UNIVERSITY OF KWAZULU-NATAL

The impact of ownership structures on the financial performance and corporate governance of JSE-listed firms.

By

Delane Naidu

214549400

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School of Accounting, Economics and Finance

College of Law and Management Studies

Supervisor: Dr. Faeezah Peerbhai

Co-Supervisor: Prof. Kerry-Ann McCullough

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DECLARATION

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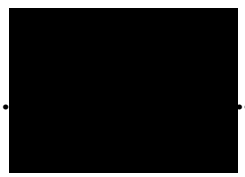
SIGNED: …  **.** **DATE: ….06 November 2023….**

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"*Learning is the only thing the mind never exhausts, never fears, and never regrets*"

~Leonardo da Vinci.

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ABSTRACT

The ownership structure of a firm plays an important role in decision making and cost control, as ownership signifies a source of authority over the company's operations, strategy, and financial decisions. The evolution of finance has resulted in increased globalisation and increasingly open markets, which has consequently led to ownership structures of companies becoming more widely distributed among various types of owners. The ownership structure has significant implications for several fundamental aspects of firms, most notably, its financial performance. In addition to the financial performance of firms, the composition of ownership structures also holds significant importance for corporate governance systems, as owners have the capacity to influence the level of compliance that firms demonstrate towards corporate governance policies. This thesis, therefore, investigates the impacts of different ownership identities (managerial, foreign, institutional, government and family) on both the financial performance and corporate governance of companies listed on the Johannesburg Stock Exchange (JSE).

The study uses panel data for non-financial JSE-listed firms, covering the 18-year period from 2004-2021. Financial performance is measured with Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and Tobin's q. The study provides a novel contribution to corporate governance research by constructing a reliable and valid index and corresponding subindices to measure the corporate governance compliance of JSE-listed firms. The main index is predicated on the provisions of the King Reports that pertain to the categories of board characteristics and structure, accounting and auditing, and risk management and internal audit. These three categories form the subindices that are used to measure the individual compliance of provisions relating to boards, audit committees, and risk management committees. The reliability and validity of these constructs are confirmed by the Cronbach's alpha test and the Principal Component Analysis (PCA), respectively.

The study adopts the system Generalized Method of Moments (GMM) approach to estimate the impact of ownership structures, as it accounts for endogeneity, thus ensuring unbiased results. The results for ownership and financial performance revealed that managerial ownership shared a positive relationship with ROE, but a negative relationship with Tobin's q. Similarly, foreign ownership had a positive impact on ROE, while institutional ownership had a negative effect on EPS. Lastly, family ownership was associated with a decline in Tobin's q.

The study also makes an original contribution to ownership research in South Africa by discovering a non-linear inverse U-shaped relationship between foreign ownership and ROE, with an optimal value of 39.6%. This infers that foreign ownership positively affects ROE when shareholdings are below 39.6%. However, when foreign ownership exceeds this threshold, firm performance is eroded. Regarding the analysis of ownership structure and corporate governance, the results showed that managerial ownership exhibited a negative effect on the board characteristics and structure subindex, while foreign ownership depicted positive effects on the main index and the accounting and auditing subindex. Regulators should therefore formulate policies that cultivate the benefits associated with managerial and foreign ownership, whilst also developing strategies to mitigate the negative effects of managerial, institutional, and family ownership.

Keywords: Ownership structure, ownership identities, financial performance, corporate governance, compliance, JSE.

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LIST OF ACRONYMS

2SLS:	Two-Stage Least Squares
3SLS:	Three-Stage Least Squares
ASX:	Australian Stock Exchange
B-BBEE:	Broad-based Black Economic Empowerment
BSE:	Bombay Stock Exchange
CEO:	Chief Executive Officer
CRISA:	Code for Responsible Investment in South Africa
CSR:	Corporate Social Responsibility
DSE:	Dhaka Stock Exchange
DWH:	Durbin-Wu-Hausman
EE:	Employment Equity
EPS:	Earnings per Share
ESG:	Environmental, Social, and Governance
EU:	European Union
FDI:	Foreign Direct Investment
FEM:	Fixed Effects Method
GCC:	Gulf Cooperation Council
GDP:	Gross Domestic Product
GEPF:	Government Employees Pension Fund
GLM:	Generalised Linear Model
GLS:	Generalized Least Squares
GMM:	Generalized Method of Moments
ICB:	Industrial Classification Benchmark
IDC:	Industrial Development Corporation
ISE:	Istanbul Stock Exchange
ISS:	Institute of Shareholder Services
IV:	Instrumental Variables
JSE:	Johannesburg Stock Exchange
KSE:	Karachi Stock Exchange
LSE:	London Stock Exchange

MENA:	Middle East and North Africa
NEDs:	Non-Executive Directors
NEF:	National Empowerment Fund
NSE:	Nairobi Stock Exchange
NYSE:	New York Stock Exchange
OCF:	Operating Cash Flow
OLS:	Ordinary Least Squares
PCA:	The Principal Components Analysis
PCSE:	Panel-Corrected Standard Error
PIC:	Public Investment Corporation
PRASA:	Passenger Rail Agency of South Africa
PSX:	Pakistan Stock Exchange
REM:	Random Effects Model
ROA:	Return on Assets
ROE:	Return on Equity
S&P:	Standard and Poor's
SAA:	South African Airways
SABC:	South African Broadcasting Corporation
SEC:	Securities and Exchange Commission
SHSE:	Shanghai Stock Exchange
SLM:	Sasabuchi-Lind-Mehlum
SMMEs:	Small, Medium, and Micro Enterprises
SOEs:	State-Owned Enterprises
SZSE:	Shenzhen Stock Exchange
TSE:	Tehran Stock Exchange
U.K:	United Kingdom
UAE:	United Arab Emirates
U.S:	United States

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CHAPTER ONE: INTRODUCTION

1.1. BACKGROUND

A firm's ownership structure refers to the way in which equity and control are distributed among different individuals or entities (Wahl, 2006). It plays an important role in decision making and cost control as ownership signifies a source of authority that can be leveraged to either support or oppose management (Jensen and Meckling, 1976; Pfeffer and Slanick, 1979). The owners of firms are also referred to as shareholders, as they purchase shares in companies to increase their wealth through either dividend, share appreciation, or both (Gordon, 1959; Chassagnon and Hollandts, 2014).

The evolution of finance has resulted in increased globalisation and increasingly open markets, which consequently led to significant transformations in ownership structures. In particular, the ownership structure of companies has become more widely distributed among various types of owners (Yammeesri, 2003; Zhang and Kyaw, 2017). Zheka (2003: 7) therefore describes ownership structures not only in terms of "the distribution of equity with regard to votes and capital, but also by the identity of the equity owners". This indicates that the ownership structure converges conceptually with ownership identities, which represents the influential shareholding groups within firms (Delios, Wu and Zhou, 2006; Kevser and Leyli, 2019). As such, within the scope of this thesis, the terminologies "ownership identities", "ownership types", and "ownership categories" are used interchangeably with "ownership structure", as all expressions essentially refer to the fundamental characteristics and arrangement of ownership within firms.

The existing literature on ownership structures encompass various classifications of ownership identities, with institutions, management, families, foreigners, governments, and companies being recognised as the main forms of ownership present in firms (Zraiq and Fadzil, 2018; Laporšek, Dolenc, Grum and Stubelj, 2021). Since each ownership type has distinct characteristics, their effects on firms vary significantly.

The composition of ownership structures varies between developed and developing nations (Björn and Eriksson, 2016; Kien and Chen, 2020). Apart from Germany, South Korea and

Japan[1], firms in developed economies typically have ownership structures that are widely dispersed among several different shareholders (Coffee, 2010; Peerbhai, Gumede, Shabangu, Gumede, Ndhlovu and Hlomela, 2021). Conversely, emerging markets tend to exhibit ownership structures that are highly concentrated with a few large shareholders (Dube, 2018). This is evident in the South African environment, where the ownership structures of JSE-listed firms reflect high concentrations of institutional ownership and foreign ownership (Ntim, 2011; National Treasury, 2017). Due to their substantial shareholding, institutional investors have considerable power over the practices and policies of their investee companies (Mans-Kemp and van Zyl, 2021). For this reason, the Code for Responsible Investment in South Africa (CRISA) was released in 2011 to guide institutional shareholders on ways of executing their investments, using their rights to improve governance, and integrating ESG issues into their investment decisions (Pillay, 2021). Foreign investors are also recognized as important shareholders on the JSE, with several firm making efforts to attract offshore investors (Cronje, 2018), which may explain the high concentration of foreign ownership on the JSE. This supports the government's primary objective of expanding Foreign Direct Investment (FDI) in South Africa (Villers, 2019).

Moderate to low levels of ownership are observed from other shareholders on the JSE. For instance, black ownership is prevalent on the JSE due to the national regulations of black economic empowerment; however, it is not highly concentrated (National Treasury, 2017; Gqubule, 2021). The JSE also demonstrates shareholding from managerial owners, as this form of ownership is encouraged by the South African corporate governance framework (Zondi and Sibanda, 2015). Shareholdings by the South African government dominates state-owned enterprises (SOEs), as these organisations are considered as vehicles for economic development (Fourie, 2014); however, this does not translate to heightened government shareholding on the JSE as most SOEs are unlisted companies. The South African government also owns the Public Investment Corporation (PIC), which controls over 10% of the JSE arising from share ownership in several listed companies (Komati, 2017; PIC, 2019). Lastly, family ownership is also prominent in South Africa, but mainly within unlisted firms, where the majority of family shareholding is concentrated in small, medium, and micro enterprises (SMMEs) (Venter and Farrington, 2009; Mashavira, 2016), rather than the JSE. Nonetheless,

[1] Firms in Germany, South Korea and Japan have concentrated ownership structures, where families own large blocks of shares (Ojo, 2013; Choi, Zahra, Yoshikawa and Han, 2015; Koji, Adhikary and Tram, 2020).

regardless of their level of shareholding, these ownership types are regarded as significant participants within the JSE.

The ownership structure has remained a domain of interest for several decades, as it has significant implications for various fundamental aspects of firms, most notably, firm financial performance (Wahl, 2006; Laporšek *et al*., 2021). The foundation of the relationship between the ownership structure and firm performance lies in the seminal work of Berle and Means (1932). Globally, this relationship has been of primary concern to scholars, management, academics, policymakers, and investors, as the ownership structure is widely recognised as an important mechanism utilised to improve the financial performance of companies (Alkurdi, Hamad, Thneibat and Elmarzouky, 2021). This is because owners/shareholders of firms play a pivotal role in providing a firm with competitive advantages and monitoring managerial decisions, as per the propositions of the resource-based theory and the agency theory. Nonetheless, Alkurdi *et al*. (2021) asserts that the relationship between the ownership structure and firm performance is dependent on the specific types of ownership identities that exist in firms.

In addition to the financial performance of firms, the composition of ownership structures also holds significant importance for corporate governance systems, as owners have the capacity to influence the level of compliance that firms demonstrate towards corporate governance policies (Zhou, 2001; Zheka, 2003; Wahl, 2006; Mashele, 2021). This occurs because owners of firms govern the actions of managers and often organise both internal and external control practices (Connelly, Hoskisson, Tihanyi and Certo, 2010). Furthermore, certain types of owners can offer valuable insights to managers on how corporate governance practices can be improved (Eng and Mak, 2003; Ntim and Soobaroyen, 2013). This was emphasized by Laporšek *et al*. (2021: 2977), who claimed that the "right" ownership combination can increase the likelihood of implementing effective corporate governance structures in firms. The ownership structure is therefore considered as one of the solutions to corporate governance inefficiencies (Akimova and Schwodiauer, 2004). As such, substantial attention was directed to ownership structures following high-profile corporate governance failures during the 2008/9 financial crisis.

According to Alabdullah (2018), prior to the financial crisis, the ownership structure was primarily considered as a mechanism that could improve the financial performance of firms. However, in the aftermath of the crisis, it emerged as a crucial instrument for facilitating the recovery of firms and strengthening corporate governance systems (Hartzell, Sun, and Titman,

2014; Kao, Hodgkinson, and Jaafar, 2019; Yang and Shyu, 2019). As a result, researchers across the globe began reassessing the effects of the ownership structure (Alabdullah, 2018).

Under the South African context, the recent corporate demise of companies such as Steinhoff, VBS Bank, Tongaat Hulett, Eskom and South African Airways (SAA) have raised considerable concerns about the appropriateness of the ownership structures and corporate governance practices within South African businesses. The corporate governance of South African firms is guided by the King Code of Good Corporate Governance[2], which provides voluntary guidelines and principles for effective corporate governance practices (Ntim *et al*., 2012; Mans-Kemp and van Zyl, 2021). Since 2017, the JSE Listing Requirements made it mandatory for companies to comply with certain King provisions to retain their listing (Giles, 2017). Nonetheless, majority of the provisions still remain voluntary; thus, the issuance of King Codes does not guarantee that firms fully comply with the recommended corporate governance practices (Aguilera and Cuervo-Cazurra, 2009). This may explain the persistent business failures that continue to transpire in South Africa.

Gaining an understanding on the effects of different ownership types can therefore contribute to the configuration of ownership structures that enhance firm performance and their compliance with the standards of the King Codes. This may, in turn, help prevent future corporate collapses and foster efficient, ethical, and sustainable functioning of firms in South Africa. Furthermore, information regarding the impact of ownership structures is valuable to shareholders in their investment decision-making, as it helps them assess the overall health and performance of companies they have invested in, enabling them to make well-informed strategic decisions, including those related to mergers and acquisitions.

According to Gugler and Weigand (2003), an ownership structure can be determined by several fundamental characteristics of the firm, including financial performance and corporate governance. As a consequence, greater complexity is enclosed within the research field of ownership structures, as it is uncertain whether the financial performance and quality of corporate governance in firms influence the type of ownership embodied within a firm, i.e., if these company fundamentals share a bidirectional relationship with any ownership categories. The possibility of a bidirectional relationship raises concerns of endogeneity issues (Chow and Recker, 2012), which is often ignored in prior ownership and corporate governance research.

[2] The initial King Report, known as King I, was introduced in South Africa in 1994. Thereafter, three subsequent reports were published: King II in 2002, King III in 2009, and King IV in 2016 (Tshipa, Brummer, Wolmarans and Du Toit, 2018).

In addition to the endogeneity bias, further complexity arises as the effect of the ownership structure may not always be of a linear nature. Certain studies (such as Gurbuz and Aybars, 2010; Phung and Hoang, 2013; Daryaei and Fattahi, 2020; Naidu, Charteris and Moores-Pitt, 2022) found evidence of a non-linear relationship between ownership structures and firm performance within emerging markets. This is because the impact of different ownership identities may be dependent on its proportion within the firm (Grosfeld, 2006; Bansal and Thenmozhi, 2020). For example, in the case of foreign ownership, foreign-owned firms may outperform local firms due to foreign investors introducing new technology, superior managerial practices, production processes and monitoring into their investee companies (Görg and Greenaway, 2004; Douma, George and Kabir, 2006; Swart, 2013). In certain circumstances, however, foreign ownership may impede firm performance if it exceeds a certain percentage due to an entrenchment effect (Phung, 2015). An entrenchment effect occurs when large shareholders pursue private benefits at the expense of minority shareholders (Morck, Shleifer and Vishny, 1988). This is observed by Naidu *et al*. (2022), who reported that foreign investors became entrenched when they surpassed 40.1% of ownership in JSE-listed firms.

Although the subject of ownership structures has aroused the interest of many researchers, majority of studies tend to concentrate on the influence of ownership on financial performance, while overlooking its potential effects on corporate governance. Hence, this thesis aims to address the major research gap by investigating the impact of various ownership categories (managerial, foreign, institutional, government, and family) on both the financial performance and corporate governance of JSE-listed firms. The study focuses on these specific ownership identities due to their prominence in the South African business environment. To the best of the author's knowledge, this research represents a pioneering effort in the South African market and will therefore provide an original contribution to the understanding of the relationships between ownership types, financial performance, and corporate governance within the JSE. Understanding the distinct effects of each ownership identity can contribute to the formulation of policies that specify the optimal ownership structures (Jamali, Sutrisno, Subekti and Assih, 2015) necessary to foster growth in the South African financial environment. Moreover, this examination can also aid companies in adopting suitable ownership structures that align with their vision and objectives, ensuring that investors are well-positioned to fulfil firm expectations (Norman, 2010).

1.2. RESEARCH PROBLEM

Since the Industrial Revolution in the mid-1700s, there has been a separation of ownership and control within firms, in which ownership is widely dispersed among a diverse range of owners, who are separate from the individuals who manage and control the day-to-day business operations (Berle and Means, 1932; Al-Matari, Al-Swidi and Fadzil, 2013). As previously mentioned, a variety of ownership identities exist (for example, managerial, foreign, institutional, company, family, etc); each characterized by distinct behaviours, motivations, and interests. On the one hand, certain groups of owners may undertake monitoring duties, enhance corporate governance, and provide competitive advantages by introducing scarce resources to their investee companies (Barney 1991; Connelly *et al*., 2010; Choi, Lee and Williams, 2011; Fazlzadeh, Hendi and Mahboubi, 2011). On the other hand, however, other shareholders are mainly interested in short-term returns and may only prioritize the cultivation of their personal interests at the expense of other shareholders (Jensen and Meckling, 1983; Wilkins, 1999; Garel, 2017). Therefore, understanding the implications of different ownership types can help companies make informed decisions about their investor relations.

The ownership structure of South African firms reflects many vital facets of the economy, pertaining to macroeconomic and financial stability, transformation, and inclusive growth (National Treasury, 2017). At the microeconomic level, the ownership structure has a significant influence on several firm-level fundamentals, most notably financial performance, and corporate governance. As such, the ownership structure of JSE-listed firms has become a significant public policy issue (Cameron, 2012).

The study of the ownership structure's impact on financial performance and corporate governance is particularly interesting in the South African context, where the JSE equity market is subject to unique ownership and corporate governance regulations, such as Broad-based Black Economic Empowerment (B-BBEE), King Codes, the CRISA, and exchange controls on foreign ownership (National Treasury, 2017; Pequenino, 2018; Pillay, 2021). The B-BBEE is designed for previously disadvantaged black South Africans to own shares in South African companies, aiming to expand economic participation among communities that were historically marginalized during Apartheid (Ntim, 2009; National Treasury, 2017; Peerbhai *et al*., 2021). Concerning managerial ownership on the JSE, the latest King Report, i.e., King IV, recommends that managers own shares in companies to converge the interests of shareholders and managers (Anyango, 2018). In contrast, the CRISA framework stipulates how institutional

shareholders should use their rights to improve corporate governance and integrate environmental, social, and governance (ESG) issues into their investment decisions (Pillay, 2021). Lastly, the current exchange control regulation and FDI policy does not place any restrictions on foreign ownership in South African firms (National Treasury, 2011; Peerbhai *et al*., 2021), thus explaining the surge of foreign shareholding on the JSE.

The distinctiveness of this study in the South African market also lies in the country's "unique institutional and corporate governance environment", which experienced major economic, social, and political transformations during the 1990s (Handley, 2005; Ntim *et al*., 2012: 84). A significant part of the economic reform was aimed at improving the way companies were governed, thus resulting in the development of the King Code of Good Corporate Governance (Ntim, 2009). In contrast to the corporate governance standards of Anglo-American countries that mainly concentrate on shareholder maximisation, the King Code also accounts for stakeholder demands, inclusivity, in addition to shareholder wealth (Ntim, 2009; Ntim *et al*., 2012). This hybrid approach is unique because it compels firms to equally prioritize both shareholder interests and broader stakeholder interests within the South African financial environment (Andreasson, 2011; Gyapong, 2016).

Although numerous studies have explored the relationship between ownership structure and financial performance in emerging markets, those examining this nexus under the South African context, such as Mugobo, Mutize and Aspeling (2016), Komati (2017) and Dube (2018) contain limitations as they fail to consider the likelihood of non-linear relationships and/or issues of endogeneity. Investigating the possibility of a non-linear relationship between different ownership types and firm performance is vital because it helps identify ownership levels that may either benefit and/or erode firm performance. Thus, understanding the non-linear impacts of the ownership structure is pivotal for policymakers and firm owners, as it enables them to implement legislative caps on ownership levels that may harm the quality of firm performance. As such, this thesis makes a valuable contribution to the existing body of research by shedding light on the linear relationship between different ownership identities (managerial, foreign, institutional, government, and family) and the financial performance of JSE-listed firms. In addition, it addresses a significant research gap by examining the non-linear relationship and endogeneity between ownership types and financial performance which, to the best of the author's knowledge, represents an original contribution to the field, as such an examination has not been previously undertaken in the South African market.

As mentioned, the dominant literature on ownership structures primarily concentrates on assessing its influence on financial performance. Although corporate governance research recognizes the importance of ownership structures in shaping corporate governance systems; only a limited number of studies actually delved into examining the direct impact of ownership types on corporate governance practices or compliance. To the knowledge of the author, this subject matter has not been investigated in South Africa. Most of the extant corporate governance literature used ownership categories as proxies of corporate governance (such as ownership concentration, managerial ownership, or institutional ownership). In these studies, ownership structures were considered as an indicator of corporate governance rather than being explored as a distinct influential factor (such as Sueyoshi, Goto and Omi, 2010; Marashdeh, 2014; Mohd, 2020).

Investigating the impact of ownership structures on corporate governance systems is especially necessary in South Africa, given that recent corporate collapses (such as VBS Bank, Steinhoff, Eskom, and SAA) have been associated with deficiencies in corporate governance practices (Mahlaka, 2020; Haasbroek, Bick and Giamporcaro, 2020). Despite the issuance of the King Reports, South Africa has still experienced several high-profile domestic business failures since 1994 (Ntim, 2009). These failures have subsequently resulted in increased scrutiny directed towards the corporate governance systems of firms listed on the JSE (Seedat, 2019; Natesan, 2019). In addition, the COVID-19 pandemic, and recent grey-listing status implemented in February 2023 further exposed the weak corporate governance practices that exist in South African companies (Lateef and Akinsulore, 2021; Haldane, 2022).

Given the significant economic uncertainty already faced in the South African market, the occurrence of additional corporate collapses in the current economic climate can have detrimental effects to the economy (Binge and Boshoff, 2020). Therefore, conducting a study of this nature in South Africa is especially purposeful during this period, as it provides an opportunity to identify and implement an ownership structure that improves the compliance of corporate governance, thereby mitigating the risk of future corporate failures.

A frequent obstacle faced in corporate governance research is the complexity of measuring corporate governance at the firm level. Previous studies primarily relied on individual measures to quantify the quality of corporate governance in firms. However, Ananchotikul (2007: 3) argued that individual proxies “capture only certain aspects of governance” and consequently provide an incomplete understanding. To overcome this problem, prior studies (such as Gompers, Ishii and Metrick, 2003; Ananchotikul, 2007; Biswas, 2012; Black, De Carvalho,

Khanna, Kim and Yurtoglu, 2017; Kobuthi, 2018) implemented compliance index models, in which they constructed an index that combined individual country-specific elements of corporate governance. These instruments exhibited greater predictive power and were thus considered as a more reliable measure of corporate governance (Black, Tang and Kim, 2003).

Ntim (2009) and Waweru (2014) are the only known South African studies that adopted compliance index models. In his unpublished study, Ntim (2009) constructed a corporate governance index that was predicated on the provisions of the King II report, to measure the corporate governance compliance of the top 100 JSE-listed firms from 2002-2006. In contrast, Waweru's (2014) index was created to measure the corporate governance of 99 firms operating in South Africa and Kenya from 2006-2010. This index combined the governance guidelines extracted from the Institute of Shareholder Services (ISS) and the King III reports. Both studies, however, have limitations related to their small sample sizes, lack of robustness tests and short study periods. The limited number of companies included in their analyses hinders the ability to draw definitive conclusions about the wider population, while the lack of robustness tests raises concerns about the validity of their results (Carleton and Stohl, 1987; Lombardi, Wilchins, Priesing and Malouf, 2002). Furthermore, the five-year sample period of both studies is comparatively short (Ntim, 2009), and may fail to adequately capture underlying patterns and rare events, such as the issuance of updated King Reports.

The compliance index model involves the construction of a main corporate governance index, as well as various subindices that reflect different subcategories of corporate governance (Ntim, 2009; Biswas, 2012). In particular, the subindices consist of individual and distinct corporate governance elements that are aggregated to form the main index. As such, the construction of subindices is necessary as they can expound on the variations in corporate governance across firms (Black, Jang and Kim, 2006; Kowalewski, Stetsyuk and Talavera, 2008). For this reason, the process of constructing corporate governance indices is regarded as a highly labour-intensive approach (Hussainey, Schleicher and Walker, 2003; Beattie, McInnes and Fearnley, 2004). Nevertheless, Ntim (2009) argued that this approach remains advantageous because it establishes a country-specific corporate governance indicator, as the indices are based on provisions that are relevant to a particular country.

This thesis therefore adopts the compliance index approach through the construction of a comprehensive corporate governance index and corresponding subindices that are based on the compliance of various King Code provisions. In particular, these measures aggregate provisions pertaining to the three main aspects of the King Code, i.e., board structures, audit

and accounting, and risk management and internal controls. In contrast to Ntim (2009) and Waweru (2014), these constructs undergo extensive robustness tests in order to verify their reliability and validity, thus increasing the dependability of this study. Furthermore, in comparison to the sample periods covered by Ntim (2009) and Waweru (2014), this study provides coverage of more recent developments.

The construction of the index and subindices therefore represents a novel contribution of this study, as it facilitates a more holistic understanding of how different ownership categories impact corporate governance practices, as well as its three subcategories. Furthermore, since South Africa lacks a formal corporate governance indicator, the index and subindices developed in this study will thus provide a significant contribution to the understanding of the corporate governance compliance levels among JSE-listed firms. This, in turn, holds valuable implications for policymakers and practitioners.

The overall dearth of South African literature evaluating the impact of ownership types on both the financial performance and corporate governance implies that South African regulators, managers, and firm owners, may not yet fully understand the implications of ownership structures. Hence, this thesis is essential for policymakers and other firm participants responsible for designing and executing corporate policies.

1.3. RESEARCH AIM, OBJECTIVES, AND QUESTIONS

The primary aim of this thesis is to study the impact of ownership structure (managerial, foreign, institutional, government, and family ownership) on the financial performance and corporate governance of JSE-listed companies. To achieve this aim, this study outlines the following research objectives:

I. To determine whether endogeneity exists between ownership categories (managerial, foreign, institutional, government, and family) and the financial performance of firms.

II. To establish if the relationship between ownership categories and financial performance is linear or non-linear.

III. If the relationship is non-linear, to determine the optimal level of ownership.

IV. To construct an index and subindices that are reliable and valid measures of corporate governance compliance in JSE-listed firms.

V. To determine whether endogeneity exists between ownership identity (managerial, foreign, institutional, government, and family) and corporate governance compliance.

VI. To establish the impact of ownership identity on corporate governance compliance in JSE-listed firms.

In satisfying these objectives, this study answers the following research questions:

I. Does endogeneity exist between any of the ownership categories (managerial, foreign, institutional, government, and family) and the financial performance of firms?

II. Is the relationship between the ownership categories and financial performance linear or non-linear?

III. If the relationship is non-linear, what is the optimal level of ownership?

IV. Is the constructed corporate governance index and corresponding subindices reliable measures of corporate governance compliance in JSE-listed firms?

V. Is the constructed corporate governance index and corresponding subindices valid measures of corporate governance compliance in JSE-listed firms?

VI. Does endogeneity exist between ownership identity (managerial, foreign, institutional, government, and family) and the corporate governance of firms?

VII. What is the effect of ownership identity on the corporate governance index?

VIII. What is the impact of ownership identity on the corporate governance subindices?

Whilst research questions I, II, and III concentrate on ownership structure and financial performance, research questions IV and V focus on the construction of the corporate governance index and subindices. Lastly, research questions VI, VII, and VIII are concerned with ownership structure and corporate governance. Therefore, whilst the primary focus of this study centres on the impacts of different ownership categories, its scope also extends to the measurement of corporate governance compliance.

1.4. THE SCOPE AND RESEARCH METHODS OF THIS STUDY

As discussed, there are two major firm fundamentals that are investigated by this thesis: financial performance and corporate governance. Prior to addressing the corporate governance fundamental, this thesis seeks to develop an index (and subindices) that efficiently measure corporate governance. The structure of this thesis addresses the details of each subject in three separate chapters. Each chapter encompasses the relevant literature, sample and data, research methods, and results from the analysis. The summary of these chapters is provided below.

1.4.1. Chapter Three: Financial Performance

The research objective of this chapter is to examine the relationship between ownership categories (managerial, foreign, institutional, government and family) and the financial performance of JSE-listed firms. This is attained by answering the following research questions:

I. Does endogeneity exist between any of the ownership categories (managerial, foreign, institutional, government, and family) and the financial performance of firms?

II. Is the relationship between the ownership categories and financial performance linear or non-linear?

III. If the relationship is non-linear, what is the optimal level of ownership?

This research is based on a sample of 267 non-financial firms, listed on the JSE from 2004-2021. This data set accounts for mergers, acquisitions, and unbundling's. Managerial, institutional, and government ownership were measured by the percentage of shares owned by each ownership type. In contrast, foreign and family ownership were proxied by dummy variables as these ownership identities are only impactful when they exceed a certain percentage of shareholding. The selected financial performance indicators in this chapter are the Return on Assets (ROA), Return on Equity (ROE), Earnings per Share (EPS), and the Tobin's q ratio.

The analysis of endogeneity is conducted using the test of dynamic completeness, test of reverse causality, and the test of strict exogeneity. These tests were used in the studies of Wintoki, Linck and Netter (2012), El-Faitouri (2014) and Akbar, Poletti-Hughes, El-Faitouri, and Shah (2016). If endogeneity is detected, the System Generalized Method of Moments (GMM) is adopted to address the second research question. This is a reliable technique that accounts for dynamic endogeneity, simultaneity, and unobserved heterogeneity, and it is

supported by its use in previous literature (Kyereboah-Coleman, 2008; Phung, 2015; Wang and Shailer, 2017; Dube, 2018; Din, Khan, Khan and Khan, 2021). In contrast, if endogeneity is not detected, the Fixed Effects Method (FEM) is employed, which is also extensively adopted in the extant literature (Phung and Hoang, 2013; Yu, 2013; Phung and Le, 2013; Milena-Jana, 2018; Gupta, Agarwal and Jagwani, 2021).

