, these market-based measures are good indicators of the long-term association between disproportionate CEO remuneration packages and increased market capitalisation and sustained company performance.

Agency theory (Section 2.5.1) promotes that top management incentives are necessary to align the goals of management with that of shareholders, while stewardship theory (Section 2.5.4) is of the opposite opinion. The objectives of shareholders, and other stakeholders include the full spectrum of a company's value creation process. Also, literature points out that excessive remuneration tends to make CEOs more short-term focussed and concerned with improving the perceptions of stakeholders with regard to their performance. Since their remuneration is typically based on accounting information it is reasonable to expect that they would be more focussed on ensuring that the liquidity of the company, as represented by the current ratio, reflects positively. Given this background and the views of literature that CEO remuneration is often not based on merit, that increased reward does not necessarily motivate improved performance and that relative, market-based performance measures should be used the following statistical hypotheses are posed:

H_{0A7}: There is positive relationship or no relationship between the relative CEO remuneration movement and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA7}: There is a negative relationship between the relative CEO remuneration movement and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B7}: There is a positive relationship or no relationship between the relative CEO remuneration movement and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB7}: There is a negative relationship between the relative CEO remuneration movement and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C7}: There is a positive relationship or no relationship between the relative CEO remuneration movement and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC7}: There is a negative relationship between the relative CEO remuneration movement and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D7}: There is a negative relationship or no relationship between the relative CEO remuneration movement and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD7}: There is a positive relationship between the relative CEO remuneration movement and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E7}: There is a positive relationship or no relationship between the relative CEO remuneration movement and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE7}: There is a negative relationship between the relative CEO remuneration movement and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD7} and H_{aE7} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

3.5 SOUTH AFRICAN COMPANIES ALSO COMPETE IN INTERNATIONAL MARKETS

After the 1994 elections, many foreign investors were attracted to once again invest in South Africa. These investors required reforms at various levels of corporate governance (Mans-Kemp & Viviers, 2015). Chabane, Roberts and Goldstein (2006) note that South Africa's integration into the global market was facilitated by government policies, such as the liberalisation of trade and exchange controls. A further example of South Africa's integration into international markets is the National Planning Commission's reasons for not achieving government's development targets since democracy. The commission claims that the financial crises experienced around the globe had both a direct and indirect impact on developments in the country; for example, the Asian crisis of 1998, the 2008 global crisis, and the shifting patterns in global trade and investment (National Planning Commission, 2011).

To fully understand how corporate governance transformation transpires, it is important to understand the socio-political environment within which corporate governance regulations are being developed, according to Miles (2010) and Andreasson (2011). King I (the first King Report on Corporate Governance) was developed shortly after the first fully democratic election amidst great uncertainty regarding the socio-political state of the country and where government policy may lead to (Padayachee, 2013; Rossouw*, et al.*, 2002). Also, during this time, a number of large corporates moved their listings offshore. As a result of this uncertainty, the King Committee was required to maintain a balance between a number of factors such as the demands and requirements of international markets, the need for freedom and flexibility to manage the companies within the country, accountability and transparency, as well as the interests of all stakeholders (Miles & Jones, 2009).

Andreasson (2011) explains that it is especially necessary to understand the socio-political context in those emerging economies where corporate governance may not yet be fully institutionalised and the failure of the corporate governance regime can be financially devastating. This financial destruction may be due to the knock-

on effects of widespread share price collapse, currency devaluation or the withdrawal of foreign investors, as evidenced by the Asian financial crisis in the latter part of the 1990s. The relevance of this is accentuated by the fact that these economies need to compete with developed markets for investors, and reforms in these markets are often strongly influenced by dominant jurisdictions, such as the United States or the United Kingdom.

Kakabadse and Korac-Kakabadse (2002) report that a survey in 2001 on 25 emerging economies placed South Africa fourth for the most effective corporate governance structures. They speculate that the reason for this high ranking can be the increasing number of South African companies that have listed on foreign exchanges, especially the LSE. Andreasson (2011, p. 654) further describes South Africa as the “largest and most sophisticated” economy in Africa and he reports that Judge Mervyn King, previous chairman of the King Committee, pronounced South Africa’s “first world, financial structure” as “extraordinary for an emerging market”. Consequently, South Africa has attracted many foreign investors, thereby underlining the confidence that South Africa’s capital markets have instilled.

Even though South Africa has a high unemployment rate and a significant portion of the population is classified as *very poor*, the government cannot only focus on alleviating poverty, warns Black (2002). Poverty is described as an inescapable consequence of the combination of the economic system in which South Africa has to compete and government’s attempt to liberalise the economy. To remain competitive in global markets, productivity needs to improve, which often results in further unemployment. This happens since productivity is often achieved through mechanisation or by the fact that fewer workers are needed to achieve the same output. To date, the South African government has largely endeavoured to balance the need to maintain credible policies that are acceptable to the international business community, with the need for socio-economic transformation (Black, 2002).

This poses the question of why South Africa, and other countries, need to take heed of global developments. Rossouw*, et al.* (2002) and Padayachee (2013) answer

this by stating that South Africa's increasing participation in the global economy makes it susceptible to international pressures for corporate governance reform. The international economy has become increasingly integrated and capital investors increasingly mobile. Therefore, no government can afford to ignore the desire for effective and efficient corporate governance. However, this does not only apply to foreign investors, but the confidence of the local market is essential for the sustainable competitiveness of the companies and the health of the national economy (OECD, 2004). Therefore, to take part in the global economy, South African companies need to adhere to international corporate governance standards. However, these companies have to do this while also promoting the African values that are embedded in the South African business environment, stipulate Rossouw*, et al.* (2002). This often leads to internal conflict, which is accentuated by the globalisation of South African companies and their dependence on foreign capital, while at the same time needing to appease local requirements. These requirements and challenges include issues such as the need for affirmative action and black economic empowerment, spiralling economic crimes, for instance, fraud and money laundering, as well as the reality of HIV/AIDS and poverty. Klapper and Love (2004) report that a study on nearly 500 companies in developing countries showed a strong association between corporate governance and company performance measures. This supports the views expressed by institutional investors in developing countries, namely that corporate governance carries as much weight in their assessment of potential investments as financial indicators. However, many companies in these countries remain sceptical about the financial benefit of transformation. This causes the practical implementation of corporate governance measures and reform initiatives to be tentative, continues Bradley (2004).

3.6 SUMMARY AND CONCLUSION

The chapter considered the additional requirements faced by companies that operate in South Africa. Over and above the requirements of good governance as participants in the global market, companies in South Africa need to deal with political, social and moral pressures to transform, in order to represent the societies

within which they operate. Since the beginning of democracy in South Africa, there has been a constant demand for socio-economic reform to promote inclusive development and eradicate inequality. However, these reforms do not happen in isolation and must be balanced with the global legitimacy of the country, that is the acceptability of the country and its policies and regulations to global investors.

Corporate governance policies and regulations need to find a balance between the market-driven objectives of shareholders and the African values that are firmly woven into the fabric of South Africa. Literature describes the challenge to re-establish a high moral code of conduct. The morals within the country, for various reasons, became blurred during apartheid.

Transformation is at the core of government's plans for the future and has found its way into the Constitution. These transformation measures include the promotion of black persons and females as well as the eradication inequality in the country. However, it remains a challenge for companies to demonstrate the financial merit of transformation to decision-makers as a justification for its implementation. Literature highlights the importance of transformation at board level, because this serves as a tangible indication of a company's attitude towards the implementation of transformation. Literature also highlighted the fact that previously disadvantaged South Africans need role models to look up to. However, the South African market may be hampered by inadequate resources available to fulfil transformational needs, especially at board level, and concrete motivation may be necessary to get companies to fully buy into implementing the required behaviour.

Government is further faced with the need to balance policies between liberating the economy to attract foreign investors, while resolving transformational requirements and the eradication of poverty and inequality. South African companies, in turn, face similar conflicting issues when competing in the global market to sell their goods and services and to attract much-needed capital, while at the same time implementing government's initiatives to transform the economy and uphold African values.

A number of board characteristics and performance measures that emerged from the literature review in this chapter, which informed the formulation of the research and statistical hypotheses. The findings on the relationship between various characteristics and the performance and risk management of companies may well serve to develop role models for previously disempowered individuals. Such role models could provide inspiration to these individuals to aim higher and achieve what was previously believed impossible.

CEO remuneration is one of the main instruments used to monitor and control top executives and to align the objectives of top management with those of shareholders. The level of CEO remuneration is a sensitive issue, especially in South Africa with its extremely high levels of inequality. The payment gap between the CEO's remuneration and the average salary/wage of other employees is seen as one of the main drivers of inequality in South Africa. In addition, the notion that executive remuneration can be used to achieve the required alignment of management's objective with that of the company and its shareholders is strongly questioned by literature and speculation exists that these exorbitant payments are largely devoid of merit. Therefore, this study aims to determine whether the size of the payment gap has a significant association with a company's performance and risk management ability. In addition, the study determined whether the movement in CEO remuneration relative to the shareholder return of a company, has a significant relationship to a company's performance and risk management.

Chapter 4 concludes the literature review by referring to previous research around the world and in South Africa that focused on investigating the possible relationship between various board characteristics and various measures of company performance. The chapter also explores the various board characteristics and measurements that stood out in previous research.

CHAPTER 4: LINK BETWEEN BOARD COMPOSITION AND COMPANY PERFORMANCE

4.1 INTRODUCTION AND BACKGROUND

This chapter contains the final part of the literature review by considering studies from around the globe on the various components of corporate governance and how these relate to the various components of a company's value creation process.

Over the past five decades, interest has grown in various fields, such as economics, finance and sociology, into the level of association between board composition and various components of company performance. This extended to attempts to determine how potential refinements to board compositions may contribute to a board's efficiency as a corporate governance instrument (Paniagua*, et al.*, 2018; Zahra & Pearce, 1989). Literature studies on a link between corporate governance and company performance have increased, especially over the last two decades, but with it the diversity of findings. This diversity of findings may well be a result of the limitations of the various studies; which include inconsistency in performance measures, differing governance standards in the various jurisdictions and the impact of contextual factors, according to Abdo and Fisher (2007). Contextual factors affected the results of previous studies on corporate finance like the jurisdiction within which the studies were conducted (Kakabadse & Korac-Kakabadse, 2002; Rossouw*, et al.*, 2002), which is why researchers have been questioning whether the findings of studies in developed countries are directly transferable to developing countries such as South Africa (Bhana, 2010; Mangena & Chamisa, 2008; Muchemwa, 2014; Ntim, 2013; Nyirenda, 2010; Rashid*, et al.*, 2010).

The concept of company value creation has evolved in last number of years from only considering the financial gains of the ultimate beneficiaries of a company, typically the shareholder, to a significantly more inclusive concept of delivering exceptional, long-term, risk-adjusted benefits to all stakeholders (Dos Santos*, et al.*, 2017; IoDSA, 2011; IoDSA, 2016). Literature and regulators demand greater

sustainability and as a result value creation needs to consider the total conduct of a company including items such as long-term strategic focus, risk management (all risks not just financial risks), a company's natural environment, social factors and greater transparency (Clarke, 2014; Dilling & Harris, 2018; Dos Santos*, et al.*, 2017; IoDSA, 2011; IoDSA, 2016).

The board of a company is ultimately responsible for the total value creation process of a company (Barlow, 2016; Mans-Kemp, Van Schalkwyk, Viviers & Staal, 2018a). Corporate regulations, such as King IV, require the boards of companies to operate in the best interests of the companies. From King IV, two key responsibilities of the board stand out namely, to manage the financial performance of a company and to manage company risk. To be able to do this the board requires appropriate levels of diversity and independence. King IV provides principles on the independence and diversity of the board. Diversity factors to consider include, knowledge, experience, age, race and gender. Further factors to consider include succession plans of the board, as well as the remuneration of top management and board members. In addition, King IV states that diversity of board membership will promote better decision-making within the board, which will ultimately translate into improved performance and risk management by a company (IoDSA, 2016). Zahra and Pearce (1989) and Harjoto, Laksmana and Yang (2014) speculate that the performance of the board is associated with the board's composition, in terms of number of directors, number of independent directors, the ratio of executive directors to NEDs, and the characteristics of the board members, which refer to the background and experience of the members.

The chapter sets out by considering the various board characteristics identified by researchers that may be associated with company performance. The various theories and research findings regarding the potential relationship of these characteristics to company performance and risk management are explored. The chapter also contains the development of the statistical hypotheses, shown in Section 1.5.3. The chapter then investigates the various indicators, as promoted in the literature review, to measure the different aspects of a company's performance and risk management ability.

4.2 BOARD CHARACTERISTICS

Aguilera (2005), Mans-Kemp*, et al.* (2018a) and Scholtz and Kieviet (2018a) reaffirm the sentiment conveyed in previous chapters that *board*s have been defined as the link between shareholders and management. According to Mangena and Chamisa (2008), the King Report features the board as the hub of a company's corporate governance. However, the literature does not clearly define the characteristics of the optimal board and, as a result, research interest in the matter is increasing (Markarian & Parbonetti, 2007; Nyirenda, 2010). Pitcher and Smith (2001) make a similar observation by summarising two contrasting views from prior studies. One school of thought states that heterogeneity makes top management teams more effective, due to their ability to assess strategic alternatives from various cognitive perspectives. A second school of thought argues that such diversity hampers the effectiveness of management. This school of thought states that heterogeneity leads to increased conflict, which makes it harder to reach strategic consensus. However, neither view is supported by robust empirical evidence, argue Kanadli (2018), Pitcher and Smith (2001), Rao and Tilt (2016) and Sarhan, Ntim and Al-Najjar (2019). Research claims that a board's characteristics can be linked to organisational outcomes, and, in keeping with agency theory, a well-structured board is more likely to act in the interests of shareholders (Mangena & Chamisa, 2008). Moreover, the successful functioning of a board is significantly associated with its composition (Lipton & Lorsch, 1992). Nonetheless, Markarian and Parbonetti (2007) and Mangena and Chamisa (2008) report that empirical evidence regarding links between board composition and company performance is mixed, especially where the individual characteristics contained in a board are considered.

From the review of the literature and regulations regarding corporate governance and the governance theories in Chapter 3, the following board characteristics have been identified that may have an association with the effectiveness of a board and the value creation process of a company.

4.2.1 Board size

The board of directors is at the pinnacle of corporate governance (Mans-Kemp*, et al.*, 2018a). De Andres*, et al.* (2005) affirm that the board's relevance in terms of a company's performance lies in its monitoring and control activity. This requires that board members have the ability to monitor management in an informed manner (Mans-Kemp*, et al.*, 2018b). Mathew*, et al.* (2018) point out that the board significantly contributes to a company's ability to manage risk and interact with its environment. Lipton and Lorsch (1992) state that an effective board is expected to act promptly in a time of crisis, for example, when a takeover offer comes to light or when a company faces potential insolvency. They believe that if boards react timeously and efficiently, minor challenges would be prevented from turning into significant problems. Min (2018) maintains that board size has a direct relationship to a board's effectiveness.

There are two schools of thought on the most efficient size of a board. One group of researchers support the premise that a larger board will better serve a company and its shareholders. Dalton, Daily, Johnson and Ellstrand (1999) explain that a company contains a number of factions or groupings that often pursue diverse goals or objectives. The authors also claim that, as companies grow, the number of these factions increases, with the result that it becomes increasingly difficult to instil cohesiveness within a company and achieve commonality of the various goals. However, it is argued that larger and more complex companies generally have a greater need for advice from its board, and therefore a larger board should be more likely to possess the skills and experience to provide the necessary guidance and advice (Coles*, et al.*, 2008; Muchemwa, 2014). Furthermore, a larger board is believed to provide greater expertise and access to resources, thereby having a greater ability to perform its duties, and consequently to enhance company performance (Jackling & Johl, 2009; Lipton & Lorsch, 1992; Scholtz & Kieviet, 2018a; Scholtz & Kieviet, 2018b). Moreover, Dalton*, et al.* (1999) state that, as dictated by resource dependency theory, larger boards may increase a company's ability to form connections with its environment, which will enable the company to secure critical resources.

However, a second group of researchers claims that large boards become cumbersome and difficult to manage, which has a negative impact on its performance. Studies have found that people are often inclined to exert less effort when operating within a larger group, a phenomenon described as *social loafing* (Chen & Cheng, 2018; Latané, Williams & Harkins, 1979; Muchemwa*, et al.*, 2016). Consequently, researchers believe that the board should contain the minimum number directors required to function properly. In addition, large boards run the risk of being less cohesive, slow in making decisions, difficult to co-ordinate, and more susceptible to manipulation by the CEO (Bermig & Frick, 2010; Mangena & Chamisa, 2008; Paniagua*, et al.*, 2018). Scholtz and Kieviet (2018a) state that this often causes larger boards to be associated with inefficient communication, monitoring and decision-making. Lipton and Lorsch (1992) are of the opinion that many board members are hampered by inadequate time to properly review and react to information, which is compounded by larger boards, where most directors find it difficult to exchange views and provide opinions on matters at hand in a meaningful way (Paniagua*, et al.*, 2018). This may lead to a situation where directors are not encouraged, and even discouraged, to give input freely and regularly. Moreover, for a board to be efficient, it is necessary to act as a cohesive unit, which is significantly jeopardised if the board becomes too big and unwieldy. Such circumstances make it difficult for the board members to develop a common understanding, based on their different viewpoints on a matter (Wang, 2012). Min (2018) claims that a larger board increases the cost of running the board.

Lipton and Lorsch (1992) favour smaller boards and advise a board size of no more than 10 members as such a board is able to ensure everyone gets to know each other and build good working relations. This, in turn, leads to more in-depth discussion and improved decision-making. Dalton*, et al.* (1999) and Paniagua*, et al.* (2018) support the notion of smaller boards and believe that true group cohesiveness can only be achieved within a smaller board, which will lead to better performance. Dalton*, et al.* (1999) opine that the ability of large boards to initiate strategic action is jeopardised by too many members. This is because large boards are less participative, less cohesive and less able to reach consensus. In addition,

a board's evaluation of executive management is easier to manipulate in a larger board due to the inability of the board to engage in strategic collaboration, state Paniagua*, et al.* (2018).

Yermack (1996) claims that the reduction of board size has become a matter of priority for institutional investors, and takeover predators often focus their attention on reducing the board's size in an effort to turn a company around. Yermack (1996) concludes that any benefits to be gained from a large board are outweighed by poor decision-making, ineffective communication and bias against risk-taking. Evans and Dion (2012) examined the relationship between the cohesiveness of groups and the said groups' performance. They measured cohesiveness as the level of unity within the group and the common acceptance of goals. Evans and Dion (2012) found a strong positive relationship between the cohesion of a group and its performance. However, they also found that where extremely high levels of cohesion existed, performance actually deteriorated.

A number of studies focused on the association between the number of directors serving on a board and a company's performance, with mixed results, report Finegold, Benson and Hecht (2007) and Paniagua*, et al.* (2018). Muchemwa*, et al.* (2016) and Paniagua*, et al.* (2018) underline the fact that disagreement exists in the literature regarding the relationship between board size and the performance of a company. For example, Dalton*, et al.* (1999), De Andres*, et al.* (2005) and Wang (2012) state that board size has a negative association with a company's performance, that is, smaller boards have been connected to higher company performance. Wang (2012) cites levels of co-ordination and problems with directors' free riding, that is not fully contributing to the board's business, as reasons for this negative relationship. However, Coles*, et al.* (2008) claim that larger boards have a positive association with a company's performance when a company is large and complex. Paniagua*, et al.* (2018) report on studies that found a positive relationship between board size and company performance, as well as studies that found a negative relationship between board size and company performance.

Literature highlights that smaller boards are more cohesive, able to make quicker decisions and better at evaluating top management. In addition, literature indicates that institutional investors prioritise the reduction of board sizes and it is typically a focus of takeover predators to reduce the board size of their targets. Based on this the following hypotheses are set:

H_{0A1}: There is a positive relationship or no relationship between board size and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA1}: There is a negative relationship between board size and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0C1}: There is a positive relationship or no relationship between board size and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC1}: There is a negative relationship between board size and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

Literature denotes that a board could improve a company's risk management ability as it contributes to the interaction with its environment. This increases with board size in that it often leads to more connections, skills and resources (resource dependency theory). However, literature also propagates that prompt action is required in a time of crisis to prevent minor events from turning into major issues. Smaller boards are found to be better able to assess the issues at hand and make swift decisions. Given the conflicting views in terms of risk management the following statistical hypothesis is posed:

H_{0B1}: There is no relationship between board size and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB1}: There is a relationship between board size and the odds that a company is ranked as a top performing company based on its share price movement volatility.

Based on the resource dependency theory and literature views that larger boards provide the company with specialised skills and resources it is expected that a larger board would benefit complex functions such as the management of a company's liquidity as measured by the cash conversion cycle and the following statistical hypotheses are posed:

H_{0D1}: There is a positive relationship or no relationship between board size and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD1}: There is a negative relationship between board size and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E1}: There is a negative relationship or no relationship between board size and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE1}: There is a positive relationship between board size and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD1} and H_{aE1} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

4.2.2 Ethnic composition

The ethnic composition of a board in a South African context refers to the number of previously disadvantaged individuals included on the board. This is largely a racial distinction and these individuals are often referred to as black people. The term *black people* is defined in the Broad-Based Black Economic Empowerment Act (53 of 2003), as amended, as Africans, Coloureds, Chinese and Indians. Nyirenda (2010) views ethnic or race composition as an important element in a company's quest to represent the community within which it operates. Nowhere is this more relevant than in South Africa, where companies are under pressure to transform at all levels in order to be more representative of the demographics of the

general population of the country. This obligation is contained in the Broad-Based Black Economic Empowerment Act (53 of 2003), as amended, where the act states that one of its objectives is to achieve substantial change in the racial composition of management structures. This entails increasing the number of black people that manage and control enterprises. Ken (2007) is of the opinion that one of the main obstacles of implementing ethnic diversity of a board is the perceptions that people hold, often unconsciously.

Diversity may also contribute to the independence of the board, thereby improving the monitoring ability of the board. However, racial diversity may also have a negative relationship with the decision-making ability of the board, warn Adams*, et al.* (2015), in that it may lead to increased conflict and the forming of factions within the board. Ntim (2015) claims that ethnic diversity, along with gender diversity, will contribute to a company's increased ability to monitor management and to make decisions as required by agency theory. Ethnic diversity, in line with resource dependency theory, also contributes to a company's ability to link with its environment, thereby being able to attract much-needed resources. Furthermore, Harjoto, Laksmana and Lee (2015) state that the different knowledge bases and different perspectives on society brought on by ethnic diversity could enhance a company's approach to corporate social responsibility. Diversity improves a board's ability to identify the needs and interests of different groups of stakeholders.

Miller and Triana (2009) believe that ethnic diversity could contribute to a company's reputation and innovation ability, which will reflect positively in the company's performance. According to Trautman (2012), ethnic diversity may give companies a competitive advantage, because the different ethnic groups have different experiences, and consequently different approaches to situations, which may lead to the generation of a wider range of ideas. The different ideas could create new opportunities. Adams*, et al.* (2015) agree by stating that if individuals contribute unique sets of valuable information to a board, a diverse board will collectively have more information at its disposal, and therefore be able to make better decisions.

Some companies may benefit more from conforming to societal expectation regarding the demographic composition of its work force than others, according to Ferreira (2010) and Fanto*, et al.* (2011). This is especially the case in South Africa, where greater ethnic diversity could be a means of gaining acceptance from the public, the media and the government. King IV states that proper employment equity is one of the elements a company should implement to be, and to be seen to be, a good corporate citizen (IoDSA, 2016). Employment equity, according to the Employment Equity Act (55 of 1998), is achieved by promoting equal opportunities and fair treatment in employment. This is done by removing discrimination and implementing affirmative action to redress disadvantages in employment, thereby ensuring equitable representation at all levels of a company (South African Institute of Chartered Accountants (SAICA), 2018). In addition, the JSE Listings Requirements state that the board should develop a policy on the promotion of racial diversity at board level, even though the targets set for racial diversity are voluntary.

However, in many instances, legislated transformation may lead to tokenism, where candidates are appointed to achieve targets regardless of whether the candidate has the ability or experience for the position (Mans-Kemp & Viviers, 2015; Nyirenda, 2010; Stratton, 2018). Nyirenda (2010) describes *tokenism* as blatant racism that degrades the candidate and hampers the candidate's ability to make a meaningful contribution to the operation of the company. Such candidates are deprived of the chance to grow and develop a sense of self-worth. Such a situation is amplified at board level due to the visibility of the position and the need for a good reputation. In addition, the Broad-Based Black Economic Empowerment Amendment Act (46 of 2013) explicitly states that *fronting practices* undermine or frustrate the objectives of the act. *Fronting* is described as the appointment of a black person to a company, who are subsequently discouraged or inhibited from substantially participating in the core activities of the company (Gerber & Curlewis, 2018). However, Nyirenda (2010) found that the occurrence of tokenism is on the decrease.

In their annual survey, considering the long- and short-term views of companies regarding the composition and focus of their boards, Loop*, et al.* (2015) found that

there was disagreement between male and female directors over the importance of racial diversity, with female directors being twice as likely as their male counterparts to view ethnic diversity as important. As the pool of qualified candidates grows, it becomes easier for companies to introduce greater ethnic diversity to the board, explain Erhardt, Werbel and Shrader (2003). Choudhury and Petrin (2018) note that a report commissioned by the United Kingdom government recommends that nomination committees develop mechanisms for identifying, developing and promoting people of colour within their companies in an effort to increase the pool of qualified candidates. Mans-Kemp*, et al.* (2018a) further state that shareholders and other stakeholders are progressively demanding that companies develop their directors on an ongoing basis.

Ntim (2015) highlights the need to investigate the relationship between ethnic diversity and companies' financial performance. Previous studies in this regard have focused on a limited number of developing economies. Miller and Triana (2009) and Ntim (2015) state that there is a strong positive relationship between ethnic diversity and companies' financial performance. Erhardt*, et al.* (2003) found that ethnic diversity had a positive relationship with companies' financial performance. However, Mans-Kemp and Viviers (2015) and Scholtz and Kieviet (2018b) report negative associations between ethnic diversity and companies' financial performance, which are mostly caused by group conflict. Pelled, Eisenhardt and Xin (1999) argue that ethnic diversity increases emotional conflict, such as anger and frustration, which diminishes performance within the board.

Literature is of the view that ethnic diversity may cause conflicts and factions within a board, which would jeopardise the decision-making ability and performance of the board and consequently the performance of a company. Given this the following statistical hypotheses are posed:

H_{0A4}: There is a positive relationship or no relationship between percentage black persons and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA4}: There is a negative relationship between percentage black persons and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0C4}: There is a positive relationship or no relationship between percentage black persons and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC4}: There is a negative relationship between percentage black persons and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

Current ratio and cash conversion cycle often provide opposing messages (see Section 4.4.1). Therefore, the benefit of improving a company's cash conversion cycle, through better relationships and therefore preferential terms from customers, creditors and funders, as a result of greater ethnic diversity may reflect negatively as a lower current ratio (lower liquidity). Therefore, based on the views of literature that ethnic diversity provides different perspectives and experiences and adds to the company's connectivity with the community within which it operates and also adds to the legitimacy of the company, which contributes to the management of a company's market risk, the following statistical hypotheses are posed:

H_{0B4}: There is a negative relationship or no relationship between percentage black persons and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB4}: There is a positive relationship between percentage black persons and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0D4}: There is a positive relationship or no relationship between percentage black persons and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD4}: There is a negative relationship between percentage black persons and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E4}: There is a negative relationship or no relationship between percentage black persons and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE4}: There is a positive relationship between percentage black persons and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

4.2.3 Gender representation

Hambrick and Mason (1984) explain that a relationship exists between the behaviour of the board, as the strategic leader of a company, and the make-up and backgrounds of the individuals that comprise the board. Chapple and Humphrey (2014) and Li and Chen (2018) proclaim that regulatory interest in gender diversity of boards has increased significantly over the past number of years. This has emerged as ranging from quotas, that is to legislate the minimum percentage of females that a company should have on its board, in some jurisdictions to recommendations and disclosure regimes in others. This is also the case in South Africa, King IV propagates that gender diversity is an important element in fostering efficiency on the board (IoDSA, 2016). Furthermore, the JSE Listings Requirements state that the nomination committee of the board must develop a policy on the promotion of gender diversity. However, targets for gender diversity remain voluntary. According to Choudhury and Petrin (2018), a report commissioned by the United Kingdom government advocates that the promotion of gender diversity on the boards of companies is part of the effort to build a *fairer society*. Flowing from these recommendations, the United Kingdom Corporate Code was amended to provide that recruitment of board candidates should be done with consideration of the benefits that diversity, including gender, may bring.

According to Mans-Kemp and Viviers (2015), *gender diversity* can be described as the number of females on the board of directors. *Females* are defined in terms of the biological or physical distinction between male and female. Ferreira (2010) suggests that the link between women on boards and company performance has probably attracted more attention in the literature than any other issue. Nielsen and

Huse (2010) believe a board that contains a blend of male and female directors may be more efficient in fulfilling its tasks than a single-sex-dominated board, which is likely to only excel in certain tasks due to the difference in behaviour between men and women. As a result of the difference in a male and female approach to leadership, the diversity of the board may serve as an indication of the board's processes and effectiveness, argue Nielsen and Huse (2010). However, the presence of women on a board of directors will only enhance a company's performance if the women bring additional perspectives to the board, and will have a negative effect if the appointments are merely out of regulatory obligation or tokenism (Gordini & Rancati, 2017; Viviers*, et al.*, 2017).

Female leaders are claimed to be less hierarchical, more co-operative and collaborative, and more focused on promoting the self-worth of others, whereas male leaders tend to be more ambitious, aggressive, daring, competitive and autocratic (Eagly, Johannesen-Schmidt & Van Engen, 2003; Viviers*, et al.*, 2017). Furthermore, Dickason and Swanepoel (2018) state that females have been found to be more risk averse than their male counterparts. However, Singh, Nadim and Ezzedeen (2012) report that studies have found little evidence of sex role stereotyping and that male and female leaders are equally task oriented and people oriented. Duehr and Bono (2006) maintain that the characteristics typically associated with the different genders have eroded over the years, making the differences between male and female leaders less obvious. The following reasons are suggested for this: a change in the social roles of males and females, an increase in the number of females entering the workplace and moving up the corporate ladder, as well as an increase in training aimed at removing gender stereotypes and other prejudiced attitudes. In support, Campbell and Mínguez-Vera (2008) posit that, to attract more females to serve on company boards, they need educational opportunities and the necessary skills to compete with their male counterparts. One of the main determining factors for the inclusion of female directors is the availability of suitable candidates, according to Erhardt*, et al.* (2003) and Mans-Kemp*, et al.* (2018b). The increase in female board directors in the last number of years coincided with the fact that women are currently earning just about

the same number of degrees, at all degree levels (such as bachelor's, master's and doctorate degrees), as men (Campbell & Mínguez-Vera, 2008; Lehohla, 2016).

The findings on the association between female directors and company performance remain mixed. Li and Chen (2018) argue that the mixed results are caused by data from different countries, time periods, or the measures used for company performance. Campbell and Mínguez-Vera (2008) and Gordini and Rancati (2017) report that the presence of women on a board does not in itself have an association with a company's value or its performance. However, they found that gender diversity on a board had a positive relationship with company value. In other words, boards are well served by a good balance between male and female directors rather than the mere presence of women. Viviers*, et al.* (2017), in turn, suggest that a critical mass of three or more females is necessary to make a noticeable impact. In addition, Gordini and Rancati (2017) report that gender diversity does not destroy shareholder value. More female directors on the board of a company will rather serve to positively influence investors' evaluation of the future potential earnings of a company. Paniagua*, et al.* (2018) and Scholtz and Kieviet (2018b) report findings that female representation on a board has a positive association with company performance. Moreover, Opstrup and Villadsen (2015) believe that gender diversity will only positively contribute to company performance where the board acts as a group, with shared responsibility. The impact of diversity is largely neutralised where board members are specialised, with specifically assigned responsibilities. Marquardt and Wiedman (2016) further provide evidence that a positive association exists between gender diversity and social legitimacy and economic efficiency and that a gender diverse board tends to achieve more transparent and accurate financial reporting than a male-dominated board.

However, researchers are not in agreement on the benefits of female appointments to the boards of companies, and consequently further investigation is needed to determine the relationship between female directors and board effectiveness and decision-making (Mans-Kemp & Viviers, 2015; Nielsen & Huse, 2010; Viviers*, et al.*, 2017). Some research suggests that boards with relatively more female directors are more likely to hold management accountable for poor company

performance. According to Mans-Kemp and Viviers (2015), the presence of females tends to improve the preparation and involvement of the board members, while Viviers*, et al.* (2017) report that females may be more responsive to customer needs and that a gender-diverse board may be more meticulous in monitoring management. However, some researchers contend that the appointment of female directors can lead to gender-based conflict as well as slow down the process of decision-making to the detriment of a company's performance, according to Mans-Kemp and Viviers (2015) and Viviers*, et al.* (2017).

As with the appointment of black directors, female appointments may also be the result of tokenism rather than perceived merit, maintain Ferreira (2010), Nyirenda (2010) and Mans-Kemp and Viviers (2015). Loop*, et al.* (2015) state that female directors are almost twice as likely to consider gender diversity important, as male directors are. Viviers*, et al.* (2017) claim that there are not enough female role models to mentor up-and-coming female directors. Furthermore, Choudhury and Petrin (2018) assert that the contribution of women will be facilitated by the continuous development of strong role models and by ensuring that women play a full part in all areas of their companies.

Literature describes females as less aggressive, less competitive and more risk averse than their male counter parts. Literature also notes that a higher representation of females leads to more transparency, better monitoring of management and more accurate reporting, which should benefit the risk management processes of the company. In addition the more conservative nature of females is expected to lead to more conservative liquidity management, hence higher current ratios, which may reflect in worse cash conversion cycles (see Section 4.4.1). However, increased female presence could lead to gender-based conflict resulting in slower decision making and the less competitive nature of females may negatively impact on the financial performance of the company. Based on this the following statistical hypotheses are formulated:

H_{0A5}: There is a positive relationship or no relationship between percentage females and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA5}: There is a negative relationship between percentage females and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B5}: There is a negative relationship or no relationship between percentage females and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB5}: There is a positive relationship between percentage females and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C5}: There is a positive relationship or no relationship between percentage females and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC5}: There is a negative relationship between percentage females and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D5}: There is a negative relationship or no relationship between percentage females and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD5}: There is a positive relationship between percentage females and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E5}: There is a positive relationship or no relationship between percentage females and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE5}: There is a negative relationship between percentage females and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

4.2.4 Director independence

Weir and Laing (2001) explain that a board consists of two types of directors, namely executive and NEDs. The JSE Listings Requirements define *executive directors* as those directors that are involved in the day-to-day management of a company. In contrast, *NEDs* are defined as directors that are not involved in the day-to-day management of the business and that are not full-time salaried employees of a company or its subsidiaries. Furthermore, King IV recommends that the majority of board members should consist of NEDs of which most should be independent. The independence of directors should be determined by considering all the indicators as prescribed by King IV, the JSE Listings Requirements and the Companies Act (71 of 2008) as a whole, on a substance-over-form basis (IoDSA, 2016; JSE, 2017).

Executive directors are full-time employees who look after the day-to-day activities of a company (Scholtz & Kieviet, 2018a). These directors bring specialised knowledge, experience and expertise to a company and have clearly defined roles and responsibilities. However, because these directors report to the CEO, they are not in a position to monitor or discipline the CEO. Therefore, it is important that mechanisms are put in place to monitor the actions of the CEO and the other executive directors. Aguilera (2005) proposes that NEDs need to achieve three objectives which will ensure that they are most productive, namely to be engaged while non-executive, to be challenging while supportive, and to be independent while involved.

Rechner and Dalton (1991) point out the conflict of interests that exists when the CEO also fulfils the role of chairman of the board. Given the board‘s monitoring role over management, the question remains whether chairpersons are able to objectively judge their own performance as CEOs. Rechner and Dalton (1991) found that companies with independent governance, namely where the CEO and chairman roles were separated, outperformed companies where these roles were converged. However, Donaldson and Davis (1991) argue that the fusion of the positions of chairman and CEO provides a focal point for a company’s leadership,

leaving no room for doubt about who is in charge or who is responsible, as advocated by stewardship theory. Furthermore, this facilitates relationships within a company and between the board and the company. Daily and Dalton (1997) report that many fund managers do not trust CEOs to look after the interests of shareholders when they also serve as board chairmen. They further state that such a situation may increase management's ability to influence the individuals who are also tasked with protecting shareholder interests. Rechner and Dalton (1991) hold a similar view.

According to Dalton*, et al.* (1999), director independence stems mainly from agency theory, which describes the inefficiency resulting from the separation of a company's ownership and management. The main mechanism for ensuring that management operates in the best interests of the owners is oversight by the board (Dah*, et al.*, 2018; Muchemwa, 2014). In fact, Dalton*, et al.* (1999) describe this as the directors' most critical function. NEDs and especially independent directors are expected to be more inclined to protect shareholder interests, but executive directors are more familiar with a company's activities, and therefore better able to monitor top management (Dah*, et al.*, 2018; Kyereboah-Coleman, 2007; Ogbechie, 2012; Sanda, Garba & Mikailu, 2008). However, Bar-Hava*, et al.* (2018) point out that there is increasing evidence that independent directors often act in ways that promote their own benefit to the detriment of shareholders, perhaps authorising generous remuneration to top management for personal reasons, such as the hope that they will be re-elected. Clarke (2007), Naudé, Hamilton , Ungerer, Malan and de Klerk (2018b) and Sanda*, et al.* (2008) state that financial disasters such as Enron, Steinhoff and Worldcom highlight the need for policies to enhance board independence. However, as Bhagat and Black (2002) advise, the aim should not be to achieve total independence, but rather to achieve substantial independence. They emphasise that Enron did in fact had a majority of independent directors on its board prior to its downfall. Independence is therefore not a safeguard against financial catastrophes. King IV also describes independence as only one aspect to consider when looking to achieve a balanced composition of the board. King IV further states that all directors have, as a matter of law, an obligation to act with an independent mindset (IoDSA, 2016).

Therefore, King IV is in favour of director independence and recommends that the majority of the board members should be NEDs and the majority of the NEDs should be independent of a company (IoDSA, 2016). In fact, Fahlenbrach*, et al.* (2017) state that most countries have introduced requirements regarding the proportion of independent directors on the boards of companies, with governance activists strongly promoting a majority of independent directors on a board. Moreover, King IV recommends that the CEO should not also act as chairman of the board and should even after retirement only be appointed as chairman once three complete years have lapsed (IoDSA, 2016).

Research on the relationship between board independence and company performance rendered mixed results (Dah*, et al.*, 2018; Fahlenbrach*, et al.*, 2017). Bhagat and Black (2002) found no evidence that board independence promoted improved company performance. Dulewicz and Herbert (2004) reported a negative relationship between company performance and director independence, but found a significant positive relationship between tenure of the independent directors and company performance. They add that various chairmen stated that the replacement of non-executive teams was disruptive and that they valued long-serving NEDs. Weir and Laing (2001) report a number of studies that either found a negative relationship between director independence and company performance or found no relationship at all. Jackling and Johl (2009) and Ameer, Ramli and Zakaria (2010) report findings that a board dominated by independent NEDs had a positive association with company performance. Tshipa (2017) found that independent NEDs had an inverse relationship to company performance because they did not understand the complexities of the business as well as the executive directors did. Weir and Laing (2000) state that NEDs can contribute significant knowledge, insights and objectivity to the decision-making of the board. However, they may find it difficult to understand the complexities of the company, because they are only engaged on a part-time basis and may hold a number of board seats, leaving them inadequate time to fully understand the company's business. Weir and Laing (2000) and Dah*, et al.* (2018) assert that the market's reaction to the appointment of non-executive and independent directors depends on the perception of the market about

how independent the director truly is and how much influence the CEO had in the director's appointment.

Weir and Laing (2001) and Dah*, et al.* (2018) provide three reasons why the expected positive relationship between company performance and director independence is not supported by empirical research:

- NEDs are not appointed on a full-time basis and other work commitments may prevent them from committing adequate time to be effective monitors.
- NEDs may not have the experience to understand the technical business issues of the company.
- NEDs may not have adequate information to make strategic decisions or give proper advice.

Aguilera (2005) concludes that one of the major challenges of improving the accountability of independent directors is to motivate these directors to move beyond *box-ticking* and to truly engage in their monitoring and advisory roles.

Even though some concerns have been raised around the ability of NEDs and independent directors to fulfil their tasks, such as not having enough time and/ or information, literature and regulations agree that the board should be composed of a majority of NEDs of which the majority, in turn, must be independent. The view is that these directors will be more inclined to look after shareholder interests, better able to set company strategy and direction and better monitors of management, which should bode well for the financial performance and risk management functions of a company. However, due to the fact that they are often unable to fully comprehend the technical complexity of the business and functions within the company, due to their part time appointment and lack of information, it is expected that they won't be able to make a significant contribution to complex functions such as the cash conversion cycle. Against these findings the following statistical hypotheses are posed:

H_{0A2}: There is a negative relationship or no relationship between percentage NEDs and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA2}: There is a positive relationship between percentage NEDs and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B2}: There is a negative relationship or no relationship between percentage NEDs and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB2}: There is a positive relationship between percentage NEDs and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C2}: There is a negative relationship or no relationship between percentage NEDs and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC2}: There is a positive relationship between percentage NEDs and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D2}: There is a negative relationship or no relationship between percentage NEDs and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD2}: There is a positive relationship between percentage NEDs and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E2}: There is a positive relationship or no relationship between percentage NEDs and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE2}: There is a negative relationship between percentage NEDs and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD2} and H_{aE2} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

H_{0A3}: There is a negative relationship or no relationship between percentage independent directors and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA3}: There is a positive relationship between percentage independent directors and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B3}: There is a negative relationship or no relationship between percentage independent directors and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB3}: There is a positive relationship between percentage independent directors and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C3}: There is a negative relationship or no relationship between percentage independent directors and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC3}: There is a positive relationship between percentage independent directors and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D3}: There is a negative relationship or no relationship between percentage independent directors and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD3}: There is a positive relationship between percentage independent directors and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E3}: There is a positive relationship or no relationship between percentage independent directors and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE3}: There is a negative relationship between percentage independent directors and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD3} and H_{aE3} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

4.2.5 Non-executive director remuneration

Bugeja, Fohn and Matolcsy (2016) observe that there is limited research on the compensation of NEDs and most of the research that does exist originates from the United States. Cordeiro, Veliyath and Eramus (2000) remark that, like executive director remuneration, NED remuneration is arguably one of the most vital incentive systems to mould and guide director action on behalf of shareholders. According to Cordeiro*, et al.* (2000), the astronomical increase in NED remuneration over the past few decades caused such a controversy in the United States that it led to special investigations by governing bodies to determine how practices around remuneration could be improved. Hempel and Fay (1994) state that CEOs may control the board by overpaying the directors. They add that, because the board determines the CEO's remuneration and the CEO, in turn, is greatly involved in determining the remuneration of the directors, a significant relationship exists between the remuneration of the CEO and that of the NEDs.

Seegers, Hopkins, Crous, Fourie and Nel (2015) point out that due the expansion of the duties, accountability and responsibilities, the demands on and risk to NEDs are increasing. A case in point, the Companies Act (71 of 2008) hold directors personally liable for losses by a company or third parties where the directors' conduct did not adhere to standards stipulated in the Act. To ensure that people with the right skills and experience are attracted and retained, careful consideration should be given to the levels of remuneration paid (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017). Hempel and Fay (1994) raised a similar notion years ago, stating that, due to the increasing pressure by shareholders on board members, it had become increasingly difficult to attract and retain quality NEDs. This leads to companies increasing the remuneration to these directors in an attempt to overcome this problem. In fact, this increase in demand on NEDs compels NEDs to spend more time in preparation for board meetings. It is estimated that these directors spend approximately 5% of their working year on board-related matters, and consequently they should earn around 5% of what the CEO earns. Furthermore, King IV states that the independence of NEDs should be maintained

by ensuring that their remuneration is not dependent on the performance of the company (IoDSA, 2016).

Masulis and Mobbs (2014) are of the opinion that NEDs are first and foremost incentivised by the prestige attached to their directorships and that they would pay most attention to the affairs of the companies they deem most prestigious. Linked to this, the aim of most independent or NEDs is to build their own reputations with the expectation that they will obtain more board seats as their reputation grows (Fahlenbrach*, et al.*, 2017; Masulis & Mobbs, 2014). A further consequence of this is that directors tend to resign from poor-performing companies, because it could tarnish their reputation to be associated with such companies (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017).

Hillman and Dalziel (2003) speculate that the most dominant subject of research in terms of the link between the activities of the board and a company's performance is the agency-based hypothesis that the monitoring activity of the board has a positive association with a company's performance. However, the results are mixed. Cordeiro*, et al.* (2000) report that early research found a significant relationship between NED remuneration and company performance. However, they are of the opinion that changes to compensation structures over the past decades may have caused these results to become distorted and recommend an update on this research. Hillman and Dalziel (2003) found no statistical support for any relationship between a board's incentives, such as remuneration, and the performance of a company. In turn, Bugeja*, et al.* (2016) report a negative relationship between NED remuneration and company performance. However, they found a strong positive relationship between NEDs' remuneration and the size of a company, the complexity of a company and the number of board meetings. Furthermore, these authors found that chairman premiums were lower in companies where the NEDs were more experienced, and higher where the chairperson had company-specific experience. Earlier, Hempel and Fay (1994) state that company size and number of board meetings are the major factors in determining NED remuneration.

Literature states non-executive director remuneration as one of the key incentive mechanisms to ensure that these directors properly look after the interests of shareholders. In addition, with the increase in demands on and risk to these directors, remuneration becomes a vital tool to attract and retain the right calibre people. It is further reasonable to expect that technical skills, market contacts and experience to provide guidance on and input into complex functions within the company, such as the cash conversion cycle would come at a premium. Based on this the following statistical hypotheses are formulated:

H_{0A9}: There is a negative relationship or no relationship between the chairman's remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA9}: There is a positive relationship between the chairman's remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B9}: There is a negative relationship or no relationship between the chairman's remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB9}: There is a positive relationship between the chairman's remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C9}: There is a negative relationship or no relationship between the chairman's remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC9}: There is a positive relationship between the chairman's remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D9}: There is a positive relationship or no relationship between the chairman's remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD9}: There is a negative relationship between the chairman's remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E9}: There is a negative relationship or no relationship between the chairman's remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE9}: There is a positive relationship between the chairman's remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD9} and H_{aE9} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

H_{0A10}: There is a negative relationship or no relationship between the average other NED remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA10}: There is a positive relationship between the average other NED remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B10}: There is a negative relationship or no relationship between the average other NED remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB10}: There is a positive relationship between the average other NED remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C10}: There is a negative relationship or no relationship between the average other NED remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC10}: There is a positive relationship between the average other NED remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D10}: There is a positive relationship or no relationship between the average other NED remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD10}: There is a negative relationship between the average other NED remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aE10}: There is a negative relationship between the average other NED remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE10}: There is a negative relationship between the average other NED remuneration as a percentage of the CEO's guaranteed remuneration and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD10} and H_{aE10} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

4.2.6 Director background

Hambrick and Mason (1984) theorise that a company's strategic choices and performance levels are, at least partially, predictable from the background of its managers and board members. The backgrounds of the directors contribute to the diversity of a board. Therefore, it is important to gain an understanding of the various elements that constitute the background of a director, to better understand what may constitute an optimal board composition. These elements include observable characteristics, such as gender and race, as described earlier, but also non-observable characteristics, such as age, nationality and levels of education (Nyirenda, 2010). Hambrick and Mason (1984) present three benefits of understanding the impact of the various characteristics. Firstly, it may enable stakeholders to better predict company outcomes. Secondly, it may assist in the selection and development of top management and board members; for example, investigating the tendencies of boards with long tenures, compared with those with shorter tenures, or whether boards with higher levels of academic education are more efficient than those without. Thirdly, it may assist strategists to predict the reaction of competitors; They may develop a feel for quick a company is likely to react if it is controlled by a board with high or low levels of industry experience.

To be effective, a board needs to consist of a group of people, with an appropriate mix of skills, knowledge and experience, such as, professional background and industry experience, in line with a company's strategic goals (Arzubiaga*, et al.*, 2018). Boards with an adequate diversity of skills and experience should be less susceptible to *groupthink* or to having *blind spots* and be better equipped to respond to market challenges and create value (Australian Institute of Company Directors [AICD], 2015). Lipton and Lorsch (1992) argue that a board with directors from different geographic locations contributes to avoiding cliques. Bhagat and Black (1999) and Ferreira (2010) are of a similar opinion, but state that the skill sets and backgrounds of the board members will influence the behaviour of a company. For instance, boards with a strong financial industry background may tend to be more highly geared or be more inclined to engage in corporate activity. Pitcher and Smith (2001) report conflicting research results. On the one hand, boards with a wide

range of backgrounds are reported to be more successful due to their higher levels of creativity and their ability to originate and exchange more innovative ideas. On the other hand, a high level of diversity may stifle a board's success due to higher levels of conflict and its inability to reach strategic consensus.