To address the third research question, a quadratic test and the Sasabuchi-Lind-Mehlum (SLM) test is employed. The SLM test is an advanced approach that determines the shape of the non-linear relationship, as well as the optimal levels of ownership for the identities that displayed non-linear effects. This technique has been frequently employed in prior literature surrounding non-linearity (Megersa and Cassimon, 2015; Loganathan, Ismail, Streimikiene, Hassan, Zavadskas and Mardani, 2017; Dary and James, 2019; Pham and Huynh, 2020).

By addressing endogeneity and non-linearity in the ownership structure- firm performance relationship, this chapter makes an original contribution to ownership research in South Africa. Moreover, the application of the SLM test represents a novel contribution to the empirical work in this field, as this method has not been previously utilised in the context of ownership structures.

1.4.2. Chapter Four: Corporate Governance Index and Subindices

The second firm fundamental addressed in this study is the corporate governance of the firms. Prior to evaluating the impact of ownership identities on the corporate governance of JSE-listed companies, a comprehensive and robust measure of corporate governance must be developed. This chapter aims to construct a reliable and valid index that reflects the compliance of corporate governance in JSE-listed firms, with three corresponding subindices that reflect the categorical compliance of (1) board structures, (2) accounting and audit, and (3) risk management and internal audit.

The aim of this chapter extends to assessing the reliability, as well as the validity of these constructs, to ensure that they are robust measures of corporate governance compliance. This is based on the assertion of Sullivan (2011) and Hajjar (2018), who claimed that credible instruments should possess both reliability and validity. Since the focus of this chapter varies from that of the previous chapter, different variables and methodologies are employed. While this research is based on the data sample used in chapter three, the final sample for this chapter consists of 266 non-financial firms due to the unavailability of corporate governance data. This chapter aims to address the research questions outlined below:

IV. Is the constructed corporate governance index and corresponding subindices reliable measures of corporate governance compliance in JSE-listed firms?

V. Is the constructed corporate governance index and corresponding subindices valid measures of corporate governance compliance in JSE-listed firms?

This chapter uses publicly available information on the compliance of King Reports (King II, King III and/or King IV) to create the corporate governance index and subsequent subindices, as per Ntim (2009). The corporate governance index is aggregated with 20 compliance provisions pertaining to the three main aspects of the King Code: (1) board structure and characteristics, (2) accounting and auditing, and (3) risk management and internal audit. These three categories are subsequently developed into their own subindices that capture compliance with the corresponding provisions. Given the absence of a formal corporate governance indicator in South Africa, the development of this index and its subindices constitutes a significant contribution of this study, in terms of providing a more comprehensive corporate governance measure.

The Cronbach's alpha method is used to examine the reliability of the constructs. This approach assesses the internal consistency of elements within the index and subindices and has been previously utilized in corporate governance research (such as Ibrahimpašić, 2012; Otman, 2014; Shahwan, 2015; Kobuthi, 2018). Principal Components Analysis (PCA) is employed to evaluate the validity of the constructs, by estimating the degree to which the individual elements capture the overall essence of the index and subindices (Heale and Twycross, 2015; Black *et al*., 2017). The combined usage of both techniques is recommended by Sijtsma (2009), who posits that the Cronbach's alpha and the PCA are complementary to each other, as both approaches are necessary to achieve a complete understanding on the robustness of constructed instruments.

To the best of the author's knowledge, the robustness of corporate governance indices has not been addressed in prior South African studies. Thus, the utilisation of Cronbach's alpha and PCA in this chapter represents an original contribution to the empirical research on corporate governance within the context of South Africa.

1.4.3. Chapter Five: Corporate Governance

The research aim of this chapter is to investigate the impact of ownership identities (managerial, foreign, institutional, government and family) on the corporate governance compliance of firms listed on the JSE. Accordingly, this chapter seeks to answer the following research questions:

VI. Does endogeneity exist between ownership identity (managerial, foreign, institutional, government, and family) and the corporate governance of firms?

VII. What is the effect of ownership identity on the corporate governance index?

VIII. What is the impact of ownership identity on the corporate governance subindices?

This chapter uses the data sample utilised in chapter four, which contains 266 non-financial JSE-listed companies. The chosen corporate governance proxies used in this chapter are the index and subindices that were constructed in chapter three.

Since the underlying focus of this chapter is similar to that of chapter three, i.e., the relationship between ownership structures and firm fundamentals; this chapter uses similar explanatory and control variables, and estimation techniques. In particular, the endogeneity bias is assessed with tests of dynamic completeness, reverse causality and strict exogeneity. Based on the results of the endogeneity tests, this chapter employs either the FEM or the system GMM, the latter of which accounts for endogeneity in the data.

To the best of the author's knowledge, the exploration of the relationship between ownership structures and corporate governance has not been previously undertaken in South Africa. By addressing the research gap, this chapter provides an original contribution to the fields of corporate governance and ownership research.

1.4.4. Delimitations of the Study

There are two delimitations of the study, which are discussed below:

Firstly, the ownership identities that are the central focus of this study are managerial, foreign, institutional, government, and family ownership. While recognising the importance of black ownership in JSE-listed firms, this ownership type was not included in this thesis for significant reasons. In particular, obtaining data on black ownership in JSE-listed firms is challenging because this information is not accessible through financial databases. The primary source for

collecting this data is the annual B-BBEE compliance reports. However, these reports are not widely available for the majority of the sample period, as many JSE-listed firms only began disclosing this information in 2017. This is because firms were not required by law to disclose compliance reports prior to 2017, as it was initially a voluntary practice.

Although the disclosure of B-BBEE compliance reports became mandatory in 2017, many JSE-listed companies still failed to implement the required compliance reporting practices (B-BBEE Commission, 2018). In fact, as of 2022, Ensor (2022) claimed that there are still JSE-listed companies that have not submitted compliance reports to the B-BBEE Commission. For these reasons, the collection of black ownership data was not feasible for the current study. Moreover, while all ownership categories differ from each other, black ownership is fundamentally distinct in terms of its origins, policies, and financing mechanisms. It is also a complex topic that is closely tied to a multitude of external factors surrounding transformation, politics, race, and discrimination, which go beyond the scope of this study.

Secondly, the corporate governance chapters of the study specifically focus on three key areas: (1) board structure and characteristics, (2) accounting and audit, and (3) risk management and internal audit. These areas are considered pivotal in the corporate governance framework; therefore, the King Reports emphasize provisions related to the board of directors, audit committees, and risk management committees. While other aspects of corporate governance (such as ethics, sustainability, diversity, etc) are also important; delving into each of these elements diverge from this research's main focus, which is ownership. Consequently, these elements are not specifically considered.

1.5. STRUCTURE OF STUDY

The thesis comprises six chapters, and the details of each are provided below:

- **Chapter Two: Theoretical Framework**

  This chapter begins with a detailed overview of the two main theories surrounding ownership structure: the agency theory and the resource-based theory. This is followed by an overview of corporate governance and its dynamics in the South African context. The chapter concludes by providing detailed explanations of each ownership category (managerial, foreign, institutional, government and family), and discusses specific linkages to agency theory and/or resource-based theory.

- **Chapter Three: The Impact of Ownership Structure on Financial Performance**

  Chapter Three investigates the impact of each ownership type on the firm's financial performance, to address research questions I, II, and III. The relevant theories of this chapter are found in chapter two; therefore, this chapter begins with an analysis of the empirical evidence, followed by detailed discussions of the data and methodological approaches. The chapter ends with an analysis of the results and provides conclusions relative to the research objectives.

- **Chapter Four: The Construction of a Corporate Governance Index and Subindices**

  Chapter four aims to construct a reliable and valid corporate governance index and subindices that represents corporate governance compliance in JSE-listed firms. This chapter begins with an overview of the two dominant empirical models surrounding corporate governance: the equilibrium variable model and the compliance index model and discusses the relative advantages and disadvantages of each model. Thereafter, the chapter proceeds with a review of the empirical literature on corporate governance indices. This is followed by the data, construction methodologies, and robustness tests applied in this chapter. Finally, the chapter concludes with an explanation of the results, relative to research questions IV and V.

- **Chapter Five: The Impact of Ownership Structure on Corporate Governance**

  Chapter five evaluates the effect of the ownership identities (managerial, foreign, institutional, government and family) on the corporate governance compliance of JSE-listed firms. Accordingly, this chapter considers research questions VI, VII, and VIII. Since the theoretical foundation of this chapter is contained in chapter two, this chapter begins with an extensive review of the empirical evidence on this topic. The chapter thereafter explains the data and research methods, prior to concluding with a discussion of the results.

- **Chapter Six: Conclusion**

  This chapter contains a summary of the study, the research objectives and the findings obtained, which provide answers to the research questions this study addresses. The chapter concludes by discussing the limitations of the study and the recommendations for future research in this field

CHAPTER TWO: THEORETICAL FRAMEWORK

2.1. INTRODUCTION

The seminal work of Berle and Means (1932) conceptualised modern enterprises as being characterised by the separation of ownership and control (i.e., shareholders and managers are separate groups), where shareholding is widely divided among a variety of owners. The separation of ownership and control may have several advantages, most notably: (i) the life of enterprises are unrestricted as stocks can be transferred over time (Repei, 2000); (ii) the shareholders have limited liability for the debts of the company (Rajak, 2008) and therefore, the maximum loss the shareholders can experience is restricted to their original investment and not to the amount of the entire corporation's debt (Repei, 2000); and (iii) the variation in shareholders may introduce firms to unique resources (Choi *et al*., 2011).

Despite these benefits, a major disadvantage of the separation of ownership and control is that it is regarded as the underlying cause of agency problems (Jensen and Meckling, 1983). According to the agency theory, the separation of ownership and management leads to added costs, which in turn, diverts companies from optimum performance (Berle and Means, 1932; Jensen and Meckling, 1976; Fama and Jensen, 1983). Alternatively, the unique resources provided by certain shareholders induces a competitive advantage that may nullify agency costs and improve firm productivity. This is postulated by the resource-based theory which explains that firms have a competitive edge if they are in possession of resources that are scarce and inimitable (Barney, 1991). Such resources have a positive influence on firm performance. From this, it can be inferred that the study of ownership structure requires a multi-theoretical proposition that constitutes both the agency theory and the resource-based theory.

The ownership structure is considered to be one of the most influential elements of financial performance (Laporšek *et al*., 2021). It has also gained recognition as an important mechanism of corporate governance that can be integral in the reduction of conflicts between controlling and minority shareholders, and managers (Shleifer and Vishny, 1986; Abdullah, Ali and Haron, 2017). As a matter of fact, Zhuang (1999) referred to the ownership structure as a key factor in shaping corporate governance systems. This was later supported by Mashele (2021), who acknowledged that the ownership structure of a company affects its corporate governance

configurations. This recognition emphasizes the critical role that the ownership structure plays in influencing how companies implement corporate governance practices.

Following the occurrence of several corporate collapses worldwide, the United Kingdom (U.K) attempted to reform their corporate governance system by publishing the Cadbury Report (1992), which stipulated voluntary provisions of best practices for firms listed in the U.K (Dedman, 2002). As a response to the increasing international attention surrounding corporate governance reform, South Africa released a series of King Reports (King I in 1994, King II in 2002, King III in 2009 and King IV in 2016), outlining voluntary recommendations for JSE-listed firms to adopt best practices of corporate governance. Considering that these codes are a voluntary initiative, the compliance of firms are not guaranteed (Ntim, 2009).

The ownership categories within firms may influence the firm's level of compliance with corporate governance standards since owners play a pivotal role in governing managerial conduct and often structure control practices (Connelly *et al*., 2010). Furthermore, Laporšek *et al*. (2021) asserted that the right ownership combination can lead to the implementation of effective corporate governance. This subsequently improves the firm's financial performance, efficiency, and their access to financial capital (Claessens and Yurtoglu, 2013). As such, in addition to its role as a corporate governance mechanism, the ownership structure is also a significant determinant of the calibre of corporate governance in firms (Li, Lu, Mittoo and Zhang, 2015).

It is evident that the ownership structure significantly influences both the financial performance and corporate governance practices within firms. Therefore, chapter two attempts to provide a theoretical framework that links these firm fundamentals. The chapter begins with a discussion on the agency theory, which is subsequently followed by the resource-based theory. Thereafter, corporate governance under the South African context is outlined. Lastly, the chapter concludes with a discussion of the different types of ownership categories.

2.2. OWNERSHIP STRUCTURE THEORIES

The literature examining ownership structures were predominantly based on both the agency theory and the resourced-based theory. Therefore, in order to fully understand the impact of ownership identities, this section embraces a multi-theoretical approach by providing discussions on both theories below.

2.2.1. Agency Theory

As briefly mentioned, the dispersed ownership structures within modern corporations leads to the phenomenon of "separation of ownership and control", in which shareholders have minimal to no direct influence on the firm's activities (Yammeesri, 2003: 14). Owners therefore designate managers with the duty of optimizing shareholder wealth. As a result, the separation of ownership and control inadvertently leads to the emergence of the agency theory, which many authors view as the most significant issue surrounding the corporate governance and financial performance of companies (Berle and Means, 1932; Jensen and Meckling, 1983; Myers and Majluf, 1984).

The agency theory describes the conflict of interests between managers (the agents), who are theorized to pursue high rewards while minimising their effort, and the owners (the principals), who aim to maximise their value from shareholdings (Jensen and Meckling, 1976). Fundamentally, managers do not always act in the best interests of shareholders, rather they act on behalf of their own self-interests (Jensen, 1986). This phenomenon is identified as the agency problem (Yammeesri, 2003). To remedy this issue, firms must ensure that the interests of managers are congruent with those of shareholders (Lacoste, Lavigne and Rigamonti, 2010).

According to Davies (2000), the board of directors in firms play a critical role in assuring the alignment of interests between managers and shareholders. They perform monitoring duties, such as overseeing the decisions and actions of the chief executive officer (CEO) and other executive management (Adams, Hermalin and Weisbach, 2010). Aside from the internal members of the board, large shareholders with substantial ownership stakes are highly incentivised to monitor management, thus minimizing agency costs (Shleifer and Vishny, 1997). Agency costs refer to the expenses incurred when there is a misalignment of interests between managers and shareholders (Huu, Thuy and Ha, 2020).

As deduced by Jensen and Meckling (1976), agency costs consist of three elements: (1) monitoring cost; (2) bonding cost; and (3) residual loss. Monitoring cost pertains to the expenses incurred by owners in arranging effective monitoring bodies over management, to ensure that the decisions and actions of managers coincide with the interests of shareholders/owners (Choi and Park, 2019). Monitoring costs are not incurred when large shareholders perform monitoring duties, as they have significant incentives to monitor managers in order to protect their wealth (Gillan and Stark, 2003; An, 2015). The concept of bonding cost refers to the compensation provided to managers in order to mitigate their

incentive for engaging in exploitative behaviour (Hong and Loan, 2017). In this case, an agent may be obligated to contracts that limit their activities (Zhou, 2014). The residual loss is the discrepancy between the theoretically optimal value of shareholders (in the absence of the agency problem) and the actual value they obtain (Coriat and Weinstein, 2012). In spite of monitoring and bonding, a certain degree of conflict between the interests of managers and shareholders may still remain (McColgan, 2001), indicating the continued presence of agency costs. This is viewed as a residual loss (Hill and Jones, 1992). In addition to induced losses, Kaaro (2014) claims that organisations also bear unessential management expenses and residual losses from unrealized investments due to the risk aversion of managers.

Although large shareholders have strong incentives to undertake monitoring roles, they can also pose a hazard to the financial performance of companies, as they may prioritize their personal interests, which conflict with the interests of minority shareholders and management (Bozec and Laurin, 2008). This describes the entrenchment effect (Claessens, Djankov and Lang, 2002), which is later detailed in section 2.4.1.

Bonding costs involving the issuance of share option schemes can also reduce the conflict of interest between managers and shareholders (Fahlenbrach and Stulz, 2009; Mawanza, 2014), also discussed in section 2.4.1. Managerial ownership through share option schemes will likely result in the manager committing to value-added activities (Noradiva, Parastou and Azlina, 2016). Accordingly, they would also refrain from exploiting corporate resources as their main objective would be the maximisation of shareholder value, due to their own interests (Jensen and Meckling, 1976).

Under different conditions, specifically in an ownership structure that is widely dispersed, owners are at a greater risk of losing control over the firms to managers and may therefore fail to monitor them efficiently (Hoang, Nguyen and Hu, 2017). In this case, managers have more opportunities to pursue their private interests. Consequently, highly dispersed ownership structures are anticipated to encounter more severe agency problems (Schulze, Lubatkin and Dino, 2003a).

Although the agency theory was initially created on the basis of conflicts between managers and shareholders within joint-stock companies, its conceptualization can be extended to the realms of managerial, foreign, institutional, government and family ownership, as presented in section 2.4. While this theory has been the dominant conceptual foundation for ownership and corporate governance research, it “presents a partial view of the world” (Douma *et al*., 2006:

368). Hence, this section incorporates a discussion of the resource-based theory, in order to attain a holistic understanding of the ownership structure.

2.2.2. Resource-based Theory

The resource-based theory concentrates on how firms differentiate from each other in terms of their resources and capabilities to achieve and sustain competitive advantage (Barney, 1991; Penrose, 2009). As such, under the resource-based theory, the performance of firms is determined by the resources that firms embody. Resources can be classified as: (i) tangible; and (ii) intangible (Hall, 1993).

According to Mungai and Bula (2018: 4), "tangible resources can be readily seen, touched, and quantified", such as plant, property, and equipment, as well as cash accounts and equivalents (Galbreath, 2005). Jørgensen (2017) asserts that technological and organizational resources such as production, planning processes and control systems also fall within the domain of tangible resources. In contrast to tangible assets, intangible resources are not easily identifiable and is therefore difficult to imitate (Kabue and Kilika, 2016), such as human resources, reputation, and innovation (Madhani, 2009). Human resources include managerial and employee skills, education, and training (Stanko, Zeller and Melina, 2014). Innovation refers to the research and development capabilities to develop and improve products, and reputation considers the perceptions of product quality among customers (Madhani, 2009). In addition, He, Chakrabarty and Eden (2016) inferred that competitive advantages can be derived through advanced knowledge about international markets and corporate governance, which enable the implementation of innovative corporate governance practices.

In order for a firm to sustain its competitive advantage, Barney (1991) claims that its resources must be rare, inimitable, and irreplaceable. Such resources are referred to as "strategic resources" (Kabue and Kilika, 2016: 101). Intangible resources are more likely to induce competitive advantages compared to tangible resources as they are often scarce and not easy to duplicate (Mungai and Bula, 2018). However, Clarke (1988) argued that competitive advantage can also be achieved from financial resources if capital is obtained on advantageous terms, and to a sufficient extent (Barney, 1997). Therefore, the implementation of proper management, as well as the efficient utilization of both tangible and intangible resources is the key to achieve competitive advantage (Zahra, 2021).

The resource-based theory proposes that the ownership and control of strategic resources determines which firms will experience superior earnings and competitive advantages over

others (Madhani, 2009). This is because owners are considered as suppliers of resources that create competitive advantages (He *et al*., 2016). Furthermore, each type of owner may provide different strategic resources to firms due to the resource heterogeneity that exists among the various ownership identities (Douma *et al*., 2006; He *et al*., 2016). Fernandez and Nieto (2006) therefore acknowledge that a firm's resource endowment is dependent on its ownership structure. Accordingly, the impact of ownership types with different resource endowments is expected to vary due to this heterogeneity in resources (Douma *et al*., 2006).

2.3. CORPORATE GOVERNANCE

Wieland (2005: 76) defined corporate governance "as leadership, management, and control of a firm by formal and informal, public and private rules". Several researchers asserted that adopting a good corporate governance system leads to reduced agency costs, ethical decision making, improved business processes and transparency (Raut, 2003; Bhattacharjya and Chang, 2007; Abor and Biekpe, 2007; Mason and Simmons, 2014). The importance of a strong corporate governance system first became apparent following several global corporate failures that occurred in the late 1980s and early 1990s, such as Long-Term Capital Management, Lincoln Savings and Loan Association, Polly Peck and Texaco, amongst others (Black, 2003; Mallin, 2006; Hawley and Kamath, 2011; Abid and Ahmed, 2014; Dibra, 2016).

As discussed in section 2.1, such failures elicited major reforms in corporate governance that impacted the way in which companies were being controlled (Ntim, 2009). For instance, in response to these corporate failures, the U.K founded the Cadbury Committee in 1991, and subsequently published the Cadbury Report in 1992, outlining its recommendations of best corporate governance practices for firms listed in the U.K (Dedman, 2002). The publication of this report increased international attention surrounding corporate governance, resulting in the swift introduction of codes in several countries, including South Africa (Aguilera and Cuervo-Cazurra, 2009). Efficient corporate governance procedures are especially imperative in developing countries as this may assist companies with attracting investment capital and/or FDI, which in turn, stimulates economic growth (Ntim, 2009).

South Africa is recognised as the first emerging market to establish a code of good corporate governance practices (Mangena and Chamisa, 2008; Ntim, 2009; Mans-Kemp and van Zyl, 2021). This commenced in 1992, when South Africa founded the King Committee on Corporate Governance in an effort to enhance the manner in which JSE-listed firms were

governed (Rossouw, Van der Watt and Rossouw, 2002). The primary objective of the King Committee was to establish how to encourage firms to adopt the best practices of corporate governance in South Africa (IoDSA, 2002). In 1994, the King Committee issued the first King Report (King I) of guidelines for the governance structures and operation of companies in South Africa (Waweru, 2014). The main components highlighted in the King I report dealt with the roles of the board of directors, accounting and auditing committee, and internal control (Van de Nest, Thornhill and Jager, 2008; Ntim, 2009), with an increased emphasis placed on the characteristics of boards (Mangena and Chamisa, 2008).

Similar to the Cadbury Report, the King Report has been revised a few times since the issuance of its first version in 1994 (Chizema, 2008; Vagadia, 2014). In particular, King II, King III and King IV were released in 2002, 2009 and 2016, respectively (Bhikha, 2014; Natesan, 2020). Considering that King I primarily focused on the regulatory and financial elements of corporate governance (Esser and Delport, 2018), King II was issued in an attempt to adapt to the economic, social and political transformation that had taken place between 1994 and 2002 (Langeni, 2018). King II therefore diverted from the autonomous concern of company profit and shifted to a more inclusive approach that involved Employment Equity (EE), B-BBEE, HIV/AIDS, and health and safety (Faure and Villiers, 2004). Additionally, in further contrast to King I, King II integrated risk management as an important pillar of corporate governance for JSE-listed firms (Ntim, 2009), which remained a significant area of concern in the latter reports.

Thereafter, in 2009, the King III report was released and, in contrast to the previous versions, the King III implored firms to elaborate on the manner in which King II principles were followed (PricewaterhouseCoopers, 2016; Langeni, 2018). Moreover, the King III also integrated provisions to improve sustainability and transparency (Natesan, 2020). In order to address "emerging issues and corporate governance developments since the release of King III", the King IV report was launched in 2016 (Esser and Delport, 2018: 4). The King IV integrated areas surrounding ethical culture, good performance, effective control, and legitimacy (Natesan, 2020). In spite of the several revisions since the publication of King I, the predominant areas in all reports still lie with the board of directors, audit committees, and risk management committees. This is because the engagement of the board of directors, audit committees, and risk management committees contribute significantly to preserving the company's overall corporate governance and minimizing the risk of firm failures (Turley and Zaman, 2004).

The King Codes are akin to the corporate governance codes adopted in Anglo-American countries, where firms are expected to fulfil the interests of shareholders (Andreasson, 2011). However, the King Codes extend beyond shareholder interests by also advocating for inclusivity as a way of addressing historical socio-economic inequalities (Chitah, 2021). The South African corporate governance model is therefore referred to as a "hybrid" approach that combines features of the shareholder[3] and stakeholder model[4] (Ntim, 2009; Gyapong, 2016: 426).

As previously stated, although several codes of good corporate governance have been introduced in the last few decades, the adoption of these codes are not guaranteed as they are voluntary initiatives (Aguilera and Cuervo-Cazurra, 2009). To ensure that JSE-listed firms are considerably aligned to the King Codes, the JSE applies its own Listing Requirements that necessitate firms to meet a list of rules that closely relate to certain provisions of the King Reports (Ntim, 2009). In the event that JSE-listed companies fail to comply with these requirements, they can face suspension or delisting from the JSE (Mangena and Chamisa, 2008). However, these firms can still retain their listing if they are able to provide valid reasons for non-compliance. In May 2017, the JSE amended its Listing Requirements by declaring that it is mandatory for JSE-listed firms to apply certain provisions of the King IV, such as appointing a company secretary, audit committee and remuneration committee (Giles, 2017).

A further source of encouragement for the compliance of corporate governance codes may emanate from the owners of the firm. This is postulated by Ntim and Soobaroyen (2013), who claimed that individual owners influence how firms implement corporate governance policies because they govern the actions of managers and are often responsible for establishing both internal and external control mechanisms (Zhou, 2001; Wahl, 2006; Connelly *et al*., 2010). Moreover, corporate governance can be impacted differently by each ownership type due to their varying interests and characteristics. As such, Laporšek *et al*. (2021) indicates that the right ownership combination can enhance the chances of firms implementing more efficient corporate governance systems. Hence, in addition to financial performance, ownership structures are also significantly linked to the quality of corporate governance in firms. The

[3] The shareholding model directs companies to exclusively pursue the interests of shareholders (Ntim, 2009).

[4] The stakeholder model encourages firms to act in the interests of stakeholders who may either directly or indirectly be affected by the activities of the firm (Tshipa, 2017).

following section therefore provides an in-depth discussion on managerial, foreign, institutional, government and family ownership.

2.4. OWNERSHIP STRUCTURE TYPOLOGY

The ownership structure encompasses the identity of the equity owners and the allocation of equity regarding votes and capital (Zheka, 2003). Accordingly, it can be considered as a multidimensional variable which can be assessed across two categories: (i) ownership identity and (ii) ownership concentration (Lee, 2008). The ownership identity category embodies the influential shareholder(s) within firms, whereas the ownership concentration category represents the cluster of the majority shares owned by shareholders (Kevser and Leyli, 2019). The focus of this thesis lies predominantly with the ownership identity.

The concept of shareholder identification receives substantial attention in the relevant firm performance and corporate governance literature (Shleifer and Vishny, 1997; Xu and Wang, 1999; Marashdeh, 2014). According to Shleifer and Vishny (1997), the objectives and costs of exerting control over managers fluctuate significantly depending on the type of owner. The implication is that the number of shares owned is not the primary focus, as it is also important to distinguish who the shareholders are, i.e., whether they are private, individual, an entity of management, a financial institution, a non-financial institution, a foreign investor, or the government.

All ownership types differ in terms of wealth, risk aversion, and how important shareholder value is to them compared to other purposes. Companies may be owned by a diverse mix of shareholders who, with a few exceptions, aim to maximize their wealth (Connelly *et al*., 2010). As stated in chapter one, this thesis focuses on the following ownership identities: managerial, foreign, institutional, government and family ownership. It is important to understand the characteristics of each ownership category prior to discussing its impact on financial performance and corporate governance. As such, each ownership type is described below.

2.4.1. Managerial Ownership

Managerial ownership is regarded as a form of insider ownership[5] that represents the proportion of shares held by managers in firms (Ogabo, Ogar and Nuipoko, 2021). Hence, managerial owners are managers, as well as firm shareholders (Eelderink, 2014). As stated in the

[5] Insiders are the shareholders who work at the company (Wahl, 2006).

discussion of the agency theory in section 2.2.1, a key dilemma within corporate governance is the misalignment of shareholder's interests with those of firm management (Anson, White and Butler, 2004). A share option scheme is therefore used to converge the interests of managers with those of shareholders, where a firm grants its manager the exclusive rights to purchase shares at a pre-determined exercise price (Mawanza, 2014). This is supported by the King Report, specifically King IV, which suggests that managers should also hold shares in the firm to align the interests of shareholders and managers (Zondi and Sibanda, 2015; Anyango, 2018).

The agency theory therefore views managerial ownership as a strong internal corporate governance mechanism designed to mitigate the agency conflicts between managers and shareholders (Serly and Zulvia, 2019). According to Jensen and Meckling (1976), when managers own shares in firms, they have the incentive to increase the firm value since they now have vested interest in the company. As such, the initial investments in sub-optimal projects that were undertaken due to private interests, and the misappropriation of assets no longer transpire, as the manager's wealth is now dependent on the firm's profit (Ang, Cole and Lin, 2000; Fleming, Heaney, and McCoske, 2005). Furthermore, since the managerial owners are actively engaged in day-to-day activities of the company (Niemi, 2005), there will be less information asymmetry, conflicts, and hierarchical organization structure.

Mustapha and Ahmad (2011) state that a less complex organization structure reduces the need for assurance and monitoring thus, leading to less agency costs. This supports the convergence of interest hypothesis, which identifies managerial ownership as a mechanism to better align the interests of managers and shareholders (Bouras and Gallali, 2017), as managers will have an incentive to enhance firm performance if they own a stake in the company. Specifically, the convergence of interest hypothesis argues that, as interests of managers and shareholders converge through share ownership, a positive relationship arises between managerial ownership and firm value (Chen, 2013). Therefore, based on this hypothesis, the greater the proportion of shares owned by managers, the higher the financial performance in firms.

However, the convergence of interest hypothesis has been challenged by the management entrenchment hypothesis (Fama and Jensen, 1983; Demsetz, 1983), which argued that managers with high levels of ownership cultivate their private interests at the expense of minority shareholders (Morck *et al*., 1988), thus exacerbating agency conflicts. In addition to entrenching the minority shareholders, Fama and Jensen (1983) and Demsetz (1983) argue that managerial ownership may also entrench the incumbent management team due to significant

voting power, leading to an increase in managerial opportunism. Thus, according to the management entrenchment hypothesis, excessive managerial ownership may have a negative impact on financial performance. The entrenchment effect is not limited to managerial ownership and can apply to other types of owners who hold significant proportion of shares.