Hambrick and Mason (1984) argue that the predictability of company performance as a result of the background of directors can be tested by determining the relationship between objective, observable and verifiable characteristics and companies' performance. They maintain that characteristics such as age, organisational tenure, professional experience and education all have an impact on the outlook of an individual or group on various aspects of a company's operations.

Researchers and regulations highlight the following characteristics that may have an association with the effectiveness of a board.

4.2.6.1 Academic qualification

Simons and Pelled (1999) emphasise that, to study the concept of *board diversity*, it is important to include the educational background of the directors. Mans-Kemp*, et al.* (2018b) claim that educational background ranks alongside age, gender and ethnic diversity when it comes to selecting board members. Literature found that education increases human capital value and consequently, that higher education levels are positively correlated with remuneration (Fedaseyeu, Linck & Wagner, 2018). It therefore stands to reason that people, and specifically potential board candidates, would look to further their education to increase their competitiveness in the workplace.

Kimberly and Evanisko (1981) state that higher levels of education stimulate an individual's receptiveness to be innovative. Dollinger (1984) report that levels of education show a positive relationship to the ability to expand boundaries, tolerate ambiguity and insoluble or complex situations. Wiersema and Bantel (1992) further maintain that education levels reflect on the cognitive ability and skills of the individual. High levels of education are associated with the ability to process

information and to differentiate among various inputs. Erhardt*, et al.* (2003) report research findings to demonstrate that greater educational background and diversity within a board and top management lead to better strategic decision-making.

According to Talke, Salomo and Kock (2011), the quality of a board's decision-making is dependent on the cognitive ability of the directors, which is formed by their individual experience, values and education. The cognitive approach of different board members influences the way in which individual team members gather and process information and the number and diversity of solutions generated. Individuals' reasoning style and personality significantly influence their direction of educational specialisation, which, in turn, shapes their perspective and outlook (Wiersema & Bantel, 1992). The authors further explain that certain academic fields are more oriented towards change than others. For example, engineering and sciences are generally more concerned with innovation and improvement.

Wiersema and Bantel (1992) found that companies with higher levels of education, higher educational specialisation diversity, and more academic training in sciences were strategically more adaptable and also more likely to implement strategic change. Smith, Smith, Olian, Sims, O'Bannon and Scully (1994) further found that education level diversity within a board had a positive relationship to company performance. Talke*, et al.* (2011) found that educational diversity within a board had a strong positive relationship to a company's innovative orientation, while Scholtz and Kieviet (2018b) found that directors with a business qualification had a positive relationship to company performance. Literature also determined that risk averse individuals tend to study more (De Paola & Gioia, 2012).

The statistical hypotheses below are formulated based on the following findings from literature. Firstly, higher levels of education should lead to innovation, better problem solving and a greater ability to differentiate thereby focussing on matters of importance. This should benefit financial performance, internal and external risk management. Also, the fact that higher education is often associated with greater risk aversion would benefit the risk management processes of a company. Even

though current ratio and cash conversion cycle often indicate opposing situations (see Section 4.4.1) it is felt that the technical ability of higher education could benefit the management of the cash conversion cycle and the risk aversity of higher educated people could benefit the current ratio.

Secondly, on the one hand greater diversity of levels of education should provide different perspectives as well as the benefits of higher and lower levels of education, such as the problem-solving ability of higher educated people and the lower levels of conservatism of people with a lower propensity to study. This should benefit financial performance. On the other hand, higher levels of diversity could cause conflict, which may lead to assuming more conservative positions and not being able to make quick decisions to seize lucrative opportunities. However, a more homogenous group (depending at what end of the scale) would either be overly conservative or not conservative enough. As a result, the following statistical hypotheses are formulated:

H_{0A16}: There is a positive relationship or no relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA16}: There is a negative relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B16}: There is a negative relationship or no relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB16}: There is a positive relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C16}: There is a positive relationship or no relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC16}: There is a negative relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D16}: There is a negative relationship or no relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD16}: There is a positive relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E16}: There is a positive relationship or no relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE16}: There is a negative relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD16} and H_{aE16} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

H_{0A17}: There is a negative relationship or no relationship between the relative education level of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA17}: There is a positive relationship between the relative education level of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B17}: There is a negative relationship or no relationship between the relative education level of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB17}: There is a positive relationship between the relative education level of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C17}: There is a negative relationship or no relationship between the relative education level of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC17}: There is a positive relationship between the relative education level of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D17}: There is a negative relationship or no relationship between the relative education level of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD17}: There is a positive relationship between the relative education level of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E17}: There is a negative relationship or no relationship between the relative education level of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE17}: There is a positive relationship between the relative education level of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

The diversity of academic back grounds in terms of fields of study will be dealt with in the next section.

4.2.6.2 Professional experience

A further important contributor to the diversity of boards is functional background, such as financial, legal and technical backgrounds (Mans-Kemp*, et al.*, 2018b; Simons & Pelled, 1999). The researchers explain that observable characteristics such as race and gender are often more prone to stereotyping and discrimination, but that many of the characteristics that directly relate to problem-solving are found in the less observable differences such as functional experience and orientation. Directors with different professional histories are likely to have different attitudes, knowledge and perspectives. Even though functional differences may stem from education, individuals' professional experience also contributes to shaping their thinking, processes and attitude. This affects directors' behaviour in every stage of innovation. For example, it may determine the issues they identify as important and how these issues are formulated. It may furthermore influence the evaluation of

alternative solutions and the person's involvement during implementation (Bantel & Jackson, 1989).

According to Kimberly and Evanisko (1981), functional differentiation is a good indicator of the propensity to accept innovation. Bantel and Jackson (1989) found a positive link between functional experience and innovation. They also found that both the level and diversity of functional experience had a positive impact on complex problem-solving. Bantel and Jackson (1989) found that functional diversity had a positive relationship to staff turnover in top management, which they speculate is the result of increased conflict. Therefore, Lipton and Lorsch (1992) advocate that it is essential for a board to have members from a variety of backgrounds and that board members are established in their own field to ensure that they are not overly dependent on their directorship for income or prestige. However, Simons and Pelled (1999) recorded research that found experience diversity negatively associated with company performance. Loop, Keller and DeNicola (2015) report that corporate directors view financial expertise as the most desirable director attribute, followed by industry experience and operational experience.

Literature proclaims that functional differences of directors are caused by education and professional experience, which forms their attitudes, knowledge, perspectives and thinking. Diversity of back grounds in terms of fields of study and fields of profession experience is said to benefit a company through more innovation, better problem solving and having a wider range of experience and perspectives to draw from. This should for instance assist companies to manage liquidity as the underlying elements, such as debtors, creditors, sales, inventory and short-term funding require different skills and knowledge to manage. Diversity of experience and knowledge is recommended by regulatory documents such as King IV and literature. However, the benefits may be hampered by conflict, which could make it difficult for a board to reach decisions and develop strategies. Based on these views from literature the following statistical hypotheses are posed:

H_{0A14}: There is a negative relationship or no relationship between academic diversity (per field) and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA14}: There is a positive relationship between academic diversity (per field) and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B14}: There is a negative relationship or no relationship between academic diversity (per filed) and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB14}: There is a positive relationship between academic diversity (per filed) and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C14}: There is a negative relationship or no relationship between academic diversity (per field) and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC14}: There is a positive relationship between academic diversity (per field) and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D14}: There is a positive relationship or no relationship between academic diversity (per field) and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD14}: There is a negative relationship between academic diversity (per field) and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E14}: There is a negative relationship or no relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE14}: There is a positive relationship between academic diversity (per qualification type) and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD14} and H_{aE14} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

H_{0A15}: There is a negative relationship or no relationship between the diversity of professional experience of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA15}: There is a positive relationship between the diversity of professional experience of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B15}: There is a negative relationship or no relationship between the diversity of professional experience of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB15}: There is a positive relationship between the diversity of professional experience of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C15}: There is a negative relationship or no relationship between the diversity of professional experience of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC15}: There is a positive relationship between the diversity of professional experience of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D15}: There is a positive relationship or no relationship between the diversity of professional experience of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD15}: There is a negative relationship between the diversity of professional experience of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E15}: There is a negative relationship or no relationship between the diversity of professional experience of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE15}: There is a positive relationship between the diversity of professional experience of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD15} and H_{aE15} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

4.2.6.3 Length of service as board member

Research offers three consequences of leadership change in a company. Firstly, leadership change improves company performance through new energy, views and ideas. Secondly, leadership change has a negative association with company performance through the creation of tension and disruption, which could easily result in a negative spiral where reduced performance leads to further replacement of company leadership. Thirdly, changes in management have little bearing on the performance of a company (Davidson, Worrell & Cheng, 1990).

Daily and Dalton (1995) and Bar-Hava*, et al.* (2018) are of the opinion that changes in company leadership are symptomatic of company distress. They report a negative relationship between leadership turnover and company performance. However, Daily and Dalton (1995) also acknowledge that changes in directors may be an attempt to implement improvements to the structure of the board. These changes will signal to the market directed efforts towards change, which may lead the market to anticipate further changes within a company, which may be beneficial to a company's image and value. Knowledge and professional experience equip directors to give better strategic guidance (Arzubiaga*, et al.*, 2018). As the saying goes, "there is no substitute for experience". Therefore, with more years of service, directors are not only likely to make better choices, but they also tend to generate greater confidence on the part of CEOs. Reguera-Alvarado and Bravo (2017) argue that long tenures allow directors to increase their expertise and level of engagement with a company. They speculate that the lack of industry and company experience and knowledge may be a handicap in the improvement of company performance. The authors further argue that long tenure provides the NED with in-depth business knowledge and experience with a company's environment. This experience assists directors in making more effective decisions, thereby contributing to improved company performance.

In contrast, Dou, Sahgal and Zhang (2015) report that independent directors with lengthy tenures are seen as ineffective in fulfilling their role as monitors and setting company strategy. Furthermore, the FRC in the United Kingdom does not consider

a director who has served on a board for longer than nine years as being independent any longer. King IV holds a similar view, recommending that, if NEDs serve in an independent capacity for more than nine years, such directors should be assessed by the board on an annual basis to ensure that the directors maintain their objectivity and independence (IoDSA, 2016).

Lipton and Lorsch (1992) propose that a limit should be placed on the tenure of directors to avoid having *professional* directors instead of directors that are forward thinking and committed to the board. Lipton and Lorsch (1992) and Dou*, et al.* (2015) suggest that directors should be removed from the board, by rotation, after 10 to 15 years. Surveys by Shaw (2011) regarding industry's views on the age and tenure of directors, found that respondents, who were also directors, preferred a maximum tenure of about 10 to 11 years and suggest a maximum retirement age for board members of about 72 years. King IV suggests that staggered rotation of board members invigorates the capabilities of the board by introducing new expertise and perspectives while ensuring that valuable knowledge and experience is retained, thereby maintaining continuity. In addition, it is important to establish a succession plan for board members, which includes identification, mentorship and development of future candidates (IoDSA, 2016).

Literature is of the view that longer tenures provide directors with industry experience and a deeper knowledge and understanding of the intricacies of a company's operation and business. However, long tenures are also said to reduce the indepence of directors and cause directors to become ineffective in fulfilling their roles. In contrast "new" directors bring new energy, views and ideas. In addition changes to the board may be seen as a company's effort to adapt to change, which could be positively viewed by the market and therefore benefit the company's image and value. Moreover, King IV recommends a limitation on the length of tenure and a staggered rotation of the board. Finally, diversity of tenure could provide the board with greater skill and experience to be more aggressive in terms of managing the cash conversion cycle, but conflicting views may cause a diverse board, in terms of tenure, to adopt more concervative positions such as a higher liquidity ratio. It therefore stands to reason that a mix of tenures on a board should be to the benefit

of a company. Given the views from literature and regulations the ensuing statistical hypotheses have been formulated:

H_{0A13}: There is a negative relationship or no relationship between the diversity of tenure of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA13}: There is a positive relationship between the diversity of tenure of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B13}: There is a negative relationship or no relationship between the diversity of tenure of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB13}: There is a positive relationship between the diversity of tenure of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C13}: There is a negative relationship or no relationship between the diversity of tenure of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC13}: There is a positive relationship between the diversity of tenure of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D13}: There is a negative relationship or no relationship between the diversity of tenure of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD13}: There is a positive relationship between the diversity of tenure of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E13}: There is a negative relationship or no relationship between the diversity of tenure of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE13}: There is a positive relationship between the diversity of tenure of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

4.2.6.4 Age

King IV advocates age as an important element in creating diversity on a board (IoDSA, 2016). Taveggia and Ross (1978), Weinstein (2020) and Wijeyekoon (2015) state that different age groups have significantly different values, beliefs and attitudes, which contribute to the *generation gap*. However, Zabel, Biermeier-Hanson, Baltes, Early and Shepard (2016) found mixed views in the literature on whether differences between age groups actually exist. Furthermore, Weinstein (2020) state that even if the ideas and motivation of the different generations may differ, it is not to say that they cannot work together.

Nyirenda (2010) describes age as an important element of the composition of boards because companies at every level consist of different age groups. Understanding the broad generational groupings and knowing the average age of the board may provide a good indication of the board's attitude towards embracing technological advances or its aversion to risk (Nyirenda, 2010). Mans-Kemp*, et al.* (2018b) advocate that age diversity is as important as gender and ethnicity when selecting directors.

Shaw (2011) reiterates the cliché that age brings wisdom and speculates that an older board may well contribute greater experience to a company. However, Shaw (2011) suggests that an older board may dampen a company's ability to anticipate change and adapt. It was found that most failed boards in the United States were, in fact, comprised of older members. Lipton and Lorsch (1992) believe that companies should lean towards relatively younger boards to ensure that the board's ideas remain fresh and the board remains active, which should have a positive association with the performance of the company. Dickason and Swanepoel (2018) state that older individuals are more risk averse than younger individuals, which cause older individuals to be less inclined and more cautious to take risks in making financial, investment and strategic decisions.

According to Ali*, et al.* (2013), the mixed results of research in terms of the relationship between director age and the performance of a company do not make it clear whether age is associated with the performance of a company. Sonza and Kloeckner (2013) found a positive association between the age of directors and their efficiency, in other words, older directors generally tended to be more effective directors. In this regard Bonn, Yoshikawa and Phan (2004) report that low average age, and higher age diversity, show a positive relationship to higher share values. Ali*, et al.* (2013) further report on research that found no significant relationship between average age levels of the board of directors and company performance. Hafsi and Turgut (2013), in turn, found a negative relationship between average age and corporate social responsibility.

Literature feels that even though age difference causes the generation gap, it is not to say that different age groups can't work together. On the one hand literature describes that younger board members bring new ideas and perspectives and are more adaptable to change, especially in terms of technology, which should benefit financial performance and processes such as the cash conversion cycle. On the other hand, literature found older board members to be more conservative and more careful to take risks in their business decisions. This should stand a company in good stead in terms of risk management. It can therefore also be expected that a mix of ages on a board should benefit the company with the best of both worlds, however, conflicts and factions that may form as a result of different age groups on the board may put a damper on the efficiency of the board, which may lead to more neutral positions such as a less aggressive cash conversion cycle. Based on these finding the following hypotheses were posed:

H_{0A11}: There is a positive relationship or no relationship between the average age of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA11}: There is a negative relationship between the average age of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B11}: There is a negative relationship or no relationship between the average age of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB11}: There is a positive relationship between the average age of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C11}: There is a positive relationship or no relationship between the average age of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC11}: There is a negative relationship between the average age of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D11}: There is a negative relationship or no relationship between the average age of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD11}: There is a positive relationship between the average age of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E11}: There is a positive relationship or no relationship between the average age of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE11}: There is a negative relationship between the average age of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD11} and H_{aE11} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

H_{0A12}: There is a negative relationship or no relationship between the age diversity of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA12}: There is a positive relationship between the age diversity of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B12}: There is a negative relationship or no relationship between the age diversity of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB12}: There is a positive relationship between the age diversity of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C12}: There is a negative relationship or no relationship between the age diversity of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC12}: There is a positive relationship between the age diversity of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D12}: There is a negative relationship or no relationship between the age diversity of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD12}: There is a positive relationship between the age diversity of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E12}: There is a positive relationship or no relationship between the age diversity of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE12}: There is a negative relationship between the age diversity of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aD12} and H_{aE12} are in opposite directions due to the opposing messages that the two measures often provide as discussed in Section 4.4.1

4.2.6.5 Nationality

Harjoto, Laksmana and Yang (2018) and Iliev and Roth (2018) point out that, as the shareholding in companies becomes more global, that is foreigners investing in local companies or companies obtaining dual listings in other jurisdictions, more foreign directors are appointed to the boards to look after foreign interests. One of

the benefits of having directors with foreign board experience is that they have wider exposure to different corporate governance regimes. However, it is not guaranteed that the foreign experience translates well across borders, according to Iliev and Roth (2018). The possible value or detraction of directors, in terms of nationality, lies mainly in agency theory and resource dependency theory (Hillman*, et al.*, 2000). In terms of agency theory, it comes down to the ability of these directors to monitor management. In terms of resource dependence theory, the focus is placed on the ability of directors to provide advice and other resources to a company (Masulis, Wang & Xie, 2012).

Views and findings on the benefit of foreign national directors are varied. Coval and Moskowitz (1999) highlight geographical distance as a major stumbling block, which increases the cost of monitoring and decreases the incentive for remotely located directors to gather information and to closely monitor management. Harjoto*, et al.* (2018) note that the geographic remoteness and diversity may jeopardise teamwork and cohesion. These directors may lack the networks and access to *soft* information related to the operations of the companies that local directors have. They may also not have the knowledge of local laws and regulations necessary to evaluate management's performance (Masulis*, et al.*, 2012). However, foreign directors may be able to provide first-hand knowledge of the foreign markets that a company invests in. They will also be able to tap into a network of foreign contacts (Masulis*, et al.*, 2012). Doidge*, et al.* (2004) are of the opinion that foreign directors ought to be able to assist companies in raising funds through access to foreign equity and debt markets. This may also serve to make a company's shares more liquid, if a wider investor base can be accessed.

Foreign directors directly contribute to the diversity of the board. For example, geographic diversity contributes to avoiding groupthink and the development of factions in the board (Lipton & Lorsch, 1992). Furthermore, enhanced diversity may give rise to competitive advantages due to the different experiences, socio-economic outlook and different approaches to challenges, according to Harjoto*, et al.* (2018) and Trautman (2012). These factors may lead to the generation of new ideas and the creation of new opportunities as a more diverse team potentially

brings a greater pool of knowledge, experiences, skills and perspectives, which may improve the board's ability to solve problems.

Ameer*, et al.* (2010) found that companies with higher levels of non-executive foreign directors were associated with better performance. In contrast, Masulis*, et al.* (2012) found that companies with a high level of foreign national directors displayed poorer performance, especially where the companies did not have a dominant presence in the foreign markets.

Foreign directors are said to provide a company with access to foreign debt and equity markets, thereby contributing to increasing the liquidity of the company's shares, which should make them more attractive to a wider range of investors. This may improve the value of the company to shareholders. The access to a wider pool of funding may allow a more aggressive stance on liquidity, as reflected in a better cash conversion cycle. However, geographic distance is raised as a concern in terms of the ability of these directors to monitor management and understand the local conditions. This may reflect in a decrease in a company's ability to manage its market risk. Based on this the following statistical hypotheses are posed:

H_{0A6}: There is a positive relationship or no relationship between the percentage South Africans on the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA6}: There is a negative relationship between the percentage South Africans on the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B12}: There is a negative relationship or no relationship between the percentage South Africans on the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB12}: There is a positive relationship between the percentage South Africans on the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C12}: There is a positive relationship or no relationship between the percentage South Africans on the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC12}: There is a negative relationship between the percentage South Africans on the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D12}: There is a negative relationship or no relationship between the percentage South Africans on the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD12}: There is a positive relationship between the percentage South Africans on the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E12}: There is a positive relationship or no relationship between the percentage South Africans on the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE12}: There is a negative relationship between the percentage South Africans on the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

4.2.6.6 Board experience

Kroll*, et al.* (2008) point out that a board is bound to be unsuccessful if it relies on the effort and care of directors without adequate experience. Experience causes directors to be better monitors, as well as better advisors to top management, as opposed to merely relying on the effort and attentiveness of the directors. Gray and Nowland (2013) and Mans-Kemp*, et al.* (2018b) support this view by stating that the board is responsible for numerous complex tasks, such as monitoring of management and company operation, making strategic decisions, and analysing market opportunities. Even though business experience, experience in specific disciplines such as accounting or finance, and independence equip directors to perform their duties, experience as a director is proposed as the most relevant expertise a director should have.

Highly experienced directors, especially NEDs, often gained the experience by sitting on a number of boards at a time. Gray and Nowland (2013) and Mans-Kemp*, et al.* (2018b) believe that outside experience in monitoring and advising is an invaluable skill that a director brings to a company. Westphal and Milton (2000) claim that external experience is a powerful and essential way to learn how to execute their roles as board members and improve their ability to interpret business situations. Hillman and Dalziel (2003) and Dou*, et al.* (2015) argue that experience equips directors to better fulfil their monitoring, advisory and counselling roles. According to Ferris, Jagannathan and Pritchard (2003), multiple directorships may be an indication of a director's quality, which could reflect positively on a company. Reguera-Alvarado and Bravo (2017) underscore this notion by stating that directors who sit on a number of boards normally have better reputations, which serve to motivate them to increase their engagement with a company, thereby actively contributing to the performance of the company. However, Mans-Kemp*, et al.* (2018b) warn that this status and the considerable remuneration that comes with multiple appointments should be balanced with the possible reputational risk, time commitment and the responsibilities that come with each appointment. Over-extension of directors are often reflected in poor board meeting attendance and lower activity levels in board committees (Chiranga & Chiwira, 2014; Mans-Kemp*, et al.*, 2018b).

Kroll*, et al.* (2008) believe that additional experience enables NEDs to provide better strategic direction, especially in specialised situations in which they have previous experience. For example, when a company wishes to explore a strategic acquisition, NEDs with experience in mergers and acquisitions would be invaluable. Chiranga and Chiwira (2014) explain that it is common practice for companies to utilise directors with multiple board seats as a tool to attract external skills, thereby bolstering the effectiveness of the board. This also gives a company access to an extensive network to better engage with its environment. Outside directorships will provide directors with broader insight into corporate strategies, which will be a valuable resource to a company according to Reguera-Alvarado and Bravo (2017) and Mans-Kemp*, et al.* (2018b). Dou*, et al.* (2015) note that a director with other board experience will have experience with a number of CEOs. This will enable

them to better assess the ability and tendency of the current CEO, thereby being able to assess the need for advice, or to counter his or her attempts to dominate the board.

However, Jackling and Johl (2009) and Mans-Kemp*, et al.* (2016b) believe that the number of board seats held by an individual should be limited because the *busyness* of directors appears to have a negative relationship to performance and that it does not add value in terms of access to resources. Chiranga and Chiwira (2014) also warn that the effectiveness of board functions, such as monitoring and supervision, is often jeopardised by too many board seats. Mans-Kemp*, et al.* (2018b) discovered that diversity goals and the limited availability of suitable candidates were some of the main reasons for overboardedness. However, they warn that overboardedness should be assessed on an individual basis, since some directors may have the ability and diligence to handle multiple directorships. Chiranga and Chiwira (2014) found that multiple directorships were common in South Africa, but this did not have any relationship to the performance of the companies. They also reported studies that found a negative relationship between company performance and multiple directorships.

A number of researchers are of the view that, due to time constraints and other obligations, a person should not be allowed to sit on more than three boards at a time (Andres, Van Den Bongard & Lehmann, 2013; Chiranga & Chiwira, 2014; Lipton & Lorsch, 1992; Mans-Kemp*, et al.*, 2018b). Ferris*, et al.* (2003) report similar views from corporate finance activists, by saying that effective monitoring requires commitment and time and that directors with full-time jobs should not serve on more than three or four other boards. Seegers and Shaw (2013) also warn that NEDs with too many board appointments may not be able to spend enough time to adequately perform their duties. However, directors with many board seats should be in a position to provide exceptional networking opportunities and access to resources, contest Mans-Kemp*, et al.* (2018b). They recommend that each case should be assessed separately, rather than setting broad rules. They further state that overboardedness becomes a problem only if the board is dominated by directors with too many board seats. The more likely scenario is that only a few

directors are over extended and that the other board members are able to compensate for their lack of performance in certain areas.

Literature promotes experience as a director, especially on several boards, as a key attribute for a director. This possibly gives them experience in issues that their current company faces for the first time and it would also lead to an extensive network and broader market knowledge. However, literature warns that too many board seats could detract directors from spending adequate time and effort on their duties, but literature also states that this is mainly an issue when the board is dominated by such directors. Based on these finding the following statistical hypotheses are formulated:

H_{0A18}: There is a negative relationship or no relationship between the average board experience of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA18}: There is a positive relationship between the average board experience of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B18}: There is a negative relationship or no relationship between the average board experience of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB18}: There is a positive relationship between the average board experience of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C18}: There is a negative relationship or no relationship between the average board experience of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC18}: There is a positive relationship between the average board experience of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D18}: There is a negative relationship or no relationship between the average board experience of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD18}: There is a positive relationship between the average board experience of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E18}: There is a negative relationship or no relationship between the average board experience of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE18}: There is a positive relationship between the average board experience of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{0A19}: There is a negative relationship or no relationship between the diversity of board experience of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{aA19}: There is a positive relationship between the diversity of board experience of the board and the odds that a company is ranked as a top performing company based on its shareholder return.

H_{0B19}: There is a negative relationship or no relationship between the diversity of board experience of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{aB19}: There is a positive relationship between the diversity of board experience of the board and the odds that a company is ranked as a top performing company based on its share price movement volatility.

H_{0C19}: There is a negative relationship or no relationship between the diversity of board experience of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{aC19}: There is a positive relationship between the diversity of board experience of the board and the odds that a company is ranked as a top performing company based on its Sharpe ratio.

H_{0D19}: There is a negative relationship or no relationship between the diversity of board experience of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{aD19}: There is a positive relationship between the diversity of board experience of the board and the odds that a company is ranked as a top performing company based on its current ratio.

H_{0E19}: There is a positive relationship or no relationship between the diversity of board experience of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

H_{aE19}: There is a negative relationship between the diversity of board experience of the board and the odds that a company is ranked as a top performing company based on its cash conversion cycle.

4.3 PERFORMANCE INDICATORS

Two components that contribute to a company's value creation process are financial performance and risk management. It is key to understand the relationship between the various board characteristics and these two components of value creation to be able to ensure that the composition of the board matches the focus of the company at the time. Various indicators have been used in the literature over the years to determine the level of company performance and the risk attached to the performance. The ensuing section considers the performance and related risk measures that stand out from the literature.

With shareholder value maximisation at the centre of teachings on finance, many studies have explored the potential relationship between board composition and company performance (Martin, Petty & Wallace, 2009). Jemison (1987) describes performance as an essential element of strategic management research and proposes that financial performance should be considered from two angles. Firstly, one should consider the level of performance. Secondly, the variability or volatility of performance should be considered as an indication of the riskiness of performance. Wouters (2009) claims that performance measures can serve to make a company's strategy more concrete and guide all levels of a company to implement the strategy. These measures could inspire all employees and the board to work harder and put in more effort. King IV also promotes risk management and financial performance as inseparable elements of value creation (IoDSA, 2016). In

addition, the Code for Responsible Investing in South Africa (CRISA) advocates the importance of sustainable long-term performance of an investment and the delivery of superior risk-adjusted return (IoDSA, 2011).

Using ratios to measure relative performance, rather than the absolute numbers reported in the financial statements, is a powerful tool for decision-makers because comparisons can be made across companies in similar industries and companies of different sizes can be compared (Delen, Kuzey & Uyar, 2013). Mans-Kemp and Viviers (2015) and Pandian*, et al.* (2006) maintain that two general approaches are used to measure the performance of companies. The first group of measures is accounting-based, which focuses mainly on a company's past performance using information published in a company's financial statements. These measures typically include ROE, ROA, return on investment, net income and sales margins (Korac-Kakabadse, Kakabadse & Kouzmin, 2001). The second group of measures is market based, which focuses more on the investors' perception of a company's value and risk (Mans-Kemp & Viviers, 2015; Pandian*, et al.*, 2006).

Over the years, companies used accounting-based measures, such as earnings compared with budget and return on investment to manage performance. These accounting-based measures have many advantages, which explain why they are so widely used. For example, the information used in these measures is subject to an internal control system that improves its reliability. In addition, these measures are widely used, easy to understand and form an essential part of a company's reporting. Moreover, accounting-based performance measures consolidate a number of aspects of a company's performance into a single coherent measure, such as ROE is the ratio of net income to shareholders' equity, which shows the amount of profit generated from the money invested by shareholders. The net income to shareholders is derived from many line items in a company's profit and loss account and cashflow statement. Any significant deviation in the ROE from period to period or from expectation could then be further investigated by analysing the underlying accounting line-items. (Verbeeten & Boons, 2009).

However, accounting-based measures are not without its flaws, states Erasmus (2008). Because it is based on accounting information as reflected in the financial statements, it is subject to a number of accounting and managerial distortions, according to Erasmus (2008) and Scholtz and Kieviet (2018b). These distortions are the result of the somewhat subjective application of accounting principles; for instance, when to recognise revenue or how quickly to depreciate assets. Voulgaris, Stathopoulos and Walker (2014) explain that the challenge with accounting information is that it aims to fulfil more than one purpose. These purposes could include that it serves as a summary of a company's results, a measure of management's performance and provides investors with the information they need to determine the value of a company. In addition, with the introduction of the fair value approach, accounting aims to provide more market-related information, which causes the accounting numbers to be more sensitive to market-wide movements. Consequently, accounts no longer screen out market-related noise, with the result that the earnings volatility is often due to factors totally outside the control of management, which jeopardises the accounts' value as a basis for performance incentives (Voulgaris*, et al.*, 2014).

Accounting-based measures are viewed as too highly aggregated, too internally focused and often not aligned with the overall strategy of the company (Chenhall & Langfield-Smith, 2007). Furthermore, these measures are only sporadically available when financial information is compiled, according to Groß (2007). Finally, these measures are also backward looking and tend to reward excessive short-term behaviour, such as data manipulation (Verbeeten & Boons, 2009).

As an alternative, many scholars and practitioners prefer market-based performance measures to overcome the shortcomings of accounting-based measures, explain Mans-Kemp and Viviers (2015). In the view of Pandian*, et al.* (2006), market-related measures capture the value of a company's intangible assets more fully. Mans-Kemp and Viviers (2015) are also of the opinion that many researchers consider market-based measures to be superior to accounting-based measures. Market-based measures are preferred because they incorporate value created by the implementation of current opportunities and also incorporate a risk-

adjusted, projected value of anticipated opportunities that may emerge in future (Bayrakdaroglu, Ersoy & Citak, 2012; Muchemwa, 2014; Scholtz & Kieviet, 2018b). While accounting-based measures may be susceptible to managerial manipulation and the results only available on a periodic basis, market-related measures, in a well-regulated and efficient market, are independent of managerial manipulation and are expected to reflect the impact of any announcements by a company, or any other relevant factors, in a short space of time (Narayan & Smyth, 2004).

The next sections consider the specific measures indicated in the literature review as reasonable indicators of the level of company performance and the risk attached to the performance.

4.3.1 Shareholder return

Even though many scholars and regulators are calling for the promotion of a wider group of stakeholders' interests in a company, it does not mean that profit becomes meaningless or that the financial interests of shareholders become less important. The importance of shareholder wealth cannot be ignored (Choudhury & Petrin, 2018). Rechner and Dalton (1991) divulge that there are many company performance measures that may be relied on, but that most are accounting based. Rechner and Dalton (1991) and Donaldson and Davis (1991) recommend that shareholder return, as measured by share price growth and dividends received, should be used to give an indication of the level of a company's performance from a shareholders' perspective.

De Wet and Du Toit (2007) and Choudhury and Petrin (2018) expound on this notion by explaining that the ultimate goal for a profit-seeking organisation is to build investor value by enhancing the value of a company over the long term. The new tendency in company evaluation is to measure a company's success by how constructive and value-adding the relationship between management and stakeholders is (Bayrakdaroglu*, et al.*, 2012). Therefore, measures such as total shareholder return have gained popularity. Abrams*, et al.* (2006) believe that one

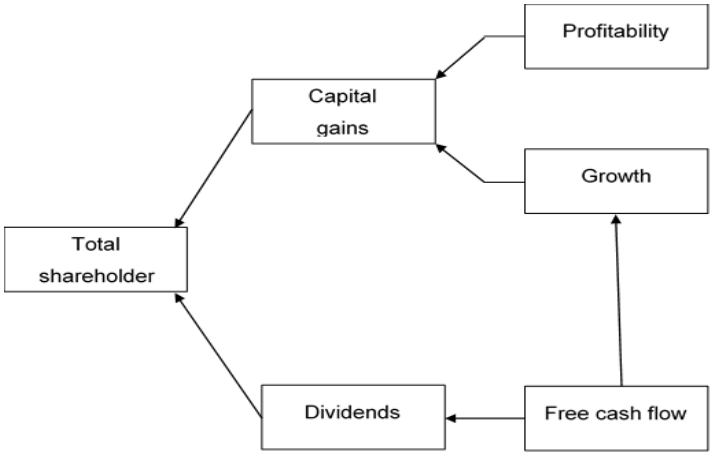
of the best indicators of shareholders' interests in a company is total shareholder return.

Total shareholder return is a purely market-based performance measure that gives an indication of investors' view of a company's share price performance and the market risk attached to that company, explain Mans-Kemp and Viviers (2015). Consequently, it gives an indication of the return that a shareholder earns over a specific period. Burgman and Van Clieaf (2012) state that mathematically speaking, total shareholder return is the appreciation (or depreciation) of the share price over a period plus the dividends earned in that period, expressed as a percentage of the share price at the beginning of the period. The assumption is made that the dividends are reinvested in the company's shares over the specific period (Abrams*, et al.*, 2006; Edwards, 1994).

As can be seen in Figure 1, Edwards (1994) points out that total shareholder return provides a comprehensive measure of how well a company has succeeded to create value for its shareholders. It includes the three elements that are at the core of value creation, as follows:

- profitability, which is measured by the cash flow return on investment and filters out any accounting distortions by removing non-cash flow income and expense items (such as depreciation) as well as expense items related to other funding sources (such as interest on debt funding);
- sustainable growth, which reflects the rate of expansion that a company can sustain with the cash retained after paying dividends, interest and maintaining the existing assets; and
- free cash flow, which represents the potential dividends paid to the shareholders and contribution to growth through reinvestment.

Figure 4-1: Internal drivers of total shareholder return



Source: Adapted from Edwards (1994)

Apart from share price and dividends, total shareholder return also captures business improvements, any restructurings that may have occurred, any share buybacks and growth. Because the calculation covers a certain time period, it can also serve to filter out short-term share price fluctuations (De Wet & Du Toit, 2007; Edwards, 1994).

According to Bayrakdaroglu*, et al.* (2012), return to shareholders is a market-based measure which eliminates distortions that may occur in accounting data and which facilitates comparability across time, companies and even industries. Furthermore, shareholder return is a good indication of whether a company is creating or destroying value, as well as a measure of assessing the efficiency and performance of managers within the context of corporate governance. However, there is limited literature coverage on whether good corporate governance leads to higher share prices, and consequently increased company value, according to Bauer*, et al.* (2004) and Cheung, Stouraitis and Tan (2010).

Shareholder return, as reflected by an increase in share price, as a measure of company performance is not without its critics. Burgman and Van Clieaf (2012) contend that the share price, and consequently the change in share price, is rather an indication of the market's perception of a company's future earnings potential than of actual performance by the company.

4.3.2 Performance volatility or market risk

According to Henkel (2009), the concept of *risk* is central to strategy for both theoretical scholars and practitioners. Jemison (1987) describes *risk* as the variability in a company's performance. From a shareholder perspective, a company's market risk is most commonly viewed from a share market perspective, in other words, the risk of owning a particular share. Geer (2012) explains that, even though some level of risk is inevitable, investors are mostly risk averse and are generally willing to pay a premium to reduce their risk, especially the risk of losses. However, investors can only be averse to the risk they know about and they would therefore be keen to identify high-risk shares before they invest.

Corter and Chen (2006) claim that risk aversion varies from investor to investor and is greatly influenced by the investment goals and attitudes of investors. The risk appetite of investors may also change over time. Under the portfolio theory, it is important to understand the investor's attitudes to risk when compiling an investment portfolio. Therefore, it is important for the investor to be able to identify factors that may indicate investment risk in terms of the various shares under consideration, to enable investors to select shares that fit within their risk preference.

Since the value of a share is determined by investors' expectations of the future earnings of the company, Koorts and Smit (2002) define the *volatility of a share price* as the measure of uncertainty about the returns that an investor can earn from a share, that is uncertainty about the future earnings of the company. Kotze (2005) clarifies that the volatility of a share price is the dispersion or deviation of the share price from its mean. Therefore, large volatility indicates that returns on a share, from share price movement, fluctuate in a wide range, and consequently represent a high risk. Farmer*, et al.* (2013) and Mathew*, et al.* (2018) concur by explaining that risk is equated to the volatility in a company's share price over the observation period. This volatility can be measured by calculating the standard deviation of the

share price over the period of measurement (Farmer*, et al.*, 2013; Perryman*, et al.*, 2016).

Hillman and Dalziel (2003) express the view that a board, as provider of critical resources to a company, has a direct association with the performance of a company. These resources reduce a company's reliance on various external contingencies, and therefore reduce the uncertainty within a company. This reduction in uncertainty translates into a reduction of risk, which will reflect in a company's share price. De Wet and Du Toit (2007) explain that management's actions could be value destroying, where these actions lead to high risk exposure for a company; for example, where management increases company gearing levels to the extent that the inherent financial risk becomes unacceptable to investors. These increased levels of risk will be reflected in negative share price movements.

4.3.3 Relative performance

Donaldson and Davis (1991) and Pandian*, et al.* (2006) point out that company performance is influenced by industry factors such as product profiles, competition and access to resources. Pandian*, et al.* (2006) further state that company-specific factors are outweighed by industry factors and that the financial market performance varies across industries.

According to Burgman and Van Clieaf (2012), stock markets are subject to economic cycles, general market conditions and other macroeconomic factors. Share prices of individual companies are impacted by the anticipation of future growth of a company and the perception regarding a company's sustainable competitive position. Burgman and Van Clieaf (2012) speculate that 50% of long-term share price changes are caused by macroeconomic factors and 25% are caused by industry-specific factors.

Lashgari (2004) proposes that a company's performance needs to be measured relative to the performance of its industry. Burgman and Van Clieaf (2012) support this notion by stating that, to achieve a more useful measure of a company's actual

performance, performance should be measured relative to a company's peer group. Lashgari (2004) believes that compensation levels linked to company performance, whether market-based or accounting-based measures are used, tend to reward employees for market trends, as opposed to their actual incremental contribution, where relative measures are not implemented. Farmer*, et al.* (2013) hold a similar view by stating that an absolute measure of company performance will penalise or reward employees, management or directors for factors outside their control. A more efficient incentive would be to exclude market-wide events, which are beyond the control of the party under review. The performance measure should compare a company's performance with that of companies facing similar market risks, such as companies in the same industry (Abrams*, et al.*, 2006).

Another measure proposed by Deysel and Kruger (2015) for eliminating some of the macroeconomic factors included in performance measures, is to ensure that an adequately long time horizon is used. They suggest that a five- to seven-year horizon would be sufficient to eliminate most short-term fluctuations caused by macroeconomic factors.

4.4 INTERNAL RISK MANAGEMENT INDICATORS

The management of a company's internal risk is another component of the overall value creation process of a company. This function, in turn, is made up of several diverse disciplines, which require different skills, experience and orientations as that to manage financial performance or market risk (Barlow, 2016). A separate assessment is therefore necessary to determine the possible associations between the various board characteristics and the internal risk management ability of a company.

A key responsibility of the board is to define the purpose of a company and determine the strategy for achieving this purpose. The board should furthermore develop the culture within the company by setting out values and required behaviour. In addition, the board needs to keep abreast of main trends and factors that impact the long-term sustainability of the company and how the main risks of

the company are dealt with (FRC, 2018; Geny, Watson, Bertsch & Roy, 2006). The main risks include the solvency, liquidity, financial risk, credit risk, market risk, regulatory risk and reputational risk (Erasmus & Le Riche, 2014; FRC, 2014). Barlow (2016) points out that boards are increasingly held responsible for managing company risks. Economic trends add to the need that boards minimise the impact of financial risks. Risk management is described as the process implemented by the board, management and other staff to identify risk to which a company is exposed and to manage this risk within the risk appetite of the company (Beasley, Clune & Hermanson, 2005; Callahan & Soileau, 2017). The board needs to create risk awareness within a company, which will improve the board's decision-making and positively impact on the governance and control environment of the company (Yatim, 2010).

King IV stipulates that, as part of its oversight function, the board needs to be watchful of the liquidity and solvency of a company and its status as a going concern (IoDSA, 2016). Erasmus (2014) expressed a similar view by stating that the board, and its committees, should manage company risks such as strategic risk, financial risk and liquidity risk.

Liu*, et al.* (2017) describe liquidity as being of the utmost importance to a company's strategy. The level of liquidity is often the key factor in determining whether new investments or projects can be undertaken or whether a company faces imminent bankruptcy, and consequently have a significant association with a company's valuation. Fleming (1986) points out that it is of paramount importance to a company's survival and prosperity to ensure that it has adequate cash available for its current operations. Liquidity management is a core focus of companies all over the world. Business owners need to ensure that they are able to meet their obligations as they fall due and that they continuously increase profitability and shareholder value. In essence, liquidity management focuses on the management of working capital. Liquidity is essential to the successful functioning of a company in that the company needs to ensure that it is neither negatively impacted by a lack of liquidity to meet its obligations, nor by excessive amounts of working capital (Owolabi & Obida, 2012). Bhunia (2013) warns that improper management of

working capital, in terms of liquidity, profitability and operating efficiency, often causes inadequate financial performance. Lundqvist (2015) also believes that adequate liquidity is necessary to seize growth opportunities. According to Simpson (2013), liquidity management is the most important financial function, but probably the most misunderstood and overlooked. Companies typically tend to only focus on liquidity management once they face a crisis or stand on the brink of bankruptcy.

4.4.1 Liquidity

The Companies Act (71 of 2008) states that a company satisfies the liquidity test when it appears that the company will be able to pay its short-term debts as they become due. According to Richards and Laughlin (1980) and Fleming (1986), the current ratio, being current assets divided by current liabilities, is a measure used for many years by stakeholders to evaluate a company's ability to meet its short-term obligations. Tauringana and Clarke (2000) also highlight the importance of the ratio as an indicator of the riskiness of a company. Cagle*, et al.* (2013) further believe that the usefulness of this ratio lies in its simplicity and the fact that it includes the impact on liquidity of all current liabilities, as opposed to cash-based analysis, which generally focuses only on accounts payable. Richards and Laughlin (1980) point out that analysts introduced the use of the *acid-test ratio* or quick ratio to overcome the variation in the time that it takes different companies to convert the various current assets into cash. This ratio attempts to eliminate those current assets that typically take longer to convert to cash. According to Richards and Laughlin (1980), the fact that these assets still convert back into cash at different speeds causes the acid-test ratio to give a different but not necessarily better result than the current ratio. As John (2001) explains, the acid-test ratio is also a balance sheet ratio intended to determine the proportion of current liabilities that are covered by current assets. What analysts typically do when using these ratios is to merely assign a higher benchmark to the current ratio than they do to the acid-test ratio (Fleming, 1986). Therefore, there is no fundamental benefit in using both ratios.

Criticism against only using the current ratio to analyse the liquidity of a company is that it is static and only looks at the liquidity at a single point in time with no

reference to the cash flow attributes of the transformation of working capital items. The risk also exists that companies manipulate current assets and current liabilities to improve the ratio for reporting purposes (Fleming, 1986). Furthermore, the balance sheet-based ratios (current ratio and acid-test ratio) have a more liquidation value approach to liquidity analyses as opposed to a going-concern approach. Companies should rather be concerned with avoiding these dire positions by ensuring the company's ability to meet its obligations in the normal course of business from operating cash flows rather than asset liquidation (Richards & Laughlin, 1980). One of the most widely used indicators to overcome the shortcomings of balance sheet-based ratios is the cash conversion cycle (Cagle*, et al.*, 2013; John, 2001; Lyroudi & McCarty, 1993; Richards & Laughlin, 1980; Zeidan & Shapir, 2017). The cash conversion cycle considers the amount of time a company takes to sell its inventory, collect the money from its debtors and repay its creditors explain Richards and Laughlin (1980), Lyroudi and McCarty (1993) and Cagle*, et al.* (2013). John (2001) believes that the benefit of this approach lies in the fact that it separately assesses a company's purchasing, production, distribution and payment activities as well as its credit and debt collection policies. This is done through the use of activity-based income statement items. The lower the value (number of days) of the cash conversion cycle, the better a company's liquidity management (Lyroudi & McCarty, 1993).

It is worth noting that the current ratio and the cash conversion cycle often give opposing messages regarding the liquidity of a company, as pointed out by Lyroudi and McCarty (1993) and Richards and Laughlin (1980). Richards and Laughlin (1980) is of the view that the indication provided by the cash conversion cycle may be more meaningful than that provided by the current ratio. Cagle*, et al.* (2013) point out, for example, that the build-up of slow-moving inventory would have a negative impact on the cash conversion cycle (and the liquidity of a company). However, the current ratio may improve because it does not distinguish between the liquidity of the various elements included in the ratio. In addition, the payment of a large creditor just before the date on which the current ratio is measured, which may be done to artificially improve the current ratio, would not have the same effect on the cash conversion cycle in that the cycle is calculated based on the average

balances over the period. Yazdanfar and Öhman (2014) support the notion by reporting a number of studies that found a positive association between a shortened cash conversion cycle and a company's profitability, because it means the company reduces the cost of holding unproductive working capital. However, they further point out that cash conversion cycle management involves extensive planning and assessing different financing options to improve performance.

4.4.2 Relative liquidity ratios

Companies in different sectors may be exposed to differing current asset cycles. For example, companies with a long lead-time production process will experience larger inventory balances and a longer time to convert these to cash (Fleming, 1986; Michalski, 2014). Gombola and Ketz (1983) also point out that different industries have different working capital needs and characteristics. The measures for working capital management, and therefore liquidity management differ across different industries, according to Lyroudi and McCarty (1993), Filbeck and Krueger (2005) and Da Costa (2014). The current ratio and cash conversion cycle for each company should therefore be evaluated relative to the sector within which the company operates.

4.5 SUMMARY AND CONCLUSION

Over the last number of decades, interest has increased in determining whether various board characteristics have an association with a company's performance. Many researchers theorised that board diversity in terms of the various characteristics should have a positive relationship to the board's effectiveness, and consequently to a company's performance and risk management ability. However, research reveals mixed results. A number of board characteristics and performance and risk management measures transpired from the literature review in this chapter, which informs the formulation of the research and statistical hypotheses.

Board size is argued to have an association with a company's performance. On the one hand, scholars advise that larger boards would be in a better position to fulfil

its monitoring and advisory duties, due to greater access to necessary skills and resources. On the other hand, scholars state that larger boards are less cohesive, harder to co-ordinate and that they find it difficult to properly exchange information and ideas, hampering the board's ability to make timely decisions and implement strategy. Therefore, the study tested whether board size has a significant relationship to a company's performance and ability to manage risk..

Ethnic composition, in terms of race, especially in South Africa, is seen as an important element in a company's quest to reflect the demographics of the country. Studies show conflicting findings in terms of the relationship between ethnic diversity and company performance. Therefore, the study tested whether the percentage of black persons has a significant association with company performance and ability to manage risk.

Gender diversity, in terms of male and female, has attracted significant literature attention over the years. Proponents of gender diversity argue that the different perspectives and attitudes of females contribute to the efficiency of the boards, and consequently to the performance of a company. However, research reports mixed findings on the relationship between gender diversity and company performance. Therefore, the study tested whether gender diversity has a significant association with company performance and risk management ability.

Director independence, in terms of NEDs who have no other links with the company, is expected to ensure better monitoring by the board over management. However, research on the relationship between company performance and director independence revealed mixed findings. The study tested whether the percentage of independent directors on the board has a significant relationship to company performance and the risk management ability of a company .

NEDs are, similar to executive directors, which was discussed in Section 3.4.2, incentivised by their remuneration to perform their duties. Increasing pressure on NEDs is making it progressively more difficult to attract the right calibre people to be appointed as NEDs. In addition, the mounting pressure requires NEDs to spend

more time in preparing for board meetings. This study aims to test whether the level of NED remuneration has a significant association with company performance and risk management ability.

It is argued that the predictability of a company's performance or risk management ability, as a result of director background, can be tested by determining the association of certain objective, easily observable characteristics with these measures. Consequently, the study determined whether the following board characteristics have a significant relationship to the performance and the risk management ability of companies:

- academic qualification;
- professional experience;
- length of tenure as a director;
- age;
- nationality; and
- experience as director (as measured by the number of other directorships).