The combination of the convergence of interests and entrenchment hypotheses proposes a non-linear relationship between managerial ownership and firm performance, where low percentages of managerial ownership positively influence firm performance due to the convergence of interest effect (Brailsford, Oliver and Pua, 1999). However, as managerial ownership increases to high levels, entrenchment takes effect, resulting in increased agency conflicts and a consequent decline in the firm's value.

2.4.2. Foreign Ownership

Gurbuz and Aybars (2010: 350) assert that "the inflows of foreign direct investment are important sources of finance for developing countries". Hence, a prevalent feature of emerging stock markets is the presence of foreign ownership (Douma *et al*., 2006).

South Africa currently grapples with a deficit in domestic savings (Lings and Netshitenzhe, 2020). This has led to a disparity between domestic savings and investment, which makes the economy severely dependent on international capital to finance investment expansion and stimulate job creation and inclusive growth (National Treasury, 2017). Recognizing the importance of FDI, the South African government has made several efforts to attract more foreign investors (Masipa, 2018; Villers, 2019; Inglesi-Lotz and Ajmi, 2021). To facilitate the continuous influx of foreign shareholding, the current FDI policy and exchange controls on foreign ownership in South Africa does not impose any restrictions on the proportion of foreign ownership in South African firms (National Treasury, 2011; Peerbhai *et al*., 2020). Prior to the COVID-19 pandemic, foreign investors owned approximately 52% of the JSE (Wasserman, 2019). However, in 2020, during the pandemic-induced recession, foreigners accounted for only 35% of activity on the JSE as they sold a net of R125.6 billion worth of shares and other listed instruments (Brown, 2021).

Foreign owners are split into two categories: (i) foreign financial institutions (portfolio investors); and (ii) foreign industrial corporations (strategic investors) (Swart, 2013). Douma *et al.* (2006) notes that the governing mechanics of each of these foreign investors vary to a great degree. According to Wilkins (1999), the main concern of foreign financial institutional shareholders pertains to the short-term earnings only. As such, these investors are more

interested in a profitable exit plan instead of getting entangled with management (Douma *et al*., 2006). Foreign industrial corporate shareholders, however, commit to firms on a long-term basis, and adopt more active roles and greater responsibilities to maximise firm profitability and productivity (Anderson, Chi and Liao, 2019). These investors therefore have significant influence over a firm's management and operations in the host country (National Treasury, 2017).

As previously mentioned in section 2.1.1 of the agency theory, to ensure that managers act in the best interest of shareholders, large outside shareholders, as well as outside directors, often assume the role of monitoring managers (Fazlzadeh *et al*., 2011). According to Choi and Park (2019), foreign shareholders play an important role regarding the monitoring of managers, thus mitigating agency problems. Unlike domestic investors, foreign investors can be effective monitors of managers on behalf of shareholder's interests because they are more likely to demand higher corporate governance standards (Gillan and Stark, 2003). Nugroho, Febrianto, Tyasti and Kuswibowo (2020) claim that foreign ownership mitigates asymmetric agency and information problems by improving transparent corporate and financial governance. This is in accordance with Douma *et al*. (2006) and Rhee and Wang (2009), who asserted that foreign ownership is critical for improving corporate governance in emerging markets.

However, it should be noted that these benefits are associated with foreign industrial corporate investors only. Although foreign financial institutional investors possess monitoring competencies, they barely affect the agency problem as their short-term focus translates to weak incentives to monitor and discipline management (Hackethal and Zdantchouk, 2006). In addition, as per the entrenchment effect discussed in sections 2.1.1 and 2.4.1, large foreign shareholders may also be the cause of expropriation of minority shareholders, which in turn, lead to an erosion of firm performance. This is supported by Phung (2015), who claimed that large foreign shareholders tend to place value on their own personal interests at the expense of other stakeholders.

Aside from the capacity to minimise agency costs, Chibber and Majumdar (1999) suggested that foreign investors may provide firms with the access to scarce resources (such as information, managerial capabilities, and financial capital) that create competitive advantages. These resources are likely to enhance profitability through increased sales together with reduced expenses (Anderson *et al*., 2019). More specifically, Multinational Corporations (MNCs) gain valuable resources from foreign corporate shareholders due to international

opportunities, cutting-edge technologies, and advanced corporate governance practices to become globally competitive (Belderbos, 2003; Luo and Wang, 2012).

2.4.3. Institutional Ownership

Obagbuwa, Kwenda and Akinola (2021: 1) describe institutional shareholders as "large shareholders" who invest on behalf of their clients and beneficiaries. These beneficiaries may include superannuation and pension funds, life and non-life insurance companies, investment and unit trusts, financial institutions such as banks and finance companies, credit co-operatives, building societies, and investment companies (Koh, 2003; Survé, 2008).

Brickley, Lease, and Smith (1988), Chung and Wang (2014), and Zhang (2016) categorized institutional ownership into two groups: (i) pressure-sensitive and (ii) pressure-insensitive investors. Pressure-sensitive investors, such as banks and insurance companies, are those who have business relationships with the companies they invest in, which can inhibit their capacity to challenge the firm's managers (Zhang, 2016; Azmi, Sata, Hanim, Abdullah, Ab and Ismail, 2021). In contrast, pressure-insensitive investors, such as investment companies, pension funds and mutual funds, refers to investors who have no business relationships with their investee firms (Srivardhan, 2009; Azmi *et al*., 2021). As such, firms with larger pressure-sensitive investors hold greater proxy votes in favour of management, whereas firms with more pressure-insensitive investors have more proxy votes against the management's recommendations (Gillan and Starks, 2003; Andrade, Bressan, Iquiapaza and Mendes-Da-Silva, 2016).

Institutional investors are regarded as the most significant shareholder due to their persistent growth over the last few decades (Gompers and Metrick, 2001; Çelik and Isaksson, 2014; Fichtner, 2019). In South Africa, the main institutional investors comprise of pension, provident funds, and insurers (Bhikha, 2014). By the end of 2016, institutional investors owned 48% of shares on the JSE (National Treasury, 2017). Given their substantial shareholding, institutional investors have considerable power to influence the practices and policies of their investee companies (Mans-Kemp and van Zyl, 2021). Therefore, on behalf of the King III, the Code for Responsible Investment in South Africa (CRISA, as defined in chapter one) was released in 2011 (Locke, 2019). As mentioned in chapter one (section 1.2), the CRISA acts as a guide for institutional shareholders on ways of executing their investments, using their rights to improve governance, and integrating ESG issues into their investment decisions (Pillay, 2021). In addition, the King IV report subsequently implemented a governance principle that emphasizes the primary responsibilities of institutional investors, specifically in ensuring that

responsible investing is practised to promote good governance and create value in the investee firms (PricewaterhouseCoopers, 2016; IoDSA, 2016).

Due to their large stake in companies, Jabeen and Ali (2017) claim that, compared to individual shareholders, institutional owners have the strong incentives to monitor corporate decisions and ensure that those decisions improve the financial performance of the firm. This concurs with the viewpoint of the agency theory, in which the activism of institutional shareholdings is expected to improve firm performance because, similar to foreign shareholders, institutional investors also undertake monitoring roles to diminish asymmetric information and agency issues (Jensen and Meckling, 1976; Myers and Majluf, 1984; Zhang, 2016). Furthermore, it is common for institutional shareholders to convey private information that they obtain from the management to other shareholders (Chidambaran and John, 2000), thereby reducing information asymmetry.

Institutional shareholders also have the capacity to improve corporate governance practices, which, in turn, may result in the mitigation of agency costs (Celik and Isaksson, 2013). These improvements may involve the replacement of low performing managers and enriching firm's transparency by implementing stronger disclosure policies. Such appealing improvements may even result in firm's attracting new investors (Sivathaasan and Udayakumara, 2015; Hwang and Jung, 2016). McConnell and Servaes (1990) further suggested that the occurrence of management entrenchment is difficult when institutional investors play an effective monitoring role, for example, institutional shareholders actively respond to remove managerial entrenchment devices, such as poison pills[6] (Gine, Moussawi and Sedunov, 2017).

The recent accounting scandals in South Africa[7], however, trigger a debate on the actual effectiveness of institutional shareholders as monitors in JSE-listed firms, as most corporate failures were attributed to ineffective corporate governance systems stemming from the lack of strategic monitoring and reporting irregularities (Mahlaka, 2020; Haasbroek *et al*., 2020). The inactivity of institutional investors in the South African market has also faced criticism from King II, King III, and King IV reports, which recognised the limited role these investors have

[6] Dawson, Pence and Stone (1987: 423) referred to poison pills as "defensive measures adopted by board of directors in response to takeover attempts or in advance of possible takeover attempts that can cause severe economic repercussions in an acquirer or potential controlling person".

[7] Steinhoff international scandal in 2017, Tongaat Hulett scandal in 2018, VBS Bank Scandal in 2018, EOH Holdings scandal in 2018, and Sasol scandal in 2019 (Obagbuwa *et al*., 2021).

played in the development of corporate governance, and explicitly requested for greater involvement (Zhang, 2016).

When faced with entrenched managers, Pound (1988) argued that institutional owners have a tendency of enabling their behaviours by voting for the management team. Brickley *et al*. (1988) noted that pressure-sensitive shareholders might prefer to go along with management decisions as they may have business relations with the company, while pressure-insensitive institutional investors are more likely to discipline and oppose the votes of management.

2.4.4. Government Ownership

Most firm shareholders strive to maximise shareholder value (Maher and Andersson, 1999). However, this differs for government shareholders, who are usually motivated by social or political objectives (Phung, 2015). In developing countries, SOEs are mandated to promote social objectives through job creation and the provision of basic resources (Khongmalai, Tang and Siengthai, 2010).

According to Fourie (2014), the South African government relies on SOEs as vehicles to support economic development. However, governance failures of important SOEs such as the South African Broadcasting Corporation (SABC), SAA, Eskom, Denel, and Transnet have instead deepened the financial issues in the economy and caused increased public controversy. These failures have resulted in frequent bailouts[8] from the South African government. Bailouts are a burden on South African taxpayers, whose incomes are shrinking, while the government continuously procures money for these bailouts by withdrawing spending from education, health, and security (Thakoor, 2020).

Shleifer (1998) claimed that government-linked firms often undertook poor corporate governance practices, as there is a lack of incentive to control agency problems because these firms have weaker accountability for their financial performance, easier access to financing, lack of exposure to a market for corporate control, and weaker monitoring by shareholders (Gnan, Hinna, Monteduro and Scarozza, 2011). Managers in SOEs are usually evaluated based on whether they have fulfilled these political and social goals (Du, Tang and Young, 2012). As such, the managers often use these goals as an excuse to violate management and ethical principles, which leads to excessive losses for the company. They use government subsidies and bribes as a tool in circumventing public policies for private gain, thus exacerbating the

[8]According to National Treasury (2020), over the past 12 years, R162 billion has been allocated to financially distressed state-owned companies, with Eskom accounting for 82%.

agency problem. In other words, from the perspective of the agency theory, government ownership often results in poor firm performance and increased agency costs because government shareholders are too detached from the firm (Shleifer, 1998), and often try to pressure companies into implementing governmental objectives at the expense of shareholder objectives (Firth, Fung and Rui, 2007).

Relative to other organization forms, SOEs and their executives usually have strong connections with political officials (Shi, Markóczy and Stan, 2014). Hence, political resources and capabilities are a source of differentiation for companies with significant levels of government ownership (Peng, Bruton, Stan and Huang, 2016), thereby creating a competitive advantage. In particular, political ties may promote the firm's public reputation and legitimacy (Xia, Ma, Lu and Yiu, 2014). In addition to political connections, the resource-based theory assumes that companies with a higher proportion of government ownership have easier access to critical resources, such as capital and profitable government contracts (Ntim, 2009; Habtoor, Hassan and Aljaaidi, 2019).

2.4.5. Family Ownership

A company with family ownership as its majority shareholder is regarded as a family-owned business (Brundin, Florin-Samuelsson and Melin, 2005). Family-owned businesses constitute the world's oldest and most dominant form of business entities (Fok, 2012). In the United States (U.S), Visser and Chiloane-Tsoka (2014: 427) reported that "family businesses account for 80% of all businesses and are responsible for nearly 50% of gross domestic product (GDP)". As a matter of fact, most entrepreneurial businesses start with financial support from family members (Astrachan, Zahra and Sharma, 2003). This is often the case for developing economies where financial support or venture capital cannot be provided (Bertrand and Schoar, 2006; Khanna and Rivkin, 2006). To the author's knowledge, there is no reliable database encompassing family businesses in South Africa. Nevertheless, PriceWaterhouseCoopers (2016) regards family-owned businesses as a driver of growth in the South African economy, as "80-90% of SMMEs in the country are family-owned" (Venter and Farrington, 2009: 136).

Arifin (2003) stated that family firms experience fewer agency problems due to less conflict between the principal and agent. Since family wealth depends on firm welfare, families either manage the firm directly or closely monitor management (Anderson and Reeb, 2003). The presence of a family member in the agent position will automatically align shareholders financial incentives with those of the managers (Jensen and Meckling, 1976), thus ensuring

optimal firm performance. Compared to non-family managers, family managers tend to view the fulfilment of family business goals as intrinsic (Zhang, 2016). They always subordinate their personal interests to working towards the organizational interests, leading to minimized agency problems (Karra, Tracey and Phillips, 2006; Chrisman, Sharma and Taggar, 2007). In addition, the mutual communication and coordination among family members help to reduce the agency costs elicited from information asymmetry (Zhang and Cao, 2016). Although family firms are more likely to deviate from standards of best practice in corporate governance (Ward, 1991), this does not lead to higher agency costs because the family shareholder is the monitor in-place (Arcot and Bruno, 2012).

However, from the entrenchment perspective, family members holding essential management positions may pursue interests of the controlling family shareholder at the expense of non-controlling shareholders (Morck and Yeung, 2003). Most family-owned firms usually prefer to establish boards that do not try to alleviate their discretion over decision making (Chen and Jaggi, 2000; Anderson and Reeb, 2004). Boards are thus dominated by family members or close friends, hence, there are very few truly independent directors within family firms who may consider the interests of minority non-family shareholders (Meng, 2009).

Aside from business interests, the influence of family-related issues in family firms creates a more complex structure of individual preferences (Chrisman, Chua and Litz, 2004). Relational and altruistic aspects have significant influence in decision-making and are regarded as other sources of agency costs (Mustakallio, Autio and Zahra, 2002; Poppo and Zenger, 2002). Altruism is defined as "a trait that positively links the welfare of an individual to the welfare of others" (Schulze, Lubatkin, Dino and Buchholtz, 2001: 102). This encompasses self-control problems (Jensen, 1994), excessive generosity within the family, and nepotism through the employment of family members instead of more accomplished non-family managers (Gómez-Mejía, Nunez-Nickel and Gutierrez, 2001; Schulze, Lubatkin and Dino, 2003b).

In the context of the resource-based theory, it is recognized that family enterprises possess a unique set of resources, which emerge from the interaction among the family, its individual members and the firm (Arregle, Hitt, Sirmon and Very, 2007). Habbershon and Williams (1999: 11) defined these resources as "familiness", which involves loyalty, a readiness to work extended hours and effortless accumulation of tacit knowledge resulting from the early engagement of children in family companies. These qualities are regarded as positive traits of human capital that contribute to creating a competitive advantage (Gedajlovic, Carney, Chrisman and Kellermanns, 2012). Arregle *et al*. (2007) believe that these resources are

specific to family firms only and therefore help to distinguish them from other business forms. However, Dyer (2006) argued that it is important that these unique resources be managed efficiently, as they pose a risk to firm value when corporate governance is inadequate.

2.5. SUMMARY OF OWNERSHIP STRUCTURE TYPOLOGY

The discussion in section 2.4 sheds light on the differences as well as similarities between each ownership category, thus implying that the potential effects of ownership structures could vary based on the identity of the owner. Managerial ownership is recognised as a corporate governance mechanism because managerial share options are frequently used to converge the interests of managers with those of shareholders, as per the convergence of interest hypothesis. However, this hypothesis was later contradicted by the management entrenchment hypothesis, which argued that managers with high levels of ownership cultivate their private interests at the expense of minority shareholders.

Foreign ownership was also acknowledged as a tool used to minimize agency costs since foreign investors often undertake monitoring roles in firms. Moreover, foreign investors also transfer scarce resources to firms that create a competitive advantage. However, the impact of foreign ownership is more complex, as there are two types of foreign owners, i.e., foreign financial institutional owners and foreign industrial corporate owners. Foreign financial institutional investors are only concerned with short-term returns, whereas foreign corporate investors adopt more active roles on a long-term basis. Hence, the benefits associated with foreign ownership materialize specifically through foreign industrial corporate investors. Nonetheless, these investors are also susceptible to the entrenchment effect.

Similar to foreign ownership, institutional ownership was categorized into two forms, namely pressure-sensitive and pressure-insensitive investors. Institutional owners often own large stakes in companies and are therefore strongly incentivized to monitor corporate decisions and improve corporate governance mechanisms. However, a major drawback of these investors, specifically pressure-sensitive shareholders, is their allowance of managerial entrenchment behaviours to cultivate their private interests.

Government ownership differs from other ownership forms, as government shareholders are motivated by social or political objectives, instead of shareholder maximisation. The agency theory considers government ownership to be detrimental to firm performance as government shareholders are too detached from the firm. Several SOEs fail due to their poor corporate

governance practices. This is observed in South Africa, where government relies on SOEs to support economic development, but the governance failures of important SOEs have instead deepened the financial issues in the economy. However, the political resources of government owners are a source of differentiation for companies, thus providing competitive advantage.

Lastly, family-owned businesses were acknowledged as the oldest and most dominant form of business entities. Compared to other organisational forms, these firms face less agency conflict since families either manage the firm directly or closely monitor management. However, relational and altruistic aspects surrounding self-control problems, excessive generosity, and nepotism contribute to agency costs. The resource-based theory recognised that family firms possess a unique bundle of resources, referred to as familiness, which involves the loyalty, willingness to work long hours and easy development of tacit knowledge.

In summary, the overall effect of the ownership structure is dependent on the type of owner.

2.6. CHAPTER CONCLUSION

This chapter provides a theoretical framework surrounding the ownership structure, where the agency theory, resource-based theory, corporate governance, and ownership structure typology served as the central aspects. The theoretical literature based on the agency and resource-based theory provided mixed implications with regards to the effects of the ownership structure on the financial performance and corporate governance of firms, indicating that the potential effects may vary according to the ownership identity. This therefore emphasizes the need for a study of this nature in the South African market, and further motivates the primary objectives of this thesis. Thus, the following three chapters provide empirical investigations into both financial performance (chapter three) and corporate governance (chapters four and five), which aim to address the research questions raised in chapter one.

CHAPTER THREE: THE IMPACT OF OWNERSHIP STRUCTURE ON FINANCIAL PERFORMANCE

3.1. INTRODUCTION

The financial performance of firms is one of the most prominent concepts within business domains that represents how effectively firms utilize their organizational resources to accomplish the firm objectives, such as the maximization of shareholders wealth and profit (Deng and Smyth, 2014; Kyengo and Kilika, 2017). Aside from the business environment, the subject of firm financial performance has drawn substantial attention in academia, specifically in corporate finance research.

Alswalmeh and Dali (2019) inferred that there are several different dimensions that impact a firm's financial performance. Zraiq and Fadzil (2018) recognized a firm's ownership structure as the most significant factor influencing the performance of firms, as owners influence the decisions taken by a firm to decrease the level of financial risk and increase financial performance (Levrau and Berghe, 2007). That being so, the identification of owners within a company's ownership structure has important implications for the company's financial performance and corporate strategy (Wahl, 2006). In addition, investigating how different ownership types impact the performance of firms can help companies adopt an ownership structure congruent with their vision and objectives, thus ensuring that investors are in a good position to fulfil firm expectations (Norman, 2010).

Chapter two demonstrates that an ownership structure is related to the presence of various categories of owners such as managers, institutions, family, government, and foreign shareholders (Gürsoy and Aydoğan, 1998), and it has been widely acknowledged that these distinct ownership identities exert different effects on firm performance (Ting, Kweh, Lean and Ng, 2016). As discussed, the foundation of the relationship between ownership structure and firm performance lies in the work of Berle and Means (1932), who noticed a separation of ownership and control within growing firms after the Industrial Revolution (Al-Matari *et al*., 2013). It is argued that the separation of ownership from control for a corporate firm creates an agency problem described as conflicts of interests between shareholders and managers (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). In point of fact, most research surrounding

ownership- financial performance nexus is rooted in the agency theory framework (such as Talebnia, Salehi, Valipour and Shafiee, 2010; Ongore, 2011; Abbas, Asad, Naqvi and Mirza, 2013). The other relevant theory pertaining to the ownership structure and financial performance lies in the resource-based theory.

As discussed in section 1.1, further complexity is encompassed in the research of the ownership structure as it is unclear whether the financial performance of firms also influences the type of ownership embodied within a firm, i.e., if firm performance shares a bidirectional relationship with any of the ownership categories. The possibility of a reverse relationship infers the presence of endogeneity issues (Chow and Recker, 2012), which is briefly discussed in chapter one. Moreover, the relationship between ownership structure and financial performance may not always be linear. Several studies documented non-linear relationships between various ownership types and financial performance in emerging markets (Hu and Zhou, 2008; Yu, 2013; Phung, 2015; Daryaei and Fattahi, 2020; Srivastava and Bhatia, 2020). This is because the effect of different ownership categories may be dependent on its proportion within the firm (Grosfeld, 2006). For example, managerial shareholding may improve financial performance when it remains below a certain threshold percentage. However, once it exceeds the threshold level, managerial shareholders may begin to erode financial performance due to an entrenchment effect (Hu and Zhou, 2008). This is perpetuated by the agency framework in chapter two (section 2.4), which suggests that managerial, foreign, and family ownership may be advantageous up to a certain level of ownership, beyond which it turns negative.

The ownership structures of firms in South Africa are highly concentrated (Ntim, 2011; Peerbhai *et al*., 2021), arising from large stakes in institutional ownership and foreign ownership[9]. Moreover, as mentioned in chapter one, the South African market is unique as the JSE equity market is subject to distinct ownership regulations, such as B-BBEE, certain King IV provisions, CRISA, FDI policy, and exchange controls on foreign ownership (National Treasury, 2017; Pequenino, 2018; Pillay, 2021). The ownership structure of firms listed on the JSE reflects several vital aspects of the economy, linking to macroeconomic and financial stability, transformation and inclusive growth, and competition (National Treasury, 2017). Thus, the ownership structure and financial performance of JSE-listed firms has become a

[9] By the end of 2016, institutional investors owned 48% of shares on the JSE, while foreign investors owned 38% of shares, and the remaining 14% was owned by other South African investors (National Treasury, 2017). As of 2017, no studies have provided updated estimates of the share ownership on the JSE. However, the data sample from this study indicates that in 2021, institutional ownership and foreign ownership constituted 38.7% and 20.6% of shares, respectively, in JSE-listed non-financial firms (see table 3-6). The remaining shares were owned by managerial, government, or family shareholders.

significant public policy issue (Cameron, 2012). While several studies examined the linkages between ownership structures and firm financial performance within emerging economies, previous South African literature (such as Mugobo *et al*., 2016; Komati, 2017; Dube, 2018) have limitations as they do not adequately address the possibility of non-linear relationships and fail to account for endogeneity.

Examining the potential existence of a non-linear relationship between ownership types and financial performance is crucial as it enables the estimation of ownership thresholds that may either enhance or undermine firm performance. Therefore, understanding the non-linear effects of the ownership structure may offer valuable insight to both policymakers and firm owners, as the implications of this study can contribute to the establishment of legislative caps on ownership levels that erode the quality of financial performance. As such, the overarching aim of this chapter is to examine the relationship between different ownership categories (managerial, foreign, institutional, government, and family) and the financial performance of JSE-listed firms. This is attained by answering the following research questions:

I. Does endogeneity exist between any of the ownership categories (managerial, foreign, institutional, government, and family) and the financial performance of firms?

II. Is the relationship between the ownership categories and financial performance linear or non-linear?

III. If the relationship is non-linear, what is the optimal level of ownership?

This chapter commences with a review of empirical evidence on the ownership structure-financial performance nexus. A discussion of the adopted research methodology is thereafter provided. Finally, this chapter concludes by presenting an analysis of the results obtained.

3.2. EMPIRICAL EVIDENCE ON THE RELATIONSHIP BETWEEN OWNERSHIP STRUCTURE ON FINANCIAL PERFORMANCE

This section reviews the existing empirical evidence surrounding the relationship between ownership structure and financial performance. The empirical evidence is categorized according to the different ownership identities (managerial, foreign, institutional, government and family). As previously discussed, both linear and non-linear relationships are prevalent in this topic. Thus, the studies reviewed in this section are further segmented into two subcategories based on the type of empirical model adopted, i.e., linear models or non-linear

models. This section also attempts to link the results of prior studies with the theories provided in chapter two.

3.2.1. Empirical Evidence on Managerial Ownership and Financial Performance

Companies administer managerial ownership as a way to mitigate the agency conflicts between managers and shareholders and thereby increase firm performance (Susanto, Pradipta, and Cecilia, 2019). However, as discussed in chapter two (section 2.4.1), the agency theory does not offer a picture of unanimity surrounding the linear relationship between managerial ownership and firm performance. On the one hand, the convergence of interest hypothesis postulates that managerial ownership may enhance firm performance as it aligns the interests of managers and shareholders (Bouras and Gallali, 2017). On the other hand, the management entrenchment hypothesis contends that large levels of managerial ownership elicit managers to act in their own interests, thus eroding firm performance (Seifzadeh, Rajaeei and Allahbakhsh, 2022). Nonetheless, the combination of the convergence of interests and management entrenchment hypotheses suggests a non-linear relationship between managerial ownership and corporate value (Brailsford *et al*., 1999). Therefore, in addition to linear models, this section also reviews studies that adopted non-linear models to examine the non-linear relationships between managerial ownership and financial performance.

3.2.1.1. Empirical studies on managerial ownership and financial performance through linear models

When examining 1689 American firms during the years 1985 to 1988, Denis, Denis and Sarin (1997) discovered that managers became entrenched at ownership levels of 1% or greater, as these managers experienced lower turnover, thus suggesting a negative relationship between managerial ownership and financial performance. This aligns with the management entrenchment hypothesis from section 2.4.1 and is further supported by Simoneti and Gergoric (2004: 220) who stated that "firms with higher managerial ownership are characterised by lower managerial turnover and lower efficiency". Later studies conducted by Belkhir (2005) and Switzer and Tangb (2009) also observed a negative association between managerial ownership and firm performance in the U.S.

In contrast, a study by Juras and Hinson (2008: 102) found that managerial shareholding (measured by director's shareholding) had no significant influence on the financial performance of 560 bank holding companies in the U.S, arguing that "directors have a very limited direct impact upon an organization". However, considering that the asset structures of

financial firms, such as banks, substantially differs from firms within other industries, the conflicting results of Juras and Hinson (2008) may be due to the different characteristics in their study sample.

Similarly, conflicting results on the effect of managerial ownership were also observed in Malaysian studies, in which Haniffa and Hudaib (2006) reported a negative effect, whereas Mohd (2010) and Mohd (2020) documented no effect. All three studies investigated the impact of corporate governance on the financial performance of non-financial listed companies in Malaysia, where managerial ownership was utilised as a corporate governance proxy. This concedes with the agency theory (section 2.4.1), where managerial ownership is considered as an important corporate governance mechanism. On the one hand, Haniffa and Hudaib (2006) used 347 listed firms between 1996 and 2000 and implemented the Ordinary Least Squares (OLS) procedure to generate results. The authors ascribed the negative relation to the insider model of corporate governance being unsuitable in the Malaysian business environment, as managerial owners may pursue more risky strategies to maximise their own interests. On the other hand, Mohd (2010) utilised 87 non-financial listed companies in 2001, while Mohd (2020) used 742 non-financial firms listed in 2013. Through regression analysis, the findings of both studies showed that managerial ownership had no effect on the financial performance of Malaysian firms. Mohd (2020) claimed that the insignificance of managerial ownership demonstrated its lack of importance in corporate governance.

The observed differences in the results between Haniffa and Hudaib (2006) and Mohd (2010) and Mohd (2020) may lie in the distinct timeframes considered in each respective study. For instance, the period of study used by Haniffa and Hudaib (2006) spread across 1996 to 2000, consequently subsuming the negative effects of the 1997 Asian financial crisis, whereas both studies by Mohd were undertaken during crisis free periods, and across one year only. Moreover, in 2001 the Malaysian government introduced new regulations that reformed corporate governance. This therefore indicates that the disparities in the findings between Haniffa and Hudaib (2006) and Mohd's (2010, 2020) studies may stem from the various events that transpired during the different timeframes.

The support for the convergence of interest hypothesis was evidenced by Fauzi and Locke (2012), who found a positive relationship between managerial ownership and firm performance in New Zealand. The authors attributed the positive effect of managerial ownership to incentive alignment and managerial commitment to their companies, as they own shares and have a stake in the residual income. This study used a balanced panel of 79 listed firms, from 2007 to 2011,

and employed a Generalised Linear Model (GLM) for estimation purposes. To ensure the robustness of their results, Fauzi and Locke (2012) used the Durbin-Wu-Hausman (DWH) test to detect whether the endogeneity bias was present between managerial ownership and firm performance. The results of the DWH test indicated the absence of endogeneity, thereby implying a unilateral relationship.

Din *et al*. (2021) examined the impact of the ownership structure on the financial performance of 146 manufacturing firms listed on the Pakistan Stock Exchange (PSX), from 2003-2012. The percentage of the shares held by directors, managers and executives of the firm were used to constitute the managerial ownership variable. Din *et al.* (2021) used the dynamic GMM technique for the regression analysis as this approach caters for the endogeneity bias. The findings of the study showed that managerial ownership shared a positive relationship with the financial performance of the firms. Aside from the convergence of interest between managers and shareholders, Din *et al.* (2021) also considers the possibility of positive relationships stemming from the reduction in the managerial myopia[10] problem. For example, several studies found that high managerial ownership is associated with the increase in innovation and productivity, which eventually enriches the value of the firm (Francis and Smith, 1995; Palia and Lichtenberg, 1999). This finding is similar to that of a Pakistani study by Zahra, Khan and Warraich (2018), who reported that a 1% rise in managerial ownership reduced the firm's probability of financial distress by 17%. Other studies that documented positive linear relationships between managerial ownership and financial performance include Balatbat, Taylor and Walter (2004) in Australia, Dey (2008) in the U.S, Sing and Sirmans (2008) in Singapore, and Leung and Horwitz (2010) in China.

Turning to evidence from African countries, Ongore (2011) examined the interrelations among ownership and firm performance in a sample of 42 firms listed on the Nairobi Stock Exchange (NSE) in Kenya. This study utilized logistic regressions which assumed that no endogeneity existed between managerial ownership and firm performance. The findings revealed that managerial ownership exerted a positive effect on firm performance, which was measured with ROA and ROE. These findings concur with the views of the agency theory mentioned in section 2.4.1, in which managerial owners are more committed to firms, which in turn, translates to superior financial performance (Ongore, 2011).

[10] Managerial myopia or managerial short-termism refers to reducing long-term investments such as research and development (R&D) to meet or beat short-term earnings targets at the expense of long-term growth (Chen, Lin and Yang, 2015).

In South Africa, Mugobo *et al*. (2016) and Dube (2018) observed a negative relationship between managerial ownership and firm performance. Mugobo *et al*. (2016) implemented a multiple regression analysis on a sample of 80 South African companies ranging from the year 2001 to 2010. 40 of the selected companies were listed on the JSE, whereas the other 40 were unlisted private companies. The findings showed a strong inverse relationship between managerial ownership and ROA, which the authors interpreted as the ramification of the lack of due diligence and poor decisions made by managerial owners. Although a substantial difference in the sample size and estimation technique, Dube (2018) reported similar results when investigating the relationship between the ownership structure and financial performance. This study utilised an unbalanced panel data set consisting of 205 non-financial firms listed on the JSE from 2004 to 2014 and adopted the FEM and the GMM for estimation purposes. Dube (2018) attributed the negative association between managerial shareholding and firm performance to the management entrenchment hypothesis described in section 2.4.1. This study measured managerial ownership as a proportion of shares held by directors. These directors included executive management, the CEO, directors of the board and chairman of the board.

Contrary to Mugobo *et al.* (2016) and Dube (2018), the South African study of Zondi and Sibanda (2015) found no relationship between managerial ownership and firm performance, when using the Two-Stage Least Squares (2SLS) method. Nonetheless, it is worth noting that the differences in results may be due to the sample size and the sector that was under observation, as Zondi and Sibanda (2015) conducted their analysis over a sample of 23 retail sector firms listed on the JSE from 2010 to 2013. Therefore, the authors conclude that retail firms specifically, are not affected by managerial ownership. The study itself considers its small sample size and short timeframe as limitations due to lack of variation.

3.2.1.2. Empirical studies on managerial ownership and financial performance through non-linear models

Non-linearity is particularly significant for managerial ownership as it coincides with both the convergence of interests and management entrenchment hypotheses. The studies analysed in this section adopted non-linear empirical models in order to account for potential non-monotonic linkages between managerial ownership and financial performance. In addition, several studies extended their non-linear analyses to estimate the optimal levels of managerial shareholding.

One of the earliest studies to provide evidence of a non-linear relationship between managerial ownership and firm performance was that of Morck *et al.* (1988), who found an S-shaped relationship with two turning points. The study was based on 371 Fortune 500 companies, and the authors used dummy variables to partition different ownership levels (at 0%, 5%, and 20%) in a piecewise regression model. The authors found a positive relationship between managerial ownership and Tobin's q when managerial shareholdings were less than 5% or above 25%. However, managerial shareholdings that ranged between 5%-25% rendered a negative relationship.

Throughout managerial ownership literature, non-linear relationships have assumed different shapes. For example, through the examination of 83 Chinese firms with the quadratic-model regressions, from 1998 to 2000, Hu and Zhou (2008) found a non-linear inverse U-shaped relationship between managerial ownership and firm performance, with an optimal value of 75%. This illustrated that managerial shareholding below 75% improved firm performance; however, once managerial ownership exceeded the optimal value, firm performance was impaired. Hu and Zhou (2008) explained that the positive effect at low levels of managerial ownership was due to incentive alignment and the negative effect at higher levels to managerial entrenchment.

In contrast to Din *et al.* (2021) from the previous section, an earlier Pakistani study by Din and Javid (2011) reported an inverse U-shaped relationship between managerial ownership and firm performance, with the optimal value of 25%. This study evaluated 60 non-financial firms listed on the Karachi Stock Exchange (KSE) 100 index from 2000-2007 and adopted simultaneous regression equations to account for endogeneity. The differences between the results of Din and Javid (2011) and Din *et al.* (2021) may be due to the fact that the latter did not test the possibility of a non-linear relationship.

Using a quadratic specification, Khan, Mather and Balachandran (2014) also found a non-linear relationship between managerial ownership and the firm performance of the 300 largest Australian firms, between 2000 to 2006. However, they observed an initial negative relationship, which, thereafter, transformed into a positive relationship. This characterized a U-shaped relationship, where Khan *et al*. (2014) explained that low levels of managerial shareholding negatively impacted firm performance, but once managerial shareholding surpassed 20%-30% of total ownership, the impact turned beneficial. This contradicts the management entrenchment hypothesis in section 2.4.1, as Khan *et al*. (2014) argued that managers could be entrenched at relatively low levels of ownership and such entrenchment

may only be eliminated until they reach a point at which they own enough shares to have their interests aligned with the owners. Similarly, Monteiro (2019) also discovered a U-shaped relationship between managerial ownership and ROA. This study was based on a sample of 102 Belgian listed firms and results were generated through a quadratic OLS regression analysis.

Although the U-shaped and inverse U-shaped relationships are the most dominant forms of non-linearity in managerial ownership-financial performance studies; several other studies show more complicated functional forms that describe the non-linear relationship. For example, when analysing 142 firms from the New York Stock Exchange (NYSE) between 1971-1983, Hermalin and Weisbach (1991) found an inverse W-shaped relationship with three turning points: (i) an increase in firm performance when the managerial ownership was less than 1% of total shareholding; (ii) a decrease when the percentage of managerial ownership was between 1%-5%; and (iii) an increase again when managerial ownership ranged from 5%-20%, followed by a second decrease in firm performance when managerial ownership exceeded 20%.

Similarly, Cui and Mak (2002) found a W-shaped relationship which also demonstrated three turning points: (i) an initial decline of Tobin's q when managerial ownership ranged from 0% to 10%; (ii) an increase for managerial ownership levels between 10% and 30%; (iii) a decrease again after managerial ownership constituted 30%-50%, followed by another increase in Tobin's q when managerial ownership exceeded the majority share proportion, i.e., above 50%. These results were generated through piecewise regressions with quadratic ownership variables. Other studies (such as Davies, Hillier and McColgan, 2005; Florackis, Kostakis and Ozkan, 2009) found the emergence of four turning points when studying non-linearity between managerial ownership and firm performance. These authors argued that the additional turning points can be explained by resurgence of entrenchment behaviour when the external market discipline becomes ineffective at certain levels of managerial ownership.

3.2.1.3. Summary of empirical evidence on managerial ownership and financial performance

The studies reviewed in this section used linear and non-linear empirical models in their examinations of the managerial ownership- financial performance nexus. The extant literature on linear models (section 3.2.1.1), provided mixed evidence as the results of certain studies found a positive impact in line with the convergence of interest hypothesis (Ongore, 2011; Fauzi and Locke, 2012; Din *et al*., 2021), whilst others reported a negative effect, supporting

the entrenchment hypothesis (Denis *et al*., 1997; Haniffa and Hudaib, 2006; Dube, 2018). Although ambiguous results are expected due to the agency theory implying that managerial shareholding is beneficial up until the level of ownership is highly concentrated, the linear approach does not provide any further analysis to capture the varying effect of different proportions of managerial ownership. The non-linear approach, however, does account for this through the utilisation of quadratic specifications (Cui and Mak, 2002; Hu and Zhou, 2008; Khan *et al*. 2014; Monteiro, 2019) and dummy variables (Morck *et al.*, 1988).

The existing literature based on the non-linear approach of analysis, in section 3.2.1.2, provides evidence of non-linearity between managerial ownership and financial performance. However, the actual form of the non-linear relationship differs across the studies. From the studies reviewed in this section, 44% indicated a U- or inverse U-shaped relationship, whilst the remainder reported a mixture between S-shaped, W-shaped, and four turning point relationships. For this reason, the U- and inverse U-shaped relations are considered as the most common forms of non-linearity. In particular, studies conducted in developed countries, such as Australia (Khan *et al*., 2014) and Belgium (Monteiro, 2019), observed U-shaped curves, while those in emerging markets like China (Hu and Zhou, 2008) and Pakistan (Din *et al*., 2021) found inverse U-shaped relationships. This suggests that the impact of managerial ownership may vary across developed and developing countries. Additionally, the second branch of literature highlights the plausibility of different levels of managerial ownership exerting a deferential impact on firm performance, which further extends to other ownership forms of this study.

Although evidence from the South African market is reviewed in this section (such as Zondi and Sibanda, 2015; Mugobo *et al.* 2016; Dube, 2018), these studies are undertaken from the perspective of linear models only, failing to account for potential non-linearity. Considering the overwhelming evidence of non-linear relationships provided in section 3.2.1.2, it is imperative to examine non-linearity between the managerial ownership- financial performance nexus in South Africa. Such an investigation can assist JSE-listed firms in determining the optimum level of managerial shareholding needed to maximise their financial performance.

3.2.2. Empirical Evidence on Foreign Ownership and Financial Performance

Several countries, including South Africa, aim to increase their inflows of foreign capital based on the underlying notion that foreign investors possess several advantages (Duong, Vu, Vo, Nguyen-le and Nguyen, 2021). The ownership structure theories in chapter two, however, present divergent postulations regarding the effect foreign ownership exerts on firm performance. On the one hand, positive effects are suggested through increased monitoring, minimised agency costs, technology transfer, and managerial and operational efficiency (Douma *et al*., 2006). On the other hand, negative effects may emerge from entrenchment. Similar to managerial ownership, the contending effects stem from different levels of foreign ownership within firms. Accordingly, this section reviews empirical literature pertaining to linear and non-linear relationships between foreign ownership and the financial performance of firms.

3.2.2.1.Empirical studies on foreign ownership and financial performance through linear models

In Turkey, Gunduz and Tatoglu (2003) compared the financial performance of foreign enterprises to those of domestic, where foreign ownership was measured with a dummy variable. The study used a sample that consisted of 34 foreign and 168 local companies listed on the Istanbul Stock Exchange (ISE). The results revealed that foreign-owned companies displayed superior performance when measured by ROA. Aydin, Sayim and Yalama (2007) conducted a similar investigation where the data set included 42 firms with foreign ownership and 259 domestic firms listed on the ISE. In corroboration with the findings of Gunduz and Tatoglu (2003), Aydin *et al*. (2007) also observed that foreign-owned firms generated a higher ROA than domestic enterprises. Both studies ascribed the positive influence of foreign ownership to increased monitoring and control capabilities, as well as the dissemination of advanced technology from foreign investors, that resulted in lower operating expenses. This is consistent with the propositions of the agency theory and resource-based theory from chapter two.

In contrast to the studies above, an Indian study by Douma *et al.* (2006) disaggregated foreign ownership into foreign institutional and foreign corporate shareholders in order to investigate the differential effects on the financial performance of firms. A sample of 1005 companies listed on the Bombay Stock Exchange (BSE) from 1999-2000, showed that foreign corporate shareholders accounted for a large proportion of total foreign ownership compared to foreign

institutional shareholders, who were restricted to a limit of 10% of total shareholding. Accordingly, results generated from an OLS estimation depicted a positive relationship between foreign corporate shareholders and ROA, whereas foreign institutional shareholders displayed no effect. This was attributed to foreign corporate shareholders having higher levels of commitment and monitoring roles. However, when the Tobin's q ratio was used to measure performance, foreign institutional investors exerted a stronger positive impact on firm performance compared to foreign corporate shareholders. Douma *et al* (2006: 651) claimed that this may indicate that foreign institutional investors are "tracking firms that have a high probability of improving their market value". When a tracked company introduces enhancements, its market value increases as these improvements become evident (Yeung, 2000). Hence, foreign institutional investors have only played a role in monitoring firms that are likely to experience an increase in market value, and subsequently invested in them. Lastly, Douma *et al.* (2006) also reported that a holistic ownership metric that combined both categories shared positive linkages with ROA and Tobin's q.

A similar evaluation was undertaken in a South African study by Swart (2013), who also bifurcated foreign ownership into corporate and institutional ownership. Local ownership variables were also included in this study as Swart (2013) used a data pairing analysis between foreign- and domestic-owned firms. In an attempt to eliminate the potential effect of firm size, the data sample of this study only contained the largest companies listed on the JSE from 2004 to 2010. In contrast to Douma *et al*. (2006), Swart's (2013) findings indicated that both forms of foreign ownership had no effect on financial performance as there was no significant difference between the financial performance (in terms of ROA and ROE) of foreign-owned firms and locally owned firms.

The results of Swart (2013) were later corroborated by Komati (2017), who reported an insignificant relationship between a unitary foreign ownership measure and the financial performance of JSE-listed firms, which was measured by ROA and ROE. The data sample of this study consisted of 148 non-financial companies listed from 2004-2014, and the FEM was adopted for estimation purposes. According to Komati (2017), a potential reason for the insignificant relation may be due to the large technological and management gap between the investor's country of origin and South Africa, thus restricting the transfer of benefits from foreign investors.

The findings of Dube (2018) contradict those of Swart (2013) and Komati (2017), as the author observed a positive relation between foreign ownership and the performance of 205 non-

financial firms listed on the JSE, from 2004 to 2014. Dube (2018) suggested that foreign investors take on effective monitoring roles and transfer skills and advanced technology to their investee companies, thus improving firm performance in terms of ROA and ROE. The concentration of foreign ownership was only based on the percentage of the top one, two, three, five and 10 foreign shareholders. Dube (2018: 410) acknowledged that "an analysis of the total number of shareholders for each firm would likely give a more accurate picture of ownership and its effects on corporate performance". Dube (2018) adopted both the FEM and the GMM in order to control potential endogeneity, thereby increasing the robustness of his results. Hence, the different estimation techniques and foreign ownership composition between Dube's (2018) study and those of Swart (2013) and Komati (2017) could be contributors to the varying results.

Although the results of Dube (2018) contrasted the findings of an insignificant foreign ownership effect in the South African market, statistical insignificance for this ownership type was reported in other emerging economies. In particular, a Chinese study by Shan and McIve (2011) found that foreign ownership displayed a positive coefficient, however, the coefficient was not statistically significant. This study was based on a panel data set of 540 companies listed on the Hong Kong Stock Exchange from 2001 to 2005. Similar to Dube (2018), the measurement of the foreign ownership variable only constituted "the proportion of shares held by foreign owners from the top 10" (Shan and McIve, 2011: 311), thereby minimising the holistic impact of foreign shareholding.

A study in Romania by Mihai (2012) also found no evidence of a significant relationship between foreign ownership and the financial performance of companies listed on Bucharest Stock Exchange in 2010. The author attributed this to the impact of the financial crisis of 2009, arguing that the positive effects of foreign ownership was not felt as the analysis was performed a year after the recession, in which most listed companies exhibited poor financial performance, regardless of their ownership structure.

In contrast, Marashdeh (2014) documented a positive relationship between foreign ownership and firm performance in Jordan. This study was based on the relation between corporate governance and firm performance (ROA and ROE) of 115 firms from 2000-2010, for which foreign ownership was proxied as a mechanism for corporate governance. This concedes with the discussion in section 2.4.2, in which foreign ownership was recognised as an important component for a firm's corporate governance. Using the Generalized Least Squares (GLS) in conjunction with the Random Effects Model (REM), the results showed that foreign ownership

positively affected firm performance, but only when measured with ROE. According to Marashdeh (2014), these findings affirmed that foreign owners have the ability to intervene in corporate governance to improve monitoring (Gillan and Starks, 2003).

Jusoh (2015) also observed a positive foreign ownership- financial performance nexus for 730 Malaysian firms from 2007-2009. This study is unique as Jusoh (2015) converted the foreign ownership variable into a logarithm to control for the skewed nature of the foreign ownership data in Malaysia. The results generated through multivariate regressions showed that foreign ownership exerted a positive influence on ROA and Tobin's q. In support of the convergence of interest hypothesis, Jusoh (2015) claimed that the positive impact materialized from the involvement of foreign investors in monitoring and controlling activities. However, the author acknowledged that his failure to account for endogeneity was a critical limitation to the study.

Using a smaller data sample that stretched across a longer duration than Jusoh's (2015) study, Ting *et al*. (2016) examined the impact of the ownership structure on the financial performance of 201 non-financial Malaysian firms, from 2002 until 2011. This study also employed the Tobin's q and ROA as performance indicators. The findings obtained from pooled OLS regressions supported those of Jusoh (2015), revealing that foreign ownership positively affected firm performance. Ting *et al*. (2016) attributed the positive impact to elements of the resource-based theory, such as superior managerial efficiency, technical skills, and technology that foreign investors brought into the working environment.

Turning to evidence from Vietnam which is based on a sample of 427 listed firms from 2014-2018, Nguyen, Pham and Dao (2020) found that foreign ownership had a positive impact on firm performance when measured by ROA and ROE, however, there was no significant impact on Tobin's q. Nevertheless, Nguyen *et al.* (2020) discovered that foreign management shared a positive relationship with Tobin's q. The finding of positive linear relationships between foreign ownership and firm performance have been a common trend under the Vietnamese context, as several studies (such as Nguyen and Dang, 2017; Nguyen and Pham, 2017) found that foreign ownership was positively related to firm performance at significance levels between 1%-5%.

A study by Phung and Le (2013), however, obtained contradictory results whilst investigating the relationships between foreign ownership, capital structure and firm value in Vietnam. Using a sample of non-financial companies listed on the Hochiminh Stock Exchange during the period of 2008-2011, results generated from the FEM and simultaneous equations revealed that

foreign ownership exerted a negative impact on firm value. Phung and Le (2013) claimed that this was due to the fact that foreign owners fail to control the agency problem through monitoring because they experience information asymmetry. As an alternative, they incur higher levels of debt as this results in creditors performing monitoring duties to minimise agency issues (Agrawal and Knoeber, 1996).

The results of Phung and Le (2013) are supported by Andow and David (2016), who found that foreign ownership had a strong negative impact on the financial performance of conglomerate firms in Nigeria, from 2004-2013. These results were generated through OLS regressions. Andow and David (2016: 238) claimed that the negative influence may stem from "the expropriation tendencies of foreign investors", which relates to the entrenchment effect discussed in section 2.4.2.

3.2.2.2.Empirical studies on foreign ownership and financial performance through non-linear models

As per section 2.4.2, the agency theory indicates that foreign investors may alleviate agency costs as they undertake monitoring responsibilities. At the same time, however, increased levels of foreign ownership may result in an entrenchment effect which, in turn, increases agency costs and decreases firm performance. Hence, this section aims to analyze the effects of different levels of ownership by reviewing studies that tested potential non-linearity between foreign ownership and financial performance.

A Ukrainian study by Akimova and Schwodiauer (2004) examined the impact of ownership structure on the financial performance of privatized companies. The data sample consisted of 202 medium and large companies from 1998 to 2000. In order to test for non-linearity, this study used a quadratic ownership variable in its OLS regressions. The results depicted a non-linear relationship between foreign ownership and financial performance, specifically an inverse U-shape with an optimal value of 39%. The authors attributed the positive effect, when foreign ownership was less than 39%, to foreign investors providing new technology, whereas the negative effect, when foreign ownership exceeded 39%, was due to the institutional environment in Ukraine being averse to foreign majority ownership.

Similar results were obtained in Turkey when Gurbuz and Aybars (2010) investigated the relationship between foreign ownership and performance of 205 non-financial firms listed on the ISE from 2005 to 2007. In contrast to Akimova and Schwodiauer (2004), Gurbuz and Aybars (2010) used foreign ownership dummy variables to represent different levels of foreign

shareholding, in which foreigners that held more than 50% of the shares were regarded as majority shareholders, and those who held less than 50% were regarded as minority shareholders. Causality tests proved that foreign ownership should be regarded as an exogenous variable. The results of the non-linear GLS model showed an inverse U-shape relationship, where foreign ownership initially shared a positive relationship with financial performance, but the relationship became negative after foreign owners held more than 50% of shares. This may be the consequence of Turkey's distinctive methods in carrying out business operations, in which they prefer to sustain local relationships and allow local ownership to have a fundamental role. These findings differ from the previous Turkish studies of Gunduz and Tatoglu (2003) and Aydin *et al.* (2007) in section 3.2.2.1, where positive linear relationships were reported. This may be attributed to the fact that these studies adopted linear empirical models, and consequently failed to test for potential non-linear relationships.

Moreover, although the previous section provided sufficient evidence of positive linear relationships occurring in Vietnam (such as Nguyen and Dang, 2017; Nguyen and Pham, 2017; Nguyen *et al*. 2020), none of those studies accounted for the possibility of non-linearity within their estimation models. Conversely, Viet (2013) attempted to investigate whether a non-linear relationship between foreign ownership and firm performance existed in Vietnam. This study was based on a sample of 407 listed non-financial firms from 2006 to 2010, and used a non-linear model that incorporated a quadratic foreign ownership term in a 2SLS regression. In contrast to Akimova and Schwodiauer (2004) and Gurbuz and Aybars (2010), the use of 2SLS highlights the authors accommodation for potential endogeneity. The results demonstrated a significant inverse U-shaped relationship between foreign ownership and firm performance. The author claimed that the inverse U-shaped relationship was connected to the entrenchment effect that foreign investors developed when they held a substantial level of shareholding, as explained in section 2.4.2. This study also provided evidence of endogeneity, suggesting that foreign investors preferred to distribute their investments towards firms with robust financial performance, large in size, low levels of debt, and within the pharmaceutical industry.

In support of Viet (2013), the Vietnamese study of Phung (2015) also observed an inverse U-shaped relationship between foreign ownership and firm performance from 2007 to 2012. The non-linear model utilised by Phung (2015) also included a quadratic foreign ownership variable, however, this study adopted the system GMM for regression analyses. Nonetheless, Phung (2015) also discovered an optimal value of 43% of foreign ownership, explaining that during the initial rise in foreign shareholding, foreign investors are incentivized to monitor the

managers; however, when foreign shareholding exceeds 43%, the entrenchment effect emerges.

Similar to Marashdeh (2014) in section 3.2.2.1, Sueyoshi *et al.* (2010) also used foreign ownership as a corporate governance proxy whilst studying the corporate governance-performance nexus for 270 Japanese manufacturing firms from 1999 to 2006. However, this study accounted for the possibility of non-linearity by including a quadratic foreign ownership term to a Tobit regression model. The findings depicted an inverse U-shaped relationship, where foreign ownership enhanced the operational performance of firms until the proportion of shares owned by foreign investors exceeded 19.49%. Thereafter, firm performance began to deteriorate. These findings are in line with a previous Japanese study by Ferris and Park (2005), who found that firm value initially increased, but declined once the level of foreign shareholding exceeded 40%. In support of the agency theory, Ferris and Park (2005) claimed that increased foreign ownership can lead to entrenchment effects as foreign investors may pursue their private interests at the expense of other shareholders.

An inverse U-shaped relation was also found in China by Greenaway, Guariglia and Yu (2014) for a sample of 21582 firms from 2000-2005. This study was unique as performance was measured by both accounting indicators (such as return on sales and ROA) and productivity indicators (such as labour productivity and total factor productivity). A quadratic foreign ownership term in conjunction with the first difference GMM approach was adopted in order to account for non-linearity and endogeneity. Greenaway *et al*. (2014) further revealed optimal foreign ownership values of 46.79% for total factor productivity; 55.65% for labour productivity; 52.31% for ROA; and 64.24% for return on sales. This inferred that local and foreign shareholding are both imperative to achieve optimum performance, as "the former contribute to knowledge of the Chinese market and legal environment, as well as political connections with local governments" and the latter, innovative technology, better managerial and corporate governance practices, and international networking skills (Greenaway *et al*., 2014: 696). This contradicts the insignificant relationship found by Shan and McIve (2011) in the previous section, in which the authors only accounted for shares that were held by the top 10 foreign owners.

A recent Indian study by Gupta *et al*. (2021) examined the impact of foreign ownership on the financial performance of 150 companies listed on the BSE, from 2009-2019. In contrast to Douma *et al.* (2006) from section 3.2.2.1, the secondary aim of Gupta *et al*. (2021) was to explore the possibility of a non-linear relationship using a quadratic foreign ownership term.

Results obtained from the FEM revealed that foreign ownership shared an inverse U-shaped relationship with ROA, with an optimal value of 29.65%, implying that financial performance would have declined if the foreign equity surpassed 29.65%.

3.2.2.3.Summary of the empirical evidence on foreign ownership and financial performance

The existing studies that undertook linear approaches provided mixed evidence, with authors reporting positive (such as Gunduz and Tatoglu, 2003; Aydin *et al*., 2007; Marashdeh, 2014; Jusoh, 2015; Ting *et al*., 2016; Dube, 2018), insignificant (such as Shan and McIve, 2011; Mihai, 2012; Swart, 2013; Komati, 2017), and negative relationships (such as Phung and Le, 2013; Andow and David, 2016) between foreign ownership and firm performance. In support of the agency and resource-based theory, the positive impacts of foreign ownership were associated with the foreign investors ability to monitor managers and transfer advanced technology to investee firms, while the negative impacts were attributed to the entrenchment effect. The measurement of foreign ownership also varied as Douma *et al*. (2006) and Swart (2014) disaggregated foreign ownership into corporate and institutional owners, in line with the specifications in section 2.4.2, whereas others measured foreign ownership as the total percentage of international shareholders.

To account for non-linearity, majority of the literature in section 3.2.2.2, integrated a quadratic foreign ownership variable in their regression models (Akimova and Schwodiauer, 2004; Viet, 2013; Marashdeh, 2014; Greenaway *et al*. 2014; Phung, 2015; Gupta *et al*. 2021), whereas others used dummy specifications. Section 3.2.2.2 provides strong evidence of a non-linear relationship between foreign ownership and firm performance, specifically in the form of an inverse U-shape. This indicates that foreign shareholding above a certain threshold level is deleterious to firm performance. Several studies further detected the threshold values of foreign ownership, which ranged between 29.65%- 64.24%, and inferred that domestic ownership should form the majority of shareholding in order to avoid entrenchment and attain superior firm performance. This branch of literature highlights the importance of examining the non-linear impacts of foreign ownership on financial performance.

Evidence from South Africa was inconclusive as Swart (2013) and Komati (2017) documented insignificant relations, whereas Dube (2018) reported a positive association. Moreover, although different estimation techniques were used in each study, all methods were of a linear nature and did not account for non-linearity. Considering the prevailing evidence of non-linear relationships within other emerging countries (provided in section 3.2.2.2) and acknowledging

the importance of FDI in South Africa, it becomes imperative to explore the non-linearity between foreign ownership and financial performance in the South African environment. Therefore, by conducting this analysis within the South African context, this study makes an original contribution to the research field.

3.2.3. Empirical Evidence on Institutional Ownership and Financial Performance

Based on the agency theory presented in chapter two, institutional ownership can either improve or erode the financial performance of companies. The positive effect stems from institutional investors having strong incentives to undertake monitoring roles (Jabeen and Ali, 2017), whereas the negative impact lies in the cultivation of their private interests (Pound, 1988). Therefore, similar to managerial ownership and foreign ownership, this section provides an empirical review of studies that used linear and/or non-linear methodologies when investigating the relationship between institutional ownership and firm performance, in an effort to decipher whether the impact of institutional ownership varies according to their level of shareholding.

3.2.3.1.Empirical studies on institutional ownership and financial performance through linear models

In the U.S, Cornett, Marcus, Saunders and Tehranian (2007) assessed the impact of institutional investor involvement on the operating performance of Standard and Poor (S&P) 100 firms over the period 1993-2000, where operating performance was measured by the operating cash flow (OCF). This study bifurcated institutional owners into pressure-sensitive and pressure-insensitive institutional investors, as per the categorization stated in section 2.2.3. Results generated through OLS regressions revealed that a positive relationship existed between pressure-insensitive investors and OCF, whereas no significant effect materialised from pressure-sensitive investors. This coincides with the work of Brickley *et al*. (1988) discussed in section 2.4.3, in which pressure-insensitive shareholders attempt to discipline management, thus improving firm performance. Pressure-sensitive shareholders, however, tend to conform to managerial decisions, thereby explaining their insignificant impact on firm performance.

A similar study was conducted in Finland by Bhattacharya and Graham (2007), who investigated the relation between pressure-sensitive and pressure-insensitive institutional owners and firm performance. However, the results of this study were a direct contrast to those of Cornett *et al.* (2007), as it was found that pressure-sensitive institutional investors negatively impacted firm performance, while pressure-insensitive institutional investors displayed no

statistical effect. The dissimilarity between the results of these studies may be due to the different estimation techniques in each study. For example, unlike Cornett *et al.* (2007), Bhattacharya and Graham (2007) adopted the Three-Stage Least Squares (3SLS) to address the endogeneity problem.

The remaining studies in this section accounted for institutional ownership as a monolithic group. For example, Mollah and Talukdar (2007) explored ownership structures and financial performance in Bangladesh from 2002-2004. The study made use of 55 listed companies on the Dhaka Stock Exchange (DSE) and adopted the 2SLS method to remedy potential endogeneity issues. The findings revealed that institutional ownership was insignificantly related to financial performance, in terms of ROA and ROE. This may be due to the fact that there was no evidence of active governance from institutional investors in Bangladesh (Sarkar and Sarkar, 2000).