A company's performance should be considered from two angles, namely the level of the performance and the variability or risk of the performance. Furthermore, the literature review indicates a preference for market-based performance measures over accounting-based measures and especially total shareholder return stands out as an all-round measure of company performance. Therefore, the study used total shareholder return to measure company performance.

Furthermore, the literature review shows that the market risk of a company can be measured by the volatility of the changes in its share price, or rather the volatility in the daily capital return on the share. The level of volatility is further shown to be an indication of the board's efficiency. Therefore, the study incorporated share price movement volatility as a measure of company and board performance.

The literature review indicates that company performance should be measured relative to a company's peers to eliminate macroeconomic factors. In addition, an

adequately long observation period should be used to eliminate macroeconomic fluctuations, namely five to seven years. Therefore, the study measured the performance of the various companies relative to the sector they operate in. Moreover, the observation period is the seven years from 2009 to 2015.

A board is responsible for managing the risk within a company. Liquidity is one of the main and often neglected areas of risk that a company faces. Two categories of liquidity measures are identified. The first is the balance sheet-based measures, such as the current ratio, which are often criticised as static and susceptible to manipulation. The second, to overcome the shortcomings of the balance sheet measures, is the cash conversion cycle, which incorporates the relevant activity-based income statement items. Therefore, the study determined whether the various board characteristics have an association with the risk management ability of a company by considering its ability to manage liquidity risk. The current ratio and cash conversion cycle are used as proxies for risk management. Different sectors may be exposed to different current asset cycles and companies in different sectors may have different working capital needs. Consequently, the study assessed the liquidity management of the companies relative to the liquidity management of the sector they operate in.

Chapter 5 provides a description of the research method and research design used to collect data as well as the dependent and independent variables that are considered in the study. In addition, the chapter provides an overview of the data collected and the processing required to develop the various variables.

CHAPTER 5: RESEARCH DESIGN AND METHODOLOGY

5.1 INTRODUCTION

This chapter provides an overview of the research method and research design in relation to the research objectives described in Section 1.5 of Chapter 1. Hofstee (2013) distinguishes between the research method and research design by explaining that the research method is the general techniques applied to answer the research questions such as interviews, case studies or the examination of secondary data. In contrast, the research design is the steps taken to reach a conclusion to a study.

From the literature study in Chapters 2 to 4, three market-based performance and market risk measures were identified, based on the expectation of shareholders, as well as two measures of a company's ability to manage components of its internal risk. These measures are shareholder return, the share price movement volatility, the risk-adjusted return to shareholders, current ratio management and cash conversion cycle management. Furthermore, from the literature review chapters, a number of board characteristics emerged that may have an association with the performance and risk management of a company based on the role of the board.

This chapter consists of an overview of the research method and research design of the study and provides a description of the data used, the sources of the data, the data collection methods employed as well as the data analysis techniques used. It further elaborates on the measurement and processing of the data to develop the variables used in the final analysis.

5.2 RESEARCH PARADIGM

Most philosophical debates on research and research methodologies are found in literature on the social sciences. However, Bryman and Bell (2015) contextualise this by stating that theories developed by social sciences have a direct influence on business research and how findings are analysed. Hudson (1992) and Bryman and

Bell (2015) postulate that the paradigm approach to research was developed by Thomas Kuhn in the late 1960s. A *research paradigm* is a set of beliefs or viewpoints from which research is approached and which determines the methods used to obtain and interpret data (Bryman & Bell, 2015; Creswell, 2007; Hudson, 1992).

In the first instance, one needs to consider assumptions regarding ontology or the nature of reality (Ponterotto, 2005). From an ontological point of view, to arrive at a definitive conclusion in terms of the hypotheses, formulated in Section 1.5, the study's research and findings were constructed from a positivistic point of view. Ponterotto (2005) and Peers (2018) define *positivism* as the belief that there is only one identifiable and measurable reality. According to Ponterotto (2005), positivism supports a deductive research strategy, which is used in this study. However, according to Jebb, Parrigon and Woo (2017), scientific progress is maximised when there is a balance between inductive and deductive approaches. Consequently, the study research hypotheses were derived through an inductive process, in that the research variables used to test the hypotheses were determined through exploration in the form of a literature review. Jebb*, et al.* (2017) explain that inductive reasoning allows the researcher to discover patterns or phenomena in the data. This is expected to lead to better enunciated research questions and may also lead to the detection of unexpected phenomena, which could not have been foreseen through using a purely deductive approach. Positivists claim to study a reality independent of the researcher's experience of it and aim to reveal general correlations that apply universally (Dudovskiy, 2018a; Welman & Kruger, 1999). However, the validity of post-positivism is also acknowledged in that the measurement of the existing situation in terms of a potential association between company performance and board characteristics cannot be perfectly measured (Creswell, 2007; Ponterotto, 2005; Racher & Robinson, 2003; Williams, 2007). In addition, the validity of critical theory is recognised in that the reality of board compositions is inevitably a function of the political, cultural, ethnic and social framework within which companies operate in South Africa (Ponterotto, 2005).

Secondly, the positivist paradigm basis of this study is also valid from an epistemological point of view. Ponterotto (2005) and Yilmaz (2013) explain that this point of view includes both dualism and objectivism on the part of the researcher. Ponterotto (2005), Yilmaz (2013), Farghaly (2018) and Peers (2018) continue to clarify that this means the researcher is totally independent of the researched topics (dualism) and that the researcher implements procedures to eliminate any bias in his or her observations (objectivism).

Finally, a positivistic approach is also supported from an axiological standpoint. According to Johnstone (2004) and Ponterotto (2005), axiology dictates that the researcher remains emotionally detached from the inquiry.

From the above it is clear that this study employs a positivistic research paradigm. Ontologically the study is based on the assumption that a company's performance and risk management ability can be separately measured (Meredith, Raturi, Amoako-Gyampah & Kaplan, 1989). Consequently, the five measures that serve as the dependent variables have been isolated and described (see Section 4.3, Section 4.4 and Section 5.5.1) on the assumption that they can exist as independent phenomena. Furthermore, the study assumed that these measures or phenomena are influenced by independently observable facts, adhering to the laws of cause and effect (Ryan, 2000). The researcher identified the board characteristics that is considered to influence the measures of company performance and risk management and developed the research and statistical hypotheses using existing theories (Dudovskiy, 2018a). The existing theories are discussed in the literature chapters (see Chapters 2 to Chapter 4). This includes the formal corporate governance theories discussed in Section 2.5 as well as the views and findings of previous studies on the various characteristics and performance and risk management measures. The development of the various hypotheses is highlighted in the literature review sections (Sections 3.4.1, 3.4.2 and 4.2) of this study.

Epistemologically the role of the researcher was restricted to that of data collector and interpreter. As described in Section 5.7 and Section 5.4 the data was collected

through physical observation by the researcher while maintaining absolute dualism (Ponterotto, 2005), that is the researcher played no part in any of the characteristics studied and contributed in no way or form to the performance or risk management of the companies studied. In addition, the researcher maintained total objectivism, in other words the study was performed without bias. This is illustrated by the fact that the hypotheses were developed as guided by the literature analysis, the sample was selected without any bias toward the inclusion of any companies (see Section 5.4). In addition, as discussed in Section 5.7 the researcher made sure that the data is trustworthy and accurately recorded with no attempt to alter the data. Furthermore, as described in Section 5.3.8, a deductive reasoning approach was followed to achieve the purpose of the study, which is typical of a positivist approach (Dudovskiy, 2018a).

5.3 DESCRIPTION OF INQUIRY STRATEGY AND BROAD RESEARCH DESIGN

This section explores the inquiry strategy used in the study and describes the research design. The following descriptors are applicable to this study:

5.3.1 Quantitative research

Garbarino and Holland (2009) simplify the terms *qualitative* and *quantitative* by describing it as the type of data produced by the research, data which can be textual or numerical, respectively. Casley and Kumar (1988), Ponterotto (2005), Zikmund (2013) and Saunders, Lewis and Thornhill (2016) provide similar definitions. Johnson and Onwuegbuzie (2004) and Farghaly (2018) assert that qualitative research is more useful to inductively generate explanatory theories and describe complex phenomena. In contrast, quantitative research is typically used in deductive research, which allows for greater generalisation of research findings and increased objectivity of the researcher. Consequently, this study is classified as quantitative research.

5.3.2 Empirical study

The study can be categorised as an empirical study. An empirical study entails data that is verifiable through observation or experience, explains Zikmund (2013). Because the data used in this study was obtained through physical observation and actual experience rather than from theory or belief, the data used in the study fulfils the requirement for an empirical study (Cahoy, 2017).

5.3.3 Basic research

The aim of basic research is to focus on fundamental principles, testing of theories or answering of research questions without a specific user in mind. In contrast, applied research is concerned with the investigation of a specific situation or set of circumstances for a specific user, according to Zikmund (2013) and Hale (2015). Consequently, this study is classified as basic research.

5.3.4 Exploratory and descriptive research

Zikmund (2013) sees exploratory research as a means of discovering new ideas that may lead to further opportunities; for example, business opportunities. Welman and Kruger (1999) explain that the aim of exploratory research is to establish whether a phenomenon or trend exists. Exploratory research is typically used when the topic or issue is new and when data is difficult to collect. According to Mouton (2003) and Saunders*, et al.* (2016), descriptive research constitutes the accurate presentation of trends or patterns in primary or secondary data. Zikmund (2013) states that it can be used to describe the characteristics of an organisation or group and to *paint a picture*. The objective of this study is to determine and describe patterns or trends that may exist within the characteristics of boards in terms of the respective performance categories. Consequently, this study can be categorised as descriptive research.

5.3.5 Time series and cross-sectional research

Time series research represents events over a period of time, which provides the advantage that change and development can be studied, according to Welman and Kruger (1999), Zikmund (2013) and Saunders*, et al.* (2016). Therefore, this study can be described as a time series study, because it collects data from selected companies over a period of time spanning from 2009 to 2015. Gujarati (2003) and Greene (2003) describe *cross-sectional data* as data on one or more variables at the same point in time. Therefore, this study can also be described as cross-sectional, because it collects data on the various companies at each point in time. A sample that consists of both time series and cross-sectional data can be described as panel data (Greene, 2003; Gujarati, 2003; Gujarati, 2011). The treatment of panel data in this study is described in Section 5.6

5.3.6 Non-experimental research

Welman and Kruger (1999) distinguish experimental and quasi-experimental research as having one thing in common, namely the level of intervention by the researcher. Blaxter, Hughes and Tight (2010) explain that the distinction between experimental and non-experimental research lies in the control that the researcher has over the data, that is, experiments manipulate data to produce an effect, while non-experimental research observes data to find an effect. This research neither sought nor was it able to intervene in the observed data in any way and is therefore classified as non-experimental research.

5.3.7 Primary and secondary data

Zikmund (2013) and Sun and Lipsitz (2018) define *secondary data* as data that has been collected for a purpose other than the purpose at hand, as opposed to primary data, which is gathered specifically for the current purpose. Emory and Cooper (1991) mention financial and accounting reports, books, periodicals and online searches as examples of secondary data sources. According to Ghauri and Grønhaug (2010) and Sun and Lipsitz (2018), it is unnecessary to collect primary

data if secondary data is available to resolve the research questions and test the resulting hypotheses. This researcher obtained the required data for the literature review from books, articles, webpages and other publications. In addition, the researcher obtained the financial, market and board composition data from the IRESS database (an international research platform with reliable data integrity) (Morris, 2018), reports published by the companies (including their annual financial statements and integrated reports) and other published information where necessary. Consequently, the data used in the study qualifies as secondary data with no primary data having been collected.

5.3.8 Deductive reasoning

Babbie (1998), Zikmund (2013) and Woiceshyn and Daellenbach (2018) distinguish between two routes of reasoning that may be applied to reach a conclusion. The first is inductive reasoning, where patterns are discovered from specific observations and the second is deductive reasoning, where an expectation or theory is developed and then tested to observe if it holds true through research observations. Welman and Kruger (1999) define *inductive reasoning* by summarising the process as commencing by observing data and attempting to unravel and detect patterns to progress to a general theory on the phenomenon being studied. Babbie (1998) and Woiceshyn and Daellenbach (2018) describe *deductive reasoning* as the development of an expectation or logical explanation from existing knowledge, from which hypotheses are formulated. The hypotheses are then evaluated by making observations to test whether the expected patterns occur. Therefore, this study employed deductive reasoning because the hypotheses were developed and the data was then collected and analysed to test the hypotheses.

The application of the above descriptors is considered most appropriate to answer the research questions and test the hypotheses stated in Section 1.5.2.

5.4 SAMPLING

Babbie (1998) warns that when researchers are looking for patterns, the risk exists that one may overgeneralise, based on a limited number of observations that display a sought-after pattern. Babbie (1998) offers a solution to guard against such overgeneralisation by suggesting that the researcher commits in advance to a sufficiently large sample of observations. With this in mind, a convenience sample was selected by exerting judgemental, non-probability sampling. The data was extracted from the various companies' records as published on the IRESS database and where data was missing or suspected to be incorrect the annual financial statements published by these companies were reviewed. Where necessary, a web search was conducted to obtain any outstanding information, from sources such as company websites and LinkedIn.

To qualify for inclusion in the final sample, the companies and directors had to meet the following criteria:

- A company had to have at least one financial year-end that fell within the observation period of 2009 to 2015.
- A director had to be on the board at financial year-end to be included in the year under observation.

The study's target sample constituted all companies listed on the main board of the JSE and specifically those in the 13 largest sectors of the JSE (as measured by the number of companies in the sector) over the period 2009 to 2015. This initial sample included 181 companies (as at 29 April 2016) and provided a coverage of 58% of companies listed on the JSE at that date. The final number of companies selected were reduced to 170, due to the fact that a number of companies only listed during 2015, and consequently did not have a financial year-end that fell within the period of observation. Table 5-1 provides a summary of the sectors included in the study as well as the number of companies and the company years included in the final sample.

Table 5-1: Summary of the companies included in the sample

	Companies	Percent	Company years
Coal	9	5.3	58
Construction and Materials	19	11.2	129
Diversified REITS	13	7.6	69
Equity Investment Instruments	9	5.3	58
Financial Services	19	11.2	115
Food Producers	13	7.6	79
General Industrials	11	6.5	75
General Mining	14	8.3	76
General Retailers	17	10.0	109
Platinum and Precious Metals	8	4.7	53
Real Estate Holding and Development	14	8.2	58
Support Services	13	7.6	75
Travel and Leisure	11	6.5	72
Total	**170**	**100.0**	**1 026**

Source: Extracted from IRESS (2017)

Table 5-1 shows the 13 largest sectors, by number of companies per sector, included in the final sample. Up to seven observation years are included per company, which equates to 170 companies and 1 026 company years being included in the selected sample. Based on these criteria, details of 2 647 directors are included in the final analysis.

The selection of the proposed sample was informed by a number of aspects as identified by means of the literature review. Firstly, Deysel and Kruger (2015) caution that market information regarding company performance is influenced by macroeconomic effects, such as economic recessions. Paulo (2011) states that company performance, especially when measured on market information such as share price, could also be influenced by speculative and emotional trading; for example, herding, contagion and momentum trading. All of these factors may cause excessive volatility in the short term. To eliminate some of these effects, Deysel and Kruger (2015) suggest an extended sample horizon of at least five years. Consequently, the seven-year period selected is considered adequate to eliminate this short-term volatility.

Secondly, the relative assessment of companies' performance indicators is advocated by Tyson and Bournois (2005) and Farmer*, et al.* (2013) to increase the usefulness of market information, because this contributes to eliminate the impact of macroeconomic and industry-specific factors. This allows the assessment of a company's relative performance, irrespective of external factors, explain Deysel and Kruger (2015). Consequently, this research first compared companies' performance and risk management metrics with the average performance and risk management metrics achieved by the respective sectors within which the companies operate to eliminate possible macroeconomic and industry-related factors. Industry-adjusted dependent variables to remove industry-related factors when analysing the performance of the individual companies are often used in financial research (Brown & Caylor, 2006; Cremers & Nair, 2005; Giroud & Mueller, 2011; Gompers*, et al.*, 2003; Johnson*, et al.*, 2009)

Thirdly, Shugan (2007) points out that passive data collection often leads to survivor bias, a phenomenon that occurs when the sample is overstated in terms of the variable measured, due to the fact that elements that did not survive are excluded. This survivor bias risk is also highlighted by Mans-Kemp and Viviers (2015). To mitigate this risk, the sample included all companies that had at least one financial year-end falling within the period under review.

5.4.1 Missing data

Missing data is one of the issues encountered in virtually every data analysis exercise (Batista & Monard, 2003; Ma & Chen, 2018; Myrtveit, Stensrud & Olsson, 2001) and this study is no exception. Two main approaches are proposed when dealing with missing data. The first is to substitute the missing data with an inferred value, such as the mean value, in relation to the available data (Kromrey & Hines, 1994; Ma & Chen, 2018; Myrtveit*, et al.*, 2001). Myrtveit*, et al.* (2001) warn that care should be taken when using mean-based replacements, because too many replacements may decrease the variability of the data and may cause the frequency distribution of the data to become misleading.

The second method is to delete variables with missing data (Nooraee, Molenberghs, Ormel & Van den Heuvel, 2018). This method is suitable where the missing data is totally random to avoid the introduction of a bias in the data (Altman & Bland, 2007; Batista & Monard, 2003; Myrtveit*, et al.*, 2001). Furthermore, care should be taken that the sample do not become too small for meaningful analysis, warn Myrtveit*, et al.* (2001).

After consideration of both methods discussed above, in the context of the research data for this study, the researcher elected not to replace any missing data. This is because the missing data was totally random and the sample sizes on which the analyses were conducted remained well in excess of the minimum sample size advised by the literature review as necessary for regression analysis, as described in Section 5.6.2.2.

5.5 DATA COLLECTION

Byers (1995) denotes *data collection* as the process of collecting data to solve a research question or test a hypothesis. Keller (2007) characterises data as the observed values for a variable. A variable, in turn, is explained to be some characteristic of a population or sample. To answer the research questions and test the hypotheses, it is essential to ensure that the required variables are clearly defined so that they can be measured accurately (Babbie, 1998).

5.5.1 Company performance-related variables

The study considered five criteria to measure the performance and risk management ability of the companies. Consequently, five separate statistical models are run, each with a different performance or risk management measurement as the dependent variable. The following sections describe the data that is observed and recorded in the study to determine the five company performance and risk management measures. The companies are ranked per measure after taking into account the relative achievement of a company compared with the average of its sector for the year under review.

5.5.1.1 Shareholder return (dependent variable - Model 1)

Total return to shareholders is the increase in capital (share price), plus the dividends received by investing in a company, according to Edwards (1994), Burgman and Van Clieaf (2012) and Mans-Kemp and Viviers (2015). Edwards (1994) illustrates the value of total shareholder return as a performance measure by claiming that it covers three elements. These elements are profitability of a company (measured as cash return on investment), sustainable growth (which represents the expansion of a company through reinvestment), and availability of free cash flow (needed to pay dividends). This measure is not without its critics. Burgman and Van Clieaf (2012) and Allaire and Dauphin (2015) challenge that total shareholder return is not an indication of the performance of a company, but rather a measure of shareholders' expectation of the furture. However, both researchers concede that it is widely used by investors, and specifically as a basis for voting on executive remuneration and corporate governance and that its value increases if used as a relative measure, that is compared with competitors of the company.

The total return per company per year is recorded from IRESS. The calculation in IRESS is supported by Mans-Kemp and Viviers (2015) and Mans-Kemp*, et al.* (2017). Total shareholder return is calculated in IRESS for each share using the following formula:

$$Total\ shareholder\ return = 100 \times \left(\frac{P_n + (\sum_{t=0}^{n-1} \frac{D_t}{K}\ x\ P_t)}{P_0}\right) - 1 \qquad (5.1)$$

Where:

P_n = share price at year-end

P_0 = share price at the beginning of the year

P_t = share price at time t

n = number of dividend intervals in the period covered by the calculations

D_t = dividend yield at time t

K = 1 for annual calculations (applicable to this study)

4 for quarterly calculations

12 for monthly calculations

52 for weekly calculations

365 for daily calculations

Next, the return for each sector, for the periods corresponding to the companies' financial years is recorded from IRESS. In other words, for each company, for each financial year, the return of the sector it operates in is recorded. To determine the relative performance of each company compared with the sector it operates in, as described in Section 4.3.3, the sector return is deducted from the company's return. This difference is then divided by the absolute value of the sector return.

5.5.1.2 Share price volatility (dependent variable - Model 2)

Market risk is represented by the volatility in a company's share price. In other words, if a share price fluctuates in a wide range, the share is seen as a high-risk share. Risk or volatility can therefore be determined by calculating the standard deviation of the movement in share price over an observation period (Farmer*, et al.*, 2013; Kotze, 2005; Mathew*, et al.*, 2018; Sayari & Marcum, 2018).

To calculate the share price volatility, the closing share price for each trading day of the year under review is extracted for each company from IRESS. The first recorded price is the closing price on the last day of the financial year ending in the 2008 calendar year, that is, the opening price for the 2009 financial year, which is the first year of observation for this study.

The share price volatility of each share is calculated by first calculating the daily share price variance over the observation period using the natural logarithm function (Koorts & Smit, 2002; Kotze, 2005).

$$u_i = ln\left(\frac{S_i}{S_{i-1}}\right) \qquad (5.2)$$

Where:

u_i = the share price movement for the day

S_i = the share price at the end of the day

From this, the daily volatility of the share price is calculated by calculating the standard deviation of the various daily movements calculated in equation (5.2) (Keller, 2007; Koop, 2000; Koorts & Smit, 2002):

$$s = \sqrt{\frac{\sum_{i=1}^{n} u_i^2 - \left(\sum_{i}^{n} u_i\right)^2}{(n-1)}} \quad (5.3)$$

Where:

u_i = the share price movement for the day

s = standard deviation for n days

n = number of days in the period

The annualised volatility is calculated by multiplying the standard deviation, calculated in equation (5.3), by the square root of the number of observations per cycle (trading days in the year) (Grimes, 2011; Kotze, 2005) The number of trading days advocated by IRESS is 250 days:

$$s_{ann} = s \times \sqrt{h} \quad (5.4)$$

Where:

h = number of observations per cycle

s_{ann} = annualised volatility

s = standard deviation as calculated in equation (6.3)

The average volatility for each year, for each sector is then calculated. To determine the relative volatility of each company, as described in Section 4.3.3, for each year, the average volatility for the sector, for that year is deducted from the company's corresponding volatility. The result is then divided by the absolute value of the sector's average volatility.

5.5.1.3 Sharpe ratio (dependent variable - Model 3)

Hendricks, Patel and Zeckhauser (1993) postulate that the observation of returns alone has some predictive ability; however, this was found to be true only in the short term. Elton*, et al.* (1996) support this finding and state that risk-adjusted returns are predictive in the short term, as well as in the longer term. In addition, investment strategy theory suggests that investors are not only interested in the return potential of their investment, but also the risk they are taking. Investors want to be sure that they are adequately compensated for the risk they are taking when making an investment (Elton*, et al.*, 1996; Sharpe, 1994). Even though the Sharpe ratio has not been found in studies focussed on the relationship between corporate governance elements, including components of board composition, and company performance, the Sharpe ratio is the most commonly used risk-adjusted performance measure to assess the performance of investments in shares, according to Berkelaar*, et al.* (2010), Castano and Del Campo (2018) and Hodoshima (2018). The Sharpe ratio consists of the following (Strong, 2009):

$$\frac{\mu - R_f}{\sigma} \qquad (5.5)$$

Where:
μ = average return of investment
R_f = risk-free rate
σ = standard deviation of the investment value

The Sharpe ratio becomes misleading when the excess return above the risk-free return becomes negative. For example, where two investments have the same negative excess return, the investment with the lower volatility, as measured by the standard deviation of the investment returns, will result in a lower Sharpe ratio (that is a larger negative Sharpe ratio) than the investment with the higher volatility (Kotecha, 2009). Israelsen (2005) suggests that the original Sharpe ratio formula is modified to resolve this anomaly. The following adjusted formula is suggested:

$$\frac{\mu - R_f}{\sigma^{\left(\frac{ER}{abs(ER)}\right)}} \quad (5.6)$$

Where:

μ = average return of investment

Rf = risk-free rate

σ = standard deviation of the investment value

ER = excess return (that is μ - Rf)

This formula leaves positive Sharpe ratios unaffected, while ensuring that negative Sharpe ratios become more intuitively sensible. However, Kotecha (2009) warns that this modified ratio is limited in its use and it should only be used for ranking purposes. Therefore, the formula is well suited for the purposes of this study to rank companies relative to their Sharpe ratios.

To calculate the ratio for each company per year of observation, the annual return for each share, as recorded from IRESS, is used. In addition, the standard deviation in daily share price movement over the year, as calculated in equation (5.3), is used. The annual return represents the overall return of the year's daily share price movements. The standard deviation of the daily share price movements indicates the variability of the return. Furthermore, the Sharpe ratio requires a risk-free investment rate. According to Coggins (2000) and Burger (2012), the preferred risk-free rate is a government bond that trades in a liquid market. Because share investments are typically made with a long-term view, the risk-free instrument should mirror this longer investment horizon. Therefore, Coggins (2000) recommends a government bond with a long-term maturity, usually in the order of around 10 years. In the South African market, the R186 government bond is the instrument that best meets the criteria. This is supported by Mans-Kemp*, et al.* (2017). The R186 average annual return for the period corresponding to the financial year of each company in question is extracted from the database published by Fusion Media, which is a division of Univision Communications a global mass media and entertainment group as per Bloomberg.

To determine the relative risk-adjusted return for each company, the average Sharpe ratio for each year, for each sector is calculated. The relative Sharpe ratio of each company, for each year is then determined by deducting the average Sharpe ratio for the sector, for the year in question, from the company's corresponding Sharpe ratio. The result is then divided by the absolute value of the sector's average Sharpe ratio.

5.5.1.4 Current ratio (dependent variable - Model 4)

The board is responsible for developing the culture within a company by setting out the values and required behaviour to ensure, among other functions, that the main risks of the company are mitigated (FRC, 2018; Geny*, et al.*, 2006). The main risks include the solvency, liquidity, financial risk, credit risk, market risk, regulatory risk and reputational risk (Erasmus & Le Riche, 2014; FRC, 2014). King IV stipulates that as part of its oversight function the board needs to be watchful of the liquidity and solvency of the company and its status as a going concern (IoDSA, 2016). Erasmus (2014) expresses a similar view by stating that the board, and its committees, should manage company risks such as strategic risk, financial risk and liquidity risk. Liu*, et al.* (2017) describe liquidity to be of the utmost importance to a company's strategy. Liquidity is essential to the successful functioning of a company in that it needs to ensure that it is not negatively impacted by a lack of liquidity or excess liquidity to meet its obligations (Owolabi & Obida, 2012). Richards and Laughlin (1980) and Fleming (1986) support the current ratio, as a measure used for many years by stakeholders, to evaluate a company's ability to meet its short-term obligations.

To calculate the current ratio, the total current assets and total current liabilities are recorded from the IRESS database. The current ratio is then calculated by using the following formula:

$$\text{Current ratio} = \frac{Current\ assets}{Current\ liabilities} \qquad (5.7)$$

(Atanas, 2014; Fleming, 1986; John, 2001)

The average current ratio for each year, for each sector is then calculated. To determine the relative current ratio of each company, as described in Section 4.4.2, for each year, the average current ratio for the sector, for that year is deducted from the company's corresponding current ratio. The result is then divided by the absolute value of the sector's average current ratio.

5.5.1.5 Cash conversion cycle (dependent variable - Model 5)

The current ratio described in the previous section is not without criticism. The literature review points out that the ratio is static, only looking at the liquidity at a single point in time, with no consideration of the cash flow attributes of the transformation of working capital items. The risk also exists that companies manipulate the current assets and current liabilities to improve the ratio for reporting purposes (Fleming, 1986). The analysis should rather focus on the ability of a company to meet its obligations through cash flow achieved from the employment of current assets in the normal course of business (Richards & Laughlin, 1980). One of the most widely used indicators to overcome the shortcomings of balance sheet-based ratios is the cash conversion cycle (Cagle*, et al.*, 2013; John, 2001; Lyroudi & McCarty, 1993; Richards & Laughlin, 1980; Zeidan & Shapir, 2017). This ratio determines the time it takes a company to convert its investment in inventory and other resources into cash from sales. This metric considers how long a company needs to sell its inventory, collect its debtors and pay its creditors without incurring penalties.

To calculate the cash conversion cycle, the inventory balance, debtor balance and creditor balance at the end of each financial year and the cost of sales and sales for each financial year are recorded from the IRESS database. The cash conversion cycle (CCC) is then calculated by using the following formula:

$$CCC = \frac{AverageInventory\ levels}{Cost\ of\ sales}\ x\ 365 + \frac{Average\ debtors}{Net\ sales}\ x\ 365 - \frac{Average\ creditors}{Cost\ of\ sales}\ x\ 365 \quad (5.8)$$

(Cagle*, et al.*, 2013; Da Costa, 2014; Zeidan & Shapir, 2017)

The average cash conversion cycle for each year, for each sector is then calculated. To determine the relative cash conversion cycle of each company, as described in Section 4.4.2, for each year, the cash conversion cycle for the specific company for the year under review is deducted from the average cash conversion cycle for the sector. The result is then divided by the absolute value of the sector's average cash conversion cycle.

5.5.2 Board characteristics (independent variables)

As stated in Section 1.3, the main aim of this study was to determine whether certain board characteristics have a statistically significant association with a company's performance and risk management ability for each of the criteria discussed in Section 5.5.1. This section describes the various characteristics considered by the study and gives an overview of the data collected and the processing of the data required to establish the variable in question. All of the variables described in the following subsections are used with each of the dependent variables discussed in Section 5.5.1 in five separate regression models, as discussed in Chapter 6.

Outliers: for each of the variables mentioned in the subsequent sections, the outliers are dealt with as follows. Outliers are data points that are significantly different, in terms of being higher or lower than the other data points in the selected sample, according to Ramsey and Ramsey (2007), Kovach and Ke (2016) and Sharma (2018). Costa (2014) claims that outliers can significantly influence statistical analysis and that it is important to filter out these outliers to avoid skewed statistical calculations, which may lead to incorrect conclusions. Kovach and Ke (2016) highlight two methods generally applied to manage outliers within a data set, namely transformation and truncation. Transformation maintains the relative ranking of the data while decreasing the skewness and error variance; however, the results produced by transformed data may prove difficult to interpret.

Truncation, in turn, is the recoding of the outlying values with the nearest reasonable values. A number of approaches can be used to determine the

reasonable value range when managing outliers through the process of truncation. Ramsey and Ramsey (2007), Sharma (2018) and Thomas (2018) promote the following as the simplest and most practical approach. First, the interquartile range (IR) is determined by deducting the third quartile value (Q3) from the first quartile value (Q1). The upper value limit is then determined as (Q3 + 1.5 x IR) and the lower value limit is determined as (Q1 - 1.5 x IR). Any outliers above the upper limit value are replaced with the upper limit value and any outliers below the lower limit value are replaced with the lower limit value.

5.5.2.1 Board size

The information for each director for each of the companies is recorded from the director records and annual/integrated reports published by IRESS, for each year under observation. To be included as part of the board, the director had to be a director at financial year-end. Consequently, total board size is measured as the number of board members as at the end of each financial year.

5.5.2.2 Gender representation

The biological gender classification of male and female is recorded for each board member. The information was mainly obtained from the annual financial statements and integrated reports of the companies sourced from IRESS. Where the information was not available from the annual financial statements, various websites such as the companies' official websites, *Who's Who*, *LinkedIn* and *Bloomberg* were used to obtain the information. The number of female directors on the board is expressed as a percentage of the total number of board members.

5.5.2.3 Ethnic composition

The ethnic classification is recorded for each board member. The information was mainly obtained from the annual financial statements and integrated reports of the companies sourced from IRESS. Where the information was not available from the annual financial statements, various websites such as the companies' official

websites, *Who's Who*, *LinkedIn* and *Bloomberg* were used to obtain the information. The total number of board members fitting the definition of a black person, as recorded in the Broad-Based Black Economic Empowerment Amendment Act (46 of 2013), which includes Africans, Chinese, Coloureds and Indians, are recorded for each financial year. The total number of black persons on the board is expressed as a percentage of the total number of board members.

5.5.2.4 Proportion of non-executive directors

The status of each director is recorded in terms of whether the director is an executive or NED. The total number of NEDs for each financial year, as represented by the directors on the board at the financial year-end, is added up. This total is expressed as a percentage of the total number of board members for that year. The information is mainly sourced from IRESS and augmented from the individual companies' annual financial statements and integrated reports sourced from IRESS, where necessary.

5.5.2.5 Proportion of independent non-executive directors

The status of each NED is recorded in terms of whether the director is considered to be an independent NED or not. The total number of independent NEDs for each financial year is added up. This total is expressed as a percentage of the total number of NEDs for that year. This information is mainly sourced from the individual annual financial statements and integrated reports of the companies sourced from IRESS and, where necessary, from the IRESS database.

5.5.2.6 Relative movement in CEO remuneration

Even though this is not a true board characteristic, the study determined whether the movement in CEO remuneration relative to the total shareholder return has a significant relationship to a company's performance and risk management ability.

To calculate the movement in CEO's remuneration relative to total shareholder return, the total remuneration for each CEO for each year, is recorded. The annual remuneration of the CEO typically consists of a guaranteed portion, which includes elements such as basic salary, pension and medical contributions and other benefits and allowances. It often also contains a non-guaranteed portion, which includes performance bonuses, share and/or share option allocations, the vesting of long-term incentive schemes and gains on share options exercised (Collier*, et al.*, 2010; Frydman & Jenter, 2010; Kirsten & Du Toit, 2018; Nyambia & Hamdan, 2018). The main source of this information is IRESS. All these elements are added together for each year under review to determine the total remuneration to the CEO. The movement in remuneration is calculated as the increase or decrease in remuneration from the previous year to the current year expressed as a percentage of the previous year.

The movement in the CEO's remuneration is then expressed as a percentage relative to the total shareholders' return for the year to obtain an indication of the relative movement in remuneration. This is calculated by deducting the return to shareholders (as calculated in Section 5.5.1.1) for the year, from the movement in CEO remuneration, and then dividing the difference by the absolute value of the shareholder return.

5.5.2.7 Payment gap

As stated in Section 3.4.1, South Africa is classified as one of the countries with the highest levels of inequality in the world and government's post-apartheid efforts to promote inclusive development, with the aim to eradicate this inequality, do not seem to have any impact (Collier*, et al.*, 2010). In fact, the opposite seems to happen in that inequality continues to increase (Collier*, et al.*, 2010; Coomey, 2007; Deysel & Kruger, 2015). Even though the payment gap is not a board characteristic, it is largely a function of the effectiveness of the board to manage the remuneration levels of the CEO (De Wet, 2012). With this in mind, the study also determined whether the increase or decrease in the payment gap has a significant association with a company's performance.

To determine the payment gap, the following information is required: the CEO's remuneration and the average remuneration of all company employees. The CEO's remuneration is recorded and calculated, as discussed in Section 5.5.2.6.

Average employee remuneration: to calculate the average employee remuneration, the total salary expense for all employees of a company, excluding the directors, is recorded for each financial year. In addition, the total number of employees is recorded for each financial year. This information is mainly obtained from the IRESS database and supplemented where possible from the annual financial statements and integrated reports of the companies sourced from IRESS.

The average employee salary is calculated by dividing the total company salary and wages, excluding director remuneration, by the total number of employees (Deysel & Kruger, 2015; Morton & Blair, 2014). The following formula is applied:

$$Average\ other\ employee\ remuneration = \frac{Total\ annual\ company\ salaries\ and\ wages}{Total\ number\ of\ employees} \quad (5.9)$$

Payment gap: the payment gap is calculated by expressing the CEO's total remuneration as a multiple of the average employee salary. Consequently, the following formula is applied to calculate the payment gap:

$$Payment\ gap = \frac{Annual\ CEO\ remuneration}{\left(\frac{Total\ annual\ company\ salaries\ and\ wages}{Total\ number\ of\ employees}\right)} \quad (5.10)$$

5.5.2.8 Chairman remuneration in relation to the guaranteed remuneration of the CEO

As described in Section 4.2.5 the chairman's remuneration is a key incentive to mould and guide their action on behalf of shareholders. With this variable, the study determined whether the chairman's remuneration relative to the CEO's guaranteed remuneration has a significant relationship to a company's performance and risk management ability. The chairman's remuneration, which mainly consists of

director's fees, is recorded from the IRESS database for each company, for each year under observation. The chairman's relative remuneration is calculated by expressing it as a percentage of the CEO's guaranteed remuneration. As described in Section 5.5.2.6, the guaranteed remuneration includes the CEO's annual salary, pension fund contributions and other fixed benefits and allowances.

5.5.2.9 Total NED remuneration in relation to the guaranteed remuneration of the CEO

As noted in Section 4.2.5 NED remuneration, as is the case for executive directors, is arguably one of the most vital elements to incentivise the directors to act in the best interest of shareholders. The study therefore determined whether NED remuneration relative to the guaranteed remuneration of the CEO has a significant relationship to a company's performance and risk management ability. To calculate this remuneration level, the annual remuneration, which mainly consists of director's fees, for each of the NEDs on the board of each company is recorded from the IRESS database. The remuneration for each of the NEDs on the board at each financial year-end is added to obtain the total remuneration for all *other* NEDs, excluding the chairman. The average remuneration per *other* NED was calculated for each financial year covered by the observation period of the study by applying the following formula:

$$Average\ non-executive\ director\ remuneration = \frac{\sum Non-executive\ director\ remuneration\ for\ the\ year}{Total\ number\ of\ non-executve\ directors\ at\ year\ end} \quad (5.11)$$

The relative level of the average other NEDs' remuneration is determined by expressing it as a percentage of the CEO's guaranteed remuneration, as discussed in Section 5.5.2.6.

5.5.2.10 Level of academic qualification of the board

Only tertiary qualifications were considered since almost all directors had tertiary qualifications, which makes it reasonable to assume that they completed their

primary and secondary education. For those few without any tertiary education it was considered reasonable to assume that if they made it onto a board, they possessed the basic skills that would be obtained from primary and secondary schooling.

Table 5-2: South African Qualification Authority's NQF ratings

Degree	NQF Rating
Doctoral degree	10
Master's degree	9
Honours degree and postgraduate diploma	8
Bachelor's degree	7
Diploma	6
No degree	0[1]

Source: South African Qualification Authority's NQF rating system (SAQA, 2014)
[1] Please note "no degree" is not an NQF classification. This is an assumption made by the researcher to ensure that "no tertiary" qualification attract a zero weighting.

Also, honorary degrees were not taken into account. The study determined whether the relative academic qualification level of the board has a significant association with a company's performance and risk-management ability. To calculate the relative academic qualification of the board, each qualification held by the board members is given a rating according to the South African Qualification Authority's NQF rating system. The ratings are as reflected in Table 5-2 (South African Qualifications Authority [SAQA], 2014).

The academic qualification level of the board is calculated as the weighted average qualification level, based on the NQF ratings. All the qualification(s) of each board member are recorded from the annual financial statements and integrated reports of the company sourced from IRESS and other websites such as *LinkedIn*, *Who's Who* and *Bloomberg*, where the information was not available from IRESS and the annual/ integrated reports. The qualification(s) of each board member are then categorised into the categories reflected in Table 5-2. The total for each category per year, that is the total per academic category for all the directors that served on the board as at the financial year-end under review is established. The total number

of each qualification category for the year is then multiplied by its corresponding NQF rating and then totalled for each year in question. The total is divided by the number of directors on the board for that year to establish a weighted average qualification factor per director of the board for the year. The higher the factor, the higher the relative level of academic qualifications of the board.

5.5.2.11 Diversity factors

For the next three board characteristics, namely academic qualification, academic background and professional background, the diversity of each characteristic is considered. To determine the diversity of these characteristics, the study used factors akin to those used to determine biodiversity factors.

Biodiversity is of significant interest to ecologists, but is complicated by the random and non-additive nature of an ecological sample (Kerkhoff, 2010; Keylock, 2005). Furthermore, Pavoine and Bonsall (2011) explain that the diversity of an ecological sample is dependent on the number of species or types and their relative abundance. Two diversity indices are most commonly used to calculate species diversity, namely the Simpson and Shannon Wiener indices (Jongsma, Hedley, Durães & Karubian, 2014; Pavoine & Bonsall, 2011). Jongsma*, et al.* (2014) and Keylock (2005) explain that these indices consider diversity as a function of the number of different categories or the *richness* of the sample and the dominance of each of the various categories or *evenness*. Due to the similarity of the sample of academic and professional backgrounds of the directors, these two ratios can measure the diversity that exists within a board and how this diversity differs between boards. The calculations for the indices are as follows:

The Simpson diversity index is calculated by using the following formula (Barcelona Field Study Centre, 2017):

$$D = 1 - \left(\frac{\sum n(n-1)}{N(N-1}\right) \quad (5.12)$$

Where:
n = the total number of observations of a particular category (such as a type of degree)
N = the total number of observations across all categories (that is for example across all degree types)

D ranges between 0 and 1, where 0 represents no diversity and 1 complete or infinite diversity (Barcelona Field Study Centre, 2017). According to Jongsma*, et al.* (2014), the Simpson index is more sensitive to the dominance by specific categories.

The Shannon Wiener diversity index is calculated by using the following formula (Kerkhoff, 2010):

$$H = -\sum \frac{n}{N} \, x \, \ln \frac{n}{N} \qquad (5.13)$$

Where:
n = the total number of observations of a particular category (such as a type of degree)
N = the total number of observations across all categories (that is for example across all degree types)

An increase in H represents an increase in diversity. According to Jongsma*, et al.* (2014), the Shannon Wiener index is more sensitive to the number of categories included in the sample.

This study calculated both indices as a control to determine if there is a significant difference between the results, that is whether the two indicators showed significantly different levels of diversity for any of the elements, in any company year. This was determined by manual comparison, which showed no material differences. In measuring the extent of the relationship between the two metrics, the Pearson's correlation coefficient indicated very high positive coefficient values (see Section 6.3.1.1A) and thus the presence of multicollinearity. One index is

therefore a proxy of the other and only one is used in the regression analyses conducted.

5.5.2.12 Diversity of academic qualifications of the directors

The study determined whether the diversity of types of academic degrees has a significant association with a company's performance and risk management ability. To determine the diversity of academic qualifications, the different qualification types are used as the different categories of academic qualifications. These categories are as follows:

- bachelor's degrees;
- honours degrees;
- master's degrees;
- doctorate degrees;
- postgraduate diplomas;
- 'normal' diplomas; and
- no tertiary education.

The total number for each category, for each year under review is determined. For example, the total number of bachelor's degrees held between all the directors that were on the board at year end, for the specific year under review, is determined. Using the Simpson diversity index and Shannon Wiener diversity index formulae respectively, the two diversity factors are calculated per year for each year under review across the stated categories. The same qualification data is used, as recorded in Section 5.5.2.10.

5.5.2.13 Diversity of academic backgrounds of the directors

The study further determined whether the diversity of academic backgrounds of directors has a significant relationship to a company's performance and risk management ability. To determine the diversity of academic backgrounds, the various degrees of each director on the board are collated from the companies' annual financial statements and integrated reports sourced from IRESS, and other

websites such as *LinkedIn*, *Who's Who* and *Bloomberg*, where necessary. Four academic field categories were created based on guidance from literature (Fricke, Grogger & Steinmayr, 2018; Wiersema & Bantel, 1992) and on the types of degrees found in the data collection. The recorded academic degrees are classified into the following categories:

- financial;
- legal;
- technical; and
- social.

The number of qualifications for each category, for each year under review is determined. For example, the total number of financial degrees held between all the directors that were on the board at year end, for the specific year under review, is determined. Using the Simpson diversity index and Shannon Wiener diversity index formulae respectively, the two diversity factors are calculated per year for each year under review across the four categories.

5.5.2.14 Diversity of professional backgrounds of the directors

Moreover, the study determined whether the professional background diversity of directors has a significant relationship to a company's performance and risk management ability. To determine the diversity of professional backgrounds, the work history of each director on the board is collated from the companies' annual financial statements and integrated reports sourced from IRESS, and other websites such as *LinkedIn*, *Who's Who* and *Bloomberg*, where necessary. The categories were created based on the nature of the data collected and guidance from literature (Bantel & Jackson, 1989; Mans-Kemp*, et al.*, 2018b; Scholtz & Kieviet, 2018b). Due to the significant number of chartered accountants this was separated from other financial degrees. Chartered accountant refers to the formal registration with the specific governing body of each country. The work histories are processed into the following categories (a director could be categorised into more than one category):

- chartered accountant;
- financial;
- legal;
- technical: company industry-specific (that is a similar industry to that in which a company operates);
- technical: non-company industry-specific;
- political; and
- academic.

The number of directors for each category, for each year under review is determined; for example, the total number of directors with financial experience that served on the board as at the financial year-end for the specific year under review. Using the Simpson diversity index and Shannon Wiener diversity index formulae respectively, the two diversity factors are calculated per year for each year under review.

5.5.2.15 Average age of the board

To calculate the average age of the board, the year of birth for all the directors for each of the companies is recorded from the IRESS database and the companies' annual financial statements and integrated reports sourced from IRESS. In most instances the year of birth is derived from the age of the directors provided in the annual reports. The age for each director is calculated from their year of birth to the date of the financial year-end under review in which they served on the board. The average age is determined by adding the ages of the directors for the specific financial year together and dividing the total by the number of board members.

5.5.2.16 Age diversity of the board

The study determined whether the age diversity of a board has a significant association with a company's performance and risk management ability. The ages for each director on the board at each financial year-end under review are determined, as described in Section 5.5.2.15. The diversity is determined by

calculating the standard deviation of the ages of the board for a specific financial year. The higher the standard deviation, the higher the diversity of age.

5.5.2.17 Average tenure of the board

To calculate the average tenure of the board, the date of first appointment to the board for each director, for each of the companies is recorded from the IRESS database and the companies' annual financial statements and integrated reports sourced from IRESS. The term of service for each director is calculated from the director's date of first appointment to the date of the financial year-end under review on which they served on the board. The average tenure is determined by adding the tenures of the directors for the specific financial year together and dividing the total by the number of board members.

5.5.2.18 Diversity of tenure of the board

The study determined whether the diversity of tenure of a board has a significant association with a company's performance and risk management ability. The terms of service for each director on the board at each financial year-end under review are determined, as described in Section 5.5.2.17. The diversity is determined by calculating the standard deviation of the tenures of the board members for a specific financial year. The higher the standard deviation, the higher the diversity of tenure.

5.5.2.19 Average board experience of the board members

Ferris*, et al.* (2003) and Gray and Nowland (2013) believe that adequate multiple director experience is gained by directors who have experience of at least three outside directorships. In other words, directors can be seen as experienced directors if they have sat on at least three boards. Consequently, this study divided the directors' experience into three categories, as follows:

- Category 1 - Directors with no other director experience, that is, directors of the current company who has not been a director of another listed company;

- Category 2 - Directors with some experience, that is, directors with experience of one or two listed company board positions other than the current company; and
- Category 3 - Experienced directors who have served on three or more listed boards over and above that of the current company.
-

The board seats refer to other listed company board positions that the directors held in the past or are still currently holding, apart from the company under review. Consequently, to determine the experience of the board members, all their other, previous and current, listed board positions are considered and the directors are classified into one of the above-mentioned categories. The average experience is determined by adding all the categories of the directors for the specific financial year together and dividing the total by the number of board members. The higher the average category number of the board, the higher its average experience.

5.5.2.20 Diversity of board experience of the board

The study ascertained whether the degree of diversity of board experience has a significant association with a company's performance and risk management ability. The categories of board experience for each director on the board, at each financial year-end under review are determined, as described in Section 5.5.2.19. The diversity is determined by calculating the standard deviation of the experience categories of the board members for a specific financial year. The higher the standard deviation, the higher the diversity of board experience.

5.5.2.21 Percentage of South African board members

The study determined whether the percentage of foreign national directors on a board has a significant relationship with the performance and risk management ability of a company. To calculate the percentage of South African board members on the board, the nationality of each board member for each company is recorded from the IRESS database, the companies' annual financial statements and integrated reports sourced from IRESS and other websites, where necessary. The

total number of South African board members for each financial year, as at the financial year-end, is determined and expressed as a percentage of the total number of board members for that year.

5.5.2.22 Interactions

Interactions occur when the effect of one variable depends on the value of another variable (Frost, 2020). The study considered the effect of interactions between a number of the variables and incorporated the interactions into the analysis as discussed below.

Literature suggests that, in addition to the potential direct association between board size and company performance, discussed in Section 4.2.1, board size also impacts the association between company performance and other board characteristics, such as number of independent non-executive directors, number of females and number of black persons diversity (Bathula, 2008; Raheja, 2005).