Aljifri and Moustafa (2007) investigated the impact of corporate governance mechanisms on the performance of United Arab Emirates (UAE), where institutional ownership was adopted as an internal mechanism of corporate governance. This study used a sample of 51 firms listed in either the Dubai Financial Market or the Abu Dubai Securities Market. The results found an insignificant relationship between institutional ownership and firm performance, which was proxied by Tobin's q. When focusing on bank performance, Arouri, Hossain and Muttakin (2011) found that institutional ownership did not have a significant impact on bank performance in Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE, i.e., the Arab Gulf Cooperation Council (GCC) countries. A latter study by Zeitun (2014) confirmed that institutional ownership exerted no significant effect on the performance of firms in the GCC countries.

Similar to Aljifri and Moustafa (2007), Kyereboah-Coleman (2008) also considered institutional ownership as a corporate governance mechanism when investigating the impact of corporate governance on firm performance (ROA and Tobin's q) in Africa. Specifically, the data sample of 103 firms were drawn from Ghana, South Africa, Nigeria, and Kenya from 1997-2001. In order to account for potential endogeneity, the study adopted GMM for estimation purposes. The results of the study were mixed as institutional ownership shared a negative relationship with ROA, but a positive relationship with Tobin's q. The author argued that institutional ownership did not necessarily help firms to utilise their assets more efficiently, thus explaining the inverse relation with ROA. The positive association with Tobin's q, however, may be due to the fact that institutional shareholding is a key signal to other investors

regarding the potential profitability of the firm. According to Kyereboah-Coleman (2008:19), this may result in a greater "demand for such shares and thus improves market valuation of such firms".

Concentrating on South African firms specifically, Dube (2018) observed a negative relationship between institutional investors and financial performance from 2004-2014, as per ROA, ROE, and Tobin's q measurements. The negative relationship can be attributed to the consequences of institutional investors typically having shorter investment horizons and opportunistic investment behaviour (Tsouknidis, 2019). Dube's (2018) findings, however, contradicts those of Komati (2017), who discovered a positive relationship between institutional ownership and the ROE of JSE-listed firms during the same time period. Komati (2017) argued that the positive relation resulted from the efficient monitoring abilities of institutional shareholders which enabled them to directly impact firm performance, thus supporting the postulations of the agency theory stated in section 2.4.3. Although the timeframes of both studies are identical, the disparity in results may stem from the difference in estimation techniques as Komati (2017) adopted the FEM only, whereas Dube (2018) integrated the GMM approach to increase the robustness of his findings.

In congruence to Komati (2017), earlier studies by Alfariah, Alanezi and Almujamed (2012) and Mao (2015) also documented positive relations between institutional ownership and firm performance in Kuwait and China, respectively. The study of Alfariah *et al.* (2012) was based on a sample of 134 non-financial firms listed on the Kuwait Stock Exchange, in which the author found that the share of the capital held by institutional investors positively affected firm performance, measured by ROA and Tobin's q, and endogeneity was assumed to be absent. Using the same performance metrics in conjunction with OLS techniques, Mao (2015) reported that institutional investors positively influenced the performance of 1019 non-financial companies listed on the Shanghai Stock Exchange (SHSE) and Shenzhen Stock Exchange (SZSE) from 2007 to 2014. These results were supported by Lin and Fu (2017), who also observed a positive link between institutional ownership and the performance of firms listed on the SHSE and SZSE. Consistent with the agency theory in section 2.4.3, all studies ascribed the positive institution ownership- firm performance nexus to the effective monitoring roles undertaken by institutional investors.

A Pakistani study by Tahir, Saleem and Arshad (2015) also observed a positive relationship between institutional ownership and the financial performance of 21 firms listed on the KSE 30 index from 2008 to 2013. This study is unique as it attempted to investigate the presence of

the endogeneity bias prior to selecting an estimation technique. Using the DWH test, Tahir *et al*. (2015) found evidence of endogeneity as the test detected a reverse relationship between firm performance and institutional ownership. Taking this into account, the study subsequently adopted the 2SLS model to address the pre-existing endogeneity bias.

In contrast to the positive relationship findings, Mashayekhi and Bazaz (2008) and Zeitun (2009) provided contradictory evidence of negative relationships in Iran and Jordan, respectively. Mashayekhi and Bazaz (2008) analysed data from companies listed in the Tehran Stock Exchange (TSE) for the years 2005-2006. Their study traced the inverse relation to the corporate governance deficiency in Iran, claiming that most institutional investors are controlled by the Iranian government, and therefore are more concerned about social and political objectives. In Jordan, Zeitun (2009) found that institutional ownership had a negative coefficient that was highly significant on ROA and Tobin's q, and also attributed corporate governance problems as the source of the negative relationship.

Although a Romanian study by Milena-Jana (2018) also observed a negative relationship; the coefficient of the institutional ownership variable was insignificant, thus implying that institutional ownership had no significant impact on the performance of firms in Romania. In particular, this study was based on 1432 Romanian firms from 2008-2015, and employed the FEM, REM, and the Panel-Corrected Standard Error (PCSE) method for estimation purposes. The author attributed the lack of significance to the fact that institutional investors are "underdeveloped in the Romanian market" (Milena-Jana, 2018: 699).

3.2.3.2.Empirical studies on institutional ownership and financial performance through non-linear models

In contrast to managerial ownership and foreign ownership, there is a limited amount of research that used non-linear models to explore the institutional ownership- firm performance nexus. The only studies to date on this subject (known to the author) are that of Wardhana and Tandelilin (2011) and Daryaei and Fattahi (2020), which are reviewed below.

An Indonesian study by Wardhana and Tandelilin (2011) discovered a U-shaped relationship between firm performance and institutional ownership from 2000-2007, showing that at high levels of institutional ownership, the institutional investors attempt to maximize Tobin's q. According to Wardhana and Tandelilin (2011: 391), low institutional ownership decreases firm performance as it permits "more opportunistic actions rather than when they have much higher level of ownership due to the loss that the controlling owner will suffer".

In contrast, Daryaei and Fattahi (2020) found an inverse U-shaped relationship between institutional ownership and the financial performance of 177 firms in Iran, where performance was measured by ROA and Tobin's q. In particular, the results revealed that levels of institutional ownership above 28.5% for ROA and 43.5% for Tobin's q resulted in performance decreases. According to Daryaei and Fattahi (2020), the negative effect above these thresholds occurred when large institutional investors developed a strategic relationship with managers to pursue their personal interests instead of their professional responsibilities (Wu, 2008). These results contradict the findings of Mashayekhi and Bazaz (2008) from the previous section, which did not account for the possibility of non-linearity.

3.2.3.3.Summary of the empirical evidence on institutional ownership and financial performance

The review of literature that used linear models to determine the institutional ownership- firm performance nexus, as presented in section 3.2.3.1, is inconclusive as studies reported positive, negative, and insignificant relationships. In line with the agency theory, the positive relationships were largely attributed to monitoring abilities of institutional owners, whereas the negative relation was ascribed to opportunistic behaviours. Furthermore, studies by Bhattacharya and Graham (2007), Cornett *et al*., (2007) and Kyereboah-Coleman (2008) produced mixed results that varied according to the category of institutional owners (i.e., pressure-insensitive, and pressure-sensitive investors) and financial performance metrics used (ROA, ROE, and Tobin's q).

In contrast to managerial ownership and foreign ownership, the non-linearity between institutional ownership and financial performance is not a common area of research. To the author's knowledge, the literature reviewed in section 3.2.3.2 are the only two existing studies that attempted to examine potential non-linearity. Moreover, these studies provided contradictory findings in which Wardhana and Tandelilin (2011) discovered a U-shaped curve, while Daryaei and Fattahi (2020) documented an inverse U-shape. The absence of South African evidence in the branch of the non-linearity of institutional ownership, together with the ambiguous findings seen in section 3.2.3.1, leads to the necessity of investigating the linear and non-linear effects of institutional ownership in the South African market.

3.2.4. Empirical Evidence on Government Ownership and Financial Performance

Based on the agency theory, the presence of government shareholders leads to a decrease in firm performance as they pursue political and social objectives at the expense of shareholder objectives (Shleifer, 1998; Firth *et al*., 2007). The resource-based theory, however, postulates a positive association between government shareholders and firm performance as significant levels of government ownership provides firms with access to political connections, financial capital, and profitable government contracts (Peng *et al*. 2016; Habtoor *et al*., 2019). The conflicting theoretical arguments of the agency theory and the resource-based theory suggests that the impact of government ownership may vary based on the level of shareholding in firms. Thus, a review of empirical literature encompassing both linear and non-linear models is necessary.

3.2.4.1.Empirical studies on government ownership and financial performance through linear models

Thomsen and Pedersen's (2000) investigation into the effect of the ownership structure on the performance of the 100 largest European companies found that government ownership exhibited a negative impact on firm performance, as it was associated with low values of market-to-book value of equity and ROA. Specifically, this study used data from the largest non-financial companies in 1990 in each of 12 European nations: Austria, Belgium, Denmark, Finland, France, Germany, the U.K, Italy, the Netherlands, Norway, Spain, and Sweden. The authors hypothesized the negative effect to be a consequence of social objectives as governments are more likely to consider jobs and social welfare as opposed to shareholder maximisation (Thomsen and Pedersen, 2000). This aligns with the propositions of the agency theory, as presented in section 2.4.4.

In support of the resource-based theory, a Chinese study by Sun, Tong and Tong (2002) documented a positive relationship between government ownership and the financial performance of all firms listed on the SHSE and the SZSE over the period 1994-1997, explaining that government shareholders provide more direct political backing and business connections. Sun *et al.* (2002) also measured firm performance using the market-to-book value of equity. These findings were later corroborated by Le and Buck (2011), who reported a positive state ownership- performance nexus for more than 1000 Chinese listed firms from 2003-2005, where performance was proxied by ROA and return on sales. Le and Buck (2011: 227) argued that, under the Chinese context, government ownership was a "strategic asset

rather than an agency burden". Similarly, Ang and Ding (2006), Aljifri and Moustafa (2007) and Najid and Rahman (2011) also observed positive relationships in Singapore, UAE, and Malaysia, respectively.

Most recently, Alanazi (2021: 34) reported a positive relationship between government shareholding and firm performance in Saudi Arabia, claiming that "government ownership contributes positively to governance through active monitoring". This study incorporated 174 companies listed on Tadawu between 2014 and 2018. Considering the possibility of endogeneity, as well as exogeneity, the study adopted both the 2SLS and the OLS method, respectfully. Results generated by both estimation techniques revealed that government ownership positively influenced firm performance. Furthermore, the study found that superior firm performance led to an increase in government ownership, thus implying that government ownership was an endogenous variable.

On the contrary, using the GLS and FEM, and Zeitun (2009) discovered that government ownership shared an insignificant association with the performance of 115 firms in Jordan during the period 2000 to 2010. This may be due to the low proportion of government ownership in Jordan (8.7%), as the author noted that Jordan contains the least level of government shareholding in the Middle East and North Africa (MENA), due to Jordanian companies undergoing privatisation since 1996 as part of the county's economic reform programme. Moreover, the Jordanian government vigorously encourages privatization as it promotes the economic growth of the country.

Nonetheless, the findings of Marashdeh (2014) contrast those of an earlier study by Zeitun and Tian (2007), who found that government ownership was negatively related to the financial performance of 59 companies, from 1989 to 2002, where firm performance was measured by ROE. The results of this study were generated using probit models, and Zeitun and Tian (2007) ascribed the negative relation to the fact that government-linked companies concentrated more on social benefit rather than the firm's profit, as per the agency framework. Although privatisation was an ongoing program during both studies, Zeitun and Tian (2007) documented a larger level of government shareholding (30.277%) compared to Marashdeh (2014). Hence, in addition to the differences in the data samples, methodology, and timeframes; the varying proportions of government ownership may also be a source of the differing results.

The existence of a negative relationship was also observed in Kenya, where Ongore, K'Obonyo and Ogutu (2011) discovered that state ownership decreased the performance of 42 firms listed

on the NSE. Ongore *et al*. (2011: 14) claimed that the inverse relationship was "due to excessive bureaucracy, tribalism, nepotism, poor human resource policies, political expediency in appointments and lack of respect for laws and regulations of the country". As a result, the authors recommended that the Kenyan government implement private management structures and solicit private individuals and institutions to jointly own the SOEs.

Conflicting evidence was found in Vietnam, where Tran, Nonneman and Jorissen (2014) discovered a negative effect of government ownership bearing on the profitability (ROA and ROE) and labour productivity of firms, from 2004-2012. The authors claimed that firms with significant levels of state shareholders have their profits extracted for the benefit of politicians and bureaucrats (Tian and Estrin, 2008). However, Quang and Xin (2014) reported a positive relationship in Vietnam in which firm performance was proxied by ROA and ROE. According to the authors, firms with state ownership receive managerial incentives from the government, which may decrease agency costs. The disparity between the results of Tran *et al.* (2014) and Quang and Xin (2014) can be explained by the differences in the nature of the data used in each study as Tran *et al.* (2014) utilized annual business surveys of the Vietnamese General Statistics Office, whereas the data set used by Quang and Xin (2014) consisted of non-financial companies listed on the Ho Chi Minh Stock Exchange.

In a similar manner, empirical evidence in South Africa is also mixed. For example, using multiple regression analysis, Mugobo *et al.* (2016) reported a positive and significant correlation between government ownership and firm performance (ROA) from 2001-2010. This positive influence may be a result of the South African government providing companies with access to resources required to improve their performance (Zhang and Kyaw, 2017). Komati (2017), however, used the FEM and found an insignificant relation for government shareholding and the ROA of JSE-listed firms, from 2004-2014. This study revealed that the average percentage of shares held by government shareholders was 7.28% and therefore argued that such a small level of shareholding lacked the ability to influence the efficiency and profitability of companies. The differences between the sample size, timeframe and estimation approaches of both studies may be sources of the varying results. The study of Mugobo *et al.* (2016) was based on 40 listed and 40 unlisted South African companies, whereas Komati's (2017) study consisted of 148 non-financial companies.

Similarly, in Ghana, Darko, Aribi and Uzonwanne (2016) made inferences about the government ownership-firm performance nexus whilst attempting to decipher the influence of corporate governance on the performance of 20 companies listed on the Ghanaian Stock

Exchange, from 2008 to 2012. The study found no evidence of a relationship between government shareholding and firm performance, indicating that state ownership was considered irrelevant to the company profitability.

3.2.4.2.Empirical studies on government ownership and financial performance through non-linear models

In contrast to the Chinese studies of Sun *et al*. (2002) and Le and Buck (2011) from the previous section, Hess, Gunasekarage and Hovey (2010) and Yu (2013) adopted non-linear estimation models and detected U-shaped relationships between state ownership and firm performance in China. The study by Hess *et al*. (2010) was based on all industrial firms listed on the SHSE and the SZSE during the period of 2000-2004. To test for non-linearity, the author generated two state ownership variables with breakpoints at 10% and 40% and used the OLS and 2SLS to account for endogeneity. Yu (2013) covered all non-financial firms on the SHSE and the SZSE from 2003 to 2010. This study included the quadratic term of state ownership within its FEM and REM regressions. The authors of both studies noted that while government shareholders initially had a negative effect at low levels of ownership, they enhanced performance as their shareholding levels increased because the government thereafter placed more effort into these firms. Several other studies conducted in China have also produced results depicting U-shaped relationships (such as Wei and Varela, 2003; Tian and Estrin, 2008; and Mao, 2015).

Adding to the uncertainty in the Vietnamese market, observed in section 3.4.2.1, Phung and Hoang (2013) found evidence of an inverse U-shaped relationship, whereas Phung (2015) reported a U-shaped linkage. Both studies were based on firms listed on the Ho Chi Minh Stock Exchange and Hanoi Stock Exchange, during the period of 2007 and 2012. The results of Phung and Hoang (2013) were produced by the FEM, where the author described the inverse U-shape as state ownership initially providing some advantages at lower levels, however, when highly concentrated, it eroded firm performance as political objectives began to exceed financial objectives. The U-shaped findings of Phung (2015) were generated using the system GMM technique, indicating that the author accounted for potential endogeneity. Both studies used quadratic state ownership variables for the test of non-linearity. In addition, Phung (2015) also estimated the optimum value of government ownership at 28.67%. This implied that performance only increases when the level of state shareholding exceeds 28.67%, as it is more probable for firms to achieve support and subsidies from the government.

Similarly, Chiang and Chen (2013) also found a U-shaped relationship when investigating the association between government ownership and the financial performance of green technology firms in Taiwan, from 2005-2009. The authors claimed that increased government ownership levels result in higher levels of monitoring. Moreover, in Taiwan, the government is regarded as the key driver of the development of the green technology industry.

3.2.4.3.Summary of the empirical evidence on government ownership and financial performance

As expected, the extant literature on linear models in section 3.2.3.1 yielded mixed results, aligning with the opposing viewpoints of the agency theory and the resource-based theory mentioned in section 2.4.4. On the one hand, studies that found negative relationships supported the agency framework, explaining that governments pursued social objectives at the expense of firm profitability. On the other hand, those that reported positive relations were in line with the resource-based theory, in that government shareholders provide firms with strong political connections and easier access to financial capital. Furthermore, insignificant relationships were also observed, in which authors attributed either low shareholding or the irrelevance of government ownership as contributing factors to the ineffectiveness of government owners (such as Marashdeh, 2014; Darko *et al*. 2016; Komati, 2017).

The second branch of literature provides evidence of non-linear relationships between government ownership and firm performance. Aside from Phung and Hoang (2013), all studies found U-shaped curves, indicating that low levels of government shareholding decrease performance; however, as their shareholding becomes more concentrated, governments provide more support to firms, thereby improving firm performance. This implies that the agency framework may be dominant at low proportions of government ownership and vice versa for the resource-based theory.

Evidence from the South African market was unclear as Mugobo *et al.* (2016) reported a positive relationship, while Komati (2017) found no significant effect of government ownership on JSE-listed firms. These results contradict the corporate governance failures of South African SOEs (as discussed in section 2.4.4), which implied the existence of a negative relationship between government ownership and South African firm performance. Mugobo *et al.* (2016) and Komati (2017) did not account for endogeneity or the possibility of a non-linear effect of government ownership in South Africa. Hence, in addition to the uncertainty emerging from the existing studies, the absence of non-linear evidence in South Africa emphasizes the

importance of studying the linear/non-linear impact of government ownership to assist in preventing further SOE failures.

3.2.5. Empirical Evidence on Family Ownership and Financial Performance

The resource-based theory considers family ownership as a source of competitive advantage due to their loyalty, tendency to work after hours, and easy development due to familiarity of the family business (Habbershon and Williams, 1999). The agency theory, however, provides mixed theoretical arguments. On the one hand, the private interests of family shareholders are congruent with organizational interests, thus avoiding agency issues (Chrisman *et al*., 2007). On the other hand, expropriation of minority shareholders, excessive generosity within the family, and nepotism may generate agency costs (Gómez-Mejía *et al*., 2001; Morck and Yeung, 2003; Schulze *et al*., 2003b). Hence, the discussion of the related literature begins with an analysis of studies that focused on linear estimations of the family ownership- firm performance nexus. Thereafter, to assess whether the varying impacts of family ownership are pertinent to their proportion of shareholding, this section also reviews studies that adopted non-linear models.

3.2.5.1.Empirical studies on family ownership and financial performance through linear models

Lee (2004) explored the effects of family ownership on the financial performance of 150 largest family businesses in the U.S. The study provided mixed results as there was a discrepancy between efficiency and profitability measures. In particular, family firms appeared to have lower profit margins, but their operational efficiency was enhanced, thereby promoting a higher ROE. These findings suggest that family firms possess competitive advantages over non-family firms, as per the postulations of the resource-based theory mentioned in section 2.4.5.

In Western Europe**,** Maury (2006) examined how family-controlled firms performed in relation to firms with non-family controlling shareholders. The study sample consisted of non-financial firms in Austria, Belgium, Finland, France, Germany, Ireland, Italy, Norway, Portugal, Spain, Sweden, Switzerland, and the U.K, with a total of 1672 firms. In addition, financial firms were also analysed separately. The study addressed the endogeneity problem using the Heckman (1979) two-step treatment effects model, which revealed that family firms outperformed non-family firms in terms of the ROA and Tobin's q, for non-financial firms. However, the results for financial firms were statistically insignificant, indicating that the impact of family ownership seemed to be more pronounced in non-financial firms than in financial firms. In

agreement with the agency theory, Maury (2006: 339) stated that "family ownership lowers the classical agency problem between owners and managers".

Based on measures of ROA and ROE, in conjunction with a multiple regression model, a Chilean study by Martinez, Stohr and Quiroga (2007) found that 100 family-owned enterprises outperformed 75 non-family firms, from 1995 to 2004. According to Martinez *et al*. (2007), this was accredited to superior monitoring abilities of family members. However, the contrary was reported for Tobin's q. The authors hypothesized that the lower Tobin's q in family-owned firms could be due to an undervalued market capitalization since these firms have a weak market presence. This supports a study by Klein, Shapiro and Young (2005) on 263 Canadian listed firms, which also found evidence suggesting that family ownership has a negative effect on corporate performance, as measured by Tobin's q.

In terms of ROE, Rajput and Joshi (2015) also found that family ownership displayed a significant positive influence on the performance of non-financial firms on the BSE 100 index, from 2007-2014. This study assumed that family ownership was an exogenous variable and thus adopted the OLS technique. In line with the notions of agency theory (discussed in section 2.4.5), the positive impact of family ownership was attributed to incentive alignment, specifically when family members also undertook managerial roles. In addition, the authors also recognized the competitive advantages of family ownership due to the long-term commitment and loyalty of family members, as per the resource-based theory.

Wang and Shailer (2017) studied the relationship between family ownership and firm performance in 17 emerging countries. Unlike Rajput and Joshi (2015), this study treated family ownership as an endogenous variable by adopting estimation approaches such as the 2SLS and the GMM. Nonetheless, the authors also observed superior performance in firms with higher levels of family ownership, suggesting that the enhanced monitoring of managers, as well as better alignment between the objectives of managers and shareholders, had a positive impact on firm performance.

In contrast to the above-mentioned studies, a Ghanian study by Kotey, Kusi and Akomatey (2019) found that family ownership negatively affected firm profitability. This study examined firms between 2003 and 2013, using pooled annual data of 23 Ghanaian listed firms and employing the OLS, REM, and 3SLS. Kotey *et al*. (2019: 11) attributed the underperformance of family firms to the agency theory, explaining that "businesses with agents acting on behalf of shareholders are most likely to do better than firms that are family owned and by extension,

family managed". As such, these family members that are given managerial positions may not possess the necessary qualifications to perform the requirements of the job efficiently. This highlights the nepotism issue mentioned in section 2.4.5.

In a similar case, whilst exploring the association between ownership and the financial performance of 36 firms listed on KSE in Pakistan, Abdullah, Sarfraz, Qun and Chaudhary (2019) also discovered that family ownership had a negative impact on firm performance. The authors explained that family members in managerial positions executed policies that were in the interest of the family but not necessarily of the firm, thus decreasing profitability.

Negative relationships were also observed in Thailand by Buachoom (2017). Under the assumption that the manager was not a family member, Buachoom (2017) investigated the relationship between family ownership and the financial performance of 432 non-financial firms, from 2000-2014. Concerned about the endogeneity bias, the author adopted the system GMM for regression purposes. Buachoom (2017) reported that the compensation of executives positively influenced the financial performance of firms. However, companies with large proportions of family ownership reduced the compensation of external managers which, in turn, eroded financial performance. These findings were later corroborated by Al Farooque, Buachoom and Sun (2020), who also found that family ownership had a negative impact on firm performance in Thailand.

3.2.5.2.Empirical studies on family ownership and financial performance through non-linear models

Anderson and Reeb (2003) studied the relation between founding-family ownership and performance of S&P 500 firms. This study accounted for the possibility of a non-linear relationship by including a quadratic family ownership variable in their 2SLS regressions. The findings demonstrated characteristics of an inverse-U shaped curve, where optimal shareholding levels were 27.6% and 30.85% for ROA and Tobin's q, respectively. Anderson and Reeb (2003: 1324) explained these results by stating that "when families have the greatest control of the firm, the potential for entrenchment and poor performance is the greatest". Thus, if the proportion of family ownership was fixed between 27%-30%, family interests and profit maximization are optimally aligned.

An inverse U-shaped link was also reported in Taiwan by Shyu (2011), who studied the family ownership- financial performance nexus, using the panel data of 465 listed companies. Through the use of the simultaneous equation system and quadratic equations, the findings of the results

revealed that family ownership positively affected firm performance when measured with Tobin's q. In the case of ROA, non-linearity was detected as the results showed that the ROA first increased and then decreased with family ownership. In particular, when family ownership exceeded 30%, family shareholders had greater incentives and power to pursue private interests at the expense of minority shareholders and firm profit; thus, describing an inverse U-shaped relationship.

Similarly, an Indian study by Srivastava and Bhatia (2020) found an inverse U-shaped relationship between family ownership and the performance of companies listed on the National Stock Exchange, from 2011-2017. Using a quadratic family ownership term with the REM, the study observed that the initial positive effect of family ownership began diminishing at approximately 30% for ROA and ROE and 42% for Tobin's q. Srivastava and Bhatia (2020) also discovered that family involvement in corporate governance positively influenced the performance of firms.

Turning to evidence from a developed market, such as the U.K, Poutziouiris, Savva and Hadjielias (2015) examined the association between family involvement and the financial performance of 141 firms listed on the London Stock Exchange (LSE) from 1998-2008, where family involvement was constituted by family ownership and management. Using a two-way FEM that incorporated a squared family ownership variable, Poutziouiris *et al.* (2015) observed an inverse U-shaped association, with an optimal value of 31% of family ownership. According to the authors, family ownership may induce enhanced firm performance, however, ownership concentration above 31% increased family opportunism that may eventually hinder performance.

3.2.5.3.Summary of the empirical evidence on family ownership and financial performance

Empirical evidence based on the linear approach (section 3.2.5.1) is mixed, with no definitive consensus as to whether family ownership positively or negatively affects firm performance. This is expected due to the conflicting views of the agency and resourced-based theory. Studies that found positive relationships ascribed their results to incentive alignment, monitoring (Martinez *et al*. 2007; Wang and Shailer, 2017), long-term commitment and loyalty of family members (Rajput and Joshi, 2015). In contrast, the negative relationships were attributed to the nepotism issue, entrenchment (Kotey *et al*., 2019) and minimised managerial compensation (Buachoom, 2017).

Studies that incorporated non-linear models, as reviewed in section 3.2.5.2, provided strong evidence of inverse U-shaped relationships between family ownership and firm performance, largely explaining that family ownership initially improved firm performance; however, when the level of shareholding exceeded a threshold value, firm performance began to deteriorate. Similar to the non-linear models of studies in the previous sections, non-linearity within the family ownership- financial performance nexus was tested through the use of a quadratic term.

3.3. RESEARCH METHODOLOGY FOR OWNERSHIP STRUCTURE AND FINANCIAL PERFORMANCE

This section discusses the data and methodology used to answer the research questions posed in this chapter. For the first research question, this chapter adopts three endogeneity tests to ascertain whether the endogeneity bias is prevalent within the ownership structures of firms listed on the JSE. These tests include the test of dynamic completeness, the test of reverse causality and the test of strict exogeneity. Based on the results of the endogeneity tests, either the FEM or system GMM is selected to model the second research question. To answer the second and third research questions, this section also provides a review of the methods used to examine non-linearity and optimal ownership levels. The sample period and data are explained first, after which the estimation techniques adopted to appraise the data are discussed.

3.3.1. Data Description for Ownership Structure and Financial Performance Analysis

Firstly, a discussion on the significance of the sample period is presented, followed by a detailed description of data utilised in this chapter.

3.3.1.1. Sample period for ownership structure and financial performance analysis

The sample used in this study consists of all non-financial firms with primary listings on the JSE, ranging over the period of 2004-2021. This sample period is selected for three notable reasons. Firstly, the timeframe of the analysis includes companies that implemented and transitioned in accordance with the varying recommendations of three different King Reports (King II for five years from 2004-2008; the King III for seven years from 2009-2016; and the King IV from 2017-2021). The transition from King II to King III and King IV may have required companies to change their overall objectives and ownership structures within firms. Owing to the fact that the King III and King IV recommended that the creation of a company's value be convoyed in a sustainable manner (Banda, 2019); the financial performance of

companies may have been affected as they were required to integrate elements of corporate social responsibility (CSR), whilst simultaneously pursuing financial objectives. Moreover, following the amendments to the JSE Listings Requirements in 2017, the recommendations of King IV were deemed as mandatory for listed entities (Naidoo, 2019). For instance, since 2017, the King IV requires that managers hold shares in the firm as a way to align the interests of shareholders and managers (Anyango, 2018), thus influencing the level of managerial ownership in JSE-listed firms which, in turn, impact the overall ownership structure.

Secondly, this sample period occurs before, during, and after the 2008/9 financial crisis. This is significant as the financial crisis was found to impact the relationship between ownership structure and firm performance (Lee, Cheng and Ning, 2017). Due to the capital markets undergoing substantial changes because of the financial crisis, Saleh, Halili, Zeitun and Salim (2017) claimed that ownership composition within firms became a key determinant of firm performance in the post-crisis period. Headline corporate failures that transpired during the financial crisis (such as Enron, WorldCom, Bear Stearns and Lehman Brothers) were attributed to poor corporate governance practices. Thus, since several ownership types are considered as valuable corporate governance mechanisms, companies began using their ownership structures as a form of protection from potential future corporate failures (Rad, 2014). This increased the importance and usefulness of the ownership structure in the post-crisis period and may have led to alterations in the composition of the ownership structure of firms. Hence, the chosen sample period allows this thesis to account for the impact of the financial crisis on the ownership configuration in firms, thereby providing a holistic outlook on the impact of ownership structure on the financial performance of firms.