According to literature the impact of minorities, that is females, black persons and foreign directors, is strongly influenced by their proportion to the overall board and not by their mere presence. One of the main factors attributed to this is that the size of the board impacts the interaction of the board and the efficiency of distributing the information required by the directors to make decisions (Macus, 2008). It was for example found that bigger boards often lead to the forming of factions, which may exclude groups such as females and black people, or social loafing where these groupings may not adequately contribute due to a lack of pressure on them to do so (Macus, 2008). In addition, the literature propagates that directors, and especially minority groupings, find it difficult to exchange views and provide opinions on matters at hand, in a meaningful way, as part of a larger board (Bathula, 2008; Muchemwa*, et al.*, 2016; Paniagua*, et al.*, 2018). Bathula (2008) found that the benefit of females in terms of improving company performance decreased in larger boards. According to Cordeiro, Profumo and Tutore (2020) minorities can easily be side-lined, to the extent that their inclusion is seen as mere tokenism, and it is only when their relative representation in relation to the board increases that

they would be able to reinforce each other's views and have a meaningful influence on decision making. Bianchi and Iatridis (2014) express the view that if the percentage of minorities on the board becomes too low it would not be possible to determine the actual role and contribution of the minority grouping in a meaningful way. Campbell and Mínguez-Vera (2008) and Gordini and Rancati (2017) also found that boards benefit from a good balance between male and female directors rather than the mere presence of women on the board. Cordeiro*, et al.* (2020) also highlight the growing pressure around the world to increase the percentage female representation on boards. It is therefore reasonable to only consider the percentage of females, black persons and foreign directors, which represents the interaction between the respective minorities and the size of the board, and not to include the absolute number of the minorities.

In terms of the independence of the board, the literature provides mixed views. On the one hand, literature indicates that large boards are easier to be manipulated by executive management due to its inability to reach consolidated positions, thereby jeopardizing the independence of the board (Paniagua*, et al.*, 2018). On the other hand, literature have shown that small boards find it difficult to be vigilant due to the fact that not enough people are available to review a matter and strongly oppose executive management if necessary, thereby weakening the assertion of a board's independence (Muchemwa*, et al.*, 2016). In similar vein to the views on minorities, literature and regulations such as King IV recommend that the majority of the board should consist of non-executive directors of whom the majority should be independent. King IV further clarifies that a majority is necessary to ensure that the independent judgement of these directors is brought to bear (IoDSA, 2016). Consequently, it is reasonable to only consider the level of independence of the board, as measured by the percentage NEDs and percentage independent directors. This effectively represents the respective interactions between the number of NEDs and independent directors and the size of the board.

An interaction term in regression modelling is typically defined as the product of two variables, with the two main effects usually also included in the model with the interaction effect. However, literature points out that this is not necessary if

adequate motivation is obtained from theory and previous studies (Frost, 2020). Consequently, based on the discussion in the previous paragraphs, the number of females, black persons, foreign directors, NEDs and independent NEDs have not been included in the regression models. Furthermore, the use of percentages as a representation of an interaction in a regression model has been acknowledged in literature (Anderson, 2019). Therefore, as argued above, the specific independent variables included, representing the interactions, are percentage of females on the board, percentage black persons on the board, percentage South African directors on the board, percentage NEDs on the board and percentage independent NEDs on the board.

5.6 DATA ANALYSIS

The studies reviewed, and specifically those conducted in South Africa, generally tested for linear relationships between corporate governance measures, including board composition elements, and company performance measures (Kirsten & Du Toit, 2018; Morris, 2018; Muchemwa, 2014; Muchemwa*, et al.*, 2016; Ntim, 2013; Ntim, 2015; Pandian*, et al.*, 2006; Scholtz & Kieviet, 2018a; Scholtz & Kieviet, 2018b; Scholtz & Smit, 2012; Semosa, 2012). However, social scientists are increasingly criticising the expectation of linear relationships when it comes to corporate and business relationships (Basimov, 2019; Canarella & Nourayi, 2008; Lee, 2019; Paniagua*, et al.*, 2018; Rasoava, 2019). Consequently, the study focussed on the use of binary logistic regression, a non-linear approach, to determine the relationship between each of the board characteristics and the odds of a company being categorised as a top performer. This allowed the study to determine the specific independent variables that have a relationship with the financial performance and risk management ability of a company. The researcher therefore, only ran correlation analysis and multiple linear regressions to confirm if the criticism regarding the existence of linear relationships holds true for this study, with no intension to discuss the analysis results in detail.

The data is typical panel data. . Panel data incorporates at least two dimensions, namely a cross-sectional dimension and a time series dimension (Desbordes, Koop

& Vicard, 2018; Hsiao, 2007). Consequently, panel data allows for multiple observations of each individual component in the sample over time, explains Hsiao (2003). The panel data set in this study includes observations for various companies over a seven-year period. As there were missing values at random, the panel is called unbalanced. The descriptive statistics and analyses for the datasets used in the multiple linear regression and binary logistic regression models respectively, are included in Section 6.2 and Section 6.3.2.

5.6.1 Multiple linear regression and correlation analysis

Pearson correlation analysis was run to determine the strength of the bivariate relationships between the various independent and dependent variables. Pearson correlation is the most widely used correlation statistic to measure the degree of the relationship between two continuous variables. The popularity of the Pearson correlation to measure the association between variables of interest lies in the fact that it is based on the method of covariance. It gives information about the magnitude of the association, or correlation, as well as the direction of the relationship. The variables used in the linear regression are all continuous variables. Literature further indicated that the Pearson correlation is insensitive to rather extreme violations of the basic assumptions of normality and type of measurement scale (Havlicek & Peterson, 1976) and therefore can be considered to be robust. The following equation was employed:

$$r_{xy} = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{\sqrt{n\sum x_i^2 - (\sum x_i)^2}\sqrt{n\sum y_i^2 - (\sum y_i)^2}} \quad (5.14)$$

(Miller, 2020)

Subsequently, panel least squares was used in the study to determine whether the objection against the existence of linear relationships between board characteristics and company performance and risk management measures is valid.

5.6.1.1 Assumptions underlying linear regression

Sample size: The sample size needs to be large enough. Field (2005), Peduzzi, Concato, Kemper, Holford and Feinstein (1996) and Vittinghoff and McCulloch (2007) highlight the rule of thumb that there should be at least 10 observations per independent variable for a reliable regression model. Newsom (2016) and Peng, Lee and Ingersoll (2002) hold a similar view and advise that a minimum overall sample size of 100 is required. However, Field (2005) believes that the goal of the test determines the minimum sample size. If the aim is to test the overall fit of the model, the minimum sample size required is 50 plus eight times the number of independent variables. However, if the goal is to test the regression coefficients of the independent variables, the minimum requirement is 104 plus the number of independent variables. For the models used in this study, that equates to 202 and 123 respectively. According to the 10 observations per category per independent variable guideline the minimum sample size is 190 observations. All models were run with more than 190 observations.

Stationarity: A stationary process series is one whose statistical properties such as the mean, variance and autocorrelation structures does not change over time. The unit root test is a test of stationarity of panel data. A number of specific unit root tests exist for panel data, such as the Levin-Lin-Chu test, the Augmented Dickey-Fuller test and the Im-Pesaran-Shin test (Cimpoeru, 2015; Greene, 2003; Gujarati, 2003; Gujarati, 2011; Kleiber & Lupi, 2011). Using the Levin-Lin-Chu test, all the variables were tested for stationarity. As shown in Appendix 5, the test indicated that the null hypothesis of a unit root could be rejected for all five dependent variables and all 19 independent variables, therefore indicating stationarity of all the variables.

Heteroscedasticity: The presence of heteroscedasticity causes the risk that *p*-values are generated that are smaller than they should be. This may cause model terms to emerge as statistically significant, while the term is in fact not significant (Frost, 2019). The OLS estimator is not optimal in the presence of

heteroscedasticity as it gives equal weight to all observations despite the fact that data points with larger disturbance variance contain less information than data points with smaller disturbances. Furthermore, standard error terms are biased in the presence of heteroscedasticity, which causes bias in test statistics and confidence intervals (Williams, 2015). To deal with the risk of heteroscedasticity, the cross-section SUR (seemingly unrelated regression) standard error and covariance is introduced. The cross-section SUR provides a robust method for computing the coefficient standard error. EViews estimates a feasible general least squares (GLS) specification correcting for heteroscedasticity and contemporaneous correlation. The Huber-White estimation was not used because the following problem was encountered “warning: estimated coefficient covariance matrix is of reduced rank” in EViews, which indicates that the results are not based on the full covariance coefficient matrix and the subsequent test statistics must be interpreted with caution. Furthermore, the Breusch-Pagan test was not used as a test of heteroscedasticity due to it being sensitive to violations of the normality assumption of the error term (Zambom & Kim, 2017).

Autocorrelation: Autocorrelation measures the relationship between a variable's current value and its past values. The Durbin-Watson test is a test for first-order serial correlation and indicates independence between the residuals when the test value falls between 1.5 and 2.5 (Glen, 2016).

5.6.1.2 Multicollinearity

Even though the absence of collinearity between independent variables, or multicollinearity, is not an assumption of linear regression analysis, it is necessary for sound modelling results (Hanck, Arnold, Gerber & Schmelzer, 2012). In other words, independent variables must be independent of each other. Multicollinearity causes the variance of the OLS estimator to be large, therefore impacting the conclusions reached on the statistical significance of the independent variables. Pallant (2007) suggests that analysts check for this anomaly before commencing with an analysis. This study tested for multicollinearity by using Pearson’s correlation test, as described in Section 6.3.1.1A.

5.6.1.3 Fixed-effects model and random-effects model

The use of the fixed-effects and random-effects models is not an underlying assumption of multiple linear regression but rather a choice. If a researcher is uncertain whether a fixed or random variable may apply, tests can be conducted to determine if a fixed or random effects model applies. Three empirical models exist for panel data: pooled, fixed-effects and random-effects. The fixed-effects model is typically used when the study is only interested in analysing the impact of variables that vary over time (Torres-Reyna, 2007). In this study, there is no expectation that the independent variables change only as a result of time, and therefore the fixed-effects model was not considered.

The random-effects model, in turn, is used when there is reason to believe that differences across the entities have some relationship to the dependent variables (Torres-Reyna, 2007). This was not the case in this study. Although the argument could have been made that the sector may have such an effect, the sector effect is largely removed by the way in which the analysis is done. The sector effect is largely removed in that the companies' performance for the various performance and risk management measures is expressed relative to the respective sectors. Consequently, the random-effects model is not required for this analysis. Industry-adjusted dependent variables serve to remove industry-related factors when analysing the performance of the individual companies and are often used in financial research (Brown & Caylor, 2006; Cremers & Nair, 2005; Giroud & Mueller, 2011; Gompers*, et al.*, 2003; Johnson*, et al.*, 2009). In the absence of fixed or random effects, the pooled model is used.

It is acknowledged that a test such as the Hausman test can be used to determine whether a fixed or random model applies. However, all statistical/econometrical tests have advantages and disadvantages. The Hausman test might lend support to one of these models even if the selected model is an inadequate description of the data (Clark & Linzer, 2015). When pre-existing information exists about the data, this information can, and should be considered in making such a decision,

that is a choice as to whether either of these types of models apply, or if no need exist to consider them.

5.6.2 Binary logistic regression

To facilitate the use of binary logistic regression, the various dependent variables are converted into binary variables. A *binary variable*, which is defined as a variable that can only assume one of two possible values (Lewis-Beck, Bryman & Futing Liao, 2004), is created, by assigning a one to top-performing companies and a zero to bottom-performing companies. The categorisation of the companies as top- or bottom-achieving companies are as follows:

- Shareholder return: companies that achieve a shareholder return above the average for the sector is categorised as a top-performing company and those that achieve a shareholder return below the average return for the sector is categorised as a bottom-performing company;
- Share price volatility: companies that achieve a share price volatility below the average for the sector is categorised as a top-performing company and those that achieve a share price volatility above the average volatility for the sector is categorised as a bottom-performing company;
- Sharpe ratio: companies that achieve a Sharpe ratio above the average for the sector is categorised as a top-performing company and those that achieve a Sharpe ratio below the average Sharpe ratio for the sector is categorised as a bottom-performing company;
- Current ratio: companies that achieve a current ratio above the average for the sector is categorised as a top-performing company and those that achieve a current ratio below the average current ratio for the sector is categorised as a bottom-performing company; and
- Cash conversion cycle: companies that achieve a cash conversion cycle below the average for the sector is categorised as a top-performing company and those that achieve a cash conversion cycle above the average cash conversion cycle for the sector is categorised as a bottom-performing company.

However, Piercy, Kaleka and Katsikeas (1998) recommend that the middle group of a high and low distribution should be eliminated to allow for a more distinct comparison to be obtained between the high-performing observations and the low-performing observations. The risk exists that the observations just above and below the divide between top and bottom may have characteristics that are common to both groupings. Cao and Duan (2017) concur that the so-called middle performers should be eliminated from the analysis. Krzywinski and Altman (2014) suggest the use of quartiles to determine the middle range of data. Francis (2004) states that quartiles are best suited for business data, because they are insensitive to outliers and sample skewness. Krzywinski and Altman (2014) and Scibilia (2013) explain that, by calculating the top and bottom quartile, the interquartile range is obtained, which represents the middle data that lies between the first and fourth quartile.

Consequently, only those companies that achieve the respective results within the top 25% of the sample are assigned a one, denoting the top-performing companies. On the other end of the spectrum, the companies whose achievement falls within the bottom 25% of the sample are assigned a zero, representing the bottom-performing companies.

5.6.2.1 Binary logistic regression model

The purpose of the study is to determine whether the various board characteristics have a statistically significant relationship to the performance of a company in terms of three specific company performance and two risk management measures. With the outcome variables transformed into binary variables, as described in the previous section, binary logistic regression can be used to analyse the data (Mensah, 2008; Tranmer & Elliot, 2008; Xu, Zhao, Nian, Feng, Bai, Luo & Luo, 2018). Like all regression analyses, binary logistic regression is a predictive analysis. Binary logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more independent variables, which may be categorical or continuous variables. Binary logistic regression modelling determines the odds of a company achieving a performance that ranks as a top achievement in terms of a performance or risk management

measure, based on the movement of the independent variables (Mensah, 2008). Furthermore, binary logistic regression provides an indication of the adequacy of the model, that is the set of independent or predictor variables, through a goodness-of-fit test. This indicates how well the independent variable predicts or describes the dependent variable (Pallant, 2010).

Azen and Walker (2011) explain that binary logistic regression is a form of a generalised linear model (GLM), which is well suited to deal with binary dependent variables or a random component with an assumed binomial distribution. According to Azen and Walker (2011), the binary logistic regression model for a binary outcome consists of three components:

Random component: the binary logistic regression model has a binary or dichotomous dependent variable, in other words Y = 1 or 0. The distribution of Y is binomial. Therefore, the binary logistic regression model aims to determine the odds that Y = 1 as a function of the independent variables, X_1, X_2,….,X_p.

Systematic component: the independent variables may be quantitative (continuous), qualitative (discrete), or both. The systematic component entails the linear function in the form of $\alpha + \beta_1X_1 + \beta_2X_2 + \ldots\ldots + \beta_pX_p$ where α and $\beta_1, \beta_2, \ldots\ldots, \beta_p$ are fixed coefficients and $X_1, X_2, \ldots\ldots, X_p$ symbolise the independent variables.

Link function: the binary nature of the dependent variable requires a transformation to establish the final binary logistic regression model. This transformation is achieved through the link function, namely the natural log of the odds that Y = 1, which is also known as the *logit* function of the probability that Y = 1. The function is expressed in the following equation: logit[P(Y = 1)] = logit(π) = ln(π/(1-π)) where π is the probability of an event occurring, in other words the odds of Y = 1.

To establish the binary logistic regression model, these three components are combined to obtain the following model (Azen & Walker, 2011; Haines, Kabera & Ndlovu, 2018):

$$\text{logit}(\pi) = \ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta 1X1 + \beta 2X2 + \ldots\ldots + \beta pXp \qquad (5.15)$$

From this equation, it follows that, for any given β, the natural logarithm of the probability of Y = 1 increases by the value of β for each unit of increase in X (the independent variable). Because this is not as intuitive as the interpretation of a normal linear regression equation, the binary logistic regression is typically interpreted in terms of odds ratios (Azen & Walker, 2011; Tranmer & Elliot, 2008).

The empirical models for each of the individual binary regressions for each of the research hypotheses are shown and discussed in Section 6.3.3. The literature background for the inclusion of each independent variable and the development of the statistical hypotheses, including the directionality of these hypotheses, is discussed in Section 3.4 Section 4.2. The literature background for the development of the dependent variables are discussed in Section 4.3 and Section 4.4.

Fixed-effects and random-effects models: As described in Section 5.6.1.3, the researcher elected not to use the fixed-effects or random-effects models in the regressions.

5.6.2.2 Assumptions underlying binary logistic regression

According to Morgan and Griego (1998), binary logistic regression should be applied to predict the presence or absence of a characteristic based on a set of independent variables. According to Lani (2010), a number of assumptions underlie the use of binary logistic analysis. This section describes the major assumptions applicable.

Nature of the dependent and independent variables: The outcome or dependent variable must be dichotomous in nature. However, logistic regression can handle categorical and continuous data as independent variables. In addition, logistic regression does not require a linear relationship between the dependent and independent variables.

Multicollinearity: Menard (2010), Daoud (2018) and Xu*, et al.* (2018) highlight the absence of collinearity between independent variables or multicollinearity as one of the major assumptions of binary logistic regression analysis. In other words, independent variables must be truly independent of each other. Correlations of sufficient magnitude have the potential to adversely affect regression estimates, leaving binary logistic regression sensitive to collinearities (Hosmer, Lemeshow & Sturdivant, 2013). Pallant (2007) has a similar view and suggests that analysts check for this anomaly before commencing with an analysis.

The presence of multicollinearity causes a number of problems, explains Menard (2010). These include biased coefficients, which are the tendency for the estimated logistic regression coefficients to be too high or too low, compared with the true values of the coefficients. It could also cause inefficiency, which is the tendency of the coefficients to display large standard errors relative to the size of the coefficient (Daoud, 2018). Moreover, it may cause invalid statistical inferences, which is where the corresponding statistical significance levels are inaccurate. Morgan and Griego (1998) warn that multicollinearity between two or more independent variables could lead to misleading results. For example, a variable may appear to have an insignificant relationship to the dependent variable where in fact its relationship is significant, was it not for the collinearity that existed with another variable. This study tested for multicollinearity by using Pearson's correlation test, as described in Section 6.3.1.1A.

Nonlinearity of the logit: Although this logistic regression analysis does not require the dependent and independent variables to be related linearly, it requires that the independent variables are linearly related to the log odds (or logit) of the dependent variable (Menard, 2010; Xu*, et al.*, 2018). Wuensch (2014) provides a similar explanation. Garson (2016) states that the right-hand independent variable side of the equation must be linear with the left-hand dependent variable side of the equation (in logistic regression, the logit is the outcome side). Linearity was tested using the Box-Tidwell transformation test, which involves the calculation of the natural log; for each continuous independent variable its natural log is computed (Osborne, 2015; Wuensch, 2014). The model is then tested by including the

interaction terms calculated as the product of the predictor and its natural log value. If any of these interaction terms are statistically significant ($p < .05$) when testing the model, then there is nonlinearity in the logit, which represents a violation of the assumption. Where a variable does not meet this assumption, one of the remedies is to convert the variable into a categorical variable to allow further use of the variable (Garson, 2016; Menard, 2010; Wuensch, 2014).

Heteroscedasticity: Heteroscedasticity refers to non-constant variances related to the error term in the model (Greene, 2003; Gujarati, 2003; Gujarati, 2011). Binary logistic regression does not need variances of the residuals to be the same for each level of the independent variables (Menard, 2010; Pallant, 2007; Tranmer & Elliot, 2008). However, even though Pallant (2007), Tranmer and Elliot (2008) and Menard (2010) state that homogeneity of variances or homoscedasticity is not a necessary assumption for binary logistic regression conducted on panel data, Gujarati (1992), Greene (2003) and Agung (2011) acknowledge that heterogeneity can exist in panel data and that the use of panel data is susceptible to the risk of heteroscedasticity. Heteroscedasticity can cause biased and misleading parameter estimates (Greene, 2003; Gujarati, 2003; Gujarati, 2011; Williams, 2015). Therefore, it was decided, as recommended by Agung (2011), to use the Huber-White estimator, which results in robust standard errors, to validate the results of the analysis when not considering the presence of heteroscedasticity. The results of the two methods of analysis showed only marginal differences. The detailed results of the two methods are included in Appendix 4.

Stationarity: As described in Section 5.6.1.1, the Levin-Lin-Chu test was used to test all the variables for stationarity. As shown in Appendix 5, the test indicated that the null hypothesis of a unit root could be rejected for all five dependent variables and all 19 independent variables, therefore indicating stationarity of all the variables.

Sample size: As discussed in Section 5.6.1.1, under the 10 observations per category per independent variable the minimum sample size is 190 observations. Four of the models are well above this minimum, with on the only the cash

conversion cycle model (binary logistic model 5 - Section 6.3.2.1) at 159 and 146 observations for the top and bottom performing companies respectively, that are below. However, Field (2005) highlights the fact that these all remain only rules of thumb, that are often considered to be overly conservative. Consequently, since the number of observations is not significantly below the “10 observations rule”, and above all the other recommendations discussed in Section 5.6.1.1, the sample size is considered to be adequate for valid analyses.

5.6.2.3 Overall model evaluation

Unlike linear regression, which uses a least squares approach (Agresti, 1996), binary logistic regression employs a maximum likelihood approach to establish the model to predict the odds of the dependent variable falling into a certain category based on the observations of the independent variables (Hosmer & Lemeshow, 2000). Agresti (1996) and Azen and Walker (2011) denote two test statistics to assess this. The first is the Wald statistic, which divides the parameter estimate by its standard error and then squares it. The second method is the Likelihood Ratio, which uses the likelihood function through two maximisations. In practice, the Likelihood Ratio is considered more reliable and preferable (Agresti, 1996; Field, 2003; Reyers, 2013).

The general principle of the Likelihood Ratio is to compare the alternative hypothesis to the null hypothesis. The alternative hypothesis is created by developing a model from the data collected for which the probability of obtaining the observed set of data is maximised (Field, 2003). The null hypothesis assumes that all coefficients in the binary logistic regression equation are zero. The Likelihood Ratio test assesses the difference between the total model with all the independent variables and a model without any independent variables. If the difference is significant, the model with the independent variables achieves a better estimation of the dependent variable result than the model with only the constant variable (Reyers, 2013). In other words, the Likelihood Ratio test determines the degree to which the logistic regression model succeeds in maximising the likelihood

that an event will occur (Hair, Black, Babin & Anderson, 2010). The likelihood test ratio is calculated as (Agresti, 1996):

$$LR = -2\log(\ell_0/\ell_1) \quad (5.16)$$

Where:

ℓ_0 = the maximum likelihood under the null hypothesis

ℓ_1 = the maximum likelihood under the alternative hypothesis.

Over and above the Likelihood Ratio, further goodness-of-fit tests can be used. Even though any of the available tests provides reasonable results, McFadden R^2 is preferred by Menard (2000) and Allison (2014) due to its intuitively reasonable interpretation. McFadden R^2 measures the proportional reduction of the error term and it is independent of the base rate. McFadden R^2 is calculated as follows (Bartlett, 2014):

$$\text{McFadden } R^2 = 1-(\log(L_c)/\log(L_{null})) \quad (5.17)$$

Where:

L_{null} = the likelihood of the null model, that is with only an intercept and no covariates

L_c = the likelihood of the current fitted model or the model containing all the independent variables.

In addition, EViews performs two further goodness-of-fit tests, namely the Hosmer Lemeshow and Andrews statistics. These tests compare the fitted expected values with the actual values. Large differences indicate an insufficient fit of the data. A probability value of above $p = .05$ indicates an acceptable fit.

Furthermore, model fit is also determined by the classification matrix. This matrix measures the predictive ability of the logistic regression model by tabulating the percentage of correct and incorrect classifications achieved by the model. In determining what constitutes a successful model, the table indicates how much

better the model succeeded in making correct classifications. In other words, how much does the model predicts the odds of a certain outcome of the dependent variable based on the movement in the independent variables, than what would have been achieved by mere chance. In general, the rule of thumb is that it should be at least 25% better than chance (Hair*, et al.*, 2010; Reyers, 2013).

This study used the Likelihood Ratio test, the McFadden R^2, the Hosmer Lemeshow statistic, the Andrews statistics and the classification matrix to assess the fit adequacy of the model.

5.6.2.4 Model optimisation

EViews calculates three model selection criteria that were used in the study to optimise the regression models. The first is the Akaike information criterion, which can be used to do model comparisons, according to Busemeyer and Diederich (2014). This criterion takes into account both the closeness of fit of the points to the model and the number of parameters used by the model. Because this is in fact a *badness-of-fit* criterion, the best fit or optimal model is the one for which the Akaike information criterion is the lowest (Busemeyer & Diederich, 2014; Mohammed, Naugler & Far, 2015; Padiyedath Gopalan, Kawamura, Takasaki, Amaguchi & Azhikodan, 2018). This factor is one of the criteria used in this study to optimise the regression models.

The second criterion to select among econometric models is the Schwarz criterion, also called the Bayesian information criterion. This criterion serves as a further technique to select among models (Koehler & Murphree, 1988). The criterion takes into account the closeness of fit of the points to the model and the number of parameters used by the model (Claeskens & Hjort, 2008). As for Akaike, the model with the lowest Schwarz criterion is considered the best fit model (Benchimol, 2013). This factor is one of the criteria used in this study to optimise the regression models.

The third criterion produced by EViews to select among models to determine the optimum model is the Hannan-Quinn information criterion (Maïnassara & Kokonendji, 2016). As for the previous criteria, the Hannan-Quinn information criterion value needs to be as low as possible to indicate the best fit model (Benchimol, 2013).

5.7 DATA RELIABILITY, VALIDITY AND ETHICS

As stated in Section 5.3.7 secondary data was used for the analysis. To assess whether secondary data is suitable to answer the research questions and meet the research objectives, attention should be given to the reliability, validity and measurement bias of the data. The reliability and validity of secondary data are functions of the data collection method and data source (Saunders*, et al.*, 2016). The source refers to assessing the authority and reputation of the source. Saunders*, et al.* (2016) explain that data from reputable, well known organisations are likely to be reliable and trustworthy, because the existence of these organisations are dependent on the credibility of their data. The data relating to the various board characteristics and share data were obtained from data directly published on IRESS, as well as financial statements and annual reports published on IRESS. IRESS is an international research platform with reliable data integrity (Bussin & Modau, 2015; Morris, 2018). Measurement bias occurs when there is a deliberate distortion (where data is purposely recorded inaccurately) of the data. The data was collected through physical observation by the researcher without any manipulation.

The validity of the performance and risk management measures are established through the literature study, which confirmed that these are preferred and widely used for the respective areas of measurement (Atanas, 2014; Cagle*, et al.*, 2013; Da Costa, 2014; Fleming, 1986; Hörnmark, 2015; John, 2001; Mans-Kemp*, et al.*, 2017; Mans-Kemp & Viviers, 2015; Mathew*, et al.*, 2018; Perryman*, et al.*, 2016; Zeidan & Shapir, 2017).

In terms of the ethical consideration of the data the researcher applied for and obtained ethical clearance from the Faculty of Economic and Management Sciences of the University of Pretoria and no company, included in the analyses, was named in the study.

5.8 SUMMARY

This chapter provided an overview of the research paradigm, inquiry strategy, broad research design, study sample selection, data collection and the variables observed as well as the data analysis methodology.

The study is based on the positivistic paradigm in that it assumes it is possible to arrive at a definitive answer, which is independent of the researcher. The study moreover employed a quantitative research approach and only used secondary data. The study sample constituted all companies listed on the main board of the JSE and specifically those in the 13 largest sectors of the JSE (measured by number of companies in the sector) during the period 2009 to 2015. This time-frame contributes to eliminate short-term volatility in the company data. In addition, industry-related factors are removed from company performance and risk management measures by expressing the company's achievement relative to the average of the sector it operates in. The required data was mainly extracted from the IRESS database and the companies' annual financial statements and integrated reports.

The performance variables considered by the study cover the various aspects of company performance from a shareholder's point of view, namely shareholder return, share price volatility and a risk-adjusted return to shareholders and the company's ability to manage liquidity risk. The aim of the study was to determine whether certain board characteristics have a significant relationship to a company's performance and risk management ability. The board characteristic considered includes board size, gender- and ethnic diversity, director independence, remuneration related characteristics, academic qualifications, fields of experience, age and tenure related variables and nationality.

The chapter provides an overview of the data analysis methods. Most studies in this field tested for the existence of linear relationships between the various board characteristics and company performance measures. However, social scientists are increasingly criticizing this approach. Consequently, pooled OLS estimation was used in the study to test the validity of the criticism, which was confirmed by weak regression results. Binary logistic regression was used to determine which board characteristics had a statistically significant association with the odds of a company being ranked as a top performer in terms of the respective performance and risk management measures.

The chapter concluded with a brief overview of the various binary logistic regression model evaluation tests and indicators and the criteria used to optimise the regression models.

Chapter 6 describes the characteristics of the final data set, as well as the analysis results.

CHAPTER 6: RESULTS AND DISCUSSION

6.1 INTRODUCTION

The chapter provides a detailed overview of the descriptive statistics for the overall and categorised data sets to develop an understanding of the basic aspects of the data used for the empirical analyses. The chapter also describes the tests performed on the data to establish the final data sets, which is used in the empirical data analyses. The chapter further gives the results of the linear regression and correlation test performed to test the criticism against looking for linear relationships in social sciences. The chapter ends by presenting the binary logistic regressions performed, with a discussion of the findings of the analyses.

6.2 DESCRIPTIVE STATISTICS

Bedeian (2014) highlights the importance of understanding the basic make-up of the primary data to be analysed in a study. This allows the researcher to gain a comprehensive understanding of the nature and construct of the data. Consequently, basic descriptive statistics are provided to assist in forming an overall understanding of the final data set. Table 6-1 sets out the descriptive statistics on an annual basis for the data set with the overall descriptive statistics being shown in Appendix 1.

Average board size remained fairly even over the study period and is in line with other literature that recorded the average board size of listed companies in South Africa as ranging between 6 and 12 board members, depending on the companies included in the samples (Jeremy, 2018; Kruger, Pinnock & Binnie, 2014; Muchemwa*, et al.*, 2016; Su, Liu & Zhang, 2019).

Table 6-1: Descriptive statistics - all variables used in the analysis

	N			Mean						
Variable	**Valid**	**Miss[1]**	**Med[2]**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Board size (#)	1 025	165	9.309	9.264	9.299	9.500	9.404	9.222	9.206	9.280
Independence										
Percentage of NEDs (%)	1 025	165	66.746	65.72	64.77	66.24	66.35	67.16	68.10	68.30
Percentage of independent NEDs (%)	1 024	166	74.13	71.18	73.76	73.46	74.72	75.02	75.03	75.15
Attributes										
Percentage of black persons (%)	1 018	172	31.71	30.07	30.81	31.84	32.57	32.69	31.59	32.04
Percentage of females (%)	1 023	167	15.15	12.54	13.88	14.28	15.51	16.00	16.44	16.68
Percentage of South Africans (%)	1 025	165	83.41	84.84	84.21	84.00	84.43	82.68	82.07	82.13
Remuneration										
Relative CEO remuneration movement (%)	751	439	56.14		3.26	85.57	26.85	59.38	37.95	111.5
Payment gap (times)	816	374	40.22	40.67	37.65	40.13	40.71	39.90	40.76	41.46
Chairman remuneration as a percentage of CEO guaranteed (%)	904	286	28.16	29.29	30.02	26.92	27.62	27.49	29.01	27.21
Average other NED remuneration as a percentage of CEO guaranteed (%)	923	267	10.85	10.45	11.09	9.92	10.74	11.17	11.28	11.14
Time based										
Average age (years)	1 012	178	54.591	53.69	53.83	54.00	54.56	54.89	55.28	55.55
Age diversity (factor)	996	194	9.465	9.463	9.405	9.568	9.350	9.487	9.446	9.525
Diversity of tenure (factor)	1 001	189	4.163	4.072	4.013	4.045	4.159	4.253	4.280	4.267
Background										
Academic diversity (per field) (factor)	1 016	174	0.473	0.495	0.491	0.478	0.471	0.466	0.463	0.452
Diversity of professional experience (factor)	1 024	166	0.813	0.803	0.809	0.817	0.820	0.816	0.811	0.813
Education										
Academic diversity (qualification type) (factor)	1 016	174	0.732	0.741	0.734	0.734	0.731	0.727	0.730	0.731
Relative education level of board (factor)	1 017	173	16.047	15.45	15.60	15.96	16.16	16.14	16.31	16.52
Experience										
Average board experience (factor)	1 025	165	1.800	1.778	1.770	1.801	1.813	1.831	1.802	1.797
Diversity of board experience (factor)	1 010	180	0.677	0.643	0.656	0.680	0.689	0.696	0.685	0.682

[1] Missing data
[2] Median
Source: SPSS output

Percentage NEDs and percentage of independent NEDs shows an increase over the study period. King IV recommends that the majority of the board should consist of NEDs and the majority of these directors, in turn, should be independent (IoDSA, 2016). According to Muchemwa*, et al.* (2016) and Scholtz and Kieviet (2018a) this recommendation by King IV (and earlier King Reports) caused an increase in the proportion of non-executives and independent directors. The increasing trend and levels of NEDs and independent directors observed in this study is in line with that reported in literature (Dzingai & Fakoya, 2017; Jeremy, 2018; Seegers*, et al.*, 2019).

The percentage black persons on the board showed a gradual increase over the observation period, this increasing trend is the result of government's initiatives, such as the introduction of the Broad-Based Black Economic Empowerment Act (53 of 2003) and the recommendation of King IV to increase diversity in terms of race (IoDSA, 2016; Ntim, 2015). The average percentage of black directors is in line with the findings of Mans-Kemp and Viviers (2015), who recorded an average of 31.9% over the period 2009 to 2012 and Deloitte's analysis of JSE boards in 2014 which found 32% of board members to be black (Kruger*, et al.*, 2014).

The percentage females on the board also shows a steady increase over the period, which is to be expected due to pressure globally, and in South Africa, to increase gender diversity on boards (Fawcett, Mans-Kemp & Viviers, 2017; Seegers*, et al.*, 2015). King IV and the JSE Listings Requirements require disclosure on the progress made towards targets for race and gender diversity (IoDSA, 2016; JSE, 2017). The average female representation on the board over the observation period is in line with the findings of Mans-Kemp and Viviers (2015), who reported an average of 14.8% from 2009 to 2012, and the findings reported by the Businesswomen's Association of South Africa of 14.6% in 2011 (Mans-Kemp & Viviers, 2015).

The level of foreign directors has increased over the period. This is as a result of company shareholdings becoming more global, in other words more foreign investors invest in local companies and more companies obtain dual listings in other jurisdictions. The foreign shareholders tend to want foreign directors to be

appointed on the boards to look after foreign interests (Harjoto*, et al.*, 2018; Iliev & Roth, 2018)

The payment gap remained at relatively constant levels throughout. The fact that it has not increased is probably the result of increasing pressure to eradicate inequality in the country, which is reflected as a specific goal in the National Development Plan. This aim is also supported by King IV. It states that the remuneration of executive management should be fair and responsible in the context of overall employee remuneration and that there is a need to resolve the gap between the remuneration of executives and that of other employees (IoDSA, 2016; Wittenberg, 2017)

The levels of chairman remuneration and other NED remuneration as a percentage of the CEO's remuneration have not changed significantly over the study period. This is probably an indication that the remuneration levels are within market consensus of what the levels should be. It may also be confirmation of the notion that because the board determines the CEO's remuneration and the CEO, in turn, is greatly involved in determining the remuneration of the directors, a significant relationship exists between the remuneration of the CEO and that of the NEDs (Hempel & Fay, 1994).

Average age shows a small increase over the period. The average over the period is in line with literature, which indicates the average age to be around 55 years (Seegers*, et al.*, 2019). The fact that boards steadily ages shows that fewer directors are leaving to make room for the next generation. This is highlighted as a possible limiting factor in the development of new candidates (Jeremy, 2018; Seegers, Hopkins, Crous & Fourie, 2014; Seegers*, et al.*, 2019). Age and tenure diversity did not materially change over the study period. This is perhaps an indication of the balance between the need for board continuity and board refreshment (Seegers*, et al.*, 2019).

Academic diversity per field has reduced over the period. This may be an indication of the popularity of financial degrees (Fricke*, et al.*, 2018) and the notion that

financial qualifications are beneficial to company performance (Scholtz & Kieviet, 2018b). In addition, from the data collection it became clear that the chartered accountant qualification is by far the most common qualification among directors. The relative education level of the boards increased over the observation period. This is due to the view that board candidates should have more formal training and education (Mans-Kemp*, et al.*, 2018b).

Literature also promulgates that education enhances the value of human capital and found that higher education levels are positively correlated with remuneration (Fedaseyeu*, et al.*, 2018). This indicates an incentive to all people and specifically potential board candidates to improve their competitive advantage by furthering their education. The diversity of types of academic degrees has deteriorated slightly, which is expected as a result of the overall increase in levels of education, since more people study further, more people will hold similar levels of degrees. The diversity of professional backgrounds has increased slightly over the observation period. This may be an indication of a general realisation that people from different backgrounds excel at different tasks within a board (Fedaseyeu*, et al.*, 2018; Mans-Kemp*, et al.*, 2018b; Seegers*, et al.*, 2014; Simons & Pelled, 1999).

Average board experience and diversity of board experience have increased slightly over the observation period but declined towards the end of the period. This may be the effect of companies encouraging their directors to also serve on other boards, to gain wider experience and exposure to businesses outside the company (Seegers*, et al.*, 2015). The stagnation indicates the well known problem that there are not enough experienced candidates available to meet the needs of the companies in the South African market. This is exacerbated by the lack of opportunity afforded new talent to gain the experience (Jeremy, 2018; Seegers*, et al.*, 2019). The lack of younger director appointments is also reflected in the increase in average age of the boards.

6.3 INFERENTIAL RESULTS

This section reports the correlation analysis, linear multiple regression modelling results, binary logistic regression modelling results and provide a discussion on the inferential results.

6.3.1 Multiple Linear regression

As discussed in Section 5.6, social scientists are increasingly criticising researchers' inclination to test for linear relationships when it comes to corporate and business relationships (Basimov, 2019; Canarella & Nourayi, 2008; Lee, 2019; Paniagua*, et al.*, 2018; Rasoava, 2019). The researcher therefore only performed the correlation analysis (Pearson's) in Section 6.3.1.1, to measure the degree and direction of the relationship between the dependent and independent variables as continuous variables, and the multiple linear regression analyses, in Section 6.3.1.1, to determine the relative strength and direction of each of the independent variables within the context of the regression models, to determine if the analysis confirms the said criticism. Consequently, the underlying results of the linear regression are not discussed in detail, but focus is rather placed on the overall outcome of the regressions.

The data analyses were conducted by using the statistical package Econometric Views (EViews, Version 11) and supplemented with the Statistical Package for the Social Sciences (SPSS, Version 25). Correlation analysis was run to determine the strength and direction of the correlation between the various independent and dependent variables. Some adjustments were made to the data set as a result of the tests required by the assumptions underlying multiple linear regression, as described in Section 5.6.1.1, before the multiple linear regression models could be run.

6.3.1.1 Correlation analysis

A. *Adjustments for multicollinearity*

The first correlation analysis conducted was to identify multicollinearity and was conducted on the set of independent variables. The study employed Pearson's correlation to determine whether there was any multicollinearity between the initial independent variables identified and collected (Morgan & Griego, 1998). Calkins (2005) explains that Pearson correlation coefficients vary between one (or negative one), which indicates perfect correlation, and zero, which indicates no correlation. Calkins (2005) further states that the rule of thumb is that a correlation coefficient of .7 and above is considered to be an indication that multicollinearity exists, which should be further dealt with.

Four sets of independent variables in this study were found to be highly collinear (Appendix 2). *Diversity of tenure of the board* and *average tenure of the board* resulted in a Pearson correlation coefficient of .819. The decision was made to eliminate the *average tenure of the board* in favour of the *diversity of tenure of the board*, because this was more in line with the overall aim of the study to determine the diversity of board characteristics and this variable was considered to make a greater contribution to understanding board diversity.

Two sets of diversity factors, namely the Simpson and Shannon Wiener factors, were calculated for three of the independent variables, as follows:

- diversity of academic qualification of the directors in terms of degree types;
- diversity of academic backgrounds of the directors; and
- diversity of professional backgrounds of the directors.

Pearson's correlation showed that the Simpson and Shannon Wiener measures of diversity displayed strong indications of multicollinearity in terms of the above variables, as depicted by the following results:

- Diversity of academic qualification of the directors in terms of types of degrees resulted in a .914 correlation coefficient between the Simpson and Shannon Wiener diversity factors.
- Diversity of academic backgrounds of the directors resulted in a .957 correlation coefficient between the Simpson and Shannon Wiener diversity factors.
- Diversity of professional backgrounds of the directors resulted in a .824 correlation coefficient between the Simpson and Shannon Wiener diversity factors.

With these two diversity factors showing such a high level of multicollinearity, it is reasonable to use only one of these factors as an indication of diversity. As described in Section 5.5.2.11, the Shannon Wiener index is more sensitive to the number of categories included in the sample, whereas the Simpson index is more sensitive to the dominance by a specific category. Because the data for this study included a fixed number of the categories per variable, it was decided that the Simpson index would be more appropriate, and consequently the Simpson diversity factor was included for the three diversity variables.

B. *Correlation analysis of independent variables with set of dependent variables*

Correlation analysis was run to determine the strength of the correlation between each pair of independent and dependent variables. The correlation matrix presented in Table 6-2 indicates the correlation coefficient between each independent variable and the set of independent variables. With only one Pearson correlation coefficient being slightly above .3, which is a moderate correlation, it is clear that weak correlations (less than 0.3), that is linear relationships, exist between all the independent variables and the respective dependent variables.

Table 6-2: Correlation matrix

Dependent variable	Return		Volatility		Sharpe ratio		Current ratio		Cash conversion cycle	
Independent variable	**PC[1]**	**Sig[2].**	**PC[1]**	**Sig[2].**	**PC[1]**	**Sig[2].**	**PC[1]**	**Sig[2].**	**PC[1]**	**Sig[2].**
Board size	.037	.258	-.327**	.000	.070*	.033	-.139**	.000	.061	.095
% NEDs	.037	.259	-.088**	.005	.013	.695	-.104**	.001	.059	.108
% Independent NEDs	-.030	.358	-.043	.170	-.012	.707	-.088**	.005	-.051	.163
% black person	-.004	.895	-.065*	.040	-.017	.601	-.188**	.000	.052	.158
% female	.022	.495	-.132**	.000	-.045	.168	-.155**	.000	.054	.143
% South African	-.012	.719	-.092**	.003	.019	.570	-.045	.150	-.062	.090
Relative CEO remuneration movement	-.005	.886	.017	.642	-.155**	.000	-.024	.508	.010	.818
Payment gap	.052	.154	-.136**	.000	.073*	.042	-.029	.415	-.023	.563
Chairman remuneration as % of CEO guaranteed	-.063	.069	-.006	.855	.084*	.015	.008	.804	.172**	.000
Other non-exec remuneration as % of CEO guaranteed	.038	.273	-.026	.426	.058	.088	.016	.631	.088*	.021
Average age	-.005	.872	-.043	.173	-.039	.240	.050	.119	.025	.495
Age diversity	.020	.542	.002	.961	-.043	.196	.136**	.000	-.081*	.029
Tenure diversity	-.017	.606	-.126**	.000	-.027	.416	.098**	.002	-.031	.407
Academic diversity per field	-.005	.887	-.020	.526	-.025	.441	.025	.430	-.001	.969
Professional experience diversity	.030	.358	-.055	.083	-.031	.343	.004	.892	.099**	.007
Academic diversity per degree type	-.070*	.033	-.017	.594	-.079*	.016	-.087**	.006	-.032	.382
Relative education level	.004	.915	-.070*	.027	.017	.609	-.133**	.000	.022	.545
Average board experience	.040	.228	-.292**	.000	.078*	.016	-.041	.191	.070	.057
Board experience diversity	-.004	.912	-.176**	.000	.014	.679	-.072*	.023	.137**	.000

** Correlation is significant at the .01 level (2-tailed), * Correlation is significant at the .05 level (2-tailed).
[1] Pearson's correlation
[2] Sig. (2-tailed)
Source: SPSS output

6.3.1.2 Multiple linear regression results

Pooled OLS estimation was used to run the five linear regression models. The results are depicted in the following sections:

A. *Total return to shareholders*

The first linear regression model was run with the relative *total return to shareholders* as the dependent variable. The following model was used in the analysis:

$$\text{Relative total return to shareholders} = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PI_{it} + \beta_4 PB_{it} + \beta_5 PF_{it} + \beta_6 PS_{it} + \beta_7 RC_{it} + \beta_8 PG_{it} + \beta_9 CR_{it} + \beta_{10} NR_{it} + \beta_{11} AA_{it} + \beta_{12} AD_{it} + \beta_{13} DT_{it} + \beta_{14} AF_{it} + \beta_{15} DP_{it} + \beta_{16} AT_{it} + \beta_{17} EL_{it} + \beta_{18} BE_{it} + \beta_{19} ED_{it} \quad (6.1)$$

Where:

α = constant

$_{it}$ = company i at time t

The codes representing the independent variables are defined in Table 1-2.

The results of the data analysis are presented in Table 6-3. A very poor fit was evident (adjusted R^2 = .005) and the model indicated nonnormality of the residuals (Jacque Bera test (395 322.0; p < .05)). To resolve the possibility of heteroscedasticity, the cross-section SUR standard errors and covariance estimation was used in Model 2. Fairly high non-normality was still evident in Model 2. A natural log transformation of the dependent variable was also considered. However, half of the values were negative or zero, thereby reducing the data set by half and thus the results could be biased. Although the fixed effect approach, if shown by the Breusch Pagan Lagrange multiplier (LM) test, could be used according to the fixed effect approach for unbalanced panels (Greene, 2003), the data was considered as Missing Completely at Random (MCAR). Under MCAR panel method is valid and the resulting estimation is consistent and unbiased, therefore the fixed effect approach to address this component was not considered. Only complete cases were analysed.

As the intent of the analysis was only to confirm if similar weak results are obtained through the use of multiple linear regression modelling, adjustments to the model was not pursued further.

Table 6-3: Multiple linear regression - Total return to shareholders

	Adjusted R^2	F-statistic (Sig)	Durbin-Watson	Statistically significant variables
Model 1	.005	1.169 (.278)	2.118	• Percentage of black persons* • Percentage of independent NEDs** • Chairman remuneration as a percentage of CEO guaranteed remuneration*
Model 2	.005	1.169 (.278)	2.118	• Percentage of South Africans* • Percentage of independent NEDs**

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews

The results in Table 6-3 indicate the following:

- The F-statistic for the regression is insignificant for both models (the beta coefficients do not differ significantly from zero - $p > .05$).
- The adjusted R^2 is very small. Only .5% of the variance in the dependent variable can be explained by the independent variables.
- Durbin-Watson is within the acceptable range (1.5 - 2.5) and close to 2, thereby indicating very little autocorrelation.

B. *Share price volatility*

The second linear regression model was run with the relative *share price volatility* as the dependent variable. The following model was used in the analysis:

$$\text{Relative share price volatility} = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PI_{it} + \beta_4 PB_{it} + \beta_5 PF_{it} + \beta_6 PS_{it} + \beta_7 RC_{it} + \beta_8 PG_{it} + \beta_9 CR_{it} + \beta_{10} NR_{it} + \beta_{11} AA_{it} + \beta_{12} AD_{it} + \beta_{13} DT_{it} + \beta_{14} AF_{it} + \beta_{15} DP_{it} + \beta_{16} AT_{it} + \beta_{17} EL_{it} + \beta_{18} BE_{it} + \beta_{19} ED_{it} \quad (6.2)$$

Where:

α = constant

$_{it}$ = company i at time t

The codes representing the independent variables are defined in Table 1-2.

The results of the data analysis are presented in Table 6-4. The model indicated nonnormality of the residuals (Jacque Bera test (5 607.2; $p < .05$)). To resolve the possibility of heteroscedasticity, the cross-section SUR standard errors and

covariance estimation were used in Model 2. In addition, as autocorrelation was present , it was decided to add an AR(1) term. Because the dependent variable is measured over time, thus a time series, and the lagged term (AR1) represents the dependent variable in the previous time period, the adjusted R^2 will increase substantially when this term is added to the model. Although nonnormality of residuals was greatly reduced in Model 2 (Jacque Bera test (704.3; $p < .05$)), it was still evident in Model 2. A natural log transformation of the dependent variable was again considered. However, more than half of the values were negative or zero, thereby reducing the data set by 68% and would cause biased results. As stated in Section 6.3.1.1 A. Adjustments to the model was not pursued further.

Table 6-4: Multiple linear regression - Share price volatility

	Adjusted R^2	F-statistic (Sig)	Durbin-Watson	Statistically significant variables
Model 1	.196	9.176 (.000)	.585	• Diversity of tenure*** • Average board experience*** • Diversity of professional experience* • Board size*** • Average other NED remuneration as a percentage of CEO guaranteed remuneration***
Model 2	.588	37.239 (.000)	2.057	• Average board experience*** • Chairman remuneration as a percentage of CEO guaranteed remuneration*** • Board size***

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews

The results in Table 6-4 indicate the following:

- The F-statistic for the regression is significant for both models (the beta coefficients differ significantly from zero - $p < .05$).
- The adjusted R^2 is relatively small. Only 19.6% of the variance in the dependent variable can be explained by the independent variables, but improves to 58.8% in model 2.
- The Durbin-Watson indicates the presence of autocorrelation in model 1 and was addressed in model 2 with the addition of the AR(1) term.

C. *Sharpe ratio*

The third linear regression model was run with the relative *Sharpe ratio* as the dependent variable. The following model was used in the analysis:

$$\text{Relative Sharpe ratio} = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PI_{it} + \beta_4 PB_{it} + \beta_5 PF_{it} + \beta_6 PS_{it} + \beta_7 RC_{it} + \beta_8 PG_{it} + \beta_9 CR_{it} + \beta_{10} NR_{it} + \beta_{11} AA_{it} + \beta_{12} AD_{it} + \beta_{13} DT_{it} + \beta_{14} AF_{it} + \beta_{15} DP_{it} + \beta_{16} AT_{it} + \beta_{17} EL_{it} + \beta_{18} BE_{it} + \beta_{19} ED_{it} \quad (6.3)$$

Where:

α = constant

$_{it}$ = company i at time t

The codes representing the independent variables are defined in Table 1-2.

Table 6-5: Multiple linear regression - Sharpe ratio

	Adjusted R^2	**F-statistic (Sig)**	**Durbin-Watson**	**Statistically significant variables**
Model 1	.053	2.896 (.000)	1.713	• Payment gap*** • Chairman remuneration as a percentage of CEO guaranteed remuneration** • Percentage of females* • Average age** • Average other NED remuneration as a percentage of CEO guaranteed remuneration ** • Relative CEO remuneration movement***
Model 2	.053	2.896 (.000)	1.713	• Payment gap*** • Diversity of tenure** • Chairman remuneration as a percentage of CEO guaranteed remuneration ** • Percentage of females* • Average age** • Average other NED remuneration as a percentage of CEO guaranteed remuneration ** • Relative CEO remuneration movement***

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews

The results of the data analysis are presented in Table 6-5. The model indicated a poor fit (adjusted R^2 = .053) and nonnormality of the residuals (Jacque Bera test (925.96; p < .05)). To resolve the possibility of heteroscedasticity, the cross-section SUR standard errors and covariance estimation was used in Model 2. As indicated for the previous two dependent variables, a natural log transformation resulted in

losing two thirds of the observations that will lead to biased results. No model adjustments was pursued further as discussed in Section 6.3.1.1 A.

The results in Table 6-5 indicate the following:

- The F-statistic for the regression is significant for both models (the beta coefficients differ significantly from zero - $p < .05$).
- The adjusted R^2 is very small. Only 5.3% of the variance in the dependent variable can be explained by the independent variables.
- The Durbin-Watson is within the acceptable range (1.5 - 2.5), indicating no serious autocorrelation.

D. *Current ratio*

The fourth linear regression model was run with the relative *current ratio* as the dependent variable. The following model was used in the analysis:

$$\text{Relative current ratio} = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PI_{it} + \beta_4 PB_{it} + \beta_5 PF_{it} + \beta_6 PS_{it} + \beta_7 RC_{it} + \beta_8 PG_{it} + \beta_9 CR_{it} + \beta_{10} NR_{it} + \beta_{11} AA_{it} + \beta_{12} AD_{it} + \beta_{13} DT_{it} + \beta_{14} AF_{it} + \beta_{15} DP_{it} + \beta_{16} AT_{it} + \beta_{17} EL_{it} + \beta_{18} BE_{it} + \beta_{19} ED_{it} \quad (6.4)$$

Where:
α = constant
$_{it}$ = company i at time t
The codes representing the independent variables are defined in Table 1-2.

The results of the data analysis are presented in Table 6-6. The model indicated a poor fit (adjusted $R^2 = .123$), the presence of autocorrelation and nonnormality of the residuals (Jacque Bera test (510.4; $p < .05$)). To resolve the possibility of heteroscedasticity, the cross-section SUR standard errors and covariance estimation was used in Model 2. To resolve the autocorrelation, an autoregressive coefficient with a lag of one (AR1) was included in Model 2.. Fairly high nonnormality was still evident in Model 2. The same problem with a natural log

transformation arose as for the previous three dependent variables. As stated in Section 6.3.1.1 A, no further model adjustments were considered.

Table 6-6: Multiple linear regression - Current ratio

	Adjusted R^2	F-statistic (Sig)	Durbin-Watson	Statistically significant variables
Model 1	.123	5.666 (.000)	.599	• Payment gap* • Diversity of professional experience*** • Board experience diversity** • Percentage of independent NEDs* • Tenure diversity** • Percentage of black persons** • Board size**
Model 2	.566	33.926 (.000)	2.315	• Academic diversity (qualification type)*** • Percentage of females** • Percentage of independent NEDs*** • Percentage of NEDs*

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews

The results in Table 6-6 indicate the following:

- The F-statistic for the regression is significant for both models (the beta coefficients differ significantly from zero - $p < .05$).
- The adjusted R^2 is relatively small. Only 12.3% of the variance in the dependent variable can be explained by the independent variables in Model 1.
- The Durbin-Watson indicates the presence of autocorrelation and was addressed in model 2.

E. *Cash conversion cycle*

The fifth linear regression model was run with the relative *cash conversion cycle* as the dependent variable. The following model was used in the analysis:

$$\text{Relative cash conversion cycle} = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PI_{it} + \beta_4 PB_{it} + \beta_5 PF_{it} + \beta_6 PS_{it} + \beta_7 RC_{it} + \beta_8 PG_{it} + \beta_9 CR_{it} + \beta_{10} NR_{it} + \beta_{11} AA_{it} + \beta_{12} AD_{it} + \beta_{13} DT_{it} + \beta_{14} AF_{it} + \beta_{15} DP_{it} + \beta_{16} AT_{it} + \beta_{17} EL_{it} + \beta_{18} BE_{it} + \beta_{19} ED_{it} \quad (6.5)$$

Where:

α = constant

$_{it}$ = company i at time t

The codes representing the independent variables are defined in Table 1-2.

The results of the data analysis are presented in Table 6-7. The model indicated a poor fit (adjusted R^2 = . 107), the presence of autocorrelation and nonnormality of the residuals (Jacque Bera test (7 288.0; p < .05)). To resolve the possibility of heteroscedasticity, the cross-section SUR standard errors and covariance estimation was used in Model 2. To resolve the autocorrelation, an autoregressive coefficient with a lag of one (AR1) was included in Model 2. Fairly high nonnormality was still evident in Model 2. The same problem with a natural log transformation arose as for the previous four dependent variables. As stated in Section 6.3.1.1 A, no further model adjustments were considered.

Table 6-7: Multiple linear regression - Cash conversion cycle

	Adjusted R^2	**F-statistic (Sig)**	**Durbin-Watson**	**Statistically significant variables**
Model 1	.107	4.170 (.000)	.727	• Academic diversity (per qualification type)*** • Percentage of South Africans*** • Diversity of professional experience** • Diversity of board experience *** • Average other NED remuneration as a percentage of CEO guaranteed remuneration *** • Percentage of independent NEDs** • Chairman remuneration as a percentage of CEO guaranteed remuneration * • Academic diversity (per field)*** • Percentage of black persons* • Percentage of NEDs*
Model 2	.438	16.450 (.000)	1.757	• Relative CEO remuneration movement** • Percentage of independent NEDs*

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews

The results in Table 6-7 indicate the following:

- The F-statistic for the regression is significant for both models (the beta coefficients differ significantly from zero - p < .05).
- The adjusted R^2 is small. Only 10.7% of the variance in the dependent variable can be explained by the independent variables.
- The Durbin-Watson indicates the presence of autocorrelation and was addressed for model 2.

6.3.2 Binary logistic regression

The low linear correlation values between each of the independent variables and the respective dependent variables, as shown in Table 6-2, as well as the poor results obtained through the multiple linear regression in Section 6.3.1.1 as applied to the panel data, confirmed the criticism from social scientists against the tendency to only test for linear relationships between human characteristics and company performance measures. It is not surprising to find that a strong linear relationship does not exist between the dependent and independent variables. Such linear relationships could be misleading, that is to expect that a unitary change in any of the board characteristics would have a fixed linear factor association with the respective performance or risk management metrics (Basimov, 2019; Canarella & Nourayi, 2008; Lee, 2019; Paniagua*, et al.*, 2018; Rasoava, 2019). The results obtained therefore support the decision to use binary logistic regression to determine which board characteristics have a statistically significant relationship with the various performance and risk management measures in determining its association with the odds that a company ranks as a top-performing company.

Due to the lack of empirical evidence and the fact that most of the relationships between the characteristics and various components of a company's value creation, used in this study, have not been tested before, and specifically from a non-linear relationship point of view, it was not possible to exclude any of the characteristics from any of the regression models. Only as part of the model optimisation process could some of the characteristics with non-significant relationships be removed.

6.3.2.1 Dependent variables: frequency statistics

As discussed earlier, due to the complex and intertwined nature of a company's value creation process and the fact that each of the underlying processes require different skills, knowledge and experience it is important to demine which board characteristic has a relationship with which element of the value creation process. Consequently, five dependent variables were used in the analyses, namely

shareholder return, *share price volatility*, *Sharpe ratio*, *current ratio* and *cash conversion cycle*. As discussed in Section 5.6.2, the final sample selection for the data analysis was established by identifying those companies that showed relative performance within the highest 25% of all companies and those that showed relative performance in the lowest 25% of all companies, in terms of the dependent variable. In other words, the companies whose performance ranked within the top 25% per measure were considered the top-performing companies and those whose performance ranked in the lowest 25% per measure were considered to be the bottom-performing companies. This was done to ensure that a clear distinction was made between top and bottom performers.

The *shareholder return, Sharpe ratio* and *current ratio* dependent variables were converted to binary variables with the companies whose performance rank in the top 25% of companies were categorised as a one. That is, companies that achieved the highest shareholder return, Sharpe ratio or current ratio relative to their specific sector. Companies whose performance rank in the bottom 25% were categorised as a zero. The *share price volatility* and *cash conversion cycle* dependent variables were converted so that companies whose performance rank in the top 25% of companies were categorised as a one. In other words companies that achieve the lowest share price volatility or lowest cash conversion cycle relative to the average performance of the respective sectors, for the year in question, Companies whose performance rank in the bottom 25%, that is, companies with the highest share price volatility or cash conversion cycle were categorized as a zero.

Table 6-8 reflects the selection frequencies for the various dependent variables.

Table 6-8: Frequency statistics - Dependent variables

	Shareholder return	Share price volatility	Sharpe ratio	Current ratio	Cash conversion cycle
Bottom 25% of companies (category 0)	232	250	236	257	159
Top 25% of companies (category 1)	232	250	235	257	146
Total	464	500	471	514	305

Source: SPSS output

The number of volatility observations was higher than that for shareholder return and the Sharpe ratio, because IRESS did not contain the companies' shareholder return for some years, mostly as a result of the companies only operating for a portion of the year. However, there was still adequate share price data to calculate the share price volatility for the periods. The Sharpe ratio could not be calculated for the periods where a company's return was not available. The number of shareholder return observations, in turn, was lower than the number of Sharpe ratio observations because IRESS reflected a zero return for the industry for the year corresponding to the financial year of a company. Therefore, even though the Sharpe ratio could be calculated using the return of the specific company, the company's return relative to that of the industry could not be determined because the formula used, as described in Section 5.5.1.1, results in a *divide by zero* error.

The number of current ratio observations was higher than that of the other dependent variables because all companies have current assets and liabilities and have to report these elements that are necessary to calculate the current ratio, which makes this information readily available for virtually all companies. The number of observations for the cash conversion cycle was lower than for the other dependent variables because this metric was not calculable for all companies. For example, investment companies do not have inventory or cost of sales.

The frequency analysis indicates that the sample sizes of the various samples used for the respective binary logistic analyses are acceptable to perform valid regressions as discussed in Section 5.6.2.2.

6.3.2.2 Independent variables: descriptive statistics for reduced data sets

As described in Section 5.5.2, the study includes a number of independent variables. With the dependent variables being converted to binary variables only the independent variables related to each of the dependent variable observations are retained. This section provides the descriptive statistics for these reduced data sets to gain some understanding of the basic aspects of the study's underlying data.

The descriptive statistics for the data sets included in the data analysis are provided in Table 6-9.

Table 6-9: Descriptive statistics - independent variables per dependent variable

Dependent variable		Return		Volatility		Sharpe ratio		Current ratio		Cash conversion cycle	
Independent variable		**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Board size (#)	T[1]	9.00	2.60	9.98	2.65	9.84	2.87	8.42	2.38	9.40	2.38
	B[1]	8.94	2.91	7.73	2.66	8.87	2.78	9.56	2.38	8.89	2.38
Independence											
Percentage of NEDs (%)	T	65.63	13.18	67.91	13.51	67.17	12.67	64.73	13.55	63.43	13.55
	B	65.93	13.49	64.61	13.62	65.37	12.82	69.25	13.91	63.19	13.91
Percentage of independent NEDs (%)	T	72.89	22.53	74.13	21.05	74.64	19.87	71.95	20.81	78.05	20.81
	B	74.20	23.00	70.90	24.43	75.21	21.34	74.66	22.43	74.29	22.43
Attributes											
Percentage of black persons (%)	T	31.19	22.68	33.44	23.97	32.06	21.38	23.67	22.87	35.50	22.87
	B	33.03	21.44	29.19	22.46	31.33	22.45	35.31	20.28	26.86	20.28
Percentage of females (%)	T	14.19	12.26	15.79	13.28	14.57	11.52	12.46	12.24	17.06	12.24
	B	14.62	11.84	11.89	10.94	15.37	11.85	17.29	11.94	13.79	11.94
Percentage of South Africans (%)	T	84.21	25.18	80.06	30.74	86.61	23.92	81.63	30.35	74.08	30.35
	B	81.25	27.51	77.60	29.77	85.10	24.71	80.79	20.22	89.69	20.22
Remuneration											
Relative CEO remuneration movement (%)	T	-4.30	208.84	46.52	255.27	-32.00	153.15	35.49	290.38	56.14	290.38
	B	118.10	256.09	51.35	221.00	85.57	322.10	53.60	228.53	37.13	228.53
Payment gap (times)	T	39.38	33.60	41.25	32.88	44.52	37.26	38.65	35.39	41.60	35.39
	B	36.43	31.87	27.05	25.68	35.65	30.77	37.85	32.48	41.98	32.48
Chairman remuneration as a percentage of CEO guaranteed (%)	T	30.46	25.63	33.67	25.85	30.69	25.19	28.32	25.09	37.84	25.09
	B	25.96	22.62	29.19	27.22	25.40	22.16	29.63	20.90	20.73	20.90
Average other NEDs remuneration as a percentage of CEO guaranteed (%)	T	10.98	7.24	11.23	25.85	11.36	7.41	11.29	25.09	12.55	25.09
	B	10.05	6.85	10.06	27.22	10.23	7.10	11.45	20.90	9.49	20.90
Time based											
Average age (years)	T	54.11	4.44	55.22	4.71	54.55	4.44	55.32	4.04	53.08	4.04
	B	54.60	4.58	54.03	4.86	54.71	4.38	54.98	4.71	53.47	4.71
Age diversity (factor)	T	9.18	2.60	9.59	2.84	9.23	2.60	10.29	2.90	9.12	2.90
	B	9.64	2.90	9.38	3.04	9.83	2.92	9.64	3.02	9.65	3.02
Diversity of tenure (factor)	T	4.19	2.61	3.94	2.43	4.46	2.54	4.64	2.09	3.90	2.09
	B	4.11	2.67	3.44	2.60	4.50	2.73	3.76	2.92	4.59	2.92

Table 6 9: Descriptive statistics - independent variables per dependent variable (continued)

Dependent variable		Return		Volatility		Sharpe ratio		Current ratio		Cash conversion cycle	
Independent variable		**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**	**Mean**	**Std Dev**
Background											
Academic diversity (per field) (factor)	T	.47	.19	.50	.18	.46	.19	.49	.22	.47	.22
	B	.48	.19	.46	.20	.46	.20	.47	.18	.45	.18
Diversity of professional experience (factor)	T	.81	.05	.81	.05	.81	.05	.81	.05	.82	.05
	B	.82	.05	.81	.05	.81	.05	.81	.06	.81	.06
Education											
Academic diversity (qualification type) (factor)	T	.73	.09	.72	.07	.73	.08	.72	.09	.72	.09
	B	.74	.07	.73	.09	.74	.08	.74	.08	.74	.08
Relative education level of board (factor)	T	16.34	4.64	16.29	4.60	16.47	4.32	15.00	3.99	15.33	3.99
	B	15.78	3.89	15.17	4.02	16.08	4.28	15.90	4.65	15.46	4.65
Experience											
Average board experience (factor)	T	1.74	.41	1.96	.37	1.86	.43	1.76	.36	1.70	.36
	B	1.72	.39	1.62	.40	1.73	.38	1.82	.42	1.68	.42
Diversity of board experience (factor)	T	.67	.19	.69	.19	.69	.19	.63	.22	.69	.22
	B	.66	.19	.62	.23	.67	.22	.68	.24	.62	.24

[1] - Top-performing companies, [2] - Bottom-performing companies

Source: SPSS output

The average board size is higher for the top performing companies for all variables except for the current ratio. This supports the notion by resource dependency theory that a larger board should be more likely to possess the skills and experience to provide the necessary guidance and advice (Coles*, et al.*, 2008; Muchemwa, 2014). The percentage of NEDs is similar or higher for top performing companies for all the variables except for the current ratio, while the percentage independent NEDs are higher for bottom performing companies except for share price movement volatility and the cash conversion cycle. This support the warning from literature that companies should seek to achieve substantial independence but not necessarily total independence, since independence is not a safeguard against financial catastrophes (Bhagat & Black, 2002).

Top performing companies showed a higher or marginally lower average percentage of black persons and females for all variables except for the current ratio. This supports the notion from literature that gender and ethnic diversity

benefits a board of directors (Harjoto*, et al.*, 2015; Ntim, 2015; Paniagua*, et al.*, 2018; Scholtz & Kieviet, 2018b). Top performing companies displayed a higher average percentage of South Africans on the board than bottom performing companies for all variables except for managing the cash conversion cycle. The benefit of having more directors from a single jurisdiction supports views from literature that geographic distance could jeopardise teamwork and cohesion and that the lack of local knowledge could hinder the director's efficiency (Harjoto*, et al.*, 2018; Masulis*, et al.*, 2012). The benefit of having more foreign directors to better manage the cash conversion cycle is in-line with the view that more foreign directors could assist a company to access foreign debt and equity markets, which could allow a company to have a more aggressive approach to funding its operating activities (Doidge*, et al.*, 2004).

The movement in CEO remuneration relative to return to shareholders is generally higher for bottom performing companies. This supports the views of literature that CEO remuneration is not necessarily based on merit and does not always motivate increased performance (Deysel & Kruger, 2015; Dorff, 2014; Rasoava, 2019; Seegers & Shaw, 2013). Top performing companies showed higher average payment gaps than bottom performing companies. This partly explains the inequality issue in South Africa, as discussed in Section 3.4.1, where higher-performing companies fail to manage the payment gap to more acceptable levels. The mean percentage of the chairman's remuneration and other directors' remuneration as a percentage of the CEO's guaranteed remuneration are both higher for top performing companies than bottom performing companies for all the dependent variables with the marginal exception of the current ratio. This supports the statements in literature that the duties and responsibilities of directors have been increasing and to ensure that people with the right skills and experience are attracted and retained, careful consideration should be given to the levels of remuneration paid (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017; Seegers*, et al.*, 2015).

The mean average age and age diversity does not differ materially between top and bottom performing companies, with the exception of share price volatility where the

average age for top performing companies are higher than for bottom performing companies. The observation in terms of volatility supports the notion in literature that older individuals are more risk averse making older individuals more cautious to take risks in making financial, investment and strategic decisions, which may result in share price movements to be less volatile (Dickason & Swanepoel, 2018). The evenness between top and bottom performers for the other variables gives credence to the speculation in literature that different age groups can work together, despite differences in values and attitudes (Subramanian, 2018). Average diversity of tenure is similar for top and bottom performing companies for shareholder return and Sharpe ratio while it is higher for top performing companies in terms of share price movement volatility and current ratio and lower for top performing companies in terms of the cash conversion cycle. This shows a higher level of conservatism, which could stem from views expressed in literature that diversity of tenure could increase conflict and indecisiveness on the board and this may jeopardise coordination and communication, thereby preventing the board from taking more aggressive approaches on company matters. (Li & Wahid, 2018).

Diversity of types of degrees, fields of study and fields of experience shows no material difference between top and bottom performing companies across all the variables. Relative level of education shows higher averages for top performing companies for shareholder return, Sharpe ratio and share price volatility, while it is lower for top performing companies in terms of current ratio and the cash conversion cycle. The benefit to the first three variables is in line with literature's findings that higher education makes individuals more receptive to innovation and more tolerant of ambiguity and complex situations, which benefits the functioning of the board (Dollinger, 1984; Fedaseyeu*, et al.*, 2018; Kimberly & Evanisko, 1981; Wiersema & Bantel, 1992). The risk aversion reflected by the observation in terms of the last two variables confirms literature findings that risk averse individuals tend to study more (De Paola & Gioia, 2012).

Finally, average board experience and board experience diversity shows higher averages for top performing companies across all dependent variables except for the current ratio. This is in-line with literature's view that board experience allows

directors to be better monitors of and advisors to top management (Gray & Nowland, 2013; Mans-Kemp*, et al.*, 2018b). Literature also promotes that more board experience equip directors with wider experience and knowledge but too many other board seats could cause directors not to dedicate adequate time and attentions to their roles and responsibilities (Jackling & Johl, 2009; Mans-Kemp*, et al.*, 2016b; Mans-Kemp*, et al.*, 2018b; Reguera-Alvarado & Bravo, 2017; Seegers, Hopkins, Crous & Fourie, 2013). A good mix of board experience should balance this out. Current ratio and cash conversion cycle often give opposing messages regarding the liquidity of a company (Lyroudi & McCarty, 1993; Richards & Laughlin, 1980). Consequently, the contribution made to improve the cash conversion cycle may contribute to decrease the current ratio.

6.3.2.3 Determining the final data set

A. *Adjustments for multicollinearity*

The adjustment for multicollinearity was conducted, as described in Section 6.3.1.1A. In summary, four sets of independent variables in this study were found to be highly collinear. Consequently, the three Shannon Wiener diversity factors and the *average tenure of the board* were eliminated in favour of the Simpson diversity factors and the *diversity of tenure of the board* respectively.

B. *Adjustments for nonlinearity of the logit*

The Box-Tidwell transformation test was used to test for nonlinearity between the independent variables and the logit of the dependent variable (linearity of the logit), which is an assumption of logistic regression, as described in Section 5.6.2.2. In the proposed data sets, the following independent variables indicated such a concern:

<u>Shareholder return</u>

- *Relative CEO remuneration movement* ($p = .033$, $p < .05$).

Share price volatility

- *Percentage of NEDs* (p = .029, p > .05); and
- *Average other NED remuneration as a percentage of CEO guaranteed remuneration* (p = .047, p < .05).

Sharpe ratio

- *Relative CEO remuneration movement* (p = .000, p < .05); and
- *Average of other directors' remuneration as a percentage of CEO guaranteed remuneration* (p = .033, p < .05).

Current ratio

- *Board size* (p = .007, p < .05);
- *Percentage of black persons* (p = .001, p < .05); and
- *Age diversity* (p = .034, p < .05).

Cash conversion cycle

- *Chairman remuneration as a percentage of CEO guaranteed remuneration* (p = .009, p < .05);
- *Tenure diversity* (p = .002, p < .05);
- *Average age* (p = .009, p < .05); and
- *Average board experience* (p = .024, p < .05).

As described in Section 5.6.2.2, one of the remedies where variables violate the linearity of the logit assumption is to convert the variable into a categorical variable to allow further use of the variable. Consequently, the affected independent variables were converted into categorical variables and used as such in each of the respective logistic regression models. For consistency, the variables were divided into three categories each. Table 6-10 indicates the frequency statistics for the categorical independent variables based on the original data.

The categorisation was done by categorising all values above the 66.7th percentile into a *high* category, all values below the 33.3rd percentile into a *low* category and all values in between into a *middle* category.

Table 6-10: Frequency statistics - categorical independent variables

	High	Middle	Low
Board size	442	258	325
Percentage of NEDs	334	328	363
Percentage of black persons	343	343	332
Relative CEO remuneration movement	250	251	250
Chairman remuneration as a percentage of CEO guaranteed remuneration	301	302	301
Average other non-executive remuneration as a percentage of CEO guaranteed remuneration	307	309	307
Average age	339	337	336
Age diversity	332	332	332
Tenure diversity	339	337	320
Average board experience	316	439	270

Source: SPSS

6.3.3 Binary logistic regression results

The data analyses were conducted by using the statistical package Econometric Views (EViews, Version 11) and supplemented with the Statistical Package for the Social Sciences (SPSS, Version 25). Binary logistic regression was used to assess the relationship of the independent variables to the odds that a company's performance ranks as a top-performing company.

6.3.3.1 Binary Logistic Regression Model 1: Total return to shareholders

A. *Original and best fitting model it - Total return to shareholders*

The first logistic regression model was run with the relative total *return to shareholders* as the dependent variable. The following model was used in the analysis:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PI_{it} + \beta_4 PB_{it} + \beta_5 PF_{it} + \beta_6 PS_{it} + \beta_7 RC_{it} + \beta_8 PG_{it} + \beta_9 CR_{it} + \beta_{10} NR_{it} + \beta_{11} AA_{it} + \beta_{12} AD_{it} + \beta_{13} DT_{it} + \beta_{14} AF_{it} + \beta_{15} DP_{it} + \beta_{16} AT_{it} + \beta_{17} EL_{it} + \beta_{18} BE_{it} + \beta_{19} ED_{it} \quad (6.6)$$

Where:

π = the probability of a company being categorised as a top performer in terms of its relative total return to shareholders.

α = constant

$_{it}$ = company i at time t

The codes representing the independent variables are defined in Table 1-2 in Section 1.5.3. The results of the data analysis are depicted in Table 6-11.

Table 6-11: Binary logistic regression (Shareholder return)

Variable	Beta coefficient	Standard error	z-statistic
Constant	6.101	3.964	1.539
Board size	.025	.029	.431
Percentage of NEDs	-.024	1.383	-.017
Percentage of independent NEDs	-1.300**	.624	-2.083
Percentage of black persons	-.612	.927	-.660
Percentage of females	-.034	1.318	-.026
Percentage of South Africans	.636	.794	.801
Relative CEO remuneration movement (categorised)	-1.041***	.168	-6.195
Payment gap	.011**	.005	2.525
Chairman remuneration as a percentage of CEO guaranteed remuneration	1.408**	.648	2.175
Average other NEDs' remuneration as a percentage of CEO guaranteed remuneration	.516	2.105	.245
Average age	-.012	.036	-.347
Age diversity	-.063	.055	-1.141
Diversity of tenure	-.140**	.061	-2.289
Academic diversity (per field)	-.929	.954	-.974
Diversity of professional experience	-1.378	3.670	-.375
Academic diversity (per qualification type)	-1.361	2.083	-.653
Relative education level of board	.074*	.041	1.815
Average board experience	-.787*	.467	-1.688
Diversity of board experience	.285	.866	.329

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews output

The model fit statistics for the initial model is shown in Table 6-13.The model in Table 6-11, as the initial model containing all the original predictor variables, was optimised in an attempt to establish the best fitting model in terms of predicting the dependent variable. This was done by removing the statistically non-significant

independent variables from the model with the aim of increasing the McFadden R^2 ratio and the Likelihood Ratio (LR) statistic, while the Prob(LR statistic) remained statistically significant ($p < .05$). A further aim was to achieve the lowest possible values for the Akaike information criterion, the Schwarz criterion and the Hannan-Quinn criterion. The independent variables were removed one at a time, based on the least statistically significant item in each model, to ensure that the impact of each removal on the adequacy of the model could be measured. The following independent variables were removed (in the order listed) to achieve the best fit set of independent variables based on the optimisation criteria:

- percentage of NEDs;
- percentage of females;
- average other NED remuneration as a percentage of CEO guaranteed remuneration;
- diversity of board experience;
- average age; and
- diversity of professional experience.

The removal of non-significant variables was continued until the highest McFadden R^2 ratio and the highest Likelihood Ratio or the lowest model selection criteria (Akaike information criterion, the Schwarz criterion and the Hannan-Quinn criterion), that is up to the point where these no longer improved were obtained. This led to the best fit model depicted in Table 6-12. The following model was used in the final analysis:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 BS_{it} + \beta_2 PI_{it} + \beta_3 PB_{it} + \beta_4 PS_{it} + \beta_5 RC_{it} + \beta_6 PG_{it} + \beta_7 CR_{it} + \beta_8 AD_{it} + \beta_9 DT_{it} + \beta_{10} AF_{it} + \beta_{11} AT_{it} + \beta_{12} EL_{it} + \beta_{13} ED_{it} \quad (6.7)$$

Table 6-12: Best fitting model (Shareholder return)

Variable	Beta coefficient	Standard error	z-statistic	Odds ratio
Constant	4.660	2.090	2.230	
Board size	.041	.055	.755	1.042
Percentage of independent NEDs	-1.455**	.597	-2.439	.233
Percentage of black persons	-.608	.782	-.778	.544
Percentage of South Africans	.649	.744	.871	1.914
Relative CEO remuneration movement (categorised)	-1.047***	.167	-6.278	.351
Payment gap	.0114**	.004	2.558	1.011
Chairman remuneration as a percentage of CEO guaranteed remuneration	1.398**	.579	2.415	4.047
Age diversity	-.055	.054	-1.030	.946
Diversity of tenure	-.151***	.057	-2.650	.860
Academic diversity (per field)	-1.166	.843	-1.384	.312
Academic diversity (qualification type)	-1.670	1.989	-.839	.188
Relative education level of board	.080**	.038	2.106	1.083
Average board experience	-.774**	.393	-1.970	.461

*** Significant at the .01 level, ** Significant at the .05 level.
Source: EViews output

The model fit statistics for the best fit model, depicted in Table 6-12, in comparison with the original model, depicted in Table 6-11, are set out in Table 6-13.

Table 6-13: Model fit statistics - Shareholder return

Statistic	Initial model with all independent variables	Best fitting model	Finding
Likelihood Ratio	71.1806, p = .0000	72.2763, p = .0000	Adequate fit
Classification hit rate increase: Proportional by chance	35.57%	32.89%	Reasonable fit
McFadden R^2	.1615	.1614	Moderate fit
Hosmer Lemeshow Andrew	2.9923, p = .9348 4.2982, p = .9329	5.5934, p = .6927 6.6326, p = .7596	Adequate fit Adequate fit
Akaike information criterion Schwartz criterion Hannan-Quinn criterion	1.2842 1.5203 1.3785	1.2458 1.4092 1.3110	

Source: EViews output

The adequacy of the models is supported by most of the model fit statistics, even though McFadden R^2 decreased very slightly for the best fit model, by only .0001 and the LR statistic increased from 71.1806 to 72.2763. The probabilities of the Likelihood Ratio are well below the threshold of p = .05 for both models. The Hosmer-Lemeshow and Andrew statistic at probabilities of .9348 and .9329 respectively for the initial model and .6927 and .7596 respectively for the best fitting model (this should be above p = .05 to be acceptable), also provide enough evidence to accept that the models fit adequately. In addition, even though the gain

from the model decreased from 35.57% to 32.89%, both models exceed the 25% threshold. As described in Section 5.6.2.3, a model needs to be at least 25% better than chance, that is, than a model without the independent variables, for it to be classified as a successful model. The table further indicates that the ultimate level of best fit was reached with the Akaike information criterion, the Schwartz criterion and the Hannan-Quinn criterion at the lowest values .Therefore, it is reasonable to accept that the best fitting model, with the set of 13 of the original 19 independent variables, best predicts the odds of a company being a top performer in terms of relative shareholder return.

Based on the fit statistics and model results, the null research hypothesis (**H_{0A})** is not supported for the following board characteristics: *Relative CEO remuneration movement*, *payment gap, chairman remuneration as a percentage of CEO guaranteed remuneration* and *relative education level of board*. For the remaining board characteristics the research hypothesis (**H_{0A})** is supported. The acceptance/rejection of each of the statistical hypotheses is summarised in
Table 7-1 in Section 7.3.2.2

B. *Model results - Total return to shareholders*

As indicated in Table 6-12, a number of board characteristics emerged as statistically significant in influencing the dependent variable, at the 1%, 5% and 10% significance levels. The first independent variable, at a 1% significance level, is *relative CEO remuneration movement*, that is the level of movement in CEO remuneration relative to the level of the return to shareholders. The negative coefficient indicates that there is a negative relationship between the odds of a company being classified as a top-performing company based on the total return to shareholders as measured relative to the return of the company's specific sector and the relative CEO remuneration movement. In other words, a company where the relative movement of the CEO remuneration moves from a lower to a higher category (the categorisation is discussed in Section 6.3.2.3B is less likely to be classified as a top performer in terms of delivering shareholder return relative to the sector of the company. In fact, a company where the relative movement of the CEO

remuneration moves to a higher category is only .35 times as likely to be classified as a top-performing company in terms of shareholder return. Consequently, the statistical hypothesis **H_{0A7}** is rejected. This supports the notion that high levels of remuneration do not necessarily provide an effective motivation for increased performance and that CEO remuneration is not always based on merit (Chamorro-Premuzic, 2013; Cooper*, et al.*, 2009; Deysel & Kruger, 2015; Dorff, 2014).

The following independent variable in Table 6-12, at the 1% significance level, is *diversity of tenure*, which indicates a negative relationship to the odds of a company being classified as a top-performing company based on shareholder return. The greater the diversity of board tenure between board members, the less likely a company is to be categorised as a top performer in terms of shareholder return relative to the return of the sector within which the company operates. This supports the concern expressed by research that, while diversity of a board creates alternative views and perspectives, it may lead to conflict, non-cohesiveness and a lack of co-ordination of the board (Adams*, et al.*, 2015). The model shows that if the diversity of tenure increases by one unit, a company is .86 times as likely to be categorised as a top-performing company. Therefore, statistical hypothesis **H_{0A13}** is not rejected.

The first independent variable in Table 6-12, at a 5% significance level, is the *percentage of independent NEDs*. This variable is also at a 5% significance level. The model displays a negative relationship between the level of independent NEDs and the odds of a company being classified as a top-performing company based on shareholder return. In other words, companies with lower levels of independent NEDs are more likely to be classified as top-performing companies in terms of shareholder return relative to the return of the sector within which the company operates. The odds ratio indicates that, for each percentage point that the level of independent directors increases, a company is .23 times as likely to be classified as a top-performing company. As a result, statistical hypothesis **H_{0A3}** is not rejected. As discussed in Section 4.2.4, this may be the result of sacrificing company-specific knowledge in favour of director independence (Baysinger & Hoskisson, 1990; Tshipa, 2017; Weir & Laing, 2000).

Then, in Table 6-12, follows the *payment gap*, which shows a positive relationship to shareholder return. This indicates that larger payment gaps equate to higher odds of a company being classified as a top-performing company in terms of return to shareholders relative to the return of the sector. More specifically, for each multiple that the payment gap increases, a company is 1.01 times as likely to be categorised as a top performer. Consequently, statistical hypothesis $\mathbf{H_{0A8}}$ is rejected. However, even though the association is statistically significant the odds are just about one time, which indicates negligible odds that the payment gap will contribute to a company being classified as a top performing company based on its total return to shareholders. This is in line with the views from literature that employees are either not aware of the magnitude of the payment gap or do not have the ability or motivation to do something with the knowledge (Faleye*, et al.*, 2013). This may on the one hand be caused by factors such as the scarcity of jobs in South Africa, which makes it difficult for employees to react and run the risk of being dismissed if they underperform (behavioural theory (Gao, 2019)). On the other hand, it may be that there are not enough promotion opportunities in the current economic climate to work for (tournament theory - (Chen*, et al.*, 2014; Faleye*, et al.*, 2013; Gao, 2019)). Nevertheless, it remains a statistically significant contributor to the odds that a company is categorised as a top performing company. Therefore, it can be expected that once the prohibitive factors change it may have a bigger impact.

The next independent variable in Table 6-12, that shows a statistically significant association with the odds of a company being classified as a top-performing company based on return to shareholders is *chairman remuneration as a percentage of CEO guaranteed remuneration* at a 5% significance level. The coefficient indicates that there is a positive relationship between the level of the chairman's remuneration, as a percentage of the CEO's guaranteed remuneration, and the odds of a company being classified as a top-performing company based on total return to shareholders. This is as expected, since higher levels of remuneration are often necessary to attract the best quality candidates for the position (Hempel & Fay, 1994; Seegers*, et al.*, 2015). The model indicates that if the chairman

remuneration level increases by one unit, a company is 4.05 times as likely to be classified as a top performer in terms of shareholder return. Therefore, statistical hypothesis **H_{0A9}** is rejected.

Then as seen in Table 6-12, at the 5% significance level, follows the *relative education level of the board*. The coefficient indicates that there is a positive relationship between the level of the relative education of the board and the odds of a company being classified as a top-performing company based on shareholder return. That is, where the board has a relatively higher level of education, a company is 1.08 times as likely to be classified as a top-performing company in terms of shareholder return. As a result, statistical hypothesis **H_{0A17}** is rejected. This supports the views expressed in the literature review that higher levels of education make individuals more receptive to innovation, more tolerable of ambiguity and complex situations and reflect on their cognitive ability and skills. This leads to improved board performance and consequently improved return to shareholders (Dollinger, 1984; Kimberly & Evanisko, 1981; Smith*, et al.*, 1994; Talke*, et al.*, 2011; Wiersema & Bantel, 1992). However, it should be noted that the impact of this variable on the odds of a company being a top performing company is relatively small. So even though it is a positive contributor its effect if not significant. This may be that the inherent conservatism typical of people that study further (De Paola & Gioia, 2012), stifles the reasonable risk taking required to excel the financial performance of a company.

The final independent variable in Table 6-12 at the 5% significance level is *average board experience*, which indicates a negative relationship to the odds of a company being classified as a top-performing company based on shareholder return relative to the return of the specific sector. If the average board experience increases by one unit, the company in question is only .46 times as likely to be classified as a top-performing company in terms of shareholder return. As a consequence, statistical hypothesis **H_{0A18}** is not rejected. This supports the warning from the literature that the number of board seats held by directors should be limited, because too many board seats may impact their ability to fulfil their duties due the fact that they no longer have adequate time to commit to the business of the

company (Andres*, et al.*, 2013; Chiranga & Chiwira, 2014; Jackling & Johl, 2009; Mans-Kemp*, et al.*, 2018b).

The remainder of the statistical null hypotheses, relating to total shareholder return have not been rejected.

6.3.3.2 Binary Logistic Regression Model 2: Share price volatility

A. *Original and best fitting model - Share price movement volatility*

The second logistic regression model is run with the relative *share price volatility* as the dependent variable. The following model was used in the analysis:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PI_{it} + \beta_4 PB_{it} + \beta_5 PF_{it} + \beta_6 PS_{it} + \beta_7 RC_{it} + \beta_8 PG_{it} + \beta_9 CR_{it} + \beta_{10} NR_{it} + \beta_{11} AA_{it} + \beta_{12} AD_{it} + \beta_{13} DT_{it} + \beta_{14} AF_{it} + \beta_{15} DP_{it} + \beta_{16} AT_{it} + \beta_{17} EL_{it} + \beta_{18} BE_{it} + \beta_{19} ED_{it} \quad (6.8)$$

Where:

π = the probability of a company being categorised as a top performer in terms of its relative share price volatility.

α = constant

$_{it}$ = company i at time t

The codes representing the independent variables are defined in Table 1-2 in Section 1.5.3. The results of the data analysis are presented in Table 6-14.

Table 6-14: Binary logistic regression (Share price volatility)

Variable	Beta coefficient	Standard error	z-statistic
Constant	-9.861	5.079	-1.942
Board size	.300***	.078	3.836
Percentage of NEDs (categorised)	-.355	.259	-.369
Percentage of independent NEDs	-0146	.787	-.185
Percentage of black persons	.258	1.045	.247
Percentage of females	2.610	1.624	1.607
Percentage of South Africans	-.811	.863	-.940
Relative CEO remuneration movement	-.066	.065	-1.012
Payment gap	.010	.006	1.582
Chairman remuneration as a percentage of CEO guaranteed remuneration	.840	.711	1.181
Average other NED remuneration as a percentage of CEO guaranteed remuneration (categorised)	.898***	.223	4.025
Average age	.020	.044	.462
Age diversity	.102	.067	1.522
Diversity of tenure	.125	.078	1.601
Academic diversity (per field)	-.712	1.124	-.633
Diversity of professional experience	.831	4.687	.177
Academic diversity (qualification type)	-1.454	2.442	-.595
Relative education level of board	.062	.048	1.294
Average board experience	1.896***	.554	3.421
Diversity of board experience	-.037	1.016	-.036

*** Significant at the .01 level.
Source: EViews output

The model in Table 6-14, as the initial model containing all the original predictor variables, was improved in an attempt to establish the best fitting model in terms of predicting the dependent variable, as described in Section 6.3.3.1A.

The following independent variables were removed (in the order listed) to achieve the best fit set of variables:

- diversity of board experience;
- diversity of professional experience;
- percentage of independent NEDs;
- percentage of black persons; and
- average age.

The best fitting model with the final, optimal set of predictor variables, which resulted from the optimisation of the model selection criteria, is reflected in Table 6-15. The following model was used in the analysis:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PF_{it} + \beta_4 PS_{it} + \beta_5 RC_{it} + \beta_6 PG_{it} + \beta_7 CR_{it} + \beta_8 NR_{it} + \beta_9 AD_{it} + \beta_{10} DT_{it} + \beta_{11} AF_{it} + \beta_{12} AT_{it} + \beta_{13} EL_{it} + \beta_{14} BE_{it} \quad (6.9)$$

Table 6-15: Best fitting model (Share price volatility)

Variable	Beta coefficient	Standard error	z-statistic	Odds ratio
Constant	-8.510	2.552	-3.335	
Board size	.297***	.076	3.900	1.345
Percentage of NEDs (categorised)	-.336	.241	-1.394	.715
Percentage of females	2.565*	1.402	1.829	12.996
Percentage of South Africans	-.737	.787	-.936	.479
Relative CEO remuneration movement	-.068	.064	-1.064	.934
Payment gap	.010*	.006	.006	1.011
Chairman remuneration as a percentage of CEO guaranteed remuneration	.835	.703	1.188	2.306
Average other NED remuneration as a percentage of CEO guaranteed remuneration (categorised)	.906***	.217	4.173	2.476
Age diversity	.104	.067	1.564	1.110
Diversity of tenure	.134*	.070	1.898	1.143
Academic diversity (per field)	-.461	1.010	-.456	.631
Academic diversity (qualification type)	-1.44	2.372	-.607	.237
Relative education level of board	.064	.042	1.504	1.066
Average board experience	1.940***	.487	3.984	6.962

*** Significant at the .01 level, * Significant at the .10 level.
Source: EViews output

As shown in Table 6-15, three of the predictor variables are statistically significant at the 1% level and three of the variables are significant at the 10% level. The model fit statistics for the best fitting model, depicted in Table 6-15, in comparison with the original model, depicted in Table 6-14, are set out in Table 6-16.

Table 6-16: Model fit statistics - Share price volatility

Statistic	Initial model with all independent variables	Best fitting model	Finding
Likelihood Ratio	121.9944, p = .0000	121.688, p = .0000	Adequate fit
Classification hit rate increase: Proportional by chance	47.06%	47.90%	Reasonable fit
McFadden R^2	.3150	.3142	Moderate fit
Hosmer Lemeshow	5.2114, p = .7348	6.6400, p = .5759	Adequate fit
Andrew	8.6359, p = .5670	10.6205, p = .3878	Adequate fit
Akaike information criterion	1.0713	1.0373	
Schwartz criterion	1.3276	1.2295	
Hannan-Quinn criterion	1.1740	1.1143	

Source: EViews output

The adequacy of the models is supported by all the fit statistics. It is worth noting that the optimisation led to a reduction in McFadden R^2 and the LR statistic, however, the reduction is marginal. The probability of the Likelihood Ratio is well below the statistical significance level of p = .05 for both models. The Hosmer-Lemeshow and Andrew statistics at probabilities of .7348 and .5670 respectively for the initial model and .5759 and .3878 respectively for the best fit model (this should be above p = .05 to be acceptable) also provide enough evidence to accept that the models fit adequately. In addition, while the gain from the model increased slightly from 47.06% in the original model to 47.90% in the optimised model, both models exceed the 25% threshold. As described in Section 5.6.2.3, a model needs to be at least 25% better than chance, that is, than a model without the independent variables, for it to be classified as a successful model. Table 6-16 also indicates that optimisation was reached with the Akaike information criterion, the Schwartz criterion and the Hannan-Quinn criterion at the lowest levels. Therefore, it is reasonable to accept that the best fitting model, with the set of 14 of the original 19 independent variables, best predicts the odds of a company being a top performer in terms of share price volatility.

Based on the fit statistics and the regression model results, the null research hypothesis (**H_{0B}**) is not supported for the following board characteristics: *Board size, % females, payment gap, average other NED remuneration as a percentage of CEO guaranteed remuneration, diversity of tenure and average board experience*. For the remaining board characteristics the research hypothesis (**H_{0B}**) is supported. As can be seen from the binary logistic regression models, a number of board characteristics emerged as having a statistically significant relationship with the odds that a company's share price movement volatility ranks within the top 25% or bottom 25% of companies. In other words, companies with the lowest volatility, and therefore risk, are classified as a top 25% company. The acceptance/rejection of each of the statistical hypotheses is summarised in
Table 7-1 in Section 7.3.2.2

B. *Model results - Share price volatility*

As stated before, from Table 6-15 , three of the board characteristics transpired as statistically significant at the 1% significance level and three at the 10% significance level in influencing the dependent variable. The first independent variable, at a 1% significance level, is *board size*, which shows a positive relationship to the odds of a company being classified as a top-performing company based on the share price volatility as measured relative to the average volatility of the sector. This indicates that larger board sizes equate to higher odds of a company being classified as a top-performing company relative to the average volatility of the sector. In other words, as a company ranking among companies with the lowest share price volatility. This shows that a larger board, in line with resource dependency theory, is more likely to better equip a company to manage the risk that a company faces (Arzubiaga*, et al.*, 2018; Dalton*, et al.*, 1999; Marlin & Geiger, 2012; Sanders & Carpenter, 1998; Young & Roberts, 2008; Yusoff & Alhaji, 2012). More specifically, for each additional board member, a company is 1.35 times as likely to be categorised as a company that achieves superior performance in terms of share price movement volatility, in other words among the lowest share price volatility. Consequently, statistical hypothesis $\mathbf{H_{0B1}}$ is rejected.

Next, in Table 6-15, follows the *average of other NED remuneration as a percentage of CEO guaranteed remuneration*. The coefficient indicates that there is a positive relationship between the average level of the other NEDs' remuneration, as a percentage of the CEO's guaranteed remuneration, and the odds of a company achieving among the lowest share price volatility relative to the average of the sector it operates in. In other words, where the average of other NED remuneration increases by 1% relative to the CEO's guaranteed remuneration, a company is 2.48 times as likely to be classified as a top performing company. That is a company that achieves a lower share price volatility relative to the average share price volatility for the sector it operates in. Therefore, statistical hypothesis $\mathbf{H_{0B10}}$ is rejected. This is plausible, because higher remuneration of the NEDs should enable a company to attract better quality people, who, in turn, should be

better able to manage the risk of the company (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017; Hempel & Fay, 1994).

The final independent variable in Table 6-15, at the 1% significance level, is *average board experience*, which indicates a positive relationship to the odds of a company being classified as a top-performing company based on the share price volatility as measured relative to the average volatility of the sector. Board experience enables directors to provide better strategic direction and multiple directorships may well be an indication of a NED's quality, which reflects positively on a company, thereby reducing the volatility in reaction of the market towards such a company (Dou*, et al.*, 2015; Ferris*, et al.*, 2003; Gray & Nowland, 2013; Hillman & Dalziel, 2003; Mans-Kemp*, et al.*, 2018b; Reguera-Alvarado & Bravo, 2017). Consequently, the higher the level of experience as board members (in terms of the number of current and previous board seats), the more likely a company is to be categorised as a company achieving among the lowest share price volatility relative to the average volatility of the sector within which the company operates. To be more specific, if the board experience increases by one unit, a company is 6.96 times as likely to be a company that rank as top-performing company in terms of share price movement volatility, that is being a company with a low share price volatility. As a result, statistical hypothesis $\mathbf{H_{0B18}}$ is rejected.