Lastly, the chosen sample period includes a pre-COVID-19 era (2004-2019) and the most recent period of market instability during the pandemic (2020-2021). Similar to the financial crisis, Goldstein, Koijen and Mueller (2021: 5135) stated that “the COVID-19 pandemic severely disrupted financial markets and the real economy worldwide”. Specifically, the pandemic led to significant downturns in the JSE. For example, Wilson (2021) reported that 20 companies delisted from the JSE in 2020, and Prinsloo and Henderson (2021) documented that 21 firms delisted in 2021, thus shrinking the size of the JSE market. Strydom (2022) recounted that international investment in the JSE was decreasing at an alarming rate, implying a decline of foreign ownership in firms. Hence, the inclusion of the COVID-19 period in the sample timeframe allows the final results to account for the changes in the ownership structures caused by the pandemic.

3.3.1.2. Data for ownership structure and financial performance analysis

The data for this study consists of all non-financial firms listed and delisted on the JSE over the sample period. Delisted firms are included in order to avoid the survivorship bias[11]. This is supported by Wilcox and Crittenden (2005) and Kouwenberg, Salomons and Thontirawong (2014), who claimed that the failure to account for delisted firms when researching historical performance can result in overestimations of past performance.

The list of firms included in the sample is shown in table A-1 of appendix A (pages 314-319). Annual firm-level data was obtained from financial statements through the Bloomberg database, while data for ownership variables were extracted from IRESS and EquityRT. The final data set consists of an unbalanced panel of 3246 annual observations for 267 firms, over 18 years, from 2004-2021. This data set also accounts for mergers, acquisitions, and unbundling's. Dates before 2004 could not be considered due to the unavailability of share ownership data on the IRESS database (Dube, 2018).

For inclusion in the data sample, firms were required to satisfy three conditions:

i. The firms needed to be listed on the JSE at any time between 31 December 2004 and 31 December 2021. However, at minimum, the firm had to be listed on the JSE for at least four years during the sample period. Companies that were listed for less than four years were excluded since an analysis over such a short time period may be regarded as unreliable and viewed as a research limitation (Jones, Kalmi, Kato and Makinen, 2010). In the same manner, firms with missing ownership and financial data that were unavailable for collection for the minimum time period were also excluded. The structure of the unbalanced panel is presented in table A-2 of the appendix (page 319).

ii. The firm's primary listings were on the JSE during the study period. This ensures consistency within the data set as the analysis is based exclusively on firms that were regulated by the JSE. Moreover, King III applies only to primary listed companies (Marx, Moolman and Ngwenya, 2016). Hence, firms with secondary listings are excluded from the data sample.

iii. The firms were not from the financial industry. As previously stated, only non-financial firms were included in the data sample. The exclusion of financial firms has been a

[11] Cheng, Huang, Fu, Wang, Wang and Lin (2021: 13) defined the survivorship bias as "the tendency to view the performance of existing stocks in the market as a representative comprehensive sample without regarding those that have gone bust".

frequent occurrence in previous studies, as seen in section 3.2 of empirical evidence (such as Gurbuz and Aybars, 2010; Mohd, 2010; Komati, 2017; Dube, 2018; Mohd, 2020; Din *et al.* 2021, etc.). This is due to the fact that the financial statements, asset structures and regulatory requirements of financial firms differ significantly from companies in other industries. For example, a study by Fama and French (1992) excluded financial firms on the basis that the high leverage in these firms is normal for their nature; however, for non-financial firms, high leverage may be an indication of financial distress. According to Dube (2018: 185), "such peculiarities can lead to results that are biased if financial firms are analysed together with non-financial firms".

Following the work of several studies (such as Fosu, 2013; Nguyen, Locke and Reddy, 2015; Akbar *et al*., 2016; Komati, 2017; Dube, 2018), industries are classified by the Industrial Classification Benchmark (ICB) that is adopted by the JSE. Accordingly, the data sample of this study contains firms from the following eight industries: 1) Basic Materials; 2) Consumer Goods; 3) Consumer Services; 4) Health Care; 5) Industrials; 6) Oil and Gas; 7) Technology; 8) Telecommunications. Similar to Komati (2017), the ninth industry, Utilities, did not consist of any companies for the sample period. The distribution of firms among the eight industries is provided in table A-3 of appendix A (page 319).

3.3.2. Variables for Ownership Structure and Financial Performance Analysis

This section aims to discuss the different variables (dependent, explanatory, and control) that are employed in this chapter.

3.3.2.1. Dependent variables for ownership structure and financial performance analysis

In reference to several of the existing studies presented in section 3.2 (such as Douma *et al*., 2006; Martinez *et al*., 2007; Ongore, 2011; Swart, 2013; Tran *et al*., 2014; Jusoh, 2015; Komati, 2017; Dube, 2018, etc), it is observed that accounting-based measures, such as ROA and ROE, are frequently used as a measure of financial performance in firms. Although they are both measures for profitability; ROA and ROE are inherently different performance indicators (Şamiloğlu, Öztop and Kahraman, 2017), as their estimates can be interpreted differently. ROA reflects how efficiently a company uses its assets to generate profit (Sucuahi and Cambarihan, 2016), whereas ROE illustrates the firm's ability to generate profits from its shareholders equity (Hirdinis, 2019). Therefore, due to its widespread usage in section 3.2, and effectiveness, both ROA and ROE are selected as dependent variables for this chapter.

In addition to accounting-based measures, several of the aforementioned studies also incorporated the Tobin's q ratio, a market-based indicator, as a measure of financial performance. This practice is supported by Kyereboah-Coleman (2008), who argued that only considering one category measure of firm performance may add to discrepancies in ascertaining the actual relationship between firm performance and the variables of interest. Furthermore, Chinaemerem and Anthony (2012) regarded the use of accounting-based performance measures along with market-based performance measures as a robust system that enhances the validity of a study's results.

As mentioned, the most common market-based measure identified in section 3.2 is the Tobin's q ratio, which is defined as the ratio of the market value of a firm to the replacement costs of its assets (Hu and Izumida, 2008). Chung and Pruitt (1994) claimed that the Tobin's q has an important role in many financial interactions. According to Oraka, Hashi and Hisarciklilar (2021: 5), the Tobin's q ratio "expresses the relationship between market valuation and intrinsic value". Tobin's q is regarded as a forward-looking approach, as it reflects expectations about future earnings, growth, and market perceptions of the value of the company, whereas ROA and ROE can be considered as a backward-looking approach that represents what management has already achieved (Demsetz and Villalonga, 2001; Kowalewski *et al*., 2008; Bardhan, Krishnan and Lin, 2013). Therefore, to generate robust results, the Tobin's q ratio is included as a financial performance indicator in this chapter.

This study also appends the EPS as an additional measure of firm performance. Several studies (such as Salim and Yadav, 2012; Ahmed and Hamdan, 2015; Zraiq and Fadzil, 2018) employed EPS to evaluate a firm's performance because it measures performance from an investor's point of view (Ahmed and Hamdan, 2015). Furthermore, all firms listed on the JSE are required to publish their EPS ratios, thus signifying its importance (Dzomonda and Fatoki, 2020). This study specifically incorporates the basic EPS measure, which according to Robbetze, Villiers and Harmse (2017), is regarded as the most beneficial EPS category for investors. They noted that basic EPS has the most significant impact on the share price movements of the top 40 companies listed on the JSE. Furthermore, basic EPS could be considered more dependable compared to headline EPS, as companies might be incentivized to manipulate headline EPS figures since this metric is emphasized in the company's press releases and widely covered in the media (Harrod, 2004; Islam, Khan, Choudhury and Adnan, 2014). Ruddy (2006) reported incidents of headline EPS manipulation for JSE-listed firms.

This study does not employ stock returns as a measure of firm performance as they can be highly volatile and subject to market shifts (Grouard, Lévy and Lubochinsky, 2003; Stiroh and Rumble, 2006), which may not necessarily reflect the financial performance of the firm. Moreover, short-term fluctuations in the stock market can obscure the underlying performance trends of the company (Grouard *et al*., 2003; Shah, Isah and Zulkernine, 2019).

Table 3-1 outlines the measure of the above-mentioned dependent variables that are utilised in this chapter.

Table 3-1: Dependent Variables for Ownership Structure and Financial Performance Analysis.

Dependent variable	Acronyms	Explanation
Return on assets	ROA	The ratio of net income to total assets.
Return on equity	ROE	The ratio of net income to the average common stockholder's equity.
Tobin's q	TQ	The ratio of the market value to the replacement value of assets.
Earnings per share	EPS	The ratio of net income to outstanding number of shares.

Source: Own construction (2021)

3.3.2.2. Explanatory variables for ownership structure and financial performance analysis

As mentioned, the key explanatory variables of this thesis are the five ownership identities of interest, i.e., managerial, foreign, institutional, government and family ownership. These variables are stated in table 3-2, and thereafter described.

Table 3-2: Explanatory Variables for Ownership Structure and Financial Performance Analysis.

Explanatory variable	Acronyms	Explanation
Managerial ownership	MAN	The percentage of shares owned by managers and directors in the firm.
Foreign ownership dummy	FOR1	The dummy variable is equal to one if foreigners hold 10% or more of the firm's equity and zero otherwise.
Foreign ownership	FOR2	The percentage of shares owned by foreigners in the firm.
Institutional ownership	INS	The percentage of shares owned by institutions in the firm.
Government ownership	GOV	The percentage of shares owned by government in the firm.
Family ownership dummy	FAM1	The dummy variable is equal to one if families hold 20% or more of the firm's equity and zero otherwise.
Family ownership	FAM2	The percentage of shares owned by families in the firm.

Source: Own construction (2021)

- **Managerial Ownership (MAN)**

To the author's knowledge, an autonomous measure of managerial shareholding does not exist for the South African market. As such, previous South African studies by Zondi and Sibanda (2015), Komati (2017) and Dube (2018) proxied managerial ownership by the shares held by directors. However, in contrast to those studies, this thesis measures managerial ownership as the percentage of shares owned by insiders. Chou (2015:865) defined insider ownership "as the aggregate shareholding of directors and managers". The combination of managerial and director shareholding may provide a clearer depiction on the relationship between managerial ownership and financial performance. This is in accordance with the studies of Yang, Lai and Tan (2008) and Chen, Hou and Lee (2012), who proxied their managerial ownership variable with the proportion of a firm's insider ownership.

Based on the agency theory, the convergence of interest hypothesis posits a positive relationship between managerial ownership and firm performance, as manager's and shareholder's interests converge through share ownership (Chen, 2013). However, the management entrenchment hypothesis (Fama and Jensen, 1983; Demsetz, 1983) contends that high managerial ownership leads to entrenchment, harming firm performance. The combination of these hypotheses proposes a non-linear relationship between managerial ownership and firm performance, where low levels of managerial ownership enhance firm performance; however, at higher levels, managerial ownership undermines firm performance.

- **Foreign Ownership (FOR1 and FOR2)**

In order to address the linear estimation of the second research question of this chapter, foreign ownership is measured with a dummy variable to account for foreign investors who own at least 10% of the total shareholding. This is based upon the definition of foreign-owned firms by the International Monetary Fund (IMF)[12]. This definition of foreign ownership has been applied in several other studies (such as Gurbuz and Aybars, 2010; Mondal and Pant, 2010; Orlic, Hashi and Hisarciklilar, 2018). Accordingly, as stipulated in table 3-2, the dummy variable (FOR1) equals to one if foreigners own 10% or more of the company's shares. In contrast, if foreigners constitute less than 10% of the company's shares, FOR1 equals to zero. However, due to the binary nature of the dummy variable, it lacks the structure required to address the non-linearity estimation of the second research question, as well as the first and

[12] IMF defines foreign-owned firms as an enterprise where foreign ownership is at least 10% of the equity shares in the company (Patterson, Montanjees, Motala and Cardillo, 2004).

third research questions concerning endogeneity and the optimal ownership percentage, respectively. Thus, a second variable for foreign ownership (FOR2) is implemented. This is a continuous variable which measures the percentage of shares owned by foreigners in the firm, thereby allowing for the detection of endogeneity non-linearity as well as the optimal percentage of foreign shareholding. In the context of dual-listed companies, foreign ownership only reflects the shares of firms listed on the JSE and does not consider the ownership of shares listed on foreign markets.

On the one hand, the agency theory infers that a non-linear relationship exists between foreign ownership and firm performance, with foreign investors initially enhancing performance through monitoring activities (Fazlzadeh *et al*., 2011), but negative effects potentially arising with highly concentrated ownership due to entrenchment (Phung, 2015). On the other hand, the resource-based theory postulates that foreign ownership positively impacts firm performance, as foreign investors can provide firms with scarce resources that create competitive advantages (Chibber and Majumdar, 1999). Thus, the expected relationship between foreign ownership and financial performance remains ambiguous.

- **Institutional Ownership (INS)**

Following the work of Dube (2018), institutional ownership specifically encompasses South African institutional investors only. This group comprises: banks; asset management firms; brokerage houses; retirement funds; and insurance firms (for example Liberty, Momentum, Sanlam, Hollard, Old Mutual, etc.). Since institutional investors are large shareholders, the agency theory postulates that they are strongly incentivized to monitor corporate decisions (Jabeen and Ali, 2017), potentially increasing firm performance. However, a notable drawback of these investors, particularly pressure-sensitive shareholders, is their tolerance of managerial entrenchment behaviours to advance their private interests (Pound, 1988), which could undermine firm performance. Consequently, the expectant relationship between institutional ownership and financial performance is unclear.

- **Government Ownership (GOV)**

Government ownership is constituted by the South African government's ownership at any of these three levels: (i) national; (ii) provincial; and (iii) local and appends "corporations owned by any of these three tiers of government" (Dube, 2018: 192). In line with Komati (2017), this includes the percentage of shares held by the PIC, Government Employees Pension Fund (GEPF) and SOEs such as Transnet, SABC, Eskom, Passenger Rail Agency of South Africa

(PRASA), Industrial Development Corporation (IDC) and the National Empowerment Fund (NEF).

In contrast to Komati (2017), Dube (2018) did not include the PIC in his measurement of government ownership, arguing that it had facets of both institutional investors and government shareholders. However, this study incorporates PIC in the government ownership framework since it is a wholly owned by the South African government (Komati, 2017; Mofokeng, 2021). Furthermore, while the PIC may exhibit characteristics akin to a pension fund, its objectives differ from those of institutional investors, focusing on social and political goals rather than shareholder maximization (Dube, 2018). Similarly, in a Malaysian study by Ting and Lean (2015), government-linked investment entities such as the employees provident fund and Khazanah were incorporated into their government ownership metric. Similar to the PIC, Khazanah serves as Malaysia's asset manager, tasked with overseeing and managing the government's commercial assets and executing strategic investments (Fini and Rethel, 2013).

Nevertheless, while the GOV variable primarily signifies government ownership, it is acknowledged that it may also encompass characteristics associated with institutional investors.

The agency theory posits a negative relationship between government ownership and firm performance, arguing that government shareholders are too detached from the firm (Shleifer, 1998) and pressure companies into implementing governmental objectives at the expense of shareholders (Firth *et al*., 2007). The resource-based theory, however, assumes that companies with a higher proportion of government ownership gain political resources and easier access to capital and profitable government contracts (Ntim, 2009; Habtoor *et al*., 2019), which may enhance firm performance. As such, the anticipated relationship between government ownership and firm performance is unclear.

- **<u>Family Ownership (FAM1 and FAM2)</u>**

Similar to foreign ownership, this study uses two variables to measure family ownership. To address the linear estimation of the second research question, family ownership is proxied by a dummy variable (FAM1) that constitutes the shares owned by families and family trusts that is at least 20%, as per the work of Lodh, Nandi and Chen (2014) and Sahasranamam, Arya and Sud (2020). In order to answer the non-linearity dimension of the second research question, as well as the first and third research questions, a continuous variable is employed (FAM2) that

measures family ownership as the ratio of equity held by individual families and family trusts in proportion to total shares of a firm.

Family firms experience fewer agency conflicts compared to other organizational forms since families either directly manage the firm or closely monitor management (Arifin, 2003). However, self-control problems, excessive generosity, and nepotism contribute to agency costs (Gómez-Mejía *et al*., 2001; Schulze *et al*., 2003b). The resource-based theory postulates that family firms may outperform other organizations due to their possession of unique resources, including loyalty, willingness to work long hours, and the easy development of tacit knowledge (Habbershon and Williams, 1999). Hence, the expected relationship between family ownership and firm performance is ambiguous.

3.3.2.3. Control variables for ownership structure and financial performance analysis

Control variables are of extreme importance in econometric analyses (Nielsen and Raswant, 2018). Several ownership-based studies included control variables in their empirical models in order to remove the potential influence that other factors may have on firm performance (such as Gurbuz and Aybars, 2010; Phung, 2015; Komati, 2017; Dube, 2018, etc.). For this reason, this study includes a set of firm-specific variables which, in turn facilitates the realization of more accurate results on the relationship between ownership types and financial performance (Chinaemerem and Anthony, 2012). The control variables that were used are listed and described in the table 3-3.

Table 3-3: Control Variables for Ownership Structure and Financial Performance Analysis.

Control variable	Acronyms	Explanation
Firm size	LNSIZE	The natural log of net assets.
Firm age	LNAGE	The natural log of the number of years since the establishment of the firm to the observation date.
Leverage ratio	LEV	The ratio of long- and short-term debt to total assets.
Dividend payout ratio	DIVPAY	The ratio of dividends per share to earnings per share.
Asset turnover ratio	ASTO	The ratio of net sales to total assets.
GDP growth	GDPG	The ratio of the change in GDP to current GDP.
Industry dummies	ID	Each dummy variable is equal to one if the firm is in the corresponding industry and zero otherwise.
Year dummies	YD	Each dummy variable is equal to one if the observation refers to the corresponding year and zero otherwise.

Source: Own construction (2021)

- **Firm Size (LNSIZE)**

Lee (2010) postulates that a firm size control variable subdues any systematic effect of a firm's size with regards to the relationship between assets and a firm's performance because the profitability of small and large firms differ significantly (Hayek, 2020). According to Short and Keasey (1999) and Joh (2003), larger firms have better opportunities than the smaller firms in creating and generating funds internally, as well as accessing external resources. Hence, due to this competitive advantage, they often outperform smaller firms (Gurbuz and Aybars, 2010). Nevertheless, larger firms are susceptible to agency problems such as information asymmetry (De Miguel, Pindado and Torre, 2004). Furthermore, as firm size increases, there is reduced control by management over strategic and operational activities (Agrawal and Knoeber, 1996). Therefore, the expected relationship between firm performance and firm size is ambiguous. As per table 3-3 above, firm size is measured by natural logarithm of net assets. Dang, Li and Yang (2013: 8) regards the natural logarithm transformation as "a rule of thumb in corporate finance" used to alleviate the extreme levels of skewness that surround firm size data.

- **Firm Age (LNAGE)**

Firm age has been employed as a control variable by a plentiful number of studies (such as Dinga, 2011; Gurbuz and Aybars, 2010; Komati, 2017; Dube 2018, etc.). As per table 3-3, this control variable is represented by the number of years a firm has been incorporated (Marashdeh, 2014) and follows a natural logarithm transformation similar to firm size. Gurbuz and Anybars (2010) claimed that older firms exhibit superior performance due to greater experience. This is in support of Thornhill and Amit (2003), who stated that older firms are exposed to experience-based economies and can therefore steer clear of the liabilities of newness. Furthermore, older firms earn higher profits compared to younger firms as younger firms are still trying to establish their own presence whilst covering their cost structure (Lipczinsky and Wilson, 2001). Accordingly, a positive relationship is expected to occur between financial performance and the age of firm.

- **Leverage Ratio (LEV)**

The leverage ratio is included as a control variable under the consideration that several companies need credit for investments and expansions, for which shareholder capital is insufficient (Yilmaz and Buyuklu, 2016), and thus, this may affect firm performance. Moreover, firms view debt as an attractive source of finance as it is less expensive than external equity finance (Fazzari, Hubbard and Petersen, 1988). Jensen and Meckling (1976) also found

that leverage plays an important role in mitigating the agency problem as creditors often monitor the actions and decisions of managers. In contrast, Kale (2014) argued that the rise in debt increases the costs to fulfil its obligation, which in turn, deteriorates firm profitability (Gurbuz and Aybars, 2010). Furthermore, Andrade and Kaplan (1998) claimed that the lower levels of leverage are linked to a lower probability of financial distress. Consequently, the expected relationship between firm performance and the leverage ratio is unclear. Table 3-3 presents the measure of leverage as the ratio of long- and short-term debt to total assets.

- **Dividend Payout Ratio (DIVPAY)**

According to Kalay (1980: 859), the payment of dividends can be viewed "as a signalling device" of the future earnings of a firm, which, in turn, leads to investors expecting firms to earn higher profits in the future (Gurbuz and Aybars, 2010). This is in accordance with the dividend signalling theory which suggests that company announcements of dividend increases are an indication of positive future results (Nguyen, Pham, Doan, Ta, Nguyen and Truong, 2021). As such, the relationship between the dividend payout ratio and firm performance is anticipated to be positive. The dividend payout control variable is measured as the ratio of dividends per share to EPS, as per table 3-3.

- **Asset Turnover Ratio (ASTO)**

Alipour (2012) stated that the asset turnover ratio represents how well a firm can manage its assets to generate sales which, in turn, affects a firm's profit. For that reason, the asset turnover ratio is included as a control variable in this study and measured by ratio of net sales to total assets, as outlined in table 3-3. According to Nurlaela, Mursito, Kustiyah, Istiqomah and Hartono (2019), a higher asset turnover ratio results in an increase in the financial performance of the firm because its management of assets for operational activities have been efficient. Therefore, a positive relationship can be anticipated between the asset turnover ratio and firm performance.

- **GDP Growth (GDPG)**

All aforementioned control variables are considered as microeconomic constituents, as they are the internal firm-specific variables which can be controlled by management (Hunjra, Chani, Javed, Naeem and Ijaz, 2014). However, aside from microeconomic factors, firm performance is also dependent on macroeconomic variables (Issah and Antwi, 2017), which are beyond the control of an organisation. Accordingly, several researchers (such as Jagannathan, 2005; Stock and Watson, 2008; Broadstock, Shu and Xu, 2011; Barakat, Elgazzar and Hanafy, 2016)

suggested that the macroeconomic environment has a strong impact on firm's financial positions. Taking this into consideration, this study includes the South African GDP growth rate as a macroeconomic control variable to remove the inherent effect that the external economy may exert on firm performance. The GDP growth rate is the measure of a country's economic growth (Amadeo and Potters, 2020). According to Odalo, Achoki and Njuguna (2016), an increased GDP has a positive influence on the purchasing power of consumers, thus leading to an increase in the demand for a company's products. The growth in demand will often result in firms experiencing higher rates of profitability (Romus, Anita, Abdillah and Zakaria, 2020). As such, the expected relationship between financial performance and the growth in GDP is positive.

- **Industry Dummy (ID)**

Firm performance and corporate governance practices differ across industries due to the disparities in ownership structure, capital structure, complexity of operations, and line of business (Elsayed, 2007). Moreover, Marashdeh (2014: 104) states that "global and economic developments may impact differently on different industries". Thus, in line with Dube (2018), this thesis adopts industry dummy variables to account for industry-specific characteristics and shocks (Hu and Izumida, 2008). As stated in table 3-3, the value of one is used if the firm is in the industry or zero otherwise.

- **Year Dummy (YD)**

The performance of firms changes over time during the periods of economic boom and recession, changes in industry conditions, regulatory environments, and technological developments (Jefferson, Rawski and Yuxin, 2000; Bamiatzi, Bozos, Cavusgil and Hult, 2016). Prior studies (such as Deloof, 2003; Kim, 2005; Sato and Söderbom, 2017) included year dummies in their analysis "to control for year-specific heterogeneity and autocorrelation" (Kim, 2005: 803). Thus, this study includes year dummy variables that is equal to one if the observation refers to the corresponding year and zero otherwise.

In addition to table 3-3, tables A-4 and A-5 of appendix A present explanations of all the industry and year dummies (page 320).

3.3.3. Empirical Models Used for Ownership Structure and Financial Performance Analysis

This section discusses the empirical specifications used to model the linear and non-linear relationships between ownership structure and financial performance.

3.3.3.1. Base model specification

Equation 3.1 specifies the base model that is used to test whether ownership structure shares a linear relationship with the financial performance of firms, with the aim of answering the second research question of this chapter. The equation is estimated for each of the financial performance measures and ownership types, functioning as a precedent upon which the estimates from non-linear models are compared (Viet, 2013).

$$\boldsymbol{Y_{it} = \beta_0 + \beta_1 O_{it} + \eta x_{it} + \gamma d_{it} + e_{it}} \tag{3.1}$$

where i = 1…N and t = 1…18; Y_{it} is either ROA, ROE, Tobin's q or EPS*;* O_{it} is the set of ownership variables (managerial, foreign dummy, institutional, government and family dummy)*;* x_{it} is the group of control variables (firm size, firm age, leverage ratio, dividend payout ratio, asset turnover ratio and GDP growth rate)*;* d_{it} is the industry and time dummies*;* and e_{it} encloses the random error term.

3.3.3.2. Model specification for non-linearity

As demonstrated by studies in the empirical evidence of section 3.2, it is necessary to consider the possibility that the impact of ownership types on financial performance may vary according to the quantity of ownership enclosed within the firm. Testing for a linear relationship alone, as described above, is inadequate as it may fail to deliver an accurate assessment of the impact of ownership structure on firm performance. Therefore, this chapter specifies equations 3.2 and 3.3 in order to examine the possibility of a non-linear relationship (U or inverse-U shape) between ownership types (managerial, foreign, institutional, government and family) and firm performance, thereby fully answering the second research question. In the event that a non-linear relationship is observed, this section proceeds with the third research question through the use of the Sasabuchi-Lind-Mehlum (SLM, as defined in chapter one) test.

Customarily, non-linear relationships were often estimated using a conventional regression framework that included a quadratic variable (McIntosh and Schlenker, 2006). This is seen in equation 3.2 below:

$$\boldsymbol{Y_{it}} = \boldsymbol{\beta_0} + \boldsymbol{\alpha O_{it}} + \boldsymbol{\lambda (O_{it})^2} + \boldsymbol{\eta x_{it}} + \boldsymbol{\gamma d_{it}} + \boldsymbol{e_{it}} \quad (3.2)$$

where i = 1…N and t = 1…18; Y_{it}*;* x_{it}*;* d_{it}*;* e_{it} are defined as per the previous usage. O_{it} is the set of ownership variables (managerial, foreign, institutional, government and family). As explained in section 3.3.2.2, when testing for non-linearity, the dummy variables for foreign ownership and family ownership are omitted and instead replaced with the continuous variables measuring the percentage of these respective ownership types (i.e., FOR2 and FAM2).

Any significance of the quadratic term (λ) signals the presence of a non-linear relationship. Moreover, the sign of the quadratic term infers the direction of the curve. According to Simonsohn (2018), a positive λ coefficient characterises a relationship that originally decreases prior to increasing; thus, implying a U-shaped curve. In direct contrast, a negative λ coefficient describes an initial increase that is followed by a decrease, thereby indicating an inverse U-shaped relation (Bougharriou, Benayed and Gabsi, 2022).

However, Megersa and Cassimon (2015) disputed the validity of this procedure by arguing that it is insufficient to test for non-linearity by itself. The addition of the quadratic variable (λ) does not ensure the occurrence of a non-linear relationship (Pham and Huynh, 2020). For instance, presuming that the existing relationship is convex yet still linear over relevant data points, this approach incorrectly generates an extreme point and thus a U-shape (Lind and Mehlum, 2010). In order to attend to this weakness and confirm the presence of non-linearity, Lind and Mehlum (2010) developed the SLM test, which is a modification of Sasabuchi's (1980) likelihood ratio test. The SLM test enables the test of non-linearity at a certain level of significance, thus facilitating the determination of the extremum point[13] between the non-linear relationship (Megersa, 2015). As such, this technique has been widely adopted in previous studies concerning non-linearity (such as Megersa and Cassimon, 2015; Loganathan *et al*., 2017; Dary and James, 2019; Pham and Huynh, 2020). Thus, in addition to the quadratic test in equation 3.2, this chapter also implements the SLM test to ensure the robustness of results.

If the estimated relationship between an ownership type and firm performance is non-linear (i.e., U-shaped or inverse U-shaped), one extremum point will exist (Lind and Mehlum, 2010). The selection of intervals were based on the observed data ranges for the five ownership variables: (i) managerial ownership [min(MAN), max(MAN)]; (ii) foreign ownership

[13] In the context of this study, the extremum point refers to optimal percentage of ownership.

[min(FOR2), max(FOR2)]; (iii) institutional ownership [min(INS), max(INS)]; (iv) government ownership [min(GOV), max(GOV)]; and (v) family ownership [min(FAM2), max(FAM2)]. The minimum values for managerial, institutional and government ownership are set at 0%. However, for foreign ownership and family ownership, the minimum values are based on their dummy variables in table 3-2, and are thus adjusted to 10% and 20%, respectively.

A negative slope at low values, followed by a positive slope at high values embodies a U-shaped curve, as illustrated in the constraint below:

$$\boldsymbol{\alpha + \lambda(O_{min}) < 0 < \alpha + \lambda(O_{max})} \tag{3.3}$$

In the event that any of these inequalities are violated; the curve cannot be regarded as U-shaped as it is either an inverse U-shaped or linear (Lind and Mehlum, 2010). To test whether the conditions of these inequalities were met by the data sample, a joint hypothesis test is proposed (Bougharriou *et al*., 2022), specified by the following composite null (inverse U-shaped relationship) in equation 3.4 and the alternative hypotheses (U-shaped relationship) in equation 3.5:

$$\boldsymbol{H_0: \alpha + 2\lambda(O_{min}) \geq 0} \; {}^{and}/_{Or} \; \boldsymbol{\alpha + 2\lambda(O_{max}) \leq 0} \tag{3.4}$$

$$\boldsymbol{H_1: \alpha + 2\lambda\,(O_{min}) < 0 \; and \; \alpha + 2\lambda(O_{max}) > 0} \tag{3.5}$$

The output from the test incorporates the Fieller (1954) confidence interval for which the estimated extreme point must lie within the data range (Megersa, 2015).