Three variables in Table 6-15 are statistically significant at the 10% significance level. The first variable is *percentage of females*. Females are said to be less aggressive, daring, competitive and more risk averse than their male counterparts (Dickason & Swanepoel, 2018; Eagly*, et al.*, 2003; Viviers*, et al.*, 2017). Therefore, it is not surprising that the model indicates a positive relationship between the percentage of females on the board and the odds of a company being classified as a top-performing company in terms of its share price volatility relative to the average volatility of the specific sector. If the percentage of females on the board increases by 1%, the company in question is 13.00 times as likely to be classified as a company achieving a lower share price movement volatility. Consequently, statistical hypothesis $\mathbf{H_{0B5}}$ is rejected.

The second variable in Table 6-15, at the 10% significance level, is *payment gap*, which indicates a positive relationship to the odds of a company being classified as a top-performing company based on its share price volatility, measured relative to the average volatility of the specific sector. This indicates that larger payment gaps equate to higher odds of a company being ranked among companies with the lowest share price volatility relative to the average volatility of the sector. The model results indicate that for each multiple that the payment gap increases, a company is 1.01 times as likely to be categorised as a company with low share price volatility. Statistical hypothesis **H_{0B8}** is rejected. Again, the resulting odds is very small at just about one time. This means that even if the payment gap is statistically significant, its contribution to the odds that a company is classified as a top performing company based on its share price movement volatility is minimal. Literature explains that employees are either uniformed as to the size of the payment gap or they are unable or unmotivated to take action (Faleye*, et al.*, 2013). This may be as a result of fear of being laid-off if they shirk their duties (behavioural theory (Gao, 2019)) or there may not be opportunities to work for promotion (tournament theory - (Chen*, et al.*, 2014; Faleye*, et al.*, 2013; Gao, 2019)) The positive association may be a result of the fact that the market responds favourably when companies can report that their costs are well under control, which leads to lower volatility. With salaries and wages being one of the largest cost items for most companies, it is often a key focus area for management to contain or reduce cost. Lower-paid staff typically suffer the brunt of these actions and to aggravate the situation, the improved profitability as a result of these actions often lead to further rewards for top management in the form of bonuses and other incentive schemes. The fact remains that payment gap is a statistically significant contributor to the odds that a company is categorised as a top performing company. It is reasonable to presume that in the event that the situation changes it may have a bigger impact, but should be studied in future research.

The third variable, in Table 6-15, that stands out at the 10% significance level is *diversity of tenure*, which indicates a positive relationship to the odds of a company being classified as a top-performing company based on share price volatility relative to the average volatility of the specific sector. If length of service diversity increases

by one unit, the company in question is 1.14 times as likely to be classified as a company achieving among the lowest share price movements. Consequently, statistical hypothesis **H_{0B13}** is rejected. Length of service of the director gives various signals to the market (Daily & Dalton, 1995). Short tenures, that is regular change, may be an indication of forthcoming change, to which the market may react positively or negatively. Longer tenures allow directors to develop in-depth knowledge of a company's business (Reguera-Alvarado & Bravo, 2017). However, in contrast, directors with lengthy tenures may be seen as becoming ineffective in fulfilling their monitoring role or providing proper strategic guidance (Dou, *et al.*, 2015). Consequently, a sufficient mix of tenures among directors will provide a balance between the benefits and messages to be obtained from different tenures, especially in managing the market's perception of a company. Even though diversity of tenures makes a positive contribution, it is not a critical characteristic to focus on when composing a board as indicated by the odds ratio, which is not much higher than one time.

The remainder of the statistical hypotheses, relating to share price volatility have not been rejected.

6.3.3.3 Binary Logistic Regression Model 3: Sharpe ratio

A. *Original and best fitting model - Sharpe ratio*

The third logistic regression model was run with the relative *Sharpe ratio* as the dependent variable. The following model was used in the analysis:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PI_{it} + \beta_4 PB_{it} + \beta_5 PF_{it} + \beta_6 PS_{it} + \beta_7 RC_{it} + \beta_8 PG_{it} + \beta_9 CR_{it} + \beta_{10} NR_{it} + \beta_{11} AA_{it} + \beta_{12} AD_{it} + \beta_{13} DT_{it} + \beta_{14} AF_{it} + \beta_{15} DP_{it} + \beta_{16} AT_{it} + \beta_{17} EL_{it} + \beta_{18} BE_{it} + \beta_{19} ED_{it} \quad (6.10)$$

Where:

π = the probability of a company being categorised as a top performer in terms of its relative Sharpe ratio.

α = constant

$_{it}$ = company i at time t

The codes representing the independent variables are defined in Table 1-2 in Section 1.5.3. The results of the data analysis are reflected in Table 6-17.

Table 6-17: Binary logistic regression (Sharpe ratio)

Variable	Beta coefficient	Standard error	z-statistic
Constant	5.778	3.324	1.738
Board size	-.002	.054	-.037
Percentage of NEDs	-.246	1.315	-.187
Percentage of independent NEDs	-.297	.652	-.456
Percentage of black persons	.556	.813	.684
Percentage of females	-2.376*	1.332	-1.784
Percentage of South Africans	-.430	.730	-.589
Relative CEO remuneration movement (categorised)	-.865***	.158	-5.463
Payment gap	.0164***	.004	3.722
Chairman remuneration as a percentage of CEO guaranteed remuneration	1.004*	.601	1.669
Average other NED remuneration as a percentage of CEO guaranteed remuneration (categorised)	.400**	.166	2.409
Average age	-.049	.036	-1.364
Age diversity	-.000	.056	-.006
Diversity of tenure	-.046	.059	-.779
Academic diversity (per field)	.114	.858	.132
Diversity of professional experience	-3.704	2.866	-1.292
Academic diversity (qualification type)	.506	2.026	.250
Relative education level of board	-.003	.039	-.083
Average board experience	.590	.428	1.379
Diversity of board experience	-.633	.851	-.744

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews output

The model in Table 6-17, as the initial model containing all the original predictor variables, was improved in an attempt to establish the best fitting model in terms of predicting the dependent variable, as described in Section 6.3.3.1A.

The following independent variables were removed (in the order listed) to achieve the best fit set of variables:

- age diversity;

- board size;
- relative education level of the board;
- academic diversity (per field);
- percentage of NEDs;

The final, best fit set of predictor variables and the results of the final model, obtained by optimising the model fit statistics and/or selection criteria by removing statistically insignificant variables, are reflected in Table 6-18. The following model was used in the analysis:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 PI_{it} + \beta_2 PB_{it} + \beta_3 PF_{it} + \beta_4 PS_{it} + \beta_5 RC_{it} + \beta_6 PG_{it} + \beta_7 CR_{it} + \beta_8 NR_{it} + \beta_9 AA_{it} + \beta_{10} DT_{it} + \beta_{11} DP_{it} + \beta_{12} AT_{it} + \beta_{13} BE_{it} + \beta_{14} ED_{it} \quad (6.11)$$

Table 6-18: Best fitting model (Sharpe ratio)

Variable	Beta coefficient	Standard error	z-statistic	Odds ratio
Constant	5.589	2.993	1.867	
Percentage of independent NEDs	-.288	.628	-.459	.750
Percentage of black persons	.537	.733	.732	1.711
Percentage of females	-2.414*	1.315	-1.836	.089
Percentage of South Africans	-.439	.692	-.635	.645
Relative CEO remuneration movement (categorised)	-.865***	.157	-5.514	.421
Payment gap	.016***	.004	3.848	1.016
Chairman remuneration as a percentage of CEO guaranteed remuneration	1.035*	.579	1.788	2.815
Average other NED remuneration as a percentage of CEO guaranteed remuneration (categorised)	.402**	.165	2.431	1.495
Average age	-.049	.032	-1.529	.952
Diversity of tenure	-.047	.056	-.841	.954
Diversity of professional experience	-3.567	2.746	-1.299	.028
Academic diversity (qualification type)	.447	1.859	.240	1.564
Average board experience	.548	.384	1.426	1.730
Diversity of board experience	-.647	.822	-.787	.524

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews output

As shown in Table 6-18, a number of predictor variables are statistically significant at the 1%, 5% and 10% significance levels. The model fit statistics for both the initial model (Table 6-17) and the best fitting model (Table 6-18) are shown in Table 6-19.

Table 6-19: Model fit statistics - Sharpe ratio

Statistic	Initial model with all independent variables	Best fitting model	Finding
Likelihood Ratio	63.4524, p = .0000	63.3910, p = .0000	Adequate fit
Classification hit rate increase: Proportional by chance	30.72%	32.53%	Reasonable fit
McFadden R^2	.1343	.1342	Moderate fit
Hosmer Lemeshow Andrew	5.6150, p = .6903 7.6505, p = .6629	8.0851, p = .4252 9.4656, p = .4886	Adequate fit Adequate fit
Akaike information criterion Schwartz criterion Hannan-Quinn criterion	1.3168 1.5416 1.4064	1.2877 1.4562 1.3548	

Source: EViews output

The adequacy of the models is supported by the fit statistics. It is worth noting that the optimisation led to a slight reduction in McFadden R^2 and the LR Statistic; however, the reduction is considered to be very marginal. The probability of the Likelihood Ratio is well below the statistical significance level of p = .05 for both models. The Hosmer-Lemeshow and Andrew statistics at probabilities of .6903 and .6629 respectively for the initial model and .4252 and .4886 respectively for the optimised model provide enough evidence to accept that the models are adequate fits. In addition, while the gain from the model increased from 30.72% for the initial model to 32.53% for the best fit model, both models exceed the 25% threshold. It is only the McFadden R^2 that indicates a moderate fit. Table 6-19 further indicates that the ultimate level of optimisation was reached with the Akaike information criterion, the Schwartz criterion and the Hannan-Quinn criterion at the lowest levels. Therefore, it is reasonable to accept that the best fitting model, with the set of 14 of the original 19 independent variables, best predicts the odds of a company being a top performer in terms of the Sharpe ratio.

Based on the fit statistics and the binary logistic regression model results, the research hypothesis ($\mathbf{H_{0C}}$) is not supported for the following board characteristics: *% females, relative CEO remuneration movement, payment gap, chairman remuneration as a percentage of CEO guaranteed remuneration and average other NED remuneration as a percentage of CEO guaranteed remuneration*. For the remaining board characteristics, the research hypothesis ($\mathbf{H_{0C}}$) is supported. A number of board characteristics were found to be statistically significant in determining whether a company's risk-adjusted return ranks in the top 25% or

bottom 25% of companies. The acceptance/rejection of each of the statistical hypotheses is summarised in
Table 7-1 in Section 7.3.2.2.

B. *Model results - Sharpe ratio*

As mentioned before, from Table 6-18, a number of the board characteristics stand out as statistically significant, at the 1%, 5% and 10% significance levels, in influencing the dependent variable. The first independent variable, at a 1% significance level, is the *relative CEO remuneration movement*, that is the level of movement in CEO remuneration relative to the level of the return to shareholders. The negative coefficient indicates that there is a negative relationship between the odds of a company being classified as a top-performing company based on the Sharpe ratio, as measured relative to the average Sharpe ratio of the company's specific sector, and the relative CEO remuneration movement. In other words, companies where the relative CEO remuneration movement moves from a lower to a higher category are less likely to be a top-performing company in terms of achieving a Sharpe ratio above the average Sharpe ratio for the sector of the company. In fact, a company where the relative CEO remuneration movement moves to a higher category is .42 times as likely to be classified as a top-performing company. Consequently, statistic hypothesis $\mathbf{H_{0C7}}$ is rejected. In Section 6.3.3.1, a similar relationship was found with the odds of a company being classified as a top-performing company based on shareholder return, while it did not show statistical significance in the relationship with the odds of a company being classified as a top-performing company based on share price volatility. Therefore, the finding here is reasonable. This finding further confirms the statement that CEO remuneration is not always based on merit (Bhagat & Black, 1999; Deysel & Kruger, 2015; Ferreira, 2010; Seegers*, et al.*, 2013). It also shows that it does not necessarily serve as an efficient incentive to align the objectives of management with those of shareholders and does not necessarily promote improved performance (Chamorro-Premuzic, 2013; Cooper*, et al.*, 2009; Deysel & Kruger, 2015).

Then, in Table 6-18, follows the *payment gap* at a 1% significance level, which shows a positive relationship to the odds of a company being classified as a top-performing company based on the Sharpe ratio. The positive relationship indicates that larger payment gaps equate to higher odds of a company achieving a superior Sharpe ratio relative to the average for the sector it operates in. More specifically, for each multiple that the payment gap increases, a company is 1.02 times as likely to be categorised as a top performer in terms of the Sharpe ratio. As a result, statistical hypothesis $\mathbf{H_{0C8}}$ is rejected. As for the previous two measures the impact of the payment gap on the odds that a company is categorised as a top performing company based on the Sharpe ratio, is very small at odds marginally above one. Literature explains that either the extent of the payment gap is not clear to staff members or they are inhibited from acting if they are aware (Faleye*, et al.*, 2013). On the one hand, according to behavioural theory a large payment gap could result in workers under performing, however, concerns of becoming unemployed, given South Africa's high unemployment rate, may discourage staff from this reaction (Gao, 2019). On the other hand, tournament theory suggests that people will be inspired to work harder in an effort to move up in the organisation, to the high paying jobs. However, the economic climate in South Africa over the past number of years may not have offered many chances to do this (Chen*, et al.*, 2014; Faleye*, et al.*, 2013; Gao, 2019). The positive relationship to an extent, explains why the perception exists that high-level performance can only be achieved by incentivising top management. The positive relationship between the payment gap and the odds of a company being classified as a top performing company sheds some light on the inequality issues in South Africa, as discussed in Section 3.4.1. This provide some evidence of the fact that most of the performance enhancement initiatives tend to be significantly biased in favour of top management, which contributes to the inequality.

The variable in Table 6-18 that stands out at a 5% significance level is *average of other NED remuneration as a percentage of CEO guaranteed remuneration*. The coefficient indicates that there is a positive relationship between the average level of the other NED remuneration, as a percentage of the CEO's guaranteed remuneration, and the odds of a company achieving a superior Sharpe ratio. In

other words, where the average of other NED remuneration relative to the CEO's guaranteed salary increases from a lower to higher category, a company is 1.50 times as likely to be classified as a top-performing company, that is a company that achieves a superior Sharpe ratio relative to the sector it operates in. Statistical hypothesis **H_{0C10}** is therefore rejected. This is expected, because this variable showed a positive relationship to the odds of a company being classified as a top-performing company based on both shareholder return (albeit insignificant) and share price volatility. In addition, it is important for companies to attract the best candidates to serve on their boards and a willingness to pay higher fees should contribute to attracting and retaining persons with the right skills and experience (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017). However, care should be taken to ensure that the level of remuneration does not jeopardise the independence of the NEDs, that is if their remuneration reaches levels where they are afraid they would lose too much if they are removed due to deemed non-cooperation or making unpopular decisions (Hempel & Fay, 1994).

Two variables in Table 6-18 stand out as significant at the 10% significance level. The first is *percentage of females* on the board, which indicates a negative relationship with the odds of a company being classified as a top-performing company based on the Sharpe ratio. If the number of females increases by 1%, the company in question is .09 times as likely to be classified as a top-performing company. Statistical hypothesis **H_{0C5}** is consequently rejected. Even though the less daring and less competitive nature of females (Eagly*, et al.*, 2003; Viviers*, et al.*, 2017), combined with their higher aversion to risk (Dickason & Swanepoel, 2018), may lead to lower volatility in a company's share price, it appears to have a disproportionately negative association with the performance of a company. In other words, the conservative nature of female seems to a have bigger impact in terms of reducing shareholder return than it has in terms of reducing risk, hence the risk-adjusted return shows a negative association.

The second variable in Table 6-18 at the 10% significance level is *chairman remuneration as a percentage of CEO guaranteed remuneration*. This variable depicts a positive relationship with the odds of a company being classified as a top-

performing company based on the dependent variable. That is, for every 1% that the chairman receives more relative to the CEO's guaranteed remuneration level, a company is 2.82 times as likely to be classified as a top-performing company in terms of attaining a Sharpe ratio that is higher than the average Sharpe ratio for that sector. As a result, statistical hypothesis **H_{0C9}** is therefore rejected. This was expected, due to the effort required by the position as well as the high levels of risk and responsibility that come with the role (Seegers*, et al.*, 2015). Relatively higher levels of remuneration should improve the appeal of a company and consequently, enhance its chances of obtaining its preferred applicants when looking for appropriately qualified candidates (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017).

The remainder of the statistical hypotheses, relating to the Sharpe ratio have not been rejected.

6.3.3.4 Binary Logistic Regression Model 4: Current ratio

A. *Original and best fitting model - Current ratio*

The fourth logistic regression model was run with the relative *current ratio* as the dependent variable. The following model was used in the analysis:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PI_{it} + \beta_4 PB_{it} + \beta_5 PF_{it} + \beta_6 PS_{it} + \beta_7 RC_{it} + \beta_8 PG_{it} + \beta_9 CR_{it} + \beta_{10} NR_{it} + \beta_{11} AA_{it} + \beta_{12} AD_{it} + \beta_{13} DT_{it} + \beta_{14} AF_{it} + \beta_{15} DP_{it} + \beta_{16} AT_{it} + \beta_{17} EL_{it} + \beta_{18} BE_{it} + \beta_{19} ED_{it} \quad (6.12)$$

Where:

π = the predicted probability of a company being categorised as a top performer in terms of its relative current ratio.

α = constant

$_{it}$ = company i at time t

The codes representing the independent variables are defined in Table 1-2 in Section 1.5.3. The results of the data analysis are reflected in Table 6-20.

Table 6-20: Binary logistic regression (Current ratio)

Variable	Beta coefficient	Standard error	z-statistic
Constant	-1.196	4.268	-.280
Board size (categorised)	-.435	.205	-2.118**
Percentage of NEDs	.801	1.652	.485
Percentage of independent NEDs	-1.164	.737	-1.579
Percentage of black persons (categorised)	-.970	.268	-3.622***
Percentage of females	1.310	1.565	.837
Percentage of South Africans	2.069	.876	2.363**
Relative CEO remuneration movement	-.049	.053	-.919
Payment gap	.014	.005	2.785***
Chairman remuneration as a percentage of CEO guaranteed remuneration	-.566	.724	-.781
Average other NED remuneration as a percentage of CEO guaranteed remuneration (categorised)	1.831	2.237	.818
Average age	-.056	.042	-1.338
Age diversity (categorised)	.159	.205	.776
Diversity of tenure	.109	.068	1.594
Academic diversity (per field)	.597	1.017	.587
Diversity of professional experience	11.108	3.785	2.935***
Academic diversity (qualification type)	-3.928	2.368	-1.659*
Relative education level of board	-.028	.043	-.656
Average board experience	-.548	.568	-.965
Diversity of board experience	-1.789	1.051	-1.702*

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews output

The model in Table 6-20, as the initial model containing all the original predictor variables, was optimised in an attempt to establish the best fit model in terms of predicting the dependent variable, as described in Section 6.3.3.1A. The following independent variables were removed (in the order listed) to achieve the best fit set of variables:

- percentage of NEDs;
- academic diversity (per field);
- relative education level of the board; and
- age diversity.

The final, best fit set of predictor variables and the results of the final model, obtained by optimising the model fit statistics and/or selection criteria by removing statistically insignificant variables, are reflected in
Table 6-21. The following model was used in the analysis:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 BS_{it} + \beta_2 PI_{it} + \beta_3 PB_{it} + \beta_4 PF_{it} + \beta_5 PS_{it} + \beta_6 RC_{it} + \beta_7 PG_{it} + \beta_8 CR_{it} + \beta_9 NR_{it} + \beta_{10} AA_{it} + \beta_{11} DT_{it} + \beta_{12} DP_{it} + \beta_{13} AT_{it} + \beta_{14} BE_{it} + \beta_{15} ED_{it} \quad (6.13)$$

Table 6-21: Best fitting model (Current ratio)

Variable	Beta coefficient	Standard error	z-statistic	Odds ratio
Constant	.185	4.009	.046	
Board size (categorised)	-.418	.198	-2.111**	.658
Percentage of independent NEDs	-1.219	.732	-1.664*	.296
Percentage of black persons (categorised)	-.923	.241	-3.830***	.397
Percentage of females	1.423	1.532	.928	4.150
Percentage of South Africans	1.915	.828	2.313**	6.787
Relative CEO remuneration movement	-.043	.052	-.812	.958
Payment gap	.014	.005	2.900***	1.014
Chairman remuneration as a percentage of CEO guaranteed remuneration	-.509	.699	-.727	.601
Average other NED remuneration as a percentage of CEO guaranteed remuneration (categorised)	1.900	2.191	.867	6.686
Average age	-.036	.038	-.956	.965
Diversity of tenure	.092	.065	1.415	1.096
Diversity of professional experience	10.113	3.620	2.793***	24 661.534
Academic diversity (qualification type)	-4.776	2.132	-2.240**	.008
Average board experience	-.662	.528	-1.253	.516
Diversity of board experience	-1.892	1.032	-1.834*	.151

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews output

The model fit statistics for both the initial model (Table 6-20) and the optimised model (Table 6-21) are shown in Table 6-22.

Table 6-22: Model fit statistics - Current ratio

Statistic	Initial model with all independent variables	Best fitting model	Finding
Likelihood Ratio	84.886, p = .000	83.571, p = .000	Adequate fit
Classification hit rate increase: Proportional by chance	45.65%	42.03%	Reasonable fit
McFadden R^2	.218	.215	Moderate fit
Hosmer Lemeshow	3.8119, p = .8737	9.0469, p = .3384	Adequate fit
Andrew	6.7374, p = .7500	11.030, p = .3552	Adequate fit
Akaike information criterion	1.2262	1.2025	
Schwartz criterion	1.4852	1.4096	
Hannan-Quinn criterion	1.3301	1.2855	

Source: EViews output

Table 6-22 indicates that the ultimate level of fit was reached with the Akaike information criterion, the Schwartz criterion and the Hannan-Quinn criterion at the

lowest levels. The adequacy of the models is supported by the fit statistics. It is worth noting that the optimisation led to a slight reduction in McFadden R^2 and the LR Statistic; however, the reduction is marginal. The probability of the Likelihood Ratio is well below the statistical significance level of $p = .05$ for both models. The Hosmer-Lemeshow and Andrew statistics at probabilities of .8737 and .7500 respectively for the initial model and of .3384 and .3552 respectively for the best fit model, also provide enough evidence to accept that the models fit adequately. In addition, even though the gain from the model decreased from 45.65% to 42.03% both models exceed the 25% threshold (this is described in more detail in Section 5.6.2.3). Therefore, it is reasonable to accept that the best fitting model, with the set of 15 of the original 19 independent variables, best predicts the odds of a company being a top performer in terms of the current ratio.

Based on the fit statistics and the regression model results, the research hypothesis (**H_{0D})** is not supported for the following board characteristics: *Board size, % black persons, % South Africans and payment gap*. For the remaining board characteristics, the research hypothesis **(H_{0D}**) is supported. A number of board characteristics were found to be statistically significant in determining the odds that a company's current ratio ranks in the top 25% or bottom 25% of companies relative to the average of the sector the company operates in. The acceptance/rejection of each of the statistical hypotheses is summarised in
Table 7-1 in Section 7.3.2.2.

B. *Model results - Current ratio*

As mentioned before, a correlation was observed between the results of the current ratio binary logistic model and the cash conversion cycle binary logistic model, for some of the independent variables. As described in Section 4.4.1 literature alluded to the possibility of such a phenomenon. The results of these two regression models are therefore discussed collectively in Section 6.3.3.5B, to avoid unnecessary repetition.

6.3.3.5 Binary Logistic Regression Model 5: Cash conversion cycle

A. *Original and best fitting model - Cash conversion cycle*

The fifth logistic regression model was run with the relative *cash conversion cycle* as the dependent variable. The following model was used in the analysis:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta_1 BS_{it} + \beta_2 PN_{it} + \beta_3 PI_{it} + \beta_4 PB_{it} + \beta_5 PF_{it} + \beta_6 PS_{it} + \beta_7 RC_{it} + \beta_8 PG_{it} + \beta_9 CR_{it} + \beta_{10} NR_{it} + \beta_{11} AA_{it} + \beta_{12} AD_{it} + \beta_{13} DT_{it} + \beta_{14} AF_{it} + \beta_{15} DP_{it} + \beta_{16} AT_{it} + \beta_{17} EL_{it} + \beta_{18} BE_{it} + \beta_{19} ED_{it} \quad (6.14)$$

Where:

π = the predicted probability of a company being categorised as a top performer in terms of its relative cash conversion cycle.

α = constant

$_{it}$ = company i at time t

The codes representing the independent variables are defined in Table 1-2 in Section 1.5.3. The results of the data analysis are reflected in Table 6-23.

Table 6-23: Binary logistic regression and best fitting model (Cash conversion cycle)

Variable	Beta coefficient	Standard error	z-statistic	Odds ratio
Constant	3.489	6.269	.557	
Board size	.220*	.118	1.866	1.246
Percentage of NEDs	-3.822*	2.206	-1.733	.022
Percentage of independent NEDs	.651	1.096	.593	1.917
Percentage of black persons	3.374**	1.530	2.205	29.195
Percentage of females	-1.063	2.483	-.428	.345
Percentage of South Africans	-6.711***	2.00	-3.355	.001
Relative CEO remuneration movement	-.012	.073	-.162	.988
Payment gap	.006	.007	.919	1.006
Chairman remuneration as a percentage of CEO guaranteed remuneration (categorised)	1.249***	.322	3.884	3.487
Average other NED remuneration as a percentage of CEO guaranteed remuneration	11.154***	3.950	2.824	69 842.641
Average age (categorised)	-.453	.383	-1.184	.636
Age diversity	-.222**	.108	-2.060	.801
Diversity of tenure (categorised)	.334	.326	1.022	1.397
Academic diversity (per field)	-.664	1.660	-.400	.515
Diversity of professional experience	5.291	4.932	1.073	198.542
Academic diversity (qualification type)	-5.782	4.181	-1.383	.003
Relative education level of board	-.183**	.076	-2.397	.833
Average board experience (categorised)	-.137	.445	-.307	.872
Diversity of board experience	4.250***	1.571	2.706	70.105

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level
Source: EViews output

The model in Table 6-23, as the initial model containing all the original predictor variables, was optimised in an attempt to establish the best fitting model in terms of predicting the dependent variable, as described in Section 6.3.3.1A. From this process, it became clear that there was no further optimisation to be gained by removing any of the non-significant variables. Consequently, the model in Table 6-23 represents the final, best fitting set of predictor variables.

The model fit statistics for the initial model, depicted in Table 6-23, are shown Table 6-24.

Table 6-24: Model fit statistics (Cash conversion cycle)

Statistic	Value	Finding
Likelihood Ratio	107.0623, p = .0000	Adequate fit
Classification hit rate increase: Proportional by chance	 50.91%	 Adequate fit
McFadden R^2	.4111	Adequate fit
Hosmer Lemeshow Andrew	14.0608, p = .0802 17.9057, p = .0566	Adequate fit Adequate fit

Source: EViews output

The adequacy of the model is supported by the fit statistics. The probability of the Likelihood Ratio is well below the statistical significance level of p = .05. The Hosmer-Lemeshow and Andrew statistics at probabilities of .0802 and .0566 respectively also provide enough evidence to accept that the model fits adequately. In addition, as can been seen from Table 6-24, the gain from the model is 50.91%, which exceeds the 25% threshold. Therefore, it is reasonable to accept that the best fitting model, with all of the original 19 independent variables, best predicts the odds of a company being a top performer in terms of the cash conversion cycle.

Based on the fit statistics and the regression model results, the research hypothesis (**H_{0E}**) is not supported for the following board characteristics: *Board size, % NEDs, % black persons, % South Africans, chairman remuneration as a percentage of CEO guaranteed remuneration, average other NED remuneration as a percentage of CEO guaranteed remuneration, age diversity and diversity of board experience*. For the remaining board characteristics, the research hypothesis (**H_{0E}**) is supported.

A number of board characteristics were found to be statistically significant in determining the odds that a company's cash conversion cycle ranks in the top 25% or bottom 25% of companies relative to the average of the sector the company operates in.

B. *Model results - Cash conversion cycle*

As mentioned in Section 6.3.3.4B correlations were found between the results of the current ratio binary logistic model and that of the cash conversion cycle for a number of the independent variables. Consequently, the results of the two models are discussed jointly in this section.

Table 6-21 and Table 6-23 indicate that a number of the board characteristics stand out as statistically significant, at the 1%, 5% and 10% significance levels, in association with the respective dependent variables. The first independent variable in Table 6-21, at a 1% significance level, is the *percentage of black persons*, which shows a negative relationship to the odds of a company being classified as a top-performing company based on the current ratio. This indicates that a higher percentage of black persons on a board equates to lower odds of a company achieving a higher current ratio relative to the average for the sector it operates in. More specifically, if the percentage of black persons moves from a lower to a higher category, a company is .40 times as likely to be categorised as a top performer in terms of the current ratio. Hence, statistical hypothesis **H_{0D4}** is rejected. In addition, in Table 6-23, at a 5% significance level, *percentage of black persons* showed a positive relationship between the percentage of black persons and the odds of a company being classified as a top-performing company based on its cash conversion cycle at a 5% significance level. In other words, where the percentage of black persons increases by 1%, a company is 29.20 times as likely to be classified as a top-performing company, that is, a company that achieves a superior cash conversion cycle relative to the sector it operates in. Consequently, statistical hypothesis **H_{0E4}** is rejected. The opposing results are in line with (Lyroudi & McCarty, 1993; Richards & Laughlin, 1980). The literature review indicated that

ethnic diversity would contribute to a company's ability to monitor management and to make decisions as required by agency theory. Furthermore, ethnic diversity, in line with resource dependency theory, would also contribute to a company's ability to link with its environment, thereby being in a position to attract much-needed resources (Ntim, 2015). Diversity also improves a board's ability to identify the needs and interests of different groups of stakeholders (Harjoto*, et al.*, 2018; Ntim, 2015). Ethnic diversity would contribute to a company's reputation and innovation ability due to the different experiences and viewpoints available to a company (Miller & Triana, 2009). In addition, greater ethnic diversity could be a means of gaining acceptance from the public and government that could contribute to the various elements of the cash conversion cycle, such as preferential payment terms (Fanto*, et al.*, 2011; Ferreira, 2010; Miller & Triana, 2009). The contribution made by an increase in percentage of black persons on a board to improve the cash conversion cycle may prove to decrease the current ratio.

Next, in Table 6-23, at 1% (cash conversion cycle - negative) and in Table 6-21 at 5% (current ratio - positive) significance levels, is *percentage of South Africans* on the board. The negative coefficient indicates that there is a negative relationship between the odds of a company being classified as a top-performing company based on the cash conversion cycle and the percentage of South Africans on the board. In other words, a company with a higher percentage of South Africans on the board is less likely to be a top-performing company in terms of achieving a cash conversion cycle that is better than the average cash conversion cycle for the sector of the company. In fact, a company where the percentage of South Africans on the board increases by 1% is .001 times as likely to be classified as a top-performing company. Statistical hypothesis $\mathbf{H_{0E6}}$ is therefore rejected. In contrast, a positive relationship emerged between the odds of a company being classified as a top-performing company based on the current ratio and the percentage of South African on a board. This indicates that an increase in the percentage of South Africans on the board equates to higher odds of a company achieving a higher current ratio relative to the average for the sector it operates in. More specifically, if the percentage of South Africans increases by 1%, a company is 6.79 times as likely to be categorised as a top performer in terms of the current ratio. As a result,

statistical hypothesis **H_{0D6}** is rejected. Literature advocates that foreign directors directly contribute to the diversity of the board, which could contribute to avoiding groupthink and the development of factions in the board (Lipton & Lorsch, 1992). Furthermore, Trautman (2012) and Harjoto*, et al.* (2018) state that the enhanced diversity may give rise to competitive advantages due to the different experiences, socio-economic outlook and different approaches to challenges. These factors may lead to the generation of new ideas and the creation of new opportunities because a more diverse team potentially brings a greater pool of knowledge, experience, skills and perspectives, which may improve the board's ability to solve problems (Harjoto*, et al.*, 2018; Trautman, 2012). Consequently, foreign directors may have more experience and innovative ideas on how to manage a company's working capital more aggressively. In addition, foreign directors may be able to assist companies in raising funds through their access to foreign equity and debt markets (Doidge*, et al.*, 2004), which may add to a company's liquidity, allowing a company to maintain less conservative internal liquidity levels. Based on the fact that the current ratio and the cash conversion cycle sometimes give opposite messages (Lyroudi & McCarty, 1993; Richards & Laughlin, 1980), it is reasonable to expect that an increase in the cash conversion cycle as a result of the lower levels of the foreign directors could lead to increased levels of the current ratio, with South African directors feeling more comfortable to maintain more conservative working capital levels.

Then, in Table 6-21, follows the *payment gap* at the 1% significance level (current ratio). The positive coefficient indicates that there is a positive relationship between the odds of a company being classified as a top-performing company in terms of managing its current ratio, as measured relative to the average current ratio of the company's specific sector, and the payment gap. In other words, a company with a higher payment gap is more likely to be a top-performing company in terms of achieving a current ratio above the average current ratio for the sector of the company. In fact, a company where the payment gap increases by one is 1.01 times as likely to be classified as a top-performing company. Statistical hypothesis **H_{0D8}** is rejected. As before the odds of 1.01 times indicates that the impact of the payment gap on the odds that a company is categorised as a top performing

company based on the current ratio, is small. Literature speculates that either staff members are unaware of the scale of the gap or they have a disinclination to react to this information (Faleye*, et al.*, 2013). Reaction comes in two forms according to literature. Firstly, behavioural theory suggests that an excessive payment gap may push staff to feeling exploited or unfairly treated and as a result deliver substandard work. Yet, the high unemployment rate in the country may dissuade staff to this, out of fear of losing their jobs (Gao, 2019). Secondly, according to tournament theory staff members are motivated by this disparity to put in more effort to get promoted to higher positions with the remuneration that comes with it. This effect may have been stifled by the scarcity of opportunities within the South African market in recent years (Chen*, et al.*, 2014; Faleye*, et al.*, 2013; Gao, 2019). The positive relationship, even though small, further contributes to the explanation of the inequality issues in South Africa, as discussed in Section 3.4.1, where higher-performing companies fail to manage the payment gap to more acceptable levels. This failure points to the fact that the perception exists that high-level company performance can only be achieved by incentivising top management, often at the cost of other employees. For example, where specific targets are set for the management of a company's liquidity, top management often stands to benefit disproportionally more than lower remunerated employees.

The next independent variable, in Table 6-23, that stands out as significant at a 1% level is the *chairman remuneration as a percentage of CEO's guaranteed remuneration*, which shows a positive relationship to the odds of a company being classified as a top-performing company based on the cash conversion cycle. This indicates that a higher relative chairman remuneration equates to higher odds of a company being classified as a top-achieving company in terms of its cash conversion cycle relative to the average for the sector it operates in. More specifically, if the chairman remuneration as a percentage of CEO guaranteed salary moves from a lower to a higher category, a company is 3.49 times as likely to be categorised as a top performer in terms of the cash conversion cycle. Consequently, statistical hypothesis $\mathbf{H_{0E9}}$ is rejected. There is a strong positive relationship between the NEDs' remuneration and the size and complexity of the company. In addition, it was found that chairman remuneration premiums were

lower in companies where the NEDs were more experienced and higher where the chairperson had company-specific experience (Bugeja*, et al.*, 2016; Hempel & Fay, 1994). Yazdanfar and Öhman (2014) state that cash conversion cycle management involves extensive planning and assessing of different financing options to improve performance. Therefore, it stands to reason that a chairman with superior experience would be better able to understand and guide more complex processes within a company, such as the cash conversion cycle. Such candidates come at a premium. In addition, a better remunerated chairman is expected to be more willing and able to dedicate adequate time and effort to his or her responsibilities (Fahlenbrach*, et al.*, 2017).

The following independent variable, in Table 6-23, that stands out as significant at a 1% level is the *average other NED remuneration as a percentage of CEO's guaranteed remuneration* (cash conversion cycle). The coefficient indicates that there is a positive relationship between the average level of the other NED remuneration, as a percentage of the CEO's guaranteed remuneration, and the odds of a company achieving a superior cash conversion cycle. In other words, where the average of other NED remuneration relative to the CEO's guaranteed salary increases by 1%, a company is 69 842.6 times as likely to be classified as a top-performing company, that is, a company that achieves a superior cash conversion cycle ratio relative to the sector it operates in. Therefore, statistical hypothesis $\mathbf{H_{0E10}}$ is rejected. The high odds ratio was noted and the data checked to ensure that this is not the result of outliers or other anomalies. As discussed in Section 5.5.2 outliers were address through truncation. The absence of outliers was further confirmed by the descriptive statistics in Appendix 1 where the maximum is 25.5% and the minimum is 0.4% and the descriptive statistics in Section 6.3.2.2, which show the means for the top and bottom performing companies are 12.55% and 9.49% respectively. In addition, all the pre-tests performed to ensure the data is suitable for the analyses rendered acceptable results. It is therefore fair to accept that the result is accurate. NED remuneration is arguably one of the most vital incentive systems to mould and guide director action on behalf of shareholders, according to Cordeiro*, et al.* (2000). There is a strong positive relationship between the NEDs' remuneration and the size and the complexity of a company (Bugeja*, et*

al., 2016). To ensure that candidates with the right skills and experience are attracted and retained, careful consideration should be given to the levels of remuneration paid (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017). Yazdanfar and Öhman (2014) stress that cash conversion cycle management involves extensive planning and assessing of different financing options to improve performance. Therefore, it is reasonable to expect that NEDs with specific knowledge and experience would be better able to understand and guide more complex processes, such as the management of the cash conversion cycle. Such candidates come at a premium and properly remunerated NEDs are expected to be more willing and able to dedicate adequate time and effort to their responsibilities (Fahlenbrach*, et al.*, 2017).

The next significant variable in Table 6-21 at the 1% significance level is the *diversity of professional experience* (current ratio). The positive coefficient indicates that there is a positive association between the odds of a company being classified as a top-performing company based on the management of the current ratio, and the diversity of backgrounds of the directors. In other words, a company with greater diversity is more likely to be a top-performing company in terms of achieving a current ratio above the average current ratio for the sector of the company. In fact, a company where the diversity increases by one diversity factor point is 24 661.53 times as likely to be classified as a top-performing company. Hence, statistical hypothesis $\mathbf{H_{0D15}}$ is not rejected. The high odds ratio was noted and the data checked to ensure that this is not the result of outliers or other anomalies. As discussed in Section 5.5.2 outliers were address through truncation. The absence of outliers was further confirmed by the descriptive statistics in Appendix 1 where the maximum is 1.00 and the minimum is 0.46 and the descriptive statistics in Section 6.3.2.2, which show the means for both the top and bottom performing companies to be 0.81. In addition, all the pre-tests performed to ensure the data is suitable for the analyses rendered acceptable results. It is therefore reasonable to accept that the result is accurate. The result provides a strong indication that the diversity of professional backgrounds of a company contributes to the management of liquidity, which impacts on a number of diverse elements, such as inventory, debtors and creditors. The different elements require different skills and experience

to be able to fully understand and direct the management thereof; for example, technical skills, market knowledge, sales experience, financial skills and interpersonal skills. A board with high diversity of professional back grounds will provide these attribute according to resource dependency theory (Arzubiaga*, et al.*, 2018; Community Business, 2013; Ferreira, 2010; Hillman & Dalziel, 2003; Marlin & Geiger, 2012; Young & Roberts, 2008).

The last independent variable in Table 6-23 that stands out as significant at a 1% level is the *diversity of board experience* (cash conversion cycle). The coefficient indicates that there is a positive relationship between the diversity of board experience, and the odds of a company achieving a better cash conversion cycle. In other words, where the diversity of board experience increases by 1 diversity factor point, a company is 70.1 times as likely to be classified as a top-performing company, that is, a company that achieves one of the top cash conversion cycle ratios relative to the sector it operates in. From this statistical hypothesis $\mathbf{H_{0E19}}$ is rejected. In contrast at the 10% significance level (current ratio), is *diversity of board experience*, which indicates a negative relationship to the odds of attaining an above sector average current ratio. If the diversity of board experience increases by one factor point, the company in question is .15 times as likely to be classified as a top-performing company. Hence statistical hypothesis $\mathbf{H_{0D19}}$ is not rejected. This is in line with literature, which states that the current ratio and the cash conversion cycle often give opposing messages regarding the liquidity of a company (Lyroudi & McCarty, 1993; Richards & Laughlin, 1980). Consequently, the contribution made by an increase in board experience diversity to improve the cash conversion cycle may cause the current ratio to decrease. On the one hand, the board is responsible for many complex tasks, such as monitoring of management and company operation, making strategic decisions, and analysing market opportunities (Gray & Nowland, 2013; Mans-Kemp*, et al.*, 2018b). The literature advocates that other experiences will enable NEDs to provide better strategic direction, especially in specialised situations in which they have previous experience, as advocated by resource theory (Arzubiaga*, et al.*, 2018; Community Business, 2013; Ferreira, 2010; Hillman & Dalziel, 2003; Marlin & Geiger, 2012; Young & Roberts, 2008). It is seen as common practice for companies to use

directors with multiple board seats as a tool to attract external skills, thereby bolstering the effectiveness of the board (Chiranga & Chiwira, 2014; Kroll*, et al.*, 2008). On the other hand, the literature review contests that the number of board seats held by an individual should be limited since the *busyness* of directors appears to have a negative relationship to performance and that it does not add value in terms of access to resources. In fact, the effectiveness of board functions, such as monitoring and supervision, is often jeopardised by too many board seats (Chiranga & Chiwira, 2014; Jackling & Johl, 2009; Mans-Kemp*, et al.*, 2016b). Consequently, maintaining a mix of directors with varying levels of experience on other boards should ensure that the board has the skills and experience necessary to oversee and steer relatively complex functions, such as the management and oversight of the cash conversion cycle, while having the focus necessary to dedicate adequate time to these functions (Kroll*, et al.*, 2008).

The first variable in Table 6-21 that stands out at a 5% significance level is *board size*, which shows a negative relationship to the odds of a company being classified as a top-performing company based on the current ratio. This indicates that an increase in board size equates to lower odds of a company achieving a higher current ratio relative to the average for the sector it operates in. More specifically, if the board size increases from a lower category to a higher category, a company is .66 times as likely to be categorised as a top performer in terms of the current ratio. Consequently, statistical hypothesis **H_{0D1}** is rejected. In contrast, in Table 6-23, at a 10% significance level, *board size* indicated a positive relationship to the odds of a company being classified as a top-performing company based on the management of its cash conversion cycle. If the number of board members increases by one, the company in question is 1.25 times as likely to be classified as a top-performing company. As a result, statistical hypothesis **H_{0E1}** is rejected. Larger and more complex companies generally have a greater need for advice from its board and therefore a larger board should be more likely to possess the skills and experience to provide this guidance and advice, which is the crux of resource dependency theory (Arzubiaga*, et al.*, 2018; Coles*, et al.*, 2008; Muchemwa, 2014; Wang*, et al.*, 2018). Furthermore, a larger board is believed to provide greater expertise and access to resources, thereby having a greater ability to perform its

duties, and consequently to enhance company performance (Jackling & Johl, 2009; Lipton & Lorsch, 1992; Scholtz & Kieviet, 2018a; Scholtz & Kieviet, 2018b). Moreover, as dictated by resource dependency theory, larger boards may increase a company's ability to form connections with its environment, which will enable a company to secure critical resources (Dalton*, et al.*, 1999). Consequently, the extensive planning and assessment of different financing options to improve the management of the cash conversion cycle appear to benefit from the potential advantages of a bigger board. The opposing results between the current ratio and the cash conversion cycle corresponds with literatures observation that these two measure tend to give opposite messages (Lyroudi & McCarty, 1993; Richards & Laughlin, 1980). Consequently, the contribution made by an increase in board size to improve the cash conversion cycle contributes to decrease the current ratio.

The next independent variable in Table 6-23 that stands out as significant at a 5% significance level is *age diversity* of the board (cash conversion cycle). The negative coefficient indicates that there is a negative relationship between the odds of a company being classified as a top-performing company based on the cash conversion cycle and the age diversity of the board. In other words, a company with a higher age diversity is less likely to be ranked as a top-performing company in terms of achieving a cash conversion cycle that is better than the average cash conversion cycle for the sector of the company. In fact, a company where the level of age diversity increases by one factor point is .80 times as likely to be classified as a top-performing company. Hence, statistical hypothesis $\mathbf{H_{0E12}}$ is rejected. Different age groups have significantly different values, beliefs and attitudes, which contribute to the *generation gap* (Taveggia & Ross, 1978). A higher level of age diversity may lead to significant conflict within the board (Weinstein, 2020; Wijeyekoon, 2015), which would make it difficult to optimally manage and oversee a complex function such as the cash conversion cycle, which involves extensive planning and assessing of different financing options to improve performance. This may lead to maintaining more conservative working capital levels.

The following independent variable in Table 6-21, at a 5% significance level, is *academic diversity (qualification type)* (current ratio). The coefficient indicates that

there is a negative relationship between the academic diversity of the board in terms of types of degrees, and the odds of a company being classified as a top-performing company based on the current ratio. In other words, where the level of academic diversity increases, a company is .01 times as likely to be classified as a top-performing company, that is, a company that achieves a superior current ratio relative to the sector it operates in. Consequently, statistical hypothesis **H_{0D16}** is not rejected. This may be a result of conflicting approaches and philosophies held by the various board members, due to their varying levels of education, regarding the operation of the company, the levels of liquidity to be maintained and the importance of the various risk elements that the company is exposed to (Mans-Kemp & Viviers, 2015; Scholtz & Kieviet, 2018b; Wiersema & Bantel, 1992).

The last independent variable in Table 6-23 that stands out as significant at a 5% level is *relative education level of the board* (cash conversion cycle). The negative coefficient indicates that there is a negative association between the odds of a company being classified as a top-performing company based on the cash conversion cycle, as measured relative to the average cash conversion cycle of the company's specific sector, and the relative education level of the board. In other words, a company whose board has a higher relative education level is less likely to be a top-performing company in terms of achieving a cash conversion cycle that is better than the average cash conversion cycle for the sector of the company. In fact, a company where the level of education of the board increases by one factor point is .83 times as likely to be classified as a top-performing company. Therefore, statistical hypothesis **H_{0E17}** is not rejected. The quality of a board's decision-making is dependent on the cognitive ability of the directors, which is formed by their individual experience, values and education (Talke*, et al.*, 2011; Wiersema & Bantel, 1992). The cognitive approach of different board members influences the way in which the individual team members gather and process information and the number and diversity of solutions generated. Individuals' reasoning style and personality significantly influence their direction of educational specialisation, which, in turn, shapes their perspective and outlook (Talke*, et al.*, 2011; Wiersema & Bantel, 1992). Therefore, it appears that as board members increase their levels of education, their philosophical approach to the various functions of a company

tends to become more aligned. It may also be that individuals with higher levels of education tend to be more reserved or conservative (De Paola & Gioia, 2012), thereby preferring a less aggressive cash conversion cycle as a measure of a company's liquidity.

The first variable in Table 6-23 at the 10% significance level is *percentage of NEDs*. This variable depicts a negative relationship with the odds of a company being classified as a top-performing company based on the cash conversion cycle. That is, for every 1% that the percentage of NEDs increases, a company is .02 times as likely to be classified as a top-performing company in terms of attaining a cash conversion cycle that is better than the average cash conversion cycle for the sector the company operates in. Statistical hypothesis $\mathbf{H_{0E2}}$ is therefore rejected. In Table 6-21 *Percentage of independent NEDs*, also, at 10% significance, indicates a negative relationship to the odds of attaining a better current ratio relative to the sector that the company operates in. In words, if the percentage of independent NEDs increases by 1%, the company in question is .30 times as likely to be classified as a top-performing company in terms of managing its current ratio. Statistical hypothesis $\mathbf{H_{0D3}}$ is not rejected. It could be argued that NEDs have an inverse relationship to company performance because they do not understand the complexities of the business as well as the executive directors (Tshipa, 2017). Furthermore, NEDs can contribute significant knowledge, insights and objectivity to the decision-making of the board (Aguilera, 2005; Arzubiaga*, et al.*, 2018; Kholmuminov*, et al.*, 2018). However, they may have difficulty in understanding the complexities of the company because they are only engaged on a part-time basis and may hold a number of board seats and do not have adequate time to devote to their tasks (Chiranga & Chiwira, 2014; Mans-Kemp*, et al.*, 2018b). In addition, NEDs often do not have the same quality of information that executive directors have (Baysinger & Hoskisson, 1990; Weir & Laing, 2000). Therefore, it was not surprising that additional NEDs would not always significantly contribute to the optimal management of an involved process such as the current ratio and the cash conversion cycle.

The remainder of the statistical hypotheses, relating to the current ratio and cash conversion cycle have not been rejected.

6.4 SUMMARY

This chapter provided descriptive statistics for the independent and dependent variables used in the study and the frequency and descriptive statistics for the variables used in the binary logistic regression to give an overall understanding of the nature of the variables. The chapter then described the processes followed to determine the final data set, which was used in the multiple linear analysis and binary logistic analysis. This resulted in the Simpson diversity factors for diversity of academic qualification of the directors in terms of degree types, diversity of academic backgrounds (per field) of the directors and diversity of professional backgrounds of the directors as well as average tenure of the board, to be removed. This was as a result of multicollinearity between these variables and the Shannon Wiener diversity factors and the diversity of tenure of the board respectively.

Correlation analysis (Pearson correlation) and multiple linear regression were run to test the criticism from social scientists against the practice of testing for linear relationships in this field of study. The correlation analysis showed that the linear correlation between the various dependent variables and all the independent variables are very low. In addition, the multiple linear regressions also resulted in poor results, with very low explanatory value. This confirmed the critics' views and consequently, the approach to use binary logistic regression to determine the relationship between each of the board characteristics and the odds of a company to be categorised as a top performing company in terms of the respective performance and risk management measures.

To run the binary logistic regression a number of variables had to be converted to categorical variables, due to nonlinearity of the logit issues. These are (Shareholder return) *Relative CEO remuneration movement,* (Share price volatility) *Percentage of NEDs* and *Average other NED remuneration as a percentage of CEO guaranteed remuneration,* (Sharpe ratio) *Relative CEO remuneration movement* and *Average*

of other directors' remuneration as a percentage of CEO guaranteed remuneration, (Current ratio) *Board size, Percentage of black persons* and *Age diversity* and (Cash conversion cycle) *Chairman remuneration as a percentage of CEO guaranteed remuneration, Tenure diversity, Average age* and *Average board experience.*

The chapter then described the processes followed to optimise each of the logistic regression models to determine the best fit set of independent variables that best predicts the dependent variables. The adequacy parameters, for each of the binary logistic models, indicated that all the models are adequate to explain the relationship between the specific board characteristics and the likelihood that a company ranks as a top-performing company based on the various performance and risk management measures.

The chapter finally provided the results of the binary logistic regression. The binary logistic regression revealed the following statistically significant relationships:

Shareholder Return	**Volatility**	**Sharpe ratio**	**Current Ratio**	**CCC[2]**
At a 1% significance level				
Relative CEO remuneration movement *(Negative)* (**H_{A7}**)	Board size (*Positive*) (**H_{B1}**)	Relative CEO remuneration movement (*Negative*) (**H_{C7}**)	Percentage of black persons (*Negative*) (**H_{D4}**)	Percentage of South Africans (*Negative*) (**H_{E6}**)
Diversity of tenure *(Negative)* (**H_{A13}**)	Average of other NED remuneration as a percentage of CEO guaranteed remuneration (*Positive*) (**H_{B10}**)	*Payment gap (Positive) (***H_{C8}**)	Payment gap (*Positive*) (**H_{D8}**)	Chairman remuneration as a percentage of CEO's guaranteed remuneration (*Positive*) (**H_{E9}**)
	Average board experience (Positive) (**H_{B18}**)		Diversity of professional experience (*Positive*) (**H_{D15}**)	Average other NED remuneration as a percentage of CEO's guaranteed remuneration (*Positive*) (**H_{E10}**)
				Diversity of board experience (*Positive*) (**H_{E19}**)
At a 5% significance level				
Percentage of independent NEDs (*Negative*) (**H_{A3}**)		Average of other NED remuneration as a percentage of CEO guaranteed remuneration (*Positive*) (**H_{B10}**)	Board size (*Negative*) (**H_{D1}**)	Percentage of black persons (*Positive*) (**H_{E4}**)
*Payment gap (Positive) (***H_{A8}**)			Percentage of South Africans (*Positive*) (**H_{D6}**)	Age diversity (*Negative*) (**H_{E12}**)

Shareholder Return	Volatility	Sharpe ratio	Current Ratio	CCC[2]
Chairman remuneration as a percentage of CEO guaranteed remuneration (*Positive*) (**H_{A9}**)			Academic diversity (qualification type) (*Negative*) (**H_{D16}**)	Relative education level of the board (*Negative*) (**H_{E17}**)
Relative education level of the board (*Positive*) (**H_{A17}**)				
Average board experience (*Negative*) (**H_{A18}**)				
At a 10% significance level				
	Percentage of females (*Positive*) (**H_{B5}**)	Percentage of females (*Negative*) (**H_{C5}**)	Percentage of NEDs (*Negative*) (**H_{D2}**)	Board size (*Positive*) (**H_{E1}**)
	Payment gap (*Positive*) (**H_{B8}**)	Chairman remuneration as a percentage of CEO guaranteed remuneration. (*Positive*) (**H_{C9}**)	Diversity of board experience (*Negative*) (**H_{D19}**)	Percentage of NEDs (*Negative*) (**H_{E2}**)
	Diversity of tenure (*Positive*) (**H_{B13}**)			

Chapter 7 concludes the thesis by detailing the main conclusions of the study in the light of the research questions, research hypotheses and statistical hypotheses outlined in Sections 1.5.1, Section 1.5.2 and Section 1.5.3 respectively. The chapter provides a summary of the contribution of the study, clarifies the limitations of the study and provides recommendations for future research.

CHAPTER 7: SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

The original view of company value creation was that only the ultimate beneficiaries, typically the shareholders, would reap financial benefit from a company. However, this has evolved, especially in recent times, to a far more all-encompassing concept of delivering superior risk-adjusted returns to all stakeholders (Dos Santos*, et al.*, 2017; IoDSA, 2011; IoDSA, 2016). Sustainability has become an important component advocated by both scholars and regulators. Value creation therefore includes items such as a long-term strategic focus, the management of all risks (not only financial risks), a company's natural environment, social factors and greater transparency (Clarke, 2014; Dilling & Harris, 2018; Dos Santos*, et al.*, 2017; IoDSA, 2011; IoDSA, 2016).

The board is at the centre of the value creation process and needs to play an active role in all aspects of this process. To be able to fulfil this role literature, as well as regulatory documents, highlights several characteristics that a board should have (Arzubiaga*, et al.*, 2018; Bhagat & Black, 1999; Ferreira, 2010; Mans-Kemp*, et al.*, 2018b; Simons & Pelled, 1999). For example, King IV expects the board to have the necessary knowledge, skills and experience as well as embrace adequate diversity (fields of knowledge, experience, age, culture, independence, race and gender) and independence (IoDSA, 2016).

Due to the complexity and scope of a company's value creation process it is impossible to consolidate this into a single measure against which success can be measured. This study, with guidance from literature, therefore, selected five measures which focusses on different aspects of the value creation process, to find some insight into how the various board characteristics relate to each of these elements. Assessing the company's activities from various angles is important. As literature advises, different board characteristics are expected to impact the various elements of a company's activities in differing ways (see Section 4.2). The

composition of a board therefore needs to continually change to adapt to different phases of a company's life-cycle, changes in strategic focus, regulatory changes and new socio-political challenges (Higgins & Gulati, 2006; Perrault & McHugh, 2015; Zimmerman & Zeitz, 2002).

To date literature has failed to provide conclusive evidence as to which board characteristics benefits which company activity or focus. Even though numerous studies have been undertaken to determine the relationship between various components of corporate governance, including elements of board composition and company performance, these studies have largely focused on developed markets (Bauer*, et al.*, 2004; Li & Chen, 2018; Mathew*, et al.*, 2018; Ntim, 2013; Paniagua*, et al.*, 2018; Perryman*, et al.*, 2016; Wang, 2012; Wu, 2009). In addition, these studies have either produced inconclusive results or came to contradicting conclusions (Brenner & Schwalbach, 2009; Deysel & Kruger, 2015; Florackis*, et al.*, 2016; Hillman & Dalziel, 2003; Nyirenda, 2010; Payne*, et al.*, 2009; Semosa, 2012). Researchers question whether the findings of these studies are transferable to developing countries such as South Africa with its unique socio-economic and political challenges (Bhana, 2010; Mangena & Chamisa, 2008; Muchemwa, 2014; Ntim, 2013; Nyirenda, 2010; Rashid*, et al.*, 2010). It is therefore not possible, and imprudent to eliminate any of the identified board characteristics from the analyses, since no clear literary guidance, especially in a South African context, have been found to do so.

In addition, studies in this field, and especially in South Africa, have typically tested for linear relationships between corporate governance elements, including some elements of board composition, and the various performance measures of a company. This practice is increasingly frowned upon (Higgins & Gulati, 2006; Perrault & McHugh, 2015; Zimmerman & Zeitz, 2002) by social scientists (Basimov, 2019; Canarella & Nourayi, 2008; Lee, 2019; Paniagua*, et al.*, 2018; Rasoava, 2019). This study therefore only used linear regression analyses to determine the validity of these objections and used binary logistic regression to determine the relationship between the various board characteristics and the odds of a company being classified as a top performing company.

Therefore, the aim of this study was to establish how the boards of top performing companies differ from the boards of bottom performing companies and whether the various board characteristics promoted by literature, government and regulators have an association with the performance of a company and its ability to manage risk, both internally and externally. The findings of the study are important in that they serve as guidance on which characteristics should or could be included in a board, depending on the aim of the stakeholders and the focus of the company. For example, would greater independence of the board lead to greater ability to manage the market risk of a company? It also provides a business case to companies to implement various transformational initiatives encouraged by government, and principles required by regulatory documents, such as King IV. This is not only where characteristics prove to promote improved levels of company performance and risk management, but also where the characteristics prove to not jeopardise these functions. These include the achievement of adequate levels of diversity in terms of field of knowledge, experience, age, race and gender in a company and on its board.

This chapter starts off with the research contribution of the study. It then summarises the findings from the literature review, which served as the background for the statistical analyses. The chapter continues to detail the main conclusions reached in the context of the purpose and objectives described in Section 1.3. The chapter concludes by indicating the limitations of the study and formulating recommendations for future research.

7.1.1 Research contribution

This study, through empirical research, makes several contributions. First, the study used binary logistic regression to determine associations between the various board characteristics and the odds of a company being classified as a top performer, as opposed to the conventional practice to test for linear relationships between the various board characters and corporate performance. This is informed

by criticism from social scientists against this practice (Basimov, 2019; Canarella & Nourayi, 2008; Lee, 2019; Paniagua*, et al.*, 2018; Rasoava, 2019).

Second, the study focused on South Africa. As discussed in the previous section, more research is needed within a South African context with regard to the potential relationship between board characteristics and the performance and risk management of companies. Not only does this study make a unique contribution, described in the following sections, to the body of work within a South African context, but it also makes unique contributions to global research in this area.

Third, the study increased the number of board characteristics assessed in previous studies by considering a comprehensive list of individual characteristics. The literature review indicated that research in terms of the relationship between the various board characteristics and company performance was inconclusive (Mans-Kemp*, et al.*, 2017; Tshipa, 2017). The research in this area mostly considered the impact of corporate governance as an unit by calculating a corporate governance score or index for each company, which assesses the combined effect of the included components (Abdo & Fisher, 2007; Ammann*, et al.*, 2013; Mans-Kemp*, et al.*, 2016a; Mans-Kemp*, et al.*, 2016b; Mans-Kemp*, et al.*, 2017; Mathew*, et al.*, 2018). Research that considered individual board characteristics, especially in South Africa, largely focused on a select number of characteristics, as shown in Table 1-1 in Section 1.4. The selected board characteristics emanated from the various sets of regulations used in South Africa, the corporate governance theories as well as the literature review (see Chapters 2 to 4). Through rigorous inferential statistical analyses, the study contributes to the understanding of the relationship between each of the board characteristics and the respective performance and risk management measures.

Fourth, the study contributes innovative approaches to determine the level of diversity for certain categorical and numerical characteristics. First of all, the study employed the Simpson and Shannon Wiener indices, which are typically used to determine biodiversity of ecological samples, to determine the diversity of a number of categorical variables, such as academic degrees and fields of experience. In the

second instance, the study used the standard deviation to determine the relative diversity levels for a number of numerical variables; for example, directors' age, years of experience and level of experience.

Fifth, the study used annualised standard deviation of daily share price movements to consider the risk attached to a company's performance. Most studies ignore the risk associated with a company's performance when considering its relationship with various elements of corporate governance (De Wet, 2012; Mans-Kemp*, et al.*, 2017; Mathew*, et al.*, 2018). The literature recommends the use of the annualised standard deviation of daily share price movements as a measure of performance risk when looking for a possible association with corporate governance (Farmer*, et al.*, 2013; Mathew*, et al.*, 2018; Perryman*, et al.*, 2016; Sayari & Marcum, 2018). No South African-based study focusing on elements of corporate finance and board composition, which considered this metric as a measure of the market risk of a company, could be found.

Sixth, the study considered the internal risk management of a company, by assessing the possible association between the various board characteristics and a company's ability to manage its liquidity risk (as an element of internal risk). The literature on corporate governance, including the composition of company boards, generally has not considered the possible relationship between the various board characteristics and the internal risk management of a company. Only one South African study could be found that considered the association between an element of board composition (number of board seats, and specifically overboardedness) and a measure of company risk, namely the current ratio (Chiranga & Chiwira, 2014). One of the key responsibilities of the board is to manage the main risks of a company (FRC, 2018; Geny*, et al.*, 2006). A company's liquidity is one of the critical risks faced by a company because this reflects on the ability of a company to meet its short-term obligations (Erasmus & Le Riche, 2014; Fleming, 1986; Tauringana & Clarke, 2000). Therefore, this study aimed to fill a gap in the South African and global literature by determining the association between the different board characteristics and the odds of a company being classified as a top performer in

terms of managing its liquidity risk. The study used the current ratio and the cash conversion cycle as an indication of a company's ability to manage its internal risk.

In conclusion, while making an academic contribution, the findings of the study also have practical application for a range of interested parties in a South African context, as described in Section 7.4.

7.2 RESEARCH FINDINGS: LITERATURE REVIEW

7.2.1 Importance and development of corporate governance

The study commenced with a literature review in Chapter 2, which discussed the importance of corporate governance, the development of corporate governance around the world and specifically in South Africa and the various corporate governance theories developed to describe the behaviour of boards and their relationship with the various stakeholders of a company. The following findings motivated the further research of this study. The King reports highlighted the need for NEDs and independent NEDs, as well as the management of the CEO's remuneration and that of the other board members, and specifically in relationship to that of the rest of a company's workforce, as elements that have a bearing on company performance and risk management. In addition, King IV recommends board diversity in terms of fields of knowledge, experience, age, race and gender. The King reports also highlights the management of risk and a company's financial performance as key components to a company's sustainability. To this the Companies Act (71 of 2008) added references to the board's role in the management of the CEO's remuneration and the management of conflicts of interest (that is director independence)

7.2.2 Corporate governance theories

Section 2.5 revealed the following findings from the various corporate governance theories, which warranted inclusion in the study. Agency theory promotes remuneration to top management as a key mechanism to align the objectives of

shareholders and management. Also, director efficiency is said to be improved by director independence, years of experience as a director and the age of a director. Stakeholder theory argues that an emphasis mainly on shareholders leads to an excessive focus on short-term profits. Consequently, elements of sustainability, such as risk management merited further investigation. Also, the focus on all stakeholders led to the inclusion of different aspects of a company's value creation, which are of concern to the different stakeholders.

According to resource dependency theory the board provides a company with key resources to enable a company to interact with its environment (manage market risk) and execute its functions. This may be in the form of market contacts and specialised skills and experience. However, for the board to be able to guide management and act as a true corporate governance agent, it needs to maintain a high degree of independence, skills and experience. Board ineffectiveness in terms of its control over management or in terms of its interaction with a company's environment often results in increased risk to shareholders through higher levels of volatility in a company's share price. Stewardship theory fundamentally portrays people, and therefore management and directors, to be motivated by a desire to achieve and by self-actualisation. As a result, this theory does not see the board as a watchdog but sees the role of the board as that of supervision, consultation and co-ordination. Therefore, little value is placed on the independence of the board, in fact the consolidation of the role of chairman and CEO is promoted as an enabling factor under stewardship theory.

Social contract theory advocates that contracts (explicit or implicit) exists between a company and all aspects of its environment. Under this theory, companies will consider economic aspects, environmental factors, ethical factors, all stakeholders and the community at large. Such a holistic approach benefits the financial performance of a company, and consequently to increase the company's value and improve the legitimacy of the company. Researchers believe that the inclusion of female directors and director independence would improve a company's adherence to social contracts, decision-making and overall governance. Legitimacy theory states that the characteristics of the board are mainly determined by a company's

attempt to obtain, restore and maintain legitimacy within its community and its other stakeholders. However, the composition of the board may only be changed as an artificial measure to signal a company's willingness to conform to social and other norms without much improvement to its operations.

7.2.3 Companies functioning in South Africa

Chapter 3 explored the South African environment and the challenges faced by companies operating in this environment. Since the introduction of democracy, there has been a constant demand on companies to transform while remaining internationally competitive. One of the challenges companies face in this regard is to demonstrate the financial merit of transformation initiatives to decision-makers as a justification for its implementation.

The chapter concluded with two related and highly contentious issues, namely the payment gap and CEO remuneration levels. The payment gap, which is the ratio between the remuneration of the CEO and the average remuneration of other employees, is one of the main causes of inequality in South Africa (Pontusson*, et al.*, 2002). South Africa is one of the countries with the highest levels of inequality in the world (Coomey, 2007; Wittenberg, 2017). The issue of the payment gap is a largely unexplored research topic, especially in South Africa (Deysel & Kruger, 2015). The statistical hypotheses developed from these findings are depicted in Table 7-1.

7.2.4 Link between board composition and company performance

Chapter 4 concluded the literature review by looking at the link between company performance and the composition of the board. Research investigating links between corporate governance and company performance has increased in recent times, but with mixed results. A number of board characteristics that may have an association with the effectiveness of the board were identified. The statistical hypotheses develop from the findings of this review are represented in Table 7-1.

7.2.4.1 Board size

Two schools of thought came to the fore regarding board size. Some scholars prefer a larger board as they feel that such a board would have better access to the diverse range of skills required to fulfil its functions (Coles*, et al.*, 2008; Dalton*, et al.*, 1999; Lipton & Lorsch, 1992; Muchemwa, 2014). However, a number of researchers prefer smaller boards as they are believed to be more cohesive, easier to co-ordinate, quicker to make decisions and leave less room for individuals to shirk their responsibilities (Bermig & Frick, 2010; Kyereboah-Coleman & Biekpe, 2006; Latané*, et al.*, 1979; Mangena & Chamisa, 2008).

7.2.4.2 Ethnic diversity

The literature review indicates that ethnic diversity provides a company with access to a wider range of views, ideas and experiences, which should lead to better decision-making (Adams*, et al.*, 2015; Harjoto*, et al.*, 2015; Trautman, 2012). It also aids a company to achieve better representation of the community it operates in (Nyirenda, 2010). However, research found that ethnic diversity could lead to higher levels of conflict, which may hamper the decision-making process (Mans-Kemp & Viviers, 2015; Pelled*, et al.*, 1999; Scholtz & Kieviet, 2018b).

7.2.4.3 Gender diversity

The advantage of gender diversity lies in the fact that males and females have different strengths and focuses (Nielsen & Huse, 2010). In other words, a single-gender board will only excel at certain tasks. Campbell and Mínguez-Vera (2008) and Gordini and Rancati (2017) state that the presence of women on a board per se does not have an impact on a company's value or its performance. In other words, a balance between male and female directors rather than the mere presence of women does have a positive association with company performance.

7.2.4.4 Director independence

The literature reviewed and most of the corporate governance theories, such as agency theory, are in favour of the majority of the board members consisting of NEDs and, more specifically, independent NEDs (Dah*, et al.*, 2018; Kyereboah-Coleman, 2007; Ogbechie, 2012; Sanda*, et al.*, 2008). This notion is also supported by King IV (IoDSA, 2016).

7.2.4.5 Non-executive director remuneration

The demands on and risks to NEDs are increasing (Seegers*, et al.*, 2015). To ensure that the right calibre of people is attracted and retained, careful consideration of the remuneration levels of NEDs is necessary (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017). As for executive directors, this is one of the main mechanisms for motivating NEDs.

7.2.4.6 Director background

The chapter then gave an overview of the elements making up the *background* of a director. The background of the directors contributes to the diversity of the board. Consequently, it is important to gain an understanding of these elements to better understand what may constitute the optimal board. The following elements were considered:

- Academic qualification: Wiersema and Bantel (1992) found that companies with higher levels of education, higher educational specialisation diversity, and more academic training in sciences were strategically more adaptable and also more likely to implement strategic change. Smith*, et al.* (1994) found that education level diversity within a board had a positive relationship to company performance.
- Professional experience: a variety of professional backgrounds bring different experiences and orientations. A wide range of studies found a positive relationship between professional experience diversity and company performance (Bantel & Jackson, 1989; Kimberly & Evanisko, 1981; Lipton &

Lorsch, 1992). However, Simons and Pelled (1999) recorded research that found experience diversity negatively associated with company performance.

- Length of service as a board member: research offers three consequences of leadership change in a company. Firstly, leadership change improves company performance through new energy, views and ideas. Secondly, leadership change negatively impacts company performance through the creation of tension and disruption. This could easily result in a negative spiral where reduced performance, in turn, leads to further replacement of company leadership. Thirdly, changes in management have little bearing on the performance of a company (Davidson*, et al.*, 1990).
- Director age: the different generations in terms of age bring different work orientations, values, beliefs and attitudes (Weinstein, 2020; Wijeyekoon, 2015). According to Ali*, et al.* (2013), the mixed results of research in terms of the relationship between director age and the performance of a company do not make it clear whether age has any relationship with the performance of a company. In this regard, Bonn*, et al.* (2004) found that low average age, and higher age diversity, showed a positive relationship to higher share values. Ali*, et al.* (2013) further found no significant relationship between average age levels of the board of directors and company performance.
- Nationality: research indicates that different nationalities on a board should be able to provide a wider range of resources to a board. Ameer*, et al.* (2010) found that companies with higher levels of non-executive foreign directors were associated with better performance. In contrast, Masulis*, et al.* (2012) found that companies with a high level of foreign national directors displayed poorer performance, especially where the companies did not have a dominant presence in the foreign markets.
- Board experience: some authors state that experience on different boards adds to the experience and expertise of the directors, which should be beneficial to a board (Gray & Nowland, 2013; Kroll*, et al.*, 2008). However, too many board seats at a time will prevent directors from dedicating adequate time and attention to ensure the proper execution of their duties (Ferris*, et al.*, 2003; Lipton & Lorsch, 1992; Mans-Kemp*, et al.*, 2018b; Seegers & Shaw, 2013).

7.2.5 Performance measures

In terms of financial performance, two types of performance measures were identified, namely accounting-based and market-based measures (Mans-Kemp & Viviers, 2015; Pandian*, et al.*, 2006).. Researchers prefer market-based performance measures to overcome the shortcomings of accounting-based measures. The main advantages of market-based measures are the fact that they happen in real time in a reasonably efficient and regulated market and they take into account risk-adjusted views of future opportunities.

Research proposes that performance should be considered from two angles. In the first instance, the level of the performance should be considered and secondly, the variability or riskiness of the performance (Jemison, 1987). Consequently, in the first instance, the study used shareholder return as a measure of the level of a company's performance. Shareholder return is a true market-based measure that presents a comprehensive measure of how well a company succeeds to create value for its shareholders (Bayrakdaroglu*, et al.*, 2012; Edwards, 1994; Mans-Kemp & Viviers, 2015). Secondly, the study used share price movement volatility as a measure of the volatility of a company's performance or the riskiness of the investment in a company. Risk is a vital element of any investment strategy and even though investors have different risk appetites, they are generally risk averse and willing to pay for the reduction in risk (Corter & Chen, 2006; Farmer*, et al.*, 2013; Geer, 2012; Henkel, 2009; Kotze, 2005).

Furthermore, the literature review also indicated that performance of a company should be measured relative to its peers (Lashgari, 2004). Consequently, the performance, both in terms of level and volatility, was expressed relative to the sector in which the company operated before the top and bottom performers were identified.

7.2.6 Risk management measures

In terms of risk management measures, the chapter pointed out that the board is responsible to oversee the operational risk management of a company (FRC, 2018;

Geny*, et al.*, 2006). The chapter reviewed the potential measures used to measure the risk management ability of a company. A company is exposed to a number of operational risks of which liquidity management is one of the most important but often misunderstood. Companies often only consider this aspect of the business when the company is on the brink of a crisis (Simpson, 2013). The literature review advises the use of balance sheet-based measures to assess a company's liquidity, such as the current ratio (Fleming, 1986; Richards & Laughlin, 1980). The benefits of the current ratio is its simplicity and the fact that it includes all current assets and liabilities (Cagle*, et al.*, 2013). However, these are criticised for being too static, looking at liquidity only at a point in time, and being susceptible to manipulation (Fleming, 1986). To overcome these shortcomings, the cash conversion cycle should be used (Cagle*, et al.*, 2013; John, 2001; Lyroudi & McCarty, 1993; Richards & Laughlin, 1980; Zeidan & Shapir, 2017). This measure considers the amount of time a company takes to sell its inventory, collect the money from its debtors and to repay its creditors (Cagle*, et al.*, 2013). It is worth noting that the current ratio and the cash conversion cycle often give opposing messages regarding the liquidity of a company, with the cash conversion cycle being considered to provide the most useful information (Lyroudi & McCarty, 1993; Richards & Laughlin, 1980).

Finally, companies in different sectors may be exposed to different current asset cycles and may have different working capital needs and characteristics (Fleming, 1986; Gombola & Ketz, 1983; Michalski, 2014). Therefore, the current ratio and cash conversion cycle for each company should be evaluated relative to the sector within which a company operates.

7.2.7 Sample and data collection

The study's target sample comprised all companies listed in the 13 largest sectors of the JSE's main board (as measured by the number of companies in the sector) over the period 2009 to 2015. This initial sample included 181 companies, providing a coverage of 58% of companies listed on the JSE. The final sample was reduced to 170 due to the fact that some companies only listed in 2015 and consequently, did not have a financial year-end during the observation period. The data was

collected from the data published on the IRESS database and the annual- and integrated reports extracted from the IRESS database and company websites where necessary. Where data could not be found from these sources, other websites such as Who's Who, LinkedIn and Bloomberg were used.

7.3 RESEARCH FINDINGS: ANALYSES

7.3.1 Linear regression analysis results

The study commenced with correlation analyses and multiple linear regression modelling to assess the merit of increasing criticism, from social scientists, of the practice to test for linear relationships when considering board characteristics and behaviour and its association with company performance (Basimov, 2019; Canarella & Nourayi, 2008; Lee, 2019; Paniagua*, et al.*, 2018; Rasoava, 2019). The low linear correlation coefficient values indicated weak to very weak relationships between each of the independent variables and the respective dependent variables. This together with the results obtained through the multiple linear regressions, which indicated poor fit and a low number of statistically significant variables, confirmed the merit of studying non-linear relationships using binary logistic regression.

7.3.2 Binary logistic regression analysis results

7.3.2.1 Research hypotheses

Five pairs of research hypotheses were tested. Due to the intricate nature of a company's value creation process, five different measures were identified from literature and regulations, covering some of the key elements of this process. Based on the views and recommendations from literature and regulations that various board characteristics are expected to benefit these value creation contributors in some way, 19 characteristics were identified. Owing to the fact that literature has not yet provided clear evidence as to which characteristic has an association with

which process/ function, none of the characteristics could be eliminated from the initial model for each measure (dependent variable). This lack of guidance is caused by several factors. Most of the relationships have not been tested before and the few that have been tested, mostly in terms of linear relationships, provided inconclusive results. In addition, most of the research was focussed on developed countries, the findings of which are not necessarily valid in the South African environment. Consequently, five research hypotheses were developed, as recorded in Section 1.5.2. From the research hypotheses a statistical hypothesis was developed for each dependent/ independent variable combination as recorded in Section 1.5.3. Consequently, all the characteristics were included in each of the five initial binary logistic regression models. These models were improved to distil the final list of characteristics for each performance and risk management measure into a best fitting model. From these five best fitting models the statistically significant characteristics were determined for each dependent variable.

7.3.2.2 Regression results

The results for the statistical hypotheses are depicted in Table 7-1.

Table 7-1: Regression results

Table 7-1shows the direction of the alternative hypotheses (consistent with Table 1-2) and the acceptance/ rejection of the null hypotheses. A grid reference system is used to label the hypotheses. For example, H_{0A1}:There is a positive relationship or no relationship between board size and the odds that a company is ranked as a top performing company based on its shareholder return. The corresponding alternative hypothesis is, Ha_{A1}: There is a negative relationship between board size and the odds that a company is ranked as a top performing company based on its shareholder return.

	Variable	A Shareholder Return	B Volatility	C Sharpe ratio	D Current Ratio	E CCC[1]
1	Board size	(H_a) Neg (R) Pos	(H_a) ND (R) Pos***	(H_a) Neg (R) Neg	(H_a) Neg (R) Neg**	(H_a) Pos (R) Pos*
Independence						
2	% NEDs	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg	(H_a) Pos (R) Pos	(H_a) Neg (R) Neg*
3	% Independent NEDs	(H_a) Pos (R) Neg**	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg*	(H_a) Neg (R) Pos
Attributes						
4	% Black persons	(H_a) Neg (R) Neg	(H_a) Pos (R) Pos	(H_a) Neg (R) Pos	(H_a) Neg (R) Neg***	(H_a) Pos (R) Pos**
5	% Females	(H_a) Neg (R) Neg	(H_a) Pos (R) Pos*	(H_a) Neg (R) Neg*	(H_a) Pos (R) Pos	(H_a) Neg (R) Neg
6	% South Africans	(H_a) Neg (R) Pos	(H_a) Pos (R) Neg	(H_a) Neg (R) Neg	(H_a) Pos (R) Pos**	(H_a) Neg (R) Neg***
Remuneration						
7	Relative CEO remuneration movement	(H_a) Neg (R) Neg***	(H_a) Neg (R) Neg	(H_a) Neg (R) Neg***	(H_a) Pos (R) Neg	(H_a) Neg (R) Neg
8	Payment gap	(H_a) ND (R) Pos$_\beta$**	(H_a) ND (R) Pos$_\beta$*	(H_a) ND (R) Pos$_\beta$***	(H_a) ND (R) Pos$_\beta$***	(H_a) ND (R) Pos
9	Chairman remuneration as a percentage of CEO guaranteed remuneration	(H_a) Pos (R) Pos**	(H_a) Pos (R) Pos	(H_a) Pos (R) Pos*	(H_a) Neg (R) Neg	(H_a) Pos (R) Pos***
10	Average other NED remuneration as a percentage of CEO guaranteed remuneration	(H_a) Pos (R) Pos	(H_a) Pos (R) Pos***	(H_a) Pos (R) Pos**	(H_a) Neg (R) Pos	(H_a) Pos (R) Pos***
Time based						
11	Average age	(H_a) Neg (R) Neg	(H_a) Pos (R) Pos	(H_a) Neg (R) Neg	(H_a) Pos (R) Neg	(H_a) Neg (R) Neg
12	Age diversity	(H_a) Pos (R) Insig	(H_a) Pos (R) Pos	(H_a) Pos (R) Neg	(H_a) Pos (R) Pos	(H_a) Neg (R) Neg**
13	Diversity of tenure	(H_a) Pos (R) Neg***	(H_a) Pos (R) Pos$_\beta$*	(H_a) Pos (R) Neg	(H_a) Pos (R) Pos	(H_a) Pos (R) Pos
Background						
14	Academic diversity (per field)	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg	(H_a) Pos (R) Pos	(H_a) Neg (R) Pos	(H_a) Pos (R) Neg
15	Diversity of professional experience	(H_a) Pos (R) Neg	(H_a) Pos (R) Pos	(H_a) Pos (R) Neg	(H_a) Neg (R) Pos***	(H_a) Pos (R) Pos
Education						
16	Academic diversity (qualification type)	(H_a) Neg (R) Neg	(H_a) Pos (R) Neg	(H_a) Neg (R) Pos	(H_a) Pos (R) Neg**	(H_a) Neg (R) Neg
17	Relative education level of board	(H_a) Pos (R) Pos$_\beta$**	(H_a) Pos (R) Pos	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg**
Experience						
18	Average board experience	(H_a) Pos (R) Neg**	(H_a) Pos (R) Pos***	(H_a) Pos (R) Pos	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg
19	Diversity of board experience	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg	(H_a) Pos (R) Neg*	(H_a) Pos (R) Pos***

*** - Significant at the .01 level, ** - Significant at the .05 level, * - Significant at the .10 level

(H_a) Statistical hypothesis

(R) Results

Pos Independent variable has an expected positive relationship with the dependent variable

Neg Independent variable has an expected negative relationship with the dependent variable

ND Independent variable has an expected relationship with the dependent variable (No direction predicted)

Statistical null hypothesis not rejected

Statistical null hypothesis rejected

[1] - Cash conversion cycle

$_\beta$ Low odds ratio indicating a small impact despite statistical significance.

Note: A positive association indicated that an increase in the characteristic increases the odds of a company being classified as a top performing company, for example an increase in percentage females improves the odds that a company will be ranked as a company with a low share price volatility.

A. *Market-based measures*

This section summarises the findings of the market-based performance measures namely, Total shareholder return, Share price and Sharpe ratio.

Board size reflected a positive relationship to the odds that a company is classified as a top-performing company in terms of reducing its share price volatility. This supports resource dependency theory that the board contributes to a company's ability to attract vital resources, such as market contacts or skills and experience (Community Business, 2013; Ferreira, 2010; Hillman & Dalziel, 2003; Marlin & Geiger, 2012; Young & Roberts, 2008). These resources typically contribute to a company's ability to interact with it market and provide guidance on how to manage the risks faced by the company (Hillman & Dalziel, 2003; Marlin & Geiger, 2012; Young & Roberts, 2008; Yusoff & Alhaji, 2012).

Even though King IV advocates a majority of independent NEDs, the *percentage of independent NEDs* showed a negative relationship to the odds that a company is classified as a top-performing company in terms of shareholder return. However, the research indicated that board independence is not a safeguard against financial catastrophes. Research further recommends that the board should not aim for total independence but rather for substantial independence (Bhagat & Black, 2002). According to Weir and Laing (2001) the negative relationship may be as a result of NEDs being appointed on a part-time basis, not having the experience to understand the technical business issues of a company or not having adequate information to make strategic decisions or give proper advice.

Percentage of female directors revealed a positive relationship to the odds that a company is classified as a top-performing company in terms of share price volatility, and a negative relationship to the odds that a company is classified as a top-

performing company in terms of the Sharpe ratio. Percentage of females depicted a negative relationship to total shareholder return although it was not statistically significant. Male directors tend to be more ambitious, aggressive, daring, competitive and autocratic, whereas female directors tend to be more co-operative and collaborative and more focused on promoting the self-worth of others (Eagly*, et al.*, 2003). This behaviour is therefore more associated with lower risk-taking, as reflected by this study's findings with regard to share price volatility. However, this conservatism may cause return to shareholders to be disproportionally lower as is reflected by the negative relationship between the percentage of female directors and a company's risk-adjusted performance.

Relative CEO remuneration movement emerged as having a negative relationship to the odds that a company is classified as a top-performing company in terms of total shareholder return as well as its Sharpe ratio. This supports the notion that CEO remuneration is not always based on merit and that it not necessarily serves as an efficient incentive to align the objective of management with that of shareholders (Cooper*, et al.*, 2009; Deysel & Kruger, 2015). Furthermore, business and psychological research found that increased reward did not necessarily motivate increased performance (Chamorro-Premuzic, 2013; Dorff, 2014).

Next, the *payment gap* showed a positive relationship to the odds that a company is classified as a top-performing company in terms of total shareholder return, share price volatility and the Sharpe ratio. However, the odds are just about one time for each of the associations, which indicates low odds that the payment gap will have an effect. This is in line with the views from literature that employees are either not aware of the magnitude of the payment gap or do not have the ability or motivation to react to the knowledge (Faleye*, et al.*, 2013). This may be as a result of fear of being made redundant if they underperform (behavioural theory (Gao, 2019)) or there may not be enough opportunities to work for promotion (tournament theory - (Chen*, et al.*, 2014; Faleye*, et al.*, 2013; Gao, 2019)) Nevertheless, it remains a statistically significant contributor to these measures and it can therefore be expected that once the prohibitive factors change it may have a bigger impact. The

positive relationship supports the perception that high returns are only possible when top management is highly incentivised, often to the detriment of other employees. As per previous studies this is identified as one of the major causes of inequality in South Africa (Pontusson*, et al.*, 2002). One of the common practices to improve profitability or manage market risk, is to cut costs. With one of the major cost items for most companies being its salary and wage bill, a major focus of management is to avoid major increases in this area and in extreme cases to reduce this cost through retrenchments (Collier*, et al.*, 2010). Unfortunately, this is more often than not focused on the remuneration of the lower-paid staff. In addition to aggravate the situation, as a result of profitability increases or positive messages being communicated to the market regarding cost control, top management is further rewarded for its effort through bonuses and other incentive schemes.

Chairman remuneration, relative to the CEO's guaranteed remuneration showed a positive relationship to the odds that a company is classified as a top-performing company in terms of shareholder return and its Sharpe ratio. In addition, *Average other NEDs' remuneration as a percentage of the CEO's guaranteed remuneration* showed a positive relationship to the odds that a company is classified as a top-performing company in terms of share price volatility and its Sharpe ratio. According to resource dependency theory, the board should provide a company with specialised skills and experience, which contribute to a company's performance and ability to manage its risk (Ferreira, 2010; Hillman & Dalziel, 2003; Young & Roberts, 2008). Therefore, to ensure that people with the right skill and experience are attracted and retained, careful consideration should be given to the levels of remuneration paid (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017; Hempel & Fay, 1994; Seegers*, et al.*, 2015). As the pressure on board members increases, due to shareholder action or regulatory requirements, it becomes more difficult to attract and retain quality chairpersons and NEDs (Hempel & Fay, 1994). Therefore, it is reasonable to expect that more skilled and thus higher-paid chairpersons and NEDs could lead to better performance and management of a company's risk.

The *length of board service diversity* showed a negative relationship to the odds that a company is classified as a top-performing company in terms of shareholder return, but a positive relationship to the odds that a company is classified as a top-performing company in terms of share price volatility. On the one hand research indicates that diversity on a board creates alternative views and perspectives (Harjoto*, et al.*, 2015; Mans-Kemp*, et al.*, 2018b; Simons & Pelled, 1999), but may cause conflict, leading to non-cohesiveness and lack of co-ordination of the board, which could result slow reaction to seize opportunities or detract from a united strategic focus (Adams*, et al.*, 2015; Bantel & Jackson, 1989; Scholtz & Kieviet, 2018b). This may cause the negative association with the return to shareholders. On the other hand, length of tenure gives various signals to the market. Changes may signal directed efforts towards change, which could lead the market to anticipate change within a company. This could be beneficial to a company's image and value or lead to market reaction which may cause volatility (Daily & Dalton, 1995). Long tenures further allow directors to increase their expertise and level of engagement with a company and provides the NED with in-depth business knowledge and experience with a company's environment (Reguera-Alvarado & Bravo, 2017). In contrast, Dou*, et al.* (2015) report that independent directors with lengthy tenures are seen as ineffective in fulfilling their role as monitors and in setting company strategy. Therefore, it is reasonable to find that a good mix in tenures among board members will benefit a company in terms of the market's perception of the company, and consequently, the volatility of its share price. It is worth noting that the odds ratio indicates a small impact by this variable.

Relative education of the board showed a positive relationship to the odds that a company is classified as a top-performing company in terms of shareholder return. However, the odds ratio marginally above one time indicates low odds that the education level of the board will contribute to a company being classified as a top performing company based on its total return to shareholders.

On the one hand *average board experience* also revealed a negative relationship with the odds that a company is classified as a top-performing company in terms of

shareholder return. This contradicts the view that experience as a board member is the most relevant experience a director could have (Gray & Nowland, 2013). However, according to the research too many board seats may cause board members not to spend enough time on each of their positions to adequately perform their duties (Chiranga & Chiwira, 2014; Mans-Kemp*, et al.*, 2018b).On the other hand *average board experience* displayed a positive relationship to the odds that a company is classified as a top-performing company in terms of share price volatility. The literature review promotes years of experience acting in the capacity of director as being the most relevant experience for a director (Gray & Nowland, 2013; Mans-Kemp*, et al.*, 2018b; Westphal & Milton, 2000). A board is responsible for numerous complex tasks, such as monitoring of management and company operations, making strategic decisions, and analysing market opportunities (Gray & Nowland, 2013; Mans-Kemp*, et al.*, 2018b). Experience on other boards will enable NEDs to provide better strategic direction, especially in specialised situations, such as mergers or acquisitions, in which they have previous experience (Gray & Nowland, 2013; Kroll*, et al.*, 2008). In addition, multiple directorships may well be an indication of a director's quality, which could reflect positively on a company (Ferris*, et al.*, 2003; Reguera-Alvarado & Bravo, 2017). This may be an indication that boards with a higher average level of experience on other boards tend to be more risk averse, which results in lower return to shareholders, albeit more stable.

B. *Internal risk management*

This section summarises the findings of the internal risk, and specifically liquidity risk, management measures namely, the current ratio and the cash conversion cycle of companies.

Board size revealed a negative relationship to the odds that a company is classified as a top-performing company in terms of the current ratio but a positive association with the odds that a company is classified as a top-performing company in terms of the cash conversion cycle of a company. Larger and more complex companies generally have a greater need for advice from its board, and therefore a larger

board, according to resource dependency theory, should be more likely to possess the skills and experience to provide this guidance and advice (Coles*, et al.*, 2008; Jackling & Johl, 2009; Lipton & Lorsch, 1992; Muchemwa, 2014; Scholtz & Kieviet, 2018a; Scholtz & Kieviet, 2018b). Moreover, larger boards may increase a company's ability to form connections with its environment, which will enable a company to secure critical resources (Dalton*, et al.*, 1999). Consequently, the extensive planning and assessment of different financing options to improve the management of the cash conversion cycle appear to benefit from the potential advantages of a bigger board. The current ratio and the cash conversion cycle often give opposing messages regarding the liquidity of a company (Lyroudi & McCarty, 1993; Richards & Laughlin, 1980). Consequently, the contribution made by an increase in board size to improve the cash conversion cycle may contribute to decrease the current ratio.

Percentage of NEDs displayed a negative relationship to the odds that a company is classified as a top-performing company in terms of the cash conversion cycle of a company. *Percentage of independent NEDs* had a negative relationship to the odds that a company is classified as a top-performing company in terms of the current ratio of a company. Previous studies contend that NEDs can contribute significant knowledge, insights and objectivity to the decision-making of the board (Arzubiaga*, et al.*, 2018; Ferreira, 2010; Hillman & Dalziel, 2003; Marlin & Geiger, 2012; Young & Roberts, 2008). However, they may have difficulty in understanding the complexities of a company because they are only engaged on a part-time basis and may hold a number of board seats and do not have adequate time to devote to their tasks. In addition, NEDs often do not have the same quality of information that executive directors have (Baysinger & Hoskisson, 1990; Weir & Laing, 2000). Therefore, it was not totally unexpected that additional NEDs, including independent NEDs, would not always significantly contribute to the optimal management of internal functions of a company such as the management of the current ratio and the cash conversion cycle.

Percentage black persons revealed a negative relationship to the odds that a company is classified as a top-performing company in terms of the current ratio, but a positive association with the odds that a company is classified as a top-performing company in terms of the cash conversion cycle. Research found that ethnic diversity contributes to a company's ability to monitor management and to make decisions as required by agency theory. Furthermore, ethnic diversity, in line with resource dependency theory, will also contribute to a company's ability to link with its environment, thereby being able to attract much-needed resources. Diversity also improves a board's ability to identify the needs and interests of different groups of stakeholders (Harjoto*, et al.*, 2018; Ntim, 2015). Ethnic diversity will contribute to a company's reputation and innovation ability due to the different experiences and viewpoints available to the company. In addition, greater ethnic diversity could be a means of gaining acceptance from the public and government that could contribute to the various elements of the cash conversion cycle, such as preferential payment terms (Fanto*, et al.*, 2011; Ferreira, 2010; Miller & Triana, 2009). The current ratio and the cash conversion cycle often give opposing messages regarding the liquidity of a company (Lyroudi & McCarty, 1993; Richards & Laughlin, 1980). Consequently, the contribution made by an increase in percentage black persons on a board to improve the cash conversion cycle may well prove to decrease the current ratio.

Percentage of South Africans on the board revealed a positive relationship to the odds that a company is classified as a top-performing company in terms of the current ratio but a negative association with the odds that a company is classified as a top-performing company in terms of the cash conversion cycle. Foreign directors directly contribute to the diversity of the board, which could contribute to avoiding groupthink and the development of factions in the board (Lipton & Lorsch, 1992). Furthermore, Trautman (2012) and Harjoto*, et al.* (2018) state that the enhanced diversity may give rise to competitive advantages due to different experiences, socio-economic outlooks and different approaches to challenges (Harjoto*, et al.*, 2018; Trautman, 2012). Consequently, foreign directors may have more experience and innovative ideas on how to manage a company's working capital more aggressively. In addition, foreign directors may be able to assist

companies in raising funds through their access to foreign equity and debt markets, which may add to a company's liquidity, allowing a company to maintain less conservative liquidity levels (Doidge*, et al.*, 2004). As stated earlier, the current ratio and the cash conversion cycle often give opposing messages regarding the liquidity of a company (Lyroudi & McCarty, 1993; Richards & Laughlin, 1980). Consequently, the increase in the cash conversion cycle as a result of the lower levels of the foreign directors could lead to increased levels of the current ratio, with South African directors feeling more comfortable to maintain more conservative working capital levels.

Payment gap displayed a positive relationship to the odds that a company is classified as a top-performing company in terms of the current ratio of a company. However, the odds are only marginally above one time, which implies low odds that the payment gap will affect the classification of a company as a top performer based on the current ratio. Literature speculate that the reason for this is that employees are either not aware of the magnitude of the payment gap or do not have the ability or motivation to react to the knowledge (Faleye*, et al.*, 2013). In contrast to behavioural theory this may be caused by the fear of being dismissed if they shun their responsibilities (Gao, 2019). Also, the effect of tournament theory may be eliminated by a shortage of opportunities to work for promotion (Chen*, et al.*, 2014; Faleye*, et al.*, 2013; Gao, 2019).

Chairman remuneration and average other NED remuneration as a percentage of CEO's guaranteed remuneration respectively showed a positive relationship to the odds that a company is classified as a top-performing company in terms of the cash conversion cycle. Research found a strong positive relationship between the NEDs' remuneration and the size and complexity of a company (Bugeja*, et al.*, 2016). To ensure that candidates with the right skills and experience are attracted and retained, careful consideration should be given to the levels of remuneration paid (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017). Yazdanfar and Öhman (2014) highlight that cash conversion cycle management involves extensive planning and assessment of different financing options to improve performance. Therefore, it

stands to reason that a chairman with superior experience would be better able to understand and guide more complex processes such as the cash conversion cycle. Such candidates come at a premium (Bar-Hava*, et al.*, 2018; Fahlenbrach*, et al.*, 2017). In addition, a better remunerated chairman is expected to be more willing and able to dedicate adequate time and effort to his or her responsibilities

Age diversity showed a negative relationship to the odds that a company is classified as a top-performing company in terms of managing the cash conversion cycle. Different age groups have significantly different values, beliefs and attitudes, which contribute to the *generation gap* (Taveggia & Ross, 1978; Weinstein, 2020; Wijeyekoon, 2015). A higher level of diversity may lead to significant conflict within the board, which would make it difficult to optimally manage and oversee a complex function such as the cash conversion cycle, which involves extensive planning and assessing of different financing options to improve performance (Yazdanfar & Öhman, 2014). This may lead to maintaining more conservative working capital levels.

Diversity of professional experience resulted in a positive relationship to the odds that a company is classified as a top-performing company in terms of the current ratio of a company. The management of liquidity is impacted by a number of diverse elements, such as inventory, debtors and creditors Richards and Laughlin (1980) and Fleming (1986). The different elements require different skills and experience to be able to fully understand and direct the management thereof; for example, technical skills, market knowledge, sales experience, financial skills and interpersonal skills (Mans-Kemp*, et al.*, 2018b; Simons & Pelled, 1999). Therefore, it was not surprising that the diversity of professional backgrounds of a company would contribute to the management of the current ratio. Furthermore, professional experience also contributes to shaping the directors' thinking, processes and attitude. This will affect directors' behaviour at every stage of innovation; for example, it may determine the issues they identify as important and how these issues are formulated (Bantel & Jackson, 1989).

Academic diversity (per qualification type) had a negative relationship to the odds that a company is classified as a top-performing company in terms of the current ratio of a company. The literature state that directors' decision-making is dependent on their cognitive ability, which is influenced by their experience, values and education (Wiersema & Bantel, 1992). The cognitive approach of different board members influences the way in which individual team members gather and process information. Individuals' reasoning style and personality significantly influence their direction of educational specialisation, which, in turn, shape their perspective and outlook (Talke*, et al.*, 2011; Wiersema & Bantel, 1992). The negative association may be the result of conflicting approaches and philosophies held by the various board members. This conflict reflects in their varying levels of education, regarding the operation of a company, the levels of liquidity to be maintained and the importance of the various risk elements that a company is exposed to.