3.3.4. Estimation Procedure for the Ownership Structure and Financial Performance Analysis

As sighted within the empirical evidence of section 3.2, the endogeneity bias has been a prevalent issue in prior ownership-based studies. As such, this chapter accounts for the potential presence of the bias prior to selecting an estimation technique.

3.3.4.1. Endogeneity bias

After Demsetz (1983) and Demsetz and Lehn (1985) demonstrated that the ownership structure was endogenously determined; the endogeneity of the ownership structure became a controversial topic within corporate finance. As a matter of fact, Chenhall and Moers (2007) claimed that the possibility of endogeneity emerges in all studies involving accounting, economics, and finance variables. Li (2016: 149) stated that "the endogeneity problem arises when the explanatory variables and the error term are correlated in a regression model, leading to biased and inconsistent parameter estimates". Moreover, the existence of at least one source of endogeneity will result in estimates that are biased and outcomes that are invalid (Schultz, Tan and Walsh, 2010). Hence, in investigating the relationship between ownership structure and financial performance, this chapter accounts for the potential of endogeneity sourced from dynamic endogeneity, simultaneity, and unobserved heterogeneity. This is in accordance with Schultz *et al*. (2010) and Wintoki *et al*. (2012), who acknowledged the aforementioned factors as the three main causes of endogeneity.

Dynamic endogeneity arises when the current values of independent variables are impacted by the past values of the dependent variables (Li, Ding, Hu and Wan, 2021). In terms of this study, the past financial performance of firms (ROA, ROE, Tobin's q and EPS) determines the current level of ownership (managerial, foreign, institutional, government and family) and/or the control characteristics of the firm. Aside from biased estimates, the occurrence of dynamic endogeneity leads to the violation of the assumption of strict exogeneity in fixed effects estimators (Arellano and Bond, 1991). This is because strict exogeneity assumes that current observations of the explanatory and control variables are orthogonal to past values of the dependent variable (Eugster, 2014). Thus, the FEM can be deemed as inefficient if there is dynamic endogeneity. There is a high probability of dynamic endogeneity as poor historical financial performance may deter potential shareholders from investing in the firm which, in turn, can affect the configuration of the firm's current ownership structure, certain firm-specific characteristics and financial performance. For example, Bishop, Filatotchev and Mickiewicz (2002) argued that international investors were more inclined to invest in firms with evidence of superior returns earned in previous years.

A study by Gugler and Weigand (2003) asserted that the main source of endogeneity between ownership and firm value stemmed from simultaneity. Schultz *et al*. (2010: 147) stated that "simultaneity occurs when two variables are co-determined", thus implying a reverse relationship. Regarding the ownership structure- performance nexus, the proportion of each

ownership category may be determined simultaneously with the company's calibre of performance. For instance, a higher percentage of institutional ownership results in enhanced firm performance or better firm performance leads to a larger proportion of institutional shareholding. Similar to dynamic endogeneity, simultaneity is also in violation of the strict exogeneity assumption of the FEM, as it results in the regressors being contemporaneously correlated with the error terms (Ullah, Akhtar and Zaefarian, 2018).

Unobserved heterogeneity is apparent when the association between two or more variables are affected by an observable factor. With respect to ownership and financial performance, firm-specific attributes may impact the structure of ownership, control characteristics and performance levels (Schultz *et al*., 2010); however, it may be indistinguishable to researchers and thus the computation can be difficult. According to Peterson (2009), the FEM may successfully eliminate endogeneity originating from unobserved heterogeneity, however, by doing so, the strict exogeneity assumption is breached.

The FEM can only generate reliable parameter estimates under the assumption of strict exogeneity, however, based on the discussion of dynamic endogeneity and simultaneity, several authors (such as Abdallah, Goergen and O'Sullivan, 2015; Ullah *et al*., 2018) view the assumption of strict exogeneity as unrealistic. In this case, Li *et al*. (2021: 399) caution that the widely used FEM "can generate biased estimates and lead to invalid conclusions". Hence, considering the strict exogeneity assumption and the ineffectiveness of the FEM in dealing with dynamic endogeneity and simultaneity, this panel estimation technique is deemed as inadequate for controlling all potential sources of endogeneity (Schultz *et al*., 2010).

Woolridge (2002) suggested that a more efficient way to manage endogeneity was through the use of the system GMM estimator. The system GMM, developed by Arellano and Bover (1995) and Blundell and Bond (1998), is an improved version of the first difference GMM. Li (2016) regarded the GMM as the leading remedy to endogeneity issues as it has the greatest correction effect on the bias. This is due to the fact that the GMM can overcome the estimation problems imposed by unobservable heterogeneity, simultaneity, and dynamic endogeneity and produce consistent parameter estimates (Roodman, 2009; Phung, 2015).

The GMM estimator does, however, have limitations (Li *et al*., 2021). Schultz *et al*. (2010) argued that, in the event that dynamic endogeneity and simultaneity are absent and the strict exogeneity assumption is met; the results generated by the FEM will be more reliable than those of the system GMM. This highlights the essentiality of endogeneity tests to determine if

the ownership-performance nexus is endogenous or exogenous. Thus, following the work of Wintoki *et al*. (2012) and Al-Saidi and Al-Shammari (2014), a string of endogeneity tests is performed prior to electing an appropriate estimation method for this chapter. These tests include the test of dynamic completeness, the test of reverse causality, and the test of strict exogeneity, each of which is elaborated upon below:

- **Test of Dynamic Completeness**

It is essential to decipher the number of performance lags that are needed to subsume all past data. Although certain authors (such as Glen, Lee and Singh, 2001; Gschwandtner, 2005; Wintoki *et al*., 2012) deemed two lags of performance to be sufficient; this chapter still proceeds with the test of dynamic completeness to verify this assertion by approximating two OLS specifications for each financial performance measure, as shown by equations 3.6 and 3.7.

$$\boldsymbol{Y_{it} = \beta_0 + k_p \sum_{p=1}^{p=4} Y_{i,t-p} + \eta x_{it} + \gamma d_{it} + e_{it}} \tag{3.6}$$

$$\boldsymbol{Y_{it} = \beta_0 + k_p \sum_{p=3}^{p=4} Y_{i,t-p} + \eta x_{it} + \gamma d_{it} + e_{it}} \tag{3.7}$$

where i = 1…N and t = 1…18; Y_{it} is either ROA, ROE, Tobin's q or EPS*;* O_{it} is the set of ownership variables (managerial, foreign, institutional, government and family) x_{it} is the group of control variables (firm size, firm age, leverage ratio, dividend payout ratio, asset turnover ratio and GDP growth rate)*;* d_{it} is the industry and time dummies*;* and e_{it} encloses the random error term. Both equations 3.6 and 3.7 involve each financial performance indicator (Y_{it}) being regressed across the firm-specific parameters (x_{it}) and the lags of past financial performance ($Y_{i,t-p}$). However, equation 3.6 is estimated with four lags of past financial performance, whereas equation 3.7 runs from the third to fourth lag of past financial performance only. As per Boschen and Smith (1995), Wintoki *et al*. (2012), Akbar *et al*. (2016) and Nadeem, Gan and Nguyen (2017), four lags are employed to ascertain whether historical performance information is subsumed by older (lags 3 and 4) or more recent lags (lags 1 and 2).

- **Test of Reverse Causality**

As per previous studies (Wintoki *et al*., 2012; El-Faitouri, 2014; Akbar *et al*., 2016), this endogeneity test is conducted with the aim of determining if past financial performance has an influence on the current variables, i.e., reverse causality. The test of reverse causality involves the estimation of the following OLS regression for each of the variables:

$$\boldsymbol{Current\ Variables_{it} = \beta_0 + \beta_1 Y_{i,t-1} + \sum_{i=1}^{n} \eta x_{i,t-1} + \gamma d_{it} + e_{it}} \tag{3.8}$$

where i = 1…N and t = 1…18; $Current\ Variables_{it}$ is either of the ownership or control variables. d_{it} and e_{it} are defined as per the previous usage. $x_{i,t-1}$ is the set of control values of firm i in period $t-1$. $Y_{i,t-1}$ is the past financial performance (ROE, ROA, Tobin's q, or EPS) of firm i in period $t-1$.

If past performance ($Y_{i,t-1}$) is significant for any current variable (i.e., the current percentage of any ownership identity or control variables) in equation 3.8, it indicates the presence of reverse causality, wherein firm performance determines these variables and not vice versa.

- **Test of Strict Exogeneity**

The test of strict exogeneity by Wooldridge (2002) is also performed under the basic arguments that the past firm performance affects the future ownership structure, which means that there is endogeneity (mainly because of simultaneity) between the ownership structure- firm performance relationship (Nadeem et al., 2017). The test of strict exogeneity entails regressing current firm performance against the current and future values of ownership types and control variables. Hence, this test differs from the test of reverse causality, as this estimation involves future values (leads) instead of past values (lags) (Wooldridge, 2010).

The FEM is adopted to estimate the following equation:

$$\boldsymbol{Y_{it} = \beta_0 + \beta_1 O_{it} + \Omega W_{i,t+1} + \eta x_{it} + \gamma d_{it} + e_{it}} \tag{3.9}$$

where *i = 1…N* and *t = 1…18*; $W_{i,t+1}$ is a subset of future values of ownership and the control variables. Y_{it} is either ROA, ROE, Tobin's q or EPS.

Any significance of future ownership values may suggest that the endogeneity of the explanatory variable is not only a consequence of fixed effects but also because future

realisations of the explanatory variables are associated with current values of the independent variables.

If endogeneity is observed in the tests of dynamic completeness, reverse causality and strict exogeneity, the system GMM approach is adopted to model the equations specified in section 3.3.3. This is further discussed below.

3.3.5. Models for Endogeneity

If the presence of endogeneity bias is detected in the output of the aforementioned endogeneity tests, the use of panel estimation techniques such as the OLS and the FEM could produce biased coefficients (Li *et al*., 2021). To remedy the endogeneity bias, several studies in section 3.2 (such as Kyereboah-Coleman, 2008; Greenaway *et al*., 2014; Phung, 2015; Wang and Shailer, 2017; Dube, 2018; Din *et al*., 2021) adopted models of the dynamic GMM because of its capacity to control for all sources of endogeneity through the application of "internal instruments during estimation" (Schultz *et al*., 2010: 146). These internal instruments take the form of selected lags of the regressors (Roodman, 2009). According to Wintoki *et al*. (2012), a major benefit of the GMM estimation method is the insertion of the instrumental variables from within the procedure itself, without having to specify further external instruments. The two mainstream methods of the dynamic GMM are the first difference GMM and the system GMM (Ullah *et al*., 2018), which are discussed in the ensuing subsections.

3.3.5.1. First difference GMM

The first difference GMM specification, introduced by Arellano and Bond (1991), is defined as a system of equations that use lagged values of endogenous and exogenous variables as instrumental variables (Phung, 2015). Wintoki *et al*. (2012) stated that first differencing eliminates any potential bias that may arise from time-invariant unobserved heterogeneity (μ_i)[14].

The first-differenced form is specified by equation 3.10 below:

$$\triangle \boldsymbol{Y_{it}} = \boldsymbol{\beta_0} + \boldsymbol{\alpha_1} \triangle \boldsymbol{Y_{i,t-1}} + \boldsymbol{\alpha_2} \triangle \boldsymbol{Y_{i,t-2}} + \boldsymbol{\beta_1} \triangle \boldsymbol{O_{it}} + \boldsymbol{\eta} \triangle \boldsymbol{x_{it}} + \boldsymbol{\gamma d_{it}} + \triangle \boldsymbol{v_{it}} \quad (3.10)$$

[14] Unobserved heterogeneity is captured by the error term (e_{it}), which is decomposed into a time-invariant effect (μ_i) and the remainder (v_{it}) that varies over time and entities (Brooks, 2014).

where $i = 1 \ldots N$ *and* $t = 1 \ldots 18$; $\triangle Y_{it} = Y_{it} - Y_{i,t-1}$; $\triangle Y_{i,t-1} = Y_{i,t-1} - Y_{i,t-2}$; $\triangle Y_{i,t-2} = Y_{i,t-2} - Y_{i,t-3}$. The potential instruments that can be used for the differenced equations drawn from the set of lagged dependent or explanatory variables, i.e., $Y_{i,t-k}; O_{i,t-k}; x_{i,t-k}$, *where* $k > 2$. This indicates that past values of financial performance, ownership proportions, and other firm-specific variables that extend beyond a two-year period are employed as instrumental variables.

This technique does, however, have limitations in that lagged level variables may be weak instruments for the first differenced version in equation 3.10 (Arellano and Bover, 1995) due to the fact that they generally share a weak correlation. Furthermore, first differencing may exacerbate the impact of measurement errors on the dependent variables (Griliches and Hausman, 1986).

3.3.5.2. System GMM

To minimise the weaknesses of the first difference GMM, Arellano and Bover (1995) and Blundell and Bond (1998) introduced an augmented model that incorporated a system of equations in differences and levels (Wintoki *et al*., 2012). The augmented version is referred to as the system GMM and adopts lagged levels as instruments for differenced equations and lagged differences as instruments for levels equations (Baltagi, 2008).

Under the system GMM, a level equation is added to the differenced equation to form a system of equations as follows:

$$\begin{bmatrix} \boldsymbol{Y_{it}} \\ \boldsymbol{\triangle Y_{it}} \end{bmatrix} = \boldsymbol{\beta_0} + \boldsymbol{\alpha_1} \begin{bmatrix} \boldsymbol{Y_{i,t-1}} \\ \boldsymbol{\triangle Y_{i,t-2}} \end{bmatrix} + \boldsymbol{\alpha_2} \begin{bmatrix} \boldsymbol{Y_{i,t-2}} \\ \boldsymbol{\triangle Y_{i,t-2}} \end{bmatrix} + \boldsymbol{\beta_1} \begin{bmatrix} \boldsymbol{O_{it}} \\ \boldsymbol{\triangle O_{it}} \end{bmatrix} + \boldsymbol{\eta} \begin{bmatrix} \boldsymbol{x_{it}} \\ \boldsymbol{\triangle x_{it}} \end{bmatrix} + \boldsymbol{\gamma d_{it}} + \boldsymbol{v_{it}} \quad (3.11)$$

where $i = 1 \ldots N$ *and* $t = 1 \ldots 18$.

The potential instruments for the levels and differenced equations are $\triangle Y_{i,t-k}; \triangle O_{i,t-k}; \triangle x_{i,t-k}$ and $Y_{i,t-k}; O_{i,t-k}; x_{i,t-k}$, where $k > 2$. The additional instruments included in equation 3.11 from the levels segment shows that there is increased robustness within the system GMM (Roodman, 2009). Thus, the system GMM estimator is more efficient than estimating only the difference equation or the level equation (Li *et al*., 2021). For this reason, several studies (such as Roodman, 2009; Wintoki *et al*., 2012; Phung, 2015) have preferred the system GMM over the first difference GMM.

After the system GMM estimation, it is necessary to perform specification tests to examine the validity of the instruments used in the GMM model. These two tests are detailed in the subsequent section.

3.3.5.3. GMM specification tests

Nguyen *et al*. (2015: 24) stated that "the validity of the system GMM estimator is contingent on whether the lagged instrumental variables are exogenous". Arellano and Bond (1991) suggested the use of two important tests, namely the Arellano-Bond autocorrelation test and the Hansen test of over-identification, to establish whether the instruments are exogenous in order to confirm the validity of the system GMM. Therefore, this chapter implements both of these tests, which are described below.

- **Arellano-Bond Autocorrelation Test**

The Arellano-Bond test for first order (AR (1)) and second order (AR (2)) checks for serial correlation in the residuals of the first difference equation (Brătucu, Tudor, Dovleac, Silvia, Sumedrea, Chitu and Trifan, 2020), where the null hypothesis is based on no serial correlation for AR (1) and AR (2). If the assumption of exogeneity among instruments is satisfied, the null hypothesis should be rejected for the AR (1) test but accepted for the AR (2) (Phung, 2015). As per Das (2016: 17), this infers that there should be "high first-order autocorrelation and no evidence for significant second-order serial correlation", in order to verify the validity of the system GMM.

- **Hansen Test of Over-identification**

The Hansen test for overidentifying restrictions examines the joint validity of instruments, where the null hypothesis specifies that the instruments are exogenous, indicating that no correlation exists between the instruments and the error terms (Phung, 2015). If the null hypothesis is rejected, then it suggested that the instruments are endogenous, thus violating the exogeneity assumption and inferring that the results for the system GMM are invalid. This test yields a J-statistic that follows a chi-squared (χ^2) distribution (Wintoki *et al*., 2012).

3.3.6. Models for Exogeneity

As previously discussed, if the tests in section 3.3.4.1 find that endogeneity is absent between the ownership structure- firm performance nexus; then panel data methods, specifically the FEM, should be adopted for estimation purposes (Kyereboah-Coleman, 2008). Other panel estimation techniques, such as the pooled OLS, is not considered due to its inability to account

for unobserved heterogeneity (Moulton, 1986), which is expected in a cross-sectional data set of this nature (Arellano, 2003; Nwakuya and Ijomah, 2017).

In contrast, Borges, Correia, Costa, Silva and Carvalho (2022: 6) affirmed that the "FEM considers individual, unobserved characteristics (i.e., unobserved heterogeneity)", thus controlling for all time-invariant (μ_i) differences between cross-sectional units (Nwakuya and Ijomah, 2017). The FEM theorizes that the time-invariant characteristics are specific to the individual and thus should not be correlated with other individual characteristics. Accordingly, there is variation among every individual, thus the individual error term and the constant should not be correlated with the others. In the event that correlation is present between error terms, the FEM is unsuitable (Torres-Reyna, 2007; Bell and Jones, 2015).

In contrast to the FEM, the REM assumes that time-invariant factors are captured by entity-specific random effects, and explanatory variables are uncorrelated with the random effects (Clark and Linzer, 2015). However, this assumption is difficult to satisfy and consequently leads to the omitted variable bias when violated (Firebaugh, Warner and Massoglia, 2013). Thus, in the absence of endogeneity, the FEM is the most suitable estimation procedure.

3.4. DATA ANALYSIS AND RESULTS FOR OWNERSHIP STRUCTURE AND FINANCIAL PERFORMANCE

This section intends to display and discuss the results from the models and procedures described in section 3.3. The discussion commences with a descriptive analysis of the data and variables used in the chapter, after which the findings of the endogeneity tests are explained. Thereafter, the output generated from the system GMM, which models equations 3.1 and 3.2, are displayed and analysed alongside the results of the SLM test.

3.4.1. Descriptive Analysis

This section commences with an analysis of the summary statistics and correlation matrix for the financial performance, ownership and control variables of the JSE-listed firms in the sample. Thereafter, the annual average values of the ownership variables are discussed, followed by an analysis of the ownership values within each industry.

3.4.1.1. Summary statistics and correlation analysis of ownership and financial performance

Table 3-4 indicates the summary statistics of all variables that are used in this chapter, whilst table 3-5 shows the correlation matrix.

Table 3-4: Summary Statistics of all Variables from 2004-2021.

	Mean	Std. Dev.	Min	Max
ROA	0.061	0.135	-0.860	1.375
ROE	0.128	0.238	-0.991	1.160
EPS	2.696	9.498	-147.45	246.948
Tobin's q	1.186	1.581	-0.384	10.829
Managerial Ownership	0.140	0.201	0.000	0.965
Foreign Ownership	0.181	0.200	0.000	0.997
Institutional Ownership	0.377	0.252	0.000	0.999
Government Ownership	0.051	0.076	0.000	0.421
Family Ownership	0.007	0.042	0.000	0.763
Firm size	20.556	2.063	1.665	26.155
Firm age	3.537	0.996	0.000	7.609
Leverage	0.178	0.211	0.000	7.528
Dividend Payout	0.234	0.265	0.000	1.52
Asset Turnover	1.367	0.931	0.000	6.946
GDP Growth	0.023	0.035	-0.064	0.056

Notes: Table 3-4 reports the summary statistics for financial performance measures (ROA, ROE, EPS and Tobin's q), ownership identities (managerial, foreign, institutional, government and family) and control variables (firm size, firm age, leverage ratio, dividend payout ratio, asset turnover ratio and GDP growth) for the period 2004 to 2021. Std. Dev. is the standard deviation, min is the minimum and max is the maximum.

Source: Own estimation (2022)

Table 3-4 shows that the mean estimates of ROA and ROE across the sample period are 6.1% and 12.8%, respectively. These estimates are lower than those of Komati (2017), who found averages of 9.48% and 15.27% from 2004 to 2014; thus, inferring a decline in the financial performance of JSE-listed firms, from an accounting perspective. With regards to the market-based indicators, the average value of 1.186 for Tobin's q suggests that the market value of JSE-listed firms exceed their replacement cost. Moreover, Sucuachi and Cambarihan (2016) stated that a Tobin's q ratio that exceeds one implies that the firm's stock is overvalued, suggesting that, for the most part, shares listed on the JSE are overvalued. This coincides with Dube (2018), who reported an average Tobin's q of 1.977 for firms listed on the JSE between 2004-2014. In terms of EPS, the mean score of 2.696 infers that most companies earn R2.696 for each share outstanding.

The Tobin's q ratio ranged from a maximum value of 10.829 to a minimum of -0.383. Negative Tobin's q values have been observed in several studies (such as Fang, Palmatier and Steenkamp, 2008; Lee and Min, 2015; Lin, Ho, Lee and Ng, 2020; Fariha, Hossain and Ghosh, 2021; Rahmawat and Pertiwi, 2021; Ambrocio, Colak and Hasan, 2023) and can be indicative

of firms experiencing financial distress. This is specifically the case for the minimum value (-0.383) displayed in table 3-4, which was recorded for Simmer and Jack Mines in 2012 before their termination by the JSE in April 2013 (Greve, 2013). The market value of Simmer and Jack Mines plummeted following the conclusion of its merger with Village Main Reef Gold Mining Company, where it morphed into a cash shell[15] as Village Main Reef absorbed the lion's share of its assets in 2011 (Bridge, 2011; Greve, 2013). Following their disposal of assets, Simmer and Jack reported a loss of R2.4 billion in June 2011. This may explain the occurrence of the negative Tobin's q ratio.

In line with several South African studies (such as Zhang, 2016; Komati, 2017; Dube, 2018), table 3-4 reports that institutional ownership accounts for the largest proportion of shares, with an average of 37.7%. As discussed in section 2.4.3, due to their large levels of ownership, institutional investors possess significant power to impact the practices and policies of the companies they invest in (Mans-Kemp and van Zyl, 2021). This explains the issuance of the CRISA by King III and the King IV report, highlighting the primary responsibilities of institutional investors (IoDSA, 2016; Pillay, 2021). The second largest ownership identity, foreign ownership, accounts for an average of 18.1% of total shareholding, which surpasses the estimates observed by Komati (2017) and Dube (2018), who reported averages of 11.83% and 9.27%, respectively, from 2004-2014. This can be attributed to the rise of FDI that followed after the presidential election of Cyril Ramaphosa in 2018, as the president declared the expansion of FDI as the primary objective for South Africa (Villers, 2019). As such, numerous efforts were subsequently undertaken to appeal to offshore investors (Cronje, 2018), which may explain the increase in foreign ownership.

On average, managerial ownership and government ownership constitute for 14% and 5.1% of total shareholding, respectively. This is similar to the estimates of Komati (2017), who documented average shareholdings of 14.58% for managerial ownership and 7.72% for government ownership. Family ownership displays the lowest concentration of total ownership, with a mean value of 0.07%. This may be due to the fact that majority of the family shareholdings in South Africa originates from SMMEs, which are not listed on the JSE (Venter and Farrington, 2009). The average family ownership is substantially lower than that of Komati (2017), who observed a mean score of 6.11%. This can be attributed to the fact that Komati

[15] Cash shells are stock market vehicles which have no assets apart from some cash and their listing on an equity market (Kolb and Tykvová, 2016).

(2017) broadly assumes that all shares held by any trust fund represents the percentage of shares held by family shareholders.

Turning to control variables, the average size of non-financial JSE-listed companies in the sample is valued at R845 974 690 in net assets[16]. Based on the average firm age of 34 years[17], it can be assumed that most firms have been operative for a long period and survived several transitions and crises such as the implementation of different King Reports, the financial crisis, and most recently, the COVID-19 pandemic. The mean score of the leverage ratio reveals that firms in the study sample rely more on equity financing relative to debt financing as only 17.8% of their assets are financed by debt, thus implying that these are less risky companies (Ebrahimi, 2017).

The average dividend payout ratio indicates that 23.4% of earnings are distributed to shareholders, thereby largely varying from the average of 41.56% reported by Dube (2018). This highlights a drastic decline in the payment of dividends from JSE-listed firms, which can be attributed to the COVID-19 pandemic as Brown (2020) reported that 65 JSE-listed companies suspended their dividend payments in the midst of the pandemic. The average asset turnover ratio of 1.367 suggests that for every rand of assets, firms earn R1.367 in revenue, suggesting that firms utilise their plant and equipment productively to generate turnover (Li and Mohanram, 2018). Lastly, the mean value of 2.3% for the GDP growth implies that South Africa achieved the ideal growth in GDP from 2004-2022 (Amadeo, 2022).

The results of the correlation analysis between the ownership, financial performance and control variables are presented on the following page in table 3-5.

[16] Average firm size of R845 974 690 = $e^{20.556}$

[17] Average firm age of 34 = $e^{3.537}$

Table 3-5: Correlation Matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) ROA	1.000														
(2) ROE	0.715	1.000													
(3) EPS	0.370	0.265	1.000												
(4) Tobin's q	0.135	0.215	0.094	1.000											
(5) Managerial Ownership	0.005	0.028	-0.133	-0.053	1.000										
(6) Foreign Ownership	0.048	0.063	0.152	0.034	-0.309	1.000									
(7) Institutional Ownership	-0.033	-0.074	-0.044	-0.048	-0.259	-0.274	1.000								
(8) Government Ownership	0.036	0.057	0.146	0.041	-0.331	0.243	-0.048	1.000							
(9) Family Ownership	-0.008	-0.008	-0.020	-0.010	0.026	-0.079	-0.054	-0.062	1.000						
(10) Firm Size	0.145	0.121	0.299	0.028	-0.416	0.397	0.012	0.508	-0.067	1.000					
(11) Firm Age	0.080	0.095	0.159	-0.007	-0.250	0.188	0.086	0.287	-0.008	0.380	1.000				
(12) Leverage	-0.228	-0.089	-0.048	0.341	-0.026	0.022	-0.005	0.059	0.004	-0.012	0.033	1.000			
(13) Dividend Payout	0.305	0.360	0.192	0.200	-0.106	0.172	-0.034	0.189	-0.044	0.316	0.213	-0.103	1.000		
(14) Asset Turnover	0.147	0.299	0.018	0.093	0.154	-0.073	-0.055	-0.061	-0.025	-0.172	-0.043	-0.035	0.192	1.000	
(15) GDP Growth	0.116	0.143	0.005	0.106	-0.005	-0.044	-0.105	-0.094	-0.038	-0.119	-0.045	-0.050	0.017	0.094	1.000

Notes: This table shows the correlation coefficients between performance measures, ownership types and control variables for the period of 2004 to 2021.

Source: Own estimation (2022)

Aside from ROA and ROE, the correlation coefficients between each variable are weak. These results are consistent with Mao (2015) in China, Naufa and Lantara (2018) in Indonesia, and Toan, Trinh, Quynch, Hung and Chau (2020) in Vietnam. ROA and ROE exhibit low positive correlations with EPS and Tobin's q, suggesting that accounting-based measures and market-based measures encapsulate different facets of firm performance (Gentry and Shen, 2010). This coincides with the discussion provided in section 3.3.2.1, where accounting-based measures evaluate a firm's profitability from a backward-looking perspective and reflect what the firm has accomplished (Wang and Shailer, 2015). In contrast, market-based measures are indicators of investment opportunities from a forward-looking perspective and reflect what a firm will achieve in the future (Demsetz and Villalonga, 2001).

All firm performance indicators share positive correlations with foreign ownership and government ownership, but both ownership categories exhibit the strongest correlation with EPS. This is in line with a Nigerian study by Tsegba, Herbet and Ene (2014), who found that foreign ownership shared a stronger correlation with EPS compared to ROA, and a Bahrainian study by Oudat, Ali, Hezbar and Qeshta (2021), who reported a more robust correlation between government ownership and EPS as opposed to ROE. In contrast, institutional ownership and family ownership are negatively correlated to all firm performance indicators. This is similar to the results of Bhattacharya and Graham (2007), who documented negative correlations between institutional ownership and ROE and Tobin's q in Finland, and Oudat *et al*. (2021), who observed negative correlations between family ownership and ROE and EPS. In line with Dube (2018), managerial ownership exhibits a positive correlation with the accounting-based measures but a negative correlation with the market-based indicators.

With the exception of managerial ownership and family ownership, firm size is positively correlated to all variables. From the perspective of firm performance, Chibber and Majumdar (1999) explained that larger firms benefit from economies of scale, market power and better access to external finance, which may enhance their performance. Contrariwise, the negative correlation between firm size and managerial ownership can be attributed to the limited wealth of managers. As the firm gets larger, managerial shareholding becomes diluted owing to their limited personal wealth and constraints on personal borrowing, which prohibit them from investing further equity in the bigger corporation (Bathala, Moon and Rao, 1994). Dube (2018) presented a similar argument to explain the negative correlation between firm size and family ownership, stating that families have limited resources in terms of financial capital.

Similar to Phung and Hoang (2013) and Dube (2018), the firm age variable produces a positive correlation with ROA, ROE (and EPS), but a negative correlation with Tobin's q, suggesting that the firms market value may decrease as the firm gets older. The negative correlation observed between firm age and managerial ownership concurs with the results of Fahlenbrach and Stulz (2008) and Fabisik, Fahlenbrach, Stulz and Taillard (2019), who asserted that younger firms have higher levels of managerial ownership. In accordance with Dube (2018), firm age and family ownership exhibit a negative correlation. Bambang and Hermawan (2013) claimed that firms with family shareholding face successional challenges as it matures, thus younger firms often comprise of higher levels of family ownership.