Relative education level of the board resulted in a negative relationship to the odds that a company is classified as a top-performing company in terms of the cash conversion cycle. The cognitive approach of different board members influences the way in which the individual team members gather and process information and the number and diversity of solutions generated. Individuals' reasoning style and personality significantly influence their direction of educational specialisation, which, in turn, shapes their perspectives and outlooks (Talke*, et al.*, 2011; Wiersema & Bantel, 1992). Literature also points out that more risk averse people tend to study more (De Paola & Gioia, 2012). It is therefore fair to assume that individuals with higher levels of education are more reserved, therefore preferring a more conservative current ratio and less aggressive cash conversion cycle as a measure of a company's liquidity.

Diversity of board experience displayed a negative relationship to the odds that a company is classified as a top-performing company in terms of the current ratio but a positive association with the odds that a company is classified as a top-performing company in terms of the cash conversion cycle of a company. Other experiences will enable NEDs to provide better strategic direction, especially in specialised situations in which they have previous experience (Kroll*, et al.*, 2008). It is common

practice for companies to use directors with multiple board seats as a tool to attract external skills, thereby bolstering the effectiveness of the board (Chiranga & Chiwira, 2014; Kroll*, et al.*, 2008). However, the literature review contests that the number of board seats held by an individual should be limited because the effectiveness of board functions, such as monitoring and supervision, is often jeopardised by too many board seats (Chiranga & Chiwira, 2014; Jackling & Johl, 2009; Mans-Kemp*, et al.*, 2016b). Consequently, maintaining a mix of directors with varying levels of experience on other boards should ensure that the board has the skills and experience necessary to oversee and steer relatively complex functions, such as the management and oversight of the cash conversion cycle, while having the necessary focus to dedicate adequate time to these functions (Kroll*, et al.*, 2008). As stated before, the current ratio and the cash conversion cycle often give opposing messages regarding the liquidity of a company (Lyroudi & McCarty, 1993; Richards & Laughlin, 1980). Consequently, the contribution made by an increase in board diversity to improve the cash conversion cycle may contribute to decrease the current ratio.

7.4 PRACTICAL IMPLICATIONS

The practical implications of the findings of the study are manifold. First, companies, and by implication shareholders, need to review the remuneration structures and incentive schemes of their top management to ensure the measures are properly defined and applied. The negative relationships with shareholder return and Sharpe ratio confirm literature's views that management's incentives are not merit based and are not really effective to align the goals of management with those of the shareholders as per agency theory. (Bhagat & Black, 1999; Chamorro-Premuzic, 2013; Deysel & Kruger, 2015; Dorff, 2014; Ferreira, 2010; Fisher, 2005; Seegers*, et al.*, 2013).

Second, the knowledge will empower companies to implement reforms in support of the national inclusive development objectives. The implementation of such transformation, for example, in terms of the ethnic and gender composition of a

board, will be much easier if evidence can be found that transformation creates value, as evidences by the positive relationship between percentage black people and managing the cash conversion cycle and between percentage females and managing share price volatility, or at least does not destroy value, as evidenced by percentage black persons not having a statistically significant relationship with return to shareholders, share price volatility or the Sharpe ratio.

Third, the finding of significant relationships between the Chairman's and the NEDs' remuneration and most of the performance measures and the involved process of managing the cash conversion cycle shows that companies will be well advised to ensure that they adequately (while maintaining fairness and responsibleness) remunerate their chairmen and other NEDs (Fahlenbrach*, et al.*, 2017). This proves to be an important incentive measure to ensure that a company attract and retain people with the right skills and experience and to ensure that these board members devote adequate attention to their tasks.

Fourth, King IV advocates that a board should consist of a majority of NEDs of whom the majority should be independent directors. However, the findings of this study indicated insignificant relationships between these two characteristics and all of the measures except for cash conversion cycle and return to shareholders where percentage NEDs and percentage independent NEDs respectively showed negative associations. This concurs with literature's view that independence is not a safeguard against financial catastrophes (Bhagat & Black, 2002). Regulators may want to review their recommendations around levels of independence and to clarify how companies can obtain substantial independence and not necessarily total independence (Bhagat & Black, 2002). This also indicates the inability of NEDs and independent NEDs to fully understand the company's business or the issues at hand to enable them to make a significant contribution. Recommendation made by King IV should be expanded to provide more guidance on how to properly develop new and existing directors (IoDSA, 2016). In addition, more guidance should be provided on the quality and timing of information that should be provided to NEDs, as well as on how to make sure that NEDs are not overly stretched between too

many other obligations that prevent them from paying adequate attention to their tasks.

Fifth, even though experience as a director on other boards is the most relevant experience that board members can have (Gray & Nowland, 2013), this study showed that the mere increase in such experience does not provide assurance of board efficiency and company performance. Companies need to ensure that the directors on their boards are not overly extended in terms of the number of board seats held. Where companies find it difficult to identify experienced individuals with adequate capacity, it may be an indication to the market (this includes directors of companies, shareholders, management, academic institutions) that new talent should be developed.

Sixth, statistically insignificant relationships between average age, age diversity, academic diversities and education levels and most of the performance and risk management measures show that different age groups and academics at least won't harm the company if appointed. Nomination committees, directors and shareholders should be encouraged to consider candidates from different age groups and different sectors, such as academics, when looking for new appointees or for candidates to groom (that is, to provide mentorship and opportunities to develop the necessary skills and gain appropriate experience) as part of the board's succession plans.

Seventh, shareholders are guided with respect to the characteristics they may wish to include in their boards, depending on their objectives or the areas that require focus within the company's operations. For example, the positive association between percentage female and share price volatility indicates that they may wish to include more females on the board if they are concerned over the share price volatility of the company.

Eighth, the percentage of black persons on the board showed a positive relationship to the management of a company's liquidity risk as measured by the cash

conversion cycle and no significant association with the other performance and market risk measures. The latter might be an indication that black persons may still be appointed as a result of tokenism and companies and government need to resolve this issue to ensure that all appointments are made on merit and that all the directors are able to fulfil their role and responsibility. However, this may be an indication that there is no difference between the abilities of the various races and that black persons are equally able to make a meaningful contribution and nomination committees and boards, with the aid of recruitment agencies specialising in the recruitment of directors, should be encouraged to appoint directors from all race groups. It may, however, also indicate a shortage of black candidates, which prevents them from making a more meaningful contribution. Government and other stakeholders should develop programmes to remedy the situation

7.5 RESEARCH LIMITATIONS

Despite the contributing findings, this study, like any other study, had limitations. In the first instance, the study was based on companies listed in the 13 largest sectors of the South African stock exchange. This focus on South Africa contributes to the understanding of the relationship between a wide range of board characteristics and certain components of company performance and risk management, across a reasonable coverage of the JSE. However, care should be taken when attempting to extrapolate the findings across the full spectrum of companies listed in South Africa. Furthermore, similar studies, focusing on other African countries need to be done to be useful in terms of comparing and extrapolating results across the continent.

In addition, the performance and risk management measures investigated were limited to five criteria, covering the level of company performance, the variability of the performance and the management of the liquidity of a company, which emerged from the literature review. The researcher does not purport these factors to be able to fully measure company performance and risk management or that the selected factors are only associated with the board characteristics observed. The

performance of a company, the risk associated with the performance and the internal risk management of a company are complex and interrelated concepts with many market, political and socio-economic factors having an impact. Some of these factors are influenced by a company's board and some are totally outside the control of management or the board. Although there is no consensus among researchers on the most accurate measure of company performance or company risk, the measures used in this study, as mentioned above, are considered valid, and have been used in previous studies (Atanas, 2014; Cagle*, et al.*, 2013; Da Costa, 2014; Fleming, 1986; Hörnmark, 2015; John, 2001; Mans-Kemp*, et al.*, 2017; Mans-Kemp & Viviers, 2015; Mathew*, et al.*, 2018; Perryman*, et al.*, 2016; Zeidan & Shapir, 2017). It should further be noted that the aim was to determine the relative performance and risk management ability of the companies as opposed to providing an absolute measure of performance or risk management. However, further studies considering other aspects of company performance and risk management are necessary to gain greater insight into this complex matter.

7.6 SUGGESTIONS FOR FURTHER RESEARCH

Based on the results of this study, some topics for future research are recommended. The study highlighted certain board characteristics as having a statistically significant association with the odds that a company is classified as a top-performing company in terms of the five dependent variables. These items are highlighted in the five *best fit* models reflected in Section 6.3.3 and summarised in Table 7-1.

Further studies are recommended, focussing on these characteristics that were found to have statistically significant associations with the various company performance and risk management measures to provide better insight into the complexities of the relationships. Future research should also investigate the factors underlying the specific characteristics; for example, the rationale for non-appointment of females, whether it is a result of the insufficiency of available expertise and experience or discriminatory reasons. This would probably have to

be done through qualitative research using interviews, questionnaires or case studies.

CEO remuneration remains a topical issue that warrants much further research, especially in how it relates to company performance and risk management. Research should include consideration of the various components that constitute the remuneration packages of the CEO and how this relates to company performance. This should be investigated both from a historical perspective, that is how remuneration relates to historic performance of a company, and a forward-looking perspective, that is how the remuneration is associated with the performance of a company after the rewards are made.

In the light of the climate of employee strikes and protest action in South Africa, specifically related to wages, and the ongoing concern around social and employment inequality in the country, further studies on the payment gap are necessary. These studies should consider the payment gap both in terms of average employee remuneration and minimum wage levels. How the payment gap relates to the performance and risk of a company will add further insight into a very contentious issue.

Future studies should also look to expand on the measures used to determine company performance, market risk and internal risk to enhance the understanding of which performance and risk measures are associated with the various board characteristics.

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APPENDICES

Appendix 1: Descriptive statistics

Appendix 1 shows the overall descriptive statistics for all variables used in the analyses.

	Valid	Missing	Mean	Median	Std. Deviation	Minimum	Maximum
Board size (#)	1 025	165	9.309	9.000	2.896	3	17
Independence							
Percentage of NEDs (%)	1 025	165	66.746	66.667	12.949	30.357	100.000
Percentage of independent NEDs (%)	1 024	166	74.132	75.000	22.090	0.000	100.000
Attributes							
Percentage of black persons (%)	1 018	172	31.706	28.571	21.560	0.000	87.553
Percentage of females (%)	1 023	167	15.152	14.286	12.158	0.000	45.556
Percentage of South Africans (%)	1 025	165	83.407	100.000	26.569	0.000	162.500
Remuneration							
Relative CEO remuneration movement (%)	751	439	56.143	14.017	272.602	-509.152	595.262
Payment gap (times)	816	374	40.215	29.111	33.244	0.024	113.292
Chairman remuneration as a percentage of CEO guaranteed (%)	904	286	28.155	19.048	23.970	0.362	76.630
Average other NED remuneration as a percentage of CEO guaranteed (%)	923	267	0.108	0.088	0.071	0.407	25.540
Time based							
Average age (years)	1 012	178	54.591	54.556	4.562	41.000	66.429
Age diversity (factor)	996	194	9.465	9.324	2.81	1.850	16.976
Diversity of tenure (factor)	1 001	189	4.163	3.746	2.597	0.000	10.653
Background							
Academic diversity (per field) (factor)	1 016	174	0.473	0.503	0.183	0.000	0.857
Diversity of professional experience (factor)	1 024	166	0.813	0.818	0.052	0.464	1.000
Education							
Academic diversity (qualification type) (factor)	1 016	174	0.732	0.742	0.076	0.333	0.952
Relative education level of board (factor)	1 017	173	16.047	16.000	4.191	5.286	27.167
Experience							
Average board experience (factor)	1 025	165	1.800	1.833	0.404	1.000	3.000
Diversity of board experience (factor)	1 010	180	0.677	0.716	0.199	0.000	1.000
Dependent variables							
Relative shareholder return	925	265	(4.077)	(0.096)	92.017	(1,942.00)	528.435
Relative volatility	1 000	190	0.001	(0.071)	0.323	(0.743)	2.140
Relative Sharpe ratio	942	248	0.059	(1.801)	10.225	(21.928)	64.494
Relative current ratio	1 026	164	(0.000)	(0.167)	0.628	(0.990)	5.568
Relative cash conversion cycle	783	407	0.052	0.142	3.675	(41.446)	34.646

Appendix 2: Correlation test results

Appendix 2 shows the results of the correlation tests (Pearson Correlation) run on the independent variables. Four sets of independent variables displayed significant correlation. Consequently, only one variable in each set is included in the final data analysis as described in section A

	Relative CEO remun move	Payment gap	Board size	% NEDs	% Black persons	% Females	% Independ NEDs	Chair remun as % of CEO guarant'd	Ave other NEDs remun as % of CEO guarant'd	Average tenure	Diversity of tenure	Average Age	Age diversity	Average board experience	Board experience diversity	% South African directors	Academic diversity (type) Shannon	Academic diversity (type) Simpson	Academic diversity (field) Shannon	Academic diversity (field) Simpson	Experienc e diversity (field) Shannon	Experienc e diversity (field) Simpson	Relative education level
Relative CEO remun move	1	.146**	-0.011	0.049	0.053	0.056	0.017	-0.065	-0.067	-0.053	-0.043	-0.007	-0.014	-0.017	-0.029	-0.065	0.009	0.010	0.025	0.035	0.021	-0.012	0.002
Payment gap	.146**	1	.243**	.200**	.198**	.144**	.135**	-.152**	-.158**	.146**	.186**	.106**	-.069*	.209**	.164**	0.058	.216**	.150**	.129**	.078*	.159**	0.060	.181**
Board size	-0.011	.243**	1	.264**	.230**	.203**	0.047	-0.001	-.073*	0.045	.121**	0.010	-.196**	.322**	.234**	.144**	.284**	0.040	.229**	.069*	.323**	-0.045	.252**
% NEDs	0.049	.200**	.264**	1	.216**	.162**	-0.024	-.115**	.081*	0.002	-0.030	.202**	-.115**	.342**	.125**	-.108**	.198**	.137**	.177**	.146**	.080*	-.078*	.159**
% Black persons	0.053	.198**	.230**	.216**	1	.539**	.104**	-0.025	0.016	-.157**	-.123**	-.203**	-.225**	0.010	.149**	.285**	.226**	.120**	.273**	.193**	.363**	.204**	.356**
% Females	0.056	.144**	.203**	.162**	.539**	1	.124**	-0.001	0.049	-.112**	-0.062	-.222**	-.128**	0.044	.126**	.189**	.231**	.161**	.091**	0.035	.239**	.135**	.269**
% Independ NEDs	0.017	.135**	0.047	-0.024	.104**	.124**	1	0.003	-0.013	-.065*	-.072*	0.022	-.085**	.100**	.081*	-0.015	.091**	0.037	.085**	0.049	0.030	-0.013	.221**
Chair remun as % of CEO	-0.065	-.152**	-0.001	-.115**	-0.025	-0.001	0.003	1	.290**	0.054	.094**	.094**	-0.048	0.047	-0.014	-.154**	-.106**	-.152**	.107**	.123**	0.007	0.003	-0.038
Ave other NEDs remun as %	-0.067	-.158**	-.073*	.081*	0.016	0.049	-0.013	.290**	1	-.078*	-0.045	0.042	-0.036	0.015	0.054	-0.018	0.013	0.028	0.004	0.018	-0.014	0.019	-0.004
Average tenure	-0.053	.146**	0.045	0.002	-.157**	-.112**	-.065*	0.054	-.078*	1	.819**	.424**	.145**	-0.040	-0.033	.113**	.069*	.070*	-0.056	-0.046	-.106**	-.119**	-.124**
Diversity of tenure	-0.043	.186**	.121**	-0.030	-.123**	-0.062	-.072*	.094**	-0.045	.819**	1	.273**	.098**	-.064*	-0.015	.096**	.102**	0.062	-0.042	-0.055	-0.007	-0.031	-0.016
Average Age	-0.007	.106**	0.010	.202**	-.203**	-.222**	0.022	.094**	0.042	.424**	.273**	1	.073*	.206**	-0.039	-.150**	0.007	0.008	.121**	.194**	-0.059	-0.022	-.115**

Appendix 2: Correlation test results (Continued)

	Relative CEO remun move	Payment gap	Board size	% NEDs	% Black persons	% Females	% Independ NEDs	Chair remun as % of CEO guarant'd	Ave other NEDs remun as % of CEO guarant'd	Average tenure	Diversity of tenure	Average Age	Age diversity	Average board experience	Board experience diversity	% South African directors	Academic diversity (type) Shannon	Academic diversity (type) Simpson	Academic diversity (field) Shannon	Academic diversity (field) Simpson	Experienc e diversity (field) Shannon	Experienc e diversity (field) Simpson	Relative education level
Age diversity	-0.014	-.069*	-.196**	-.115**	-.225**	-.128**	-.085**	-0.048	-0.036	.145**	.098**	.073*	1	-.142**	-.135**	-.098**	-.149**	-.096**	-.202**	-.150**	-.208**	-.131**	-.295**
Average board experience	-0.017	.209**	.322**	.342**	0.010	0.044	.100**	0.047	0.015	-0.040	-.064*	.206**	-.142**	1	.371**	-0.058	0.051	-0.034	0.034	-0.015	.081**	-0.037	.205**
Board experience diversity	-0.029	.164**	.234**	.125**	.149**	.126**	.081*	-0.014	0.054	-0.033	-0.015	-0.039	-.135**	.371**	1	.083**	.245**	.214**	-0.009	-0.058	.147**	0.020	.209**
% South African directors	-0.065	0.058	.144**	-.108**	.285**	.189**	-0.015	-.154**	-0.018	.113**	.096**	-.150**	-.098**	-0.058	.083**	1	0.036	0.010	-.116**	-.196**	.184**	.146**	.186**
Academic diversity (type) Shannon	0.009	.216**	.284**	.198**	.226**	.231**	.091**	-.106**	0.013	.069*	.102**	0.007	-.149**	0.051	.245**	0.036	1	.914**	.084**	0.048	.168**	0.016	.365**
Academic diversity (type) Simpson	0.010	.150**	0.040	.137**	.120**	.161**	0.037	-.152**	0.028	.070*	0.062	0.008	-.096**	-0.034	.214**	0.010	.914**	1	-.080*	-.062*	0.031	-0.016	.243**
Academic diversity (field) Shannon	0.025	.129**	.229**	.177**	.273**	.091**	.085**	.107**	0.004	-0.056	-0.042	.121**	-.202**	0.034	-0.009	-.116**	.084**	-.080*	1	.957**	.337**	.187**	.274**
Academic diversity (field) Simpson	0.035	.078*	.069*	.146**	.193**	0.035	0.049	.123**	0.018	-0.046	-0.055	.194**	-.150**	-0.015	-0.058	-.196**	0.048	-.062*	.957**	1	.256**	.191**	.150**
Experience diversity (field) Shannon	0.021	.159**	.323**	.080*	.363**	.239**	0.030	0.007	-0.014	-.106**	-0.007	-0.059	-.208**	.081**	.147**	.184**	.168**	0.031	.337**	.256**	1	.824**	.318**
Experience diversity (field) Simpson	-0.012	0.060	-0.045	-.078*	.204**	.135**	-0.013	0.003	0.019	-.119**	-0.031	-0.022	-.131**	-0.037	0.020	.146**	0.016	-0.016	.187**	.191**	.824**	1	.164**
Relative education level	0.002	.181**	.252**	.159**	.356**	.269**	.221**	-0.038	-0.004	-.124**	-0.016	-.115**	-.295**	.205**	.209**	.186**	.365**	.243**	.274**	.150**	.318**	.164**	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed)

Appendix 3: Linearity test results

Appendix 3 shows the results of the Box-Tidwell Transformation tests, which were used to test for nonlinearity between the independent variables and the logit of the dependent variables (linearity of the logit). A number of independent variables did not adhere to this assumption and were subsequently converted to categorical variables as described in section B

Variables in the Equation - Total Company Return

	B	S.E.	Wald	df	Sig.	Exp(B)
Relative CEO remuneration movement	-0.333	0.157	4.526	1	0.033**	0.717
Payment gap	-0.008	0.013	0.366	1	0.545	0.992
Board size	-0.626	0.329	3.619	1	0.057*	0.535
% NEDs	1.187	9.071	0.017	1	0.896	3.277
% Black persons	52.461	33.802	2.409	1	0.121	6.07759E+22
% Females	-122.203	93.383	1.712	1	0.191	0.000
% Independent non-executive directors	-9.607	31.776	0.091	1	0.762	0.000
Chair remuneration as % of CEO guaranteed	2.617	2.484	1.110	1	0.292	13.701
Average other NEDs remuneration as % of CEO guaranteed	-12.281	7.524	2.665	1	0.103	0.000
Diversity of tenure	0.692	0.398	3.031	1	0.082*	1.998
Average Age	-0.955	0.665	2.063	1	0.151	0.385
Age diversity	-0.342	0.295	1.342	1	0.247	0.711
Average board experience	-3.709	4.390	0.714	1	0.398	0.025
Board experience diversity	16.777	38.584	0.189	1	0.664	19321267.841
% South Africans on board	-33.938	22.176	2.342	1	0.126	0.000
Academic diversity (degree type) Simpson	23.364	23.138	1.020	1	0.313	14018969869
Academic diversity (field) Simpson	33.068	40.306	0.673	1	0.412	2.29829E+14
Experience diversity (field) Simpson	211.207	122.317	2.982	1	0.084*	5.31898E+91
Relative education level	0.301	0.235	1.638	1	0.201	1.351
Constant	133.623	99.017	1.821	1	0.177	1.07541E+58

** Significant at the .05 level, * Significant at the .10 level

Variables in the Equation - Share price volatility

	B	S.E.	Wald	df	Sig.	Exp(B)
Relative CEO remuneration movement	-0.033	0.184	0.033	1	0.857	0.967
Payment gap	0.003	0.018	0.032	1	0.859	1.003
Board size	-0.383	0.464	0.680	1	0.409	0.682
% NEDs	-25.035	11.436	4.793	1	0.029**	0.000
% Black persons	74.210	45.169	2.699	1	0.100*	1.69467E+32
% Females	223.073	133.678	2.785	1	0.095*	7.57231E+96
% Independent non-executive directors	37.044	45.090	0.675	1	0.411	1.22524E+16
Chair remuneration as % of CEO guaranteed	5.349	3.130	2.920	1	0.088*	210.319
Average other NEDs remuneration as % of CEO guaranteed	-21.383	10.744	3.961	1	0.047**	0.000
Academic diversity (degree type) Simpson	-3.092	32.688	0.009	1	0.925	0.045
Academic diversity (field) Simpson	3.497	55.258	0.004	1	0.950	33.009
Experience diversity (field) Simpson	154.262	170.418	0.819	1	0.365	9.88554E+66
Relative education level	-0.155	0.319	0.236	1	0.627	0.856
Age diversity	-0.069	0.411	0.028	1	0.867	0.933
Average board experience	-6.317	6.509	0.942	1	0.332	0.002
Board experience diversity	82.299	53.897	2.332	1	0.127	5.51911E+35
Diversity of tenure	0.818	0.509	2.590	1	0.108	2.267
% South Africans on board	37.363	27.055	1.907	1	0.167	1.68442E+16
Average Age	1.539	0.816	3.560	1	0.059*	4.661
Constant	172.860	137.030	1.591	1	0.207	1.18029E+75

** Significant at the .05 level

Appendix 3: Linearity test results (continued)

Variables in the equation - Sharpe ratio

	B	S.E.	Wald	df	Sig.	Exp(B)
Relative CEO remuneration movement	-1.594	0.261	37.310	1	0.000***	0.203
Payment gap	0.017	0.014	1.450	1	0.229	1.017
Board size	-0.060	0.347	0.030	1	0.862	0.942
% NEDs	-14.337	9.714	2.178	1	0.140	0.000
% Black persons	8.912	36.485	0.060	1	0.807	7421.534
% Females	-122.773	102.826	1.426	1	0.232	0.000
% Independent non-executive directors	-36.765	34.984	1.104	1	0.293	0.000
Chair remuneration as % of CEO guaranteed	1.045	2.435	0.184	1	0.668	2.843
Average other NEDs remuneration as % of CEO guaranteed	-16.258	7.608	4.566	1	0.033***	0.000
Academic diversity (degree type) Simpson	-8.763	25.145	0.121	1	0.727	0.000
Academic diversity (field) Simpson	7.685	42.118	0.033	1	0.855	2175.450
Experience diversity (field) Simpson	60.215	59.608	1.020	1	0.312	1.41588E+26
Relative education level	0.010	0.257	0.002	1	0.968	1.010
Age diversity	-0.267	0.336	0.629	1	0.428	0.766
Average board experience	4.051	4.612	0.771	1	0.380	57.437
Board experience diversity	-54.106	53.491	1.023	1	0.312	0.000
Diversity of tenure	0.266	0.417	0.407	1	0.524	1.305
% South Africans on board	46.362	31.345	2.188	1	0.139	1.3635E+20
Average Age	0.710	0.645	1.212	1	0.271	2.035
Constant	81.036	61.293	1.748	1	0.186	1.56077E+35

*** Significant at the .01 level

Variables in the Equation - Current ratio

	B	S.E.	Wald	df	Sig.	Exp(B)
Relative CEO remuneration movement	-0.148	0.164	0.818	1	0.366	0.862
Payment gap	-0.031	0.016	3.693	1	0.055***	0.970
Board size	-1.678	0.623	7.266	1	0.007*	0.187
% NEDs	2.076	12.772	0.026	1	0.871	7.972
% Black persons	144.205	44.041	10.721	1	0.001***	4.24097E+62
% Females	124.231	121.167	1.051	1	0.305	8.97535E+53
% Independent non-executive directors	-0.054	44.204	0.000	1	0.999	0.947
Chair remuneration as % of CEO guaranteed	2.485	3.283	0.573	1	0.449	11.999
Average other NEDs remuneration as % of CEO guaranteed	1.961	9.927	0.039	1	0.843	7.107
Diversity of tenure	0.381	0.514	0.549	1	0.459	1.464
Average Age	-1.133	0.794	2.037	1	0.154	0.322
Age diversity	0.935	0.440	4.503	1	0.034**	2.547
Average board experience	-3.093	6.698	0.213	1	0.644	0.045
Board experience diversity	43.617	56.049	0.606	1	0.436	8.76642E+18
% South Africans on board	-11.486	26.213	0.192	1	0.661	0.000
Academic diversity (degree type) Simpson	-49.424	29.483	2.810	1	0.094*	0.000
Academic diversity (field) Simpson	97.266	58.785	2.738	1	0.098*	1.74653E+42
Experience diversity (field) Simpson	38.653	84.444	0.210	1	0.647	6.12279E+16
Relative education level	0.451	0.272	2.754	1	0.097*	1.570
Constant	-61.126	70.896	0.743	1	0.389	0.000

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level

Appendix 3: Linearity test results (continued)

Variables in the Equation - Cash conversion cycle

	B	S.E.	Wald	df	Sig.	Exp(B)
Relative CEO remuneration movement	0.062	0.277	0.050	1	0.822	1.064
Payment gap	0.036	0.042	0.743	1	0.389	1.037
Board size	-1.987	1.437	1.913	1	0.167	0.137
% NEDs	-6.035	18.669	0.105	1	0.746	0.002
% Black persons	118.181	112.530	1.103	1	0.294	2.1157E+51
% Females	-413.068	230.191	3.220	1	0.073*	0.000
% Independent non-executive directors	-96.154	90.563	1.127	1	0.288	0.000
Chair remuneration as % of CEO guaranteed	-21.248	8.140	6.814	1	0.009***	0.000
Average other NEDs remuneration as % of CEO guaranteed	-6.165	28.793	0.046	1	0.830	0.002
Diversity of tenure	-5.990	1.929	9.639	1	0.002***	0.003
Average Age	6.654	2.558	6.767	1	0.009***	775.702
Age diversity	-1.522	1.091	1.944	1	0.163	0.218
Average board experience	37.812	16.696	5.129	1	0.024**	2.63924E+16
Board experience diversity	116.581	167.131	0.487	1	0.485	4.26967E+50
% South Africans on board	26.279	126.757	0.043	1	0.836	2.58654E+11
Academic diversity (degree type) Simpson	-52.986	73.161	0.525	1	0.469	0.000
Academic diversity (field) Simpson	150.316	130.718	1.322	1	0.250	1.91242E+65
Experience diversity (field) Simpson	2.212	168.195	0.000	1	0.990	9.131
Relative education level	-0.538	0.815	0.436	1	0.509	0.584
Constant	343.988	186.321	3.409	1	0.065*	2.467E+149

*** Significant at the .01 level, ** Significant at the .05 level, * Significant at the .10 level

Appendix 4: Test of heteroscedasticity

Appendix 4 shows the results of the regression analysis, for each of the dependent variables, using the *default* analysis method, which do not consider the presence of heteroscedasticity and the Huber-White estimator method. As can be seen from the results the difference between the two methods is insignificant.

Dependent Variable: **Shareholder return**
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Sample: 2009 2015
Included observations: 324
Convergence achieved after 3 iterations
Coefficient covariance computed using observed Hessian ***(Not considering heteroscedasticity)***

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	4.660	2.090	2.230	0.025
Relative education level of board	0.080	0.038	2.106	0.035
Percentage South Africans	0.649	0.744	0.871	0.383
Payment gap	0.011	0.004	2.558	0.010
Percentage of independent NEDs	-1.455	0.597	-2.439	0.014
Board size	0.0414	0.055	0.755	0.450
Percentage of black persons	-0.608	0.782	-0.778	0.436
Chairman remuneration as a percentage of CEO guaranteed remuneration	1.398	0.579	2.415	0.015
Age diversity	-0.055	0.054	-1.029	0.303
Academic diversity (per field)	-1.166	0.843	-1.384	0.166
Academic diversity (per degree)	-1.670	1.989	-0.839	0.401
Relative CEO movement (categorised)	-1.047	0.167	-6.277	0.000
Diversity of tenure	-0.151	0.057	-2.649	0.008
Average board experience	-0.774	0.393	-1.970	0.048

McFadden R-squared	0.1613	Mean dependent var	0.530
S.D. dependent var	0.4998	S.E. of regression	0.454
Akaike info criterion	1.2458	Sum squared resid	64.174
Schwarz criterion	1.4091	Log likelihood	-187.823
Hannan-Quinn criteria.	1.3110	Deviance	375.647
Restr. Deviance	447.924	Restr. Log likelihood	-223.962
LR statistic	72.276	Avg. log likelihood	-0.579
Prob(LR statistic)	0.000		

Obs with Dep=0	152	Total obs	324
Obs with Dep=1	172		

Source: EViews output

Appendix 4: Test of heteroscedasticity (continued)

Dependent Variable: **Shareholder return**
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Sample: 2009 2015
Included observations: 324
Convergence achieved after 3 iterations
Coefficient covariance computes using ***Huber-White method (Considering heteroscedasticity)***

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	4.659	2.034	2.290	0.022
Relative education level of board	0.080	0.038	2.102	0.035
Percentage South Africans	0.648	0.771	0.841	0.400
Payment gap	0.011	0.004	2.457	0.014
Percentage of independent NEDs	-1.455	0.585	-2.487	0.012
Board size	0.041	0.055	0.746	0.455
Percentage of black persons	-0.608	0.799	-0.760	0.446
Chairman remuneration as a percentage of CEO guaranteed remuneration	1.398	0.578	2.418	0.015
Age diversity	-0.055	0.052	-1.053	0.292
Academic diversity (per field)	-1.166	0.748	-1.558	0.119
Academic diversity (per degree)	-1.670	1.9165	-0.871	0.383
Relative CEO movement (categorised)	-1.046	0.165	-6.310	0.000
Diversity of tenure	-0.150	0.056	-2.671	0.007
Average board experience	-0.773	0.380	-2.032	0.042

McFadden R-squared	0.161	Mean dependent var	0.530
S.D. dependent var	0.499	S.E. of regression	0.454
Akaike info criterion	1.245	Sum squared resid	64.174
Schwarz criterion	1.409	Log likelihood	-187.823
Hannan-Quinn criteria.	1.311	Deviance	375.647
Restr. Deviance	447.924	Restr. Log likelihood	-223.962
LR statistic	72.276	Avg. log likelihood	-0.579
Prob(LR statistic)	0.000		

Obs with Dep=0	152	Total obs	324
Obs with Dep=1	172		

Source: EViews output

Appendix 4: Test of heteroscedasticity (continued)

Dependent Variable: **Share price volatility**
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Sample: 2009 2015
Included observations: 285
Convergence achieved after 4 iterations
Coefficient covariance computed using observed Hessian ***(Not considering heteroscedasticity)***

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	-8.51	2.551	-3.335	0.000
Relative education level of board	0.063	0.042	1.503	0.132
Percentage South Africans	-0.736	0.787	-0.935	0.349
Payment gap	0.010	0.005	1.782	0.074
Board size	0.296	0.076	3.900	0.000
Chairman remuneration as a percentage of CEO guaranteed remuneration	0.835	0.703	1.188	0.234
Age diversity	0.104	0.066	1.563	0.117
Academic diversity (per degree)	-1.440	2.372	-0.607	0.543
Diversity of tenure	0.133	0.070	1.897	0.057
Average board experience	1.940	0.487	3.983	0.000
Average other NED remuneration as a percentage of CEO guaranteed remuneration (categorised)	0.906	0.217	4.172	0.000
Percentage of NEDs (categorised)	-0.335	0.240	-1.393	0.163
Relative CEO remuneration movement	-0.068	0.064	-1.063	0.287
Percentage of females	2.564	1.402	1.828	0.067
Academic diversity (per field)	-0.460	1.009	-0.456	0.648

McFadden R-squared	0.314	Mean dependent var	0.582
S.D. dependent var	0.494	S.E. of regression	0.399
Akaike info criterion	1.037	Sum squared resid	43.130
Schwarz criterion	1.229	Log likelihood	-132.809
Hannan-Quinn criteria.	1.114	Deviance	265.619
Restr. Deviance	387.307	Restr. Log likelihood	-193.653
LR statistic	121.687	Avg. log likelihood	-0.465
Prob(LR statistic)	0.000		

Obs with Dep=0	119	Total obs	285
Obs with Dep=1	166		

Source: EViews output

Appendix 4: Test of heteroscedasticity (continued)

Dependent Variable: **Share price volatility**
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Sample: 2009 2015
Included observations: 285
Convergence achieved after 4 iterations
Coefficient covariance computed using ***Huber-White method (Considering heteroscedasticity)***

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	-8.510	2.809	-3.028	0.002
Relative education level of board	0.063	0.041	1.542	0.123
Percentage South Africans	-0.736	0.751	-0.980	0.326
Payment gap	0.0104	0.006	1.671	0.094
Board size	0.296	0.078	3.768	0.000
Chairman remuneration as a percentage of CEO guaranteed remuneration	0.835	0.669	1.247	0.212
Age diversity	0.104	0.076	1.361	0.173
Academic diversity (per degree)	-1.440	2.425	-0.594	0.552
Diversity of tenure	0.133	0.081	1.637	0.101
Average board experience	1.940	0.517	3.753	0.000
Average other NED remuneration as a percentage of CEO guaranteed remuneration (categorised)	0.906	0.224	4.036	0.000
Percentage of NEDs (categorised)	-0.335	0.235	-1.423	0.154
Relative CEO remuneration movement	-0.068	0.061	-1.102	0.270
Percentage of females	2.564	1.283	1.998	0.045
Academic diversity (per field)	-0.460	1.047	-0.440	0.659

McFadden R-squared	0.314	Mean dependent var	0.582
S.D. dependent var	0.494	S.E. of regression	0.399
Akaike info criterion	1.037	Sum squared resid	43.130
Schwarz criterion	1.229	Log likelihood	-132.809
Hannan-Quinn criteria.	1.114	Deviance	265.619
Restr. Deviance	387.307	Restr. Log likelihood	-193.653
LR statistic	121.687	Avg. log likelihood	-0.465
Prob(LR statistic)	0.000		

Obs with Dep=0	119	Total obs	285
Obs with Dep=1	166		

Source: EViews output

Appendix 4: Test of heteroscedasticity (continued)

Dependent Variable: **Sharpe ratio**
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Sample: 2009 2015
Included observations: 341
Convergence achieved after 3 iterations
Coefficient covariance computed using observed Hessian ***(Not considering heteroscedasticity)***

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	5.588	2.993	1.867	0.061
Payment gap	0.016	0.004	3.848	0.000
Percentage South Africans	-0.439	0.691	-0.634	0.525
Percentage of independent NEDs	-0.288	0.627	-0.459	0.646
Diversity of tenure	-0.047	0.056	-0.840	0.400
Average board experience	0.547	0.383	1.426	0.153
Chairman remuneration as a percentage of CEO guaranteed remuneration	1.035	0.578	1.787	0.073
Percentage of black persons	0.537	0.733	0.732	0.464
Percentage of females	-2.414	1.315	-1.835	0.066
Diversity of professional experience	-3.567	2.746	-1.299	0.193
Average age	-0.048	0.0310	-1.528	0.126
Average other NED remuneration as a percentage of CEO guaranteed remuneration (categorised)	0.401	0.165	2.431	0.015
Diversity of board experience	-0.646	0.822	-0.786	0.431
Relative CEO remuneration movement (categorised)	-0.865	0.156	-5.513	0.000
Academic diversity (per degree)	0.446	1.859	0.240	0.810

McFadden R-squared	0.134	Mean dependent var	0.486
S.D. dependent var	0.500	S.E. of regression	0.465
Akaike info criterion	1.287	Sum squared resid	70.76
Schwarz criterion	1.456	Log likelihood	-204.548
Hannan-Quinn criteria.	1.354	Deviance	409.097
Restr. Deviance	472.4	Restr. Log likelihood	-236.244
LR statistic	63.39	Avg. log likelihood	-0.599
Prob(LR statistic)	0.000		

Obs with Dep=0	175	Total obs	341
Obs with Dep=1	166		

Source: EViews output

Appendix 4: Test of heteroscedasticity (continued)

Dependent Variable: **Sharpe ratio**
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Sample: 2009 2015
Included observations: 341
Convergence achieved after 4 iterations
Coefficient covariance computed using ***Huber-White method (Considering heteroscedasticity)***

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	5.588	2.822	1.979	0.047
Payment gap	0.016	0.004	3.952	0.000
Percentage South Africans	-0.439	0.620	-0.707	0.479
Percentage of independent NEDs	-0.288	0.642	-0.448	0.653
Diversity of tenure	-0.047	0.058	-0.808	0.418
Average board experience	0.547	0.400	1.367	0.171
Chairman remuneration as a percentage of CEO guaranteed remuneration	1.035	0.573	1.805	0.071
Percentage of black persons	0.537	0.744	0.721	0.470
Percentage of females	-2.414	1.308	-1.845	0.065
Diversity of professional experience	-3.567	2.713	-1.314	0.188
Average age	-0.048	0.032	-1.499	0.133
Average other NED remuneration as a percentage of CEO guaranteed remuneration (categorised)	0.401	0.159	2.522	0.011
Diversity of board experience	-0.646	0.847	-0.763	0.445
Relative CEO remuneration movement (categorised)	-0.865	0.150	-5.750	0.000
Academic diversity (per degree)	0.446	1.757	0.254	0.799

McFadden R-squared	0.134	Mean dependent var	0.486
S.D. dependent var	0.500	S.E. of regression	0.465
Akaike info criterion	1.287	Sum squared resid	70.76
Schwarz criterion	1.456	Log likelihood	-204.548
Hannan-Quinn criteria.	1.354	Deviance	409.097
Restr. Deviance	472.4	Restr. Log likelihood	-236.244
LR statistic	63.39	Avg. log likelihood	-0.599
Prob(LR statistic)	0.000		

Obs with Dep=0	175	Total obs	341
Obs with Dep=1	166		

Source: EViews output

Appendix 4: Test of heteroscedasticity (continued)

Dependent Variable: **Current Ratio**
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Sample: 2009 2015
Included observations: 281
Convergence achieved after 5 iterations
Coefficient covariance computed using observed Hessian ***(Not considering heteroscedasticity)***

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	0.184	4.008	0.046	0.963
Academic diversity (per degree)	-4.776	2.132	-2.240	0.025
Average age	-0.035	0.037	-0.956	0.339
Percentage of black persons (categorised)	-0.922	0.240	-3.829	0.000
Board size (categorised)	-0.417	0.197	-2.111	0.034
Percentage of South Africans	1.915	0.828	2.312	0.020
Payment gap	0.014	0.004	2.899	0.003
Relative CEO remuneration movement	-0.042	0.052	-0.811	0.417
Diversity of professional experience	10.11	3.620	2.793	0.005
Percentage of females	1.422	1.532	0.928	0.353
Diversity of board experience	-1.892	1.031	-1.833	0.066
Average other NED remuneration as a percentage of CEO guaranteed remuneration	1.899	2.192	0.866	0.386
Percentage of independent NEDs	-1.218	0.732	-1.664	0.096
Average board experience	-0.661	0.528	-1.252	0.210
Diversity of tenure	0.092	0.065	1.415	0.157
Chairman remuneration as a percentage of CEO guaranteed remuneration	-0.508	0.699	-0.727	0.467

McFadden R-squared	0.214	Mean dependent var	0.491
S.D. dependent var	0.500	S.E. of regression	0.442
Akaike info criterion	1.202	Sum squared resid	51.836
Schwarz criterion	1.409	Log likelihood	-152.944
Hannan-Quinn criteria.	1.285	Deviance	305.889
Restr. Deviance	389.459	Restr. Log likelihood	-194.729
LR statistic	83.570	Avg. log likelihood	-0.544
Prob(LR statistic)	0.000		

Obs with Dep=0	143	Total obs	281
Obs with Dep=1	138		

Source: EViews output

Appendix 4: Test of heteroscedasticity (continued)

Dependent Variable: **Current Ratio**
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Sample: 2009 2015
Included observations: 281
Convergence achieved after 5 iterations
Coefficient covariance computes using ***Huber-White method (Considering heteroscedasticity)***

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	0.184	4.106	0.045	0.964
Academic diversity (per degree)	-4.776	2.083	-2.292	0.021
Average age	-0.035	0.040	-0.894	0.370
Percentage of black persons (categorised)	-0.922	0.247	-3.721	0.000
Board size (categorised)	-0.417	0.204	-2.039	0.041
Percentage South Africans	1.915	0.931	2.055	0.039
Payment gap	0.014	0.004	3.001	0.002
Relative CEO remuneration movement	-0.042	0.049	-0.865	0.387
Diversity of professional experience	10.11	3.813	2.651	0.008
Percentage of females	1.422	1.504	0.945	0.344
Diversity of board experience	-1.892	1.023	-1.847	0.064
Average other NED remuneration as a percentage of CEO guaranteed remuneration	1.899	2.246	0.845	0.397
Percentage of independent NEDs	-1.218	0.739	-1.647	0.099
Average board experience	-0.661	0.528	-1.253	0.210
Diversity of tenure	0.092	0.06	1.392	0.163
Chairman remuneration as a percentage of CEO guaranteed remuneration	-0.508	0.651	-0.780	0.435

McFadden R-squared	0.214	Mean dependent var	0.491
S.D. dependent var	0.500	S.E. of regression	0.442
Akaike info criterion	1.202	Sum squared resid	51.836
Schwarz criterion	1.409	Log likelihood	-152.944
Hannan-Quinn criteria.	1.285	Deviance	305.889
Restr. Deviance	389.459	Restr. Log likelihood	-194.729
LR statistic	83.570	Avg. log likelihood	-0.544
Prob(LR statistic)	0.0000		

Obs with Dep=0	143	Total obs	281
Obs with Dep=1	138		

Source: EViews output

Appendix 4: Test of heteroscedasticity (continued)

Dependent Variable: **Cash conversion cycle**
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Sample: 2009 2015
Included observations: 188
Convergence achieved after 6 iterations
Coefficient covariance computed using observed Hessian ***(Not considering heteroscedasticity)***

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	3.489	6.269	0.556	0.577
Academic diversity (per degree)	-5.782	4.180	-1.383	0.166
Academic diversity (per field)	-0.663	1.660	-0.399	0.689
Average age (categorised)	-0.453	0.382	-1.184	0.236
Diversity of tenure (categorised)	0.333	0.326	1.022	0.306
Chairman remuneration as a percentage of CEO guaranteed remuneration (categorised)	1.248	0.321	3.883	0.000
Average board experience (categorised)	-0.136	0.445	-0.306	0.759
Percentage of black persons	3.374	1.530	2.204	0.027
Board size	0.220	0.118	1.866	0.062
Relative education level of board	-0.183	0.076	-2.396	0.016
Payment gap	0.006	0.006	0.918	0.358
Percentage South Africans	-6.711	2.000	-3.355	0.000
Percentage of NEDs	-3.822	2.205	-1.732	0.083
Percentage of independent NEDs	0.650	1.096	0.593	0.553
Diversity of professional experience	5.290	4.932	1.072	0.283
Age diversity	-0.221	0.107	-2.059	0.039
Average other NED remuneration as a percentage of CEO guaranteed remuneration	11.153	3.949	2.823	0.004
Percentage of females	-1.063	2.483	-0.428	0.668
Relative CEO remuneration movement	-0.011	0.073	-0.162	0.871
Diversity of board experience	4.250	1.570	2.706	0.006

McFadden R-squared	0.411	Mean dependent var	0.484
S.D. dependent var	0.501	S.E. of regression	0.379
Akaike info criterion	1.028	Sum squared resid	24.22
Schwarz criterion	1.372	Log likelihood	-76.68
Hannan-Quinn criteria.	1.168	Deviance	153.369
Restr. Deviance	260.431	Restr. Log likelihood	-130.215
LR statistic	107.062	Avg. log likelihood	-0.407
Prob(LR statistic)	0.000		
Obs with Dep=0	97	Total obs	188
Obs with Dep=1	91		

Source: EViews output

Appendix 4: Test of heteroscedasticity (continued)

Dependent Variable: **Cash conversion cycle**
Method: ML - Binary Logit (Newton-Raphson / Marquardt steps)
Sample: 2009 2015
Included observations: 188
Convergence achieved after 6 iterations
Coefficient covariance computes using ***Huber-White method (Considering heteroscedasticity)***

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	5.096	5.456	0.933	0.350
Academic diversity (per degree)	-5.650	4.067	-1.389	0.164
Academic diversity (per field)	-0.676	1.754	-0.385	0.699
Average age (categorised)	-0.451	0.414	-1.089	0.276
Age diversity	-0.204	0.110	-1.848	0.064
Average board experience (categorised)	-0.099	0.453	-0.219	0.826
Diversity of tenure (categorised)	0.342	0.361	0.947	0.343
Chairman remuneration as a percentage of CEO guaranteed remuneration (categorised)	1.257	0.294	4.266	0.000
Percentage of black persons	3.262	1.465	2.226	0.026
Board size	0.185	0.119	1.555	0.119
Average other NED remuneration as a percentage of CEO guaranteed remuneration	10.785	4.606	2.341	0.019
Percentage of females	-1.241	2.120	-0.585	0.558
Diversity of professional experience	1.796	1.378	1.302	0.192
Relative CEO remuneration movement	-0.007	0.068	-0.108	0.913
Relative education level of board	-0.184	0.065	-2.822	0.004
Payment gap	0.006	0.008	0.744	0.456
Percentage of South Africans	-6.584	2.465	-2.670	0.007
Percentage of NEDs	-3.942	2.116	-1.862	0.062
Percentage of independent NEDs	0.590	1.041	0.566	0.570
Diversity of board experience	4.151	1.843	2.252	0.024

McFadden R-squared	0.414	Mean dependent var	0.484
S.D. dependent var	0.501	S.E. of regression	0.378
Akaike info criterion	1.024	Sum squared resid	24.079
Schwarz criterion	1.368	Log likelihood	-76.262
Hannan-Quinn criteria.	1.163	Deviance	152.524
Restr. Deviance	260.431	Restr. Log likelihood	-130.215
LR statistic	107.907	Avg. log likelihood	-0.405
Prob(LR statistic)	0.000		

Obs with Dep=0	97	Total obs	188
Obs with Dep=1	91		

Source: EViews output

Appendix 5: Panel data unit root test

Appendix 5 shows the results of the Levin, Lin & Chu unit root tests.

Variable	Assumes common unit root process		
	t-statistic	Probability	Stationary
Payment gap	-21.995	.000	Yes
Percentage of females	-31.093	.000	Yes
Percentage of black persons	-25.082	.000	Yes
Board size	-17.931	.000	Yes
Experience diversity	-166.58	.000	Yes
Academic diversity per degree	-23.199	.000	Yes
Relative education level per board member	-61.434	.000	Yes
Academic diversity per field	-40.866	.000	Yes
Average other NED remuneration as a percentage of CEO guaranteed remuneration	-30.293	.000	Yes
Percentage of NEDs	-92.692	.000	Yes
Percentage of independent NEDs	-26.734	.000	Yes
Percentage of South Africans on the board	-19.618	.000	Yes
Diversity of tenure	-11.814	.000	Yes
Average board experience	-183.23	.000	Yes
Chairman remuneration as a percentage of CEO guaranteed remuneration	-7.8546	.000	Yes
Age diversity	-381.125	.000	Yes
Relative CEO remuneration movement	-47.573	.000	Yes
Board experience diversity	-74.463	.000	Yes
Relative return to shareholders	-289.841	.000	Yes
Relative share price volatility	-35.801	.000	Yes
Relative Sharpe ratio	-75.641	.000	Yes
Relative current ratio	-51.013	.000	Yes
Relative cash conversion cycle	-31.904	.000	Yes