Leverage is negatively correlated with ROA, ROE, and EPS, but shares a positive correlation with Tobin's q. Hence, based on the accounting-based measures and EPS, leverage decreases firm performance. This may be due to the fact that firms with higher debt may suffer from an interest burden, high operating risks, and increased risk of bankruptcy (Brunnermeier and Krishnamurthy, 2020). However, the positive correlation between leverage and Tobin's q suggests that higher levels of leverage in the capital structure of listed firms on the JSE are associated with a stronger firm market performance. This is in line with a Nigerian study by Ibhagui and Olokoyo (2018).

Managerial ownership and institutional ownership are negatively correlated with the leverage ratio, which implies that both of these ownership types are reluctant to invest in firms with substantial levels of debt. Conversely, the positive correlation between leverage and the other ownership variables (i.e., foreign, government and family) concur with Shubita and Shubita (2019), Phung (2015) and Dube (2018). From an information asymmetry perspective, Phung and Le (2013) argued that foreign shareholders endure a greater degree of information asymmetry than local investors and therefore, they tend to pressure firms to use more leverage as an alternative monitoring mechanism. Similarly, this may also be the case for firms with government ownership as they are known to lack stringent corporate governance mechanisms, such as monitoring (Ponomareva and Ahlberg, 2016; Chang and Lin, 2022). Regarding family ownership, Dube (2018) claimed that families prefer not to dilute their shareholdings and would rather incur debt as opposed to external equity to maintain control of their firms.

The dividend payout ratio is positively correlated with all performance measures. According to Jiraporn, Kim and Kim (2011), the distribution of dividends reduces the free cash flows of a firm. This pressures companies to seek funds externally for new investments which, in turn, increases the level of external monitoring. Increased monitoring results in improved corporate

governance, which positively affects a firm's financial performance (Murekefu and Ouma, 2012). In a similar vein, the dividend payout ratio is also positively correlated to foreign ownership. Since foreign shareholders often experience information asymmetry due to their geographical distance from investee firms, they prefer higher dividend payouts as "dividends can substitute for direct monitoring of firms" (Chai, 2010: 1). In line with prior literature (such as Nizar Al-Malkawi, 2007; Wang, Manry and Wandler, 2011; Bradford, Chen and Zhu, 2013), a positive correlation is also observed between government ownership and the dividend payout ratio. This association can be interpreted according to the signalling theory, where firms with government shareholders desire to signal a good image and attract investors in the capital market by paying higher cash dividends (La Porta, Lopez-de-Silanes, Shleifer and Vishny, 2000; Bataineh, 2021).

In contrast, managerial, institutional, and family ownership are linked to the dividend payout ratio with negative correlations. For managerial ownership, Sumail (2018: 857) claimed that companies with significant managerial ownership "prefer to retain earnings than paying them in the form of dividends", thus explaining the inverse association. Similarly, the primary concern of institutional and family owners relates to investing in more profitable projects with retained earnings, rather than obtaining dividend payments from firms (Dhuhri and Diantimala, 2018; Duygun, Guney and Moin, 2018). Yousaf, Ali and Hassan (2019) further argued that family firms expropriate external shareholders by paying lower dividends.

The asset turnover ratio is positively correlated with all performance measures, thus illustrating that firms listed on the JSE make efficient usage of their assets (Baik, Chae, Choi and Farber, 2013). However, with the exception of managerial ownership, the asset turnover ratio shares a negative correlation with all ownership identities. This supports the findings of Singh and Davidson (2003), who argued that higher managerial ownership positively influences the asset utilization efficiency, however, ownership from external sources do not assist in increasing the asset turnover.

Considering that a key indicator of a healthy economy is reflected through its GDP growth, it is expected that the performance of companies will attune with the overall development of the country (Haiss and Sümegi, 2008), thereby explaining the positive correlation between GDP growth and all firm performance proxies. Furthermore, Rasyid and Linda (2019: 772) stated that "when GDP increases, society purchasing power automatically increases, so companies can produce more, which in turn will increase profitability". Negative, albeit weak, correlations exist between GDP growth and all ownership types. Due to the fact that managerial, foreign,

institutional, and family owners are motivated by financial objectives, they may harm other elements of GDP growth such as business spending and export decisions.

In summary, based on the ownership structure- financial performance nexus, all financial performance indicators share positive correlations with foreign ownership and government ownership, and negative correlations with institutional ownership and family ownership. Disparately, managerial ownership is positively correlated to the accounting-based measures, but negatively correlated to the market-based measures.

3.4.1.2. Summary statistics of ownership variables

Table 3-6 displays the mean values of the ownership variables over the sample period, while table 3-7 presents the mean estimates across different industries.

Table 3-6: Average Percentage of Ownership for the Sample of Firms 2004-2021.

Year	Managerial	Foreign	Institutional	Government	Family
2004	0.105	0.144	0.245	0.020	0.001
2005	0.121	0.167	0.317	0.032	0.001
2006	0.151	0.154	0.346	0.038	0.001
2007	0.161	0.147	0.326	0.033	0.008
2008	0.192	0.146	0.321	0.033	0.006
2009	0.182	0.157	0.331	0.038	0.004
2010	0.162	0.166	0.342	0.044	0.005
2011	0.155	0.170	0.364	0.049	0.005
2012	0.143	0.183	0.368	0.056	0.005
2013	0.139	0.192	0.370	0.055	0.004
2014	0.138	0.221	0.435	0.060	0.014
2015	0.129	0.212	0.433	0.060	0.013
2016	0.124	0.198	0.411	0.059	0.016
2017	0.125	0.203	0.423	0.061	0.008
2018	0.121	0.196	0.443	0.067	0.007
2019	0.117	0.204	0.453	0.072	0.007
2020	0.111	0.193	0.456	0.076	0.008
2021	0.086	0.206	0.387	0.070	0.006

Notes: This table displays the mean values of the variation of ownership categories (managerial, foreign, institutional, government and family) for the period 2004-2021.

Source: Own estimation (2022)

Table 3-6 shows that the proportion of managerial ownership in JSE-listed firms decreased from 10.5% in 2004 to 8.6% in 2021. However, managerial ownership followed an upward trend from 2004 to 2008, but subsequently experienced a decline from 2009 to 2021. The initial decline in 2009 could be attributed to the global financial crisis, during which managerial owners may have opted to sell their equity holdings to mitigate losses. This is observed by Spinos (2013), who reported a decrease in the level of managerial shareholding in the U.S during the period of the financial crisis. The persistent decline that followed after the financial

crisis may be due to the prevailing uncertainty of the South African environment, as well as the occurrence of corporate failures. These uncertain economic conditions and perceived business risks may have also prompted managerial owners to sell their shares or reduce their ownership interests in JSE-listed firms.

In contrast to managerial ownership, foreign, institutional, government, and family shareholders demonstrated increases in ownership from 2004-2021, albeit minor fluctuations observed throughout the period. In particular, the percentage of foreign ownership increased from 14.4% in 2004 to 20.7% in 2021, reaching its peak of 22.1% in 2014. The observed increasing pattern in foreign ownership may be attributed to the South African government continuously pursuing strategies to attract more foreign investment throughout the sample period (Cronje, 2018; Villers, 2019; Legg, 2022). In addition, South African companies actively made significant efforts to acquire foreign investors. In 2015, Hogg (2015) reported that most of the profit generated by the JSE top 40 companies were derived from operations conducted outside the borders of South Africa. These international operations of South African companies may have positioned themselves as attractive investment opportunities for offshore investors, thus resulting in the inflow of foreign ownership.

In line with table 3-4, table 3-6 shows that institutional investors consistently held the largest percentage of ownership in each year. Similar to foreign ownership, institutional shareholding exhibited an upward trend with minor declines observed in 2007, 2008, 2015, 2016, and 2021. Among all ownership identities, institutional ownership demonstrated the highest increase throughout the sample period, starting with 24.5% of shareholding in 2004 and rising to 38.7% in 2021. This indicates that the size and importance of institutional investors has grown over the years in South Africa (Bhika, 2014). The increased participation of institutional investors may also be attributed to the improvement in the South African regulatory environment and corporate governance standards, which are of great importance to these investors (Chung and Zhang, 2011; Zhang, 2016).

The lowest proportions of ownership on the JSE are held by government and family shareholders. Throughout the sample period, government ownership in JSE-listed firms fluctuated between 2% and 7.6%, with a 5% increase from 2004 to 2021. Due to the failures of prominent SOEs (such as SABC, SAA, Eskom, Denel, and Transnet), firms may seek to limit government shareholding due to concerns of potential government interference, financial issues, and public controversies. With regards to family owners, slight incremental increases were observed from 2007, reaching a peak of 1.6% in 2016. However, by the end of 2021,

family ownership declined to 0.6% only. As stated in section 3.4.1.1, family shareholding is relatively low on the JSE as the majority of these shareholdings are allocated to South African unlisted SMMEs.

Table 3-7: Average Percentage of Ownership across Industries, over the period of 2004-2021.

Industry	Managerial	Foreign	Institutional	Government	Family
Basic Materials	0.082	0.265	0.351	0.071	0.001
Consumer Goods	0.064	0.188	0.420	0.074	0.009
Consumer Services	0.133	0.182	0.397	0.037	0.010
Health Care	0.096	0.164	0.348	0.092	0.012
Industrials	0.169	0.170	0.383	0.045	0.004
Oil and Gas	0.231	0.128	0.292	0.057	0.000
Technology	0.215	0.088	0.382	0.030	0.004
Telecommunications	0.208	0.169	0.272	0.060	0.004

Notes: This table displays the mean values of the variation of ownership categories (managerial, foreign, institutional, government, and family) across different industries for the period for the period 2004-2021.

Source: Own estimation (2022)

The results from table 3-7 reveal that, on average, institutional ownership has the highest level of shareholding across all industries during the 18-year period. This is expected as institutional investors consistently held the largest percentage of ownership from 2004-2021, as per table 3-7. This type of ownership is dominant in all industries as these investors often invest in many companies across several different sectors, as a way to diversify their portfolio risk and maintain liquidity (Harber, 2017). Due to their large proportions of ownership on the JSE, institutional investors are regarded as important suppliers of capital (National Treasury, 2017). The highest level of institutional ownership (42%) is observed in the consumer goods industry. This may be due to the fact that large institutional investors are primarily interested in investing in large companies, which are prominent in the consumer goods industry (Ferreira and Matos, 2008; Zane, 2022). For example, in 2017, the large cap corporation Shoprite, contained 58.14% of institutional shareholding (Shoprite Holdings Ltd, 2017).

Foreign ownership constituted the second largest shareholding in the first five industries (i.e., basic materials, consumer goods, consumer services, health care, and industrials). In accordance with Dube (2018), the basic materials industry contained the highest percentage of foreign ownership. This may be attributed to South Africa's abundance of natural resources (Asiedu, 2006), such as coal, diamonds, and gold. Wasserman (2019) reported that mining companies such as Gold Fields, Harmony and Anglo Gold were among the top five foreign-owned stocks in South Africa in 2019. However, managerial ownership exceeded foreign shareholding in the oil and gas, technology, and telecommunications industry.

The oil and gas, as well as the technology industry, are known for their high-risk and high-reward nature (Gheorghiu and Popescu, 2020; Nawrocki and Jonek-Kowalska, 2022). Since managerial shareholding is often linked to better decision making (Ruan, Tian and Ma, 2011), the presence of managerial owners can be particularly beneficial in these industries, as it provides incentives for managers to take well-considered risks that do not harm shareholders. Accordingly, oil and gas companies listed on the JSE, such as Keaton Energy and Wescoal, frequently implement share-based incentive programs, where directors are issued company shares as a form of remuneration in order to ensure that they continuously contribute to shareholder value (Keaton Energy, 2016; Wescoal Holdings Limited, 2021).

Similarly, Carter and Lynch (2001) reported that it is also common for firms in the technology industry to compensate their employees with stock options. Regarding the telecommunications industry, due to the critical nature of its services, the South African telecommunications sector is subject to extensive regulations and oversight by the Independent Communications Authority of South Africa (ICASA) (Hawthorne, 2015; Howell and Potgieter, 2022). Ownership structures that are concentrated with managerial shareholding may therefore aid the required regulatory compliance of good corporate governance practices, as outlined by the King IV report (Anyango, 2018).

The largest share of government ownership is present in the healthcare industry (9.2%). The South African government may choose to allocate more investments to this industry due to the shared social objectives between healthcare firms and the government. For example, Adcock Ingram, which possesses over 10% of government shareholding, was recognised as a partner of the State in addressing the national challenges posed by HIV and AIDS in South Africa. Nonetheless, although government ownership is most prominent in the healthcare industry; managerial, institutional, and foreign ownership still contain higher percentages of ownership in this industry, as indicated by table 3-7. Finally, family ownership is relatively low in all industries due to their prominence in unlisted SMMEs.

3.4.2. Regression Results for Endogeneity Tests

This section discusses the results of the endogeneity tests, namely, the test of dynamic completeness, the test of reverse causality, and the test of strict exogeneity.

3.4.2.1. Regression results for test of dynamic completeness

As per the discussion in section 3.3.4.1, although earlier research considered two financial performance lags as adequate to capture the persistence of profitability progressively, this chapter still conducts the test of dynamic completeness to confirm this contention. The results thereof are presented in table 3-8. Panel A estimates equation 3.6, where four lags of the performance measures are enfolded, while panel B models equation 3.7, in which only the third and fourth performance lags are included, and the two most recent lags are dropped.

Table 3-8: Regression Results of the Test of Dynamic Completeness.

	Panel A				Panel B			
	ROA	**ROE**	**EPS**	**Tobin's q**	**ROA**	**ROE**	**EPS**	**Tobin's q**
Financial Performance$_{t-1}$	**0.400**	**0.440**	**0.360**	**0.652**				
	(17.08)***	**(10.76)*****	**(2.36)****	**(11.32)*****				
Financial Performance$_{t-2}$	**0.077**	0.035	0.123	**0.180**				
	(2.96)***	(0.80)	(1.48)	**(2.82)*****				
Financial Performance$_{t-3}$	**0.085**	**0.108**	0.091	-0.025	**0.197**	**0.226**	**0.217**	**0.453**
	(3.39)***	**(2.57)****	(1.45)	(0.58)	**(4.25)*****	**(6.09)*****	**(2.23)****	**(9.85)*****
Financial Performance$_{t-4}$	0.000	0.037	0.019	-0.003	0.056	**0.105**	0.085	-0.014
	(0.01)	(1.29)	(0.41)	(0.26)	(1.41)	**(3.41)*****	(1.30)	(0.72)
Firm Size	**0.004**	**0.005**	**0.442**	-0.008	**0.007**	**0.010**	**0.738**	-0.001
	(2.85)***	**(1.98)****	**(2.58)*****	(1.23)	**(3.23)*****	**(3.66)*****	**(4.03)*****	(0.09)
Firm Age	0.005	0.009	**0.579**	0.022	**0.008**	**0.014**	**0.960**	**0.048**
	(1.65)	(1.29)	**(2.22)****	(1.45)	**(2.24)****	**(2.02)****	**(3.31)*****	**(2.09)****
Leverage	**-0.076**	-0.016	-1.420	0.066	**-0.118**	-0.040	-2.186	**0.180**
	(4.95)***	(0.51)	(1.03)	(1.07)	**(6.35)*****	(1.07)	(1.39)	**(2.01)****
Dividend Payout	**0.068**	**0.141**	**2.660**	**0.293**	**0.110**	**0.223**	**4.550**	**0.811**
	(6.42)***	**(8.48)*****	**(2.13)****	**(4.47)*****	**(10.45)*****	**(11.78)*****	**(3.92)*****	**(10.84)*****
Asset Turnover	0.004	**0.022**	0.172	0.021	0.004	**0.033**	0.177	0.038
	(1.19)	**(4.76)*****	(1.42)	(1.08)	(1.21)	**(6.35)*****	(1.20)	(1.41)
GDP Growth	-0.504	-0.627	51.530	**11.899**	**-2.260**	**-4.981**	4.501	**-15.096**
	(0.67)	(0.50)	(0.65)	**(3.26)*****	**(2.31)****	**(3.64)*****	(0.05)	**(3.56)*****
R^2	0.35	0.24	0.29	0.78	0.25	0.33	0.17	0.53

Notes: This table reports the results from OLS regressions of lags of financial performance (Financial Performance$_{t-i}$ is the i^{th} period lagged financial performance indicator) and the control variables (firm size, firm age, leverage ratio, dividend payout ratio, asset turnover ratio and GDP growth) on current financial performance (ROA, ROE, EPS and Tobin's q). Panels A and B show the results with lags for years 1 to 4 and lags for years 3 and 4, respectively. All test statistics are based on robust, firm-clustered standard errors. Year and industry dummies are included in all specifications. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Source: Own estimation (2022)

In panel A, the first lag is significant for all financial performance measures, whereas the second lag is significant for ROA and Tobin's q and the third lag is significant for ROA and ROE. In contrast, the fourth lag is insignificant for all financial performance indicators. After the first and second lags are dropped in panel B, the third lag becomes significant for all financial performance measures while the fourth lag is significant for ROE only. Hence, the results vary depending on the performance measure under consideration.

Overall, these results provide evidence of endogeneity, as table 3-8 shows that past firm performance impacts current firm performance for all four measures. Moreover, in panel B, the observation that the later lags (year 3 and 4) become significant when the first and second lags are dropped suggests that while these later lags contain relevant information, the more recent lags (year 1 and 2) already subsume a large portion of this information. This renders the inclusion of the later lags as less crucial. These findings are broadly consistent with those of Wintoki *et al*. (2012), in that the later lags emerge as more significant when the past lags are omitted. Accordingly, two lags of past performance are considered sufficient to capture the dynamic elements of firm performance and hence are incorporated into equation 3.11.

3.4.2.2. Regression results for test of reverse causality

Table 3-9 presents the OLS results of equation 3.8, where the current ownership variables (managerial, foreign, institutional, government and family) and control variables were regressed against the firm performance and control variables from one year prior. Specifically, panels A, B, C and D pertains to the one-year lag of ROA, ROE, EPS and Tobin's q, respectively. Table 3-9 can be found on pages 107 and 108.

Table 3-9: OLS Regression Results for Test of Reverse Causality.

	MAN	FOR2	INS	GOV	FAM2	LNSIZE	LEV	DIVPAY	ASTO	GDPG
Panel A: ROA										
ROA_{t-1}	**0.101**	-0.004	0.021	-0.007	0.003	**0.687**	**-0.053**	**0.237**	**-0.240**	0.001
	(3.06)***	(0.17)	(0.53)	(0.67)	(0.86)	**(4.34)*****	**(2.17)****	**(8.74)*****	**(2.61)*****	(0.75)
$LNSIZE_{t-1}$	**-0.038**	**0.035**	**-0.006**	**0.017**	**-0.001**	**0.923**	0.002	**0.018**	0.001	0.000
	(13.27)***	**(15.71)*****	**(2.03)****	**(18.99)*****	**(3.26)*****	**(25.88)*****	(1.45)	**(7.81)*****	(0.31)	(0.61)
$LNAGE_{t-1}$	**-0.013**	-0.001	**0.014**	**0.010**	**0.001**	0.030	0.002	**0.009**	0.007	0.000
	(3.61)***	(0.23)	**(2.68)*****	**(6.81)*****	**(1.68)***	(1.32)	(0.71)	**(1.95)***	(1.04)	(1.24)
LEV_{t-1}	0.004	0.022	-0.005	**0.019**	-0.002	**0.274**	**0.456**	-0.023	**-0.332**	0.005
	(0.24)	(1.32)	(0.24)	**(2.41)****	(0.87)	**(3.89)*****	**(2.42)****	(1.53)	**(2.21)****	(1.47)
$DIVPAY_{t-1}$	0.011	**0.050**	**-0.048**	0.004	**-0.006**	0.104	-0.010	**0.510**	0.029	-0.001
	(0.75)	**(3.22)*****	**(2.39)****	(0.78)	**(3.15)*****	(1.56)	(0.99)	**(21.89)*****	(1.01)	(0.48)
$ASTO_{t-1}$	**0.025**	0.005	**-0.017**	**0.003**	**-0.002**	0.025	**-0.016**	**0.024**	**0.886**	0.000
	(5.47)***	(1.46)	**(3.21)*****	**(2.66)*****	**(2.08)****	(1.55)	**(1.95)***	**(5.65)*****	**(43.15)*****	(0.59)
$GDPG_{t-1}$	-0.105	-0.084	**0.629**	-0.036	-0.008	-0.701	-0.031	-0.050	0.719	0.033
	(0.61)	(0.45)	**(2.22)****	(0.51)	(0.33)	(0.48)	(0.20)	(0.20)	(1.31)	(1.34)
Panel B: ROE										
ROE_{t-1}	**0.050**	0.023	-0.014	0.003	0.003	**0.467**	-0.006	**0.133**	**-0.147**	0.001
	(2.92)***	(1.28)	(0.62)	(0.46)	(1.69)	**(4.34)*****	(0.49)	**(8.02)*****	**(3.42)*****	(0.74)
$LNSIZE_{t-1}$	**-0.038**	**0.034**	**-0.005**	**0.017**	**-0.001**	**0.923**	0.002	**0.018**	0.001	0.000
	(13.20)***	**(15.73)*****	**(1.92)***	**(18.96)*****	**(3.28)*****	**(25.96)*****	(1.22)	**(7.98)*****	(0.26)	(0.61)
$LNAGE_{t-1}$	**-0.013**	-0.002	**0.014**	**0.010**	0.001	0.027	0.002	**0.009**	0.007	0.000
	(3.64)***	(0.31)	**(2.74)*****	**(6.77)*****	(1.64)	(1.24)	(0.64)	**(1.87)***	(1.12)	(1.24)
LEV_{t-1}	-0.005	0.024	-0.008	**0.020**	-0.002	**0.215**	**0.462**	**-0.044**	**-0.311**	0.005
	(0.28)	(1.42)	(0.37)	**(2.55)****	(1.02)	**(3.02)*****	**(2.46)****	**(2.82)*****	**(2.07)****	(1.43)
$DIVPAY_{t-1}$	0.010	**0.044**	**-0.042**	0.003	**-0.007**	0.071	-0.015	**0.506**	0.037	-0.001
	(0.71)	**(2.81)*****	**(2.08)****	(0.49)	**(3.24)*****	(1.10)	(1.35)	**(21.45)*****	(1.30)	(0.50)
$ASTO_{t-1}$	**0.023**	0.004	**-0.016**	**0.003**	**-0.002**	0.007	**-0.017**	**0.019**	**0.892**	0.000
	(5.01)***	(1.09)	**(2.96)*****	**(2.43)****	**(2.25)****	(0.41)	**(1.93)***	**(4.40)*****	**(42.84)*****	(0.50)
$GDPG_{t-1}$	-0.112	-0.085	**0.629**	-0.036	-0.009	-0.754	-0.028	-0.067	0.736	0.033
	(0.64)	(0.46)	**(2.22)****	(0.51)	(0.34)	(0.52)	(0.18)	(0.26)	(1.36)	(1.33)

	MAN	FOR2	INS	GOV	FAM2	LNSIZE	LEV	DIVPAY	ASTO	GDPG
Panel C: EPS										
EPS_{t-1}	**-0.037**	0.018	-0.062	-0.002	**0.005**	**0.430**	-0.043	**0.156**	-0.090	-0.002
	(1.89)*	(0.42)	(1.10)	(0.13)	**(1.88)***	**(2.49)****	(1.59)	**(3.75)*****	(1.12)	(1.11)
$LNSIZE_{t-1}$	**-0.037**	**0.034**	-0.005	**0.017**	**-0.001**	**0.924**	0.002	**0.018**	0.000	0.000
	(12.92)***	**(15.42)*****	(1.64)	**(18.61)*****	**(3.31)*****	**(25.28)*****	(1.36)	**(7.84)*****	(0.10)	(0.76)
$LNAGE_{t-1}$	**-0.012**	-0.001	**0.015**	**0.010**	**0.001**	0.032	0.002	**0.010**	0.005	0.000
	(3.36)***	(0.26)	**(2.55)****	**(6.79)*****	**(1.67)***	(1.42)	(0.67)	**(2.11)****	(0.85)	(1.31)
LEV_{t-1}	-0.007	0.023	-0.008	**0.020**	-0.002	**0.203**	**0.461**	**-0.047**	**-0.307**	0.005
	(0.42)	(1.37)	(0.42)	**(2.53)****	(1.07)	**(2.91)*****	**(2.46)****	**(3.17)*****	**(2.05)****	(1.41)
$DIVPAY_{t-1}$	**0.024**	**0.049**	**-0.043**	0.003	**-0.006**	**0.166**	-0.015	**0.532**	0.005	-0.000
	(1.69)*	**(3.21)*****	**(2.19)****	(0.65)	**(3.36)*****	**(2.39)****	(1.43)	**(22.91)*****	(0.19)	(0.34)
$ASTO_{t-1}$	**0.026**	0.005	**-0.017**	**0.003**	**-0.002**	**0.032**	**-0.017**	**0.026**	**0.884**	0.000
	(5.65)***	(1.45)	**(3.18)*****	**(2.62)*****	**(2.05)****	**(1.90)***	**(1.99)****	**(6.14)*****	**(43.25)*****	(0.64)
$GDPG_{t-1}$	-0.117	-0.080	**0.616**	-0.036	-0.008	-0.646	-0.037	-0.030	0.711	0.032
	(0.68)	(0.43)	**(2.31)****	(0.52)	(0.29)	(0.44)	(0.24)	(0.12)	(1.28)	(1.32)
Panel D: Tobin's q										
TQ_{t-1}	**-0.004**	0.001	-0.002	0.001	-0.000	**0.040**	**-0.029**	**0.017**	**-0.023**	**0.001**
	(1.94)*	(0.33)	(0.61)	(0.72)	(0.30)	**(3.69)*****	**(2.08)****	**(3.57)*****	**(2.05)****	**(1.97)****
$LNSIZE_{t-1}$	**-0.037**	**0.035**	**-0.005**	**0.017**	**-0.001**	**0.929**	0.001	**0.020**	-0.001	0.000
	(13.37)***	**(15.98)*****	**(1.94)***	**(19.15)*****	**(3.19)*****	**(26.43)*****	(0.95)	**(8.65)*****	(0.22)	(0.72)
$LNAGE_{t-1}$	**-0.012**	-0.001	**0.014**	**0.010**	**0.001**	0.038	-0.001	**0.012**	0.003	0.000
	(3.50)***	(0.22)	**(2.45)****	**(6.85)*****	**(1.73)***	(1.64)	(0.28)	**(2.64)*****	(0.43)	(1.46)
LEV_{t-1}	0.004	0.021	-0.001	**0.018**	-0.002	0.073	**0.551**	**-0.102**	**-0.233**	0.003
	(0.26)	(1.14)	(0.02)	**(2.35)****	(0.97)	(0.91)	**(5.15)*****	**(4.28)*****	**(2.65)*****	(1.38)
$DIVPAY_{t-1}$	**0.027**	**0.049**	**-0.042**	0.002	**-0.006**	**0.128**	0.023	**0.514**	0.034	-0.001
	(1.87)*	**(3.13)*****	**(2.09)****	(0.46)	**(3.15)*****	**(1.75)***	(1.40)	**(21.31)*****	(1.14)	(0.86)
$ASTO_{t-1}$	**0.026**	0.005	**-0.017**	**0.003**	**-0.002**	**0.029**	**-0.014**	**0.025**	**0.886**	0.000
	(5.73)***	(1.45)	**(3.13)*****	**(2.58)*****	**(2.07)****	**(1.73)***	**(2.52)****	**(5.77)*****	**(44.41)*****	(0.52)
$GDPG_{t-1}$	-0.105	-0.084	**0.630**	-0.036	-0.008	-0.776	0.005	-0.080	0.756	0.032
	(0.61)	(0.46)	**(2.37)****	(0.52)	(0.33)	(0.53)	(0.03)	(0.32)	(1.34)	(1.31)

Notes: This table reports the results from OLS regressions of lags of financial performance (ROA, ROE, EPS and Tobin's q) and the control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), dividend payout (DIVPAY), asset turnover (ASTO) and GDP growth (GDPG)) on current ownership (manager (MAN), foreign (FOR2), institutional (INS), government (GOV) and family (FAM2)) and the control variables for ROA, ROE, EPS and Tobin's q in Panels A–D, respectively. Year and industry dummies are included in all specifications. See section 3.3.2 for the complete definitions of all variables. *, ** and *** indicate significance at 10%, 5% and 1% respectively for the t-statistics. Items in boldface are significant at the 10% level or higher.

Source: Own estimation (2022)

The results from table 3-9 show that, among the five ownership identities, only managerial ownership and family ownership are significantly related to all the past financial performance measures. In particular, managerial ownership shares a positive association with the past values of the accounting-based measures (ROE and ROA), but a negative relationship with the past market-based indicators (EPS and Tobin's q). On the one hand, this implies that firms issue more stock options to managers following periods of robust financial profits, resulting in higher managerial ownership. On the other hand, companies that previously experienced high market values may contain lower managerial ownership, as insiders sell their shares while the stock is performing well in the equity market (Fahlenbrac and Stulz, 2009).

In terms of family ownership, the estimates in panel C indicate that family ownership is positively related to the past performance of EPS. This implies that firms that had high EPS values in the past are likely to have significant levels of family ownership. Following the viewpoint of Akbar *et al.* (2016), these findings highlight the conundrums of reverse causality, in which past financial performance from one year ago are thought to influence the percentage of managerial and family shareholding, but not vice versa; and the omitted variables bias, where managerial and family ownership can be determined simultaneously with certain financial performance measures.

Panels A and B show that for the control variables, only the GDP growth rate has no significant impact on past ROA, while firm size, leverage, dividend payouts and asset turnover ratios are significantly related to past ROA. Similarly, the lag of ROE is significant in explaining all values except for the GDP growth rate and the leverage ratio. Panels C and D infer that the lag of Tobin's q is significantly related to all control variables, while the lag of EPS is only significant for firm size and dividend payout. That being said, all control variables retain a certain level of endogeneity with firm performance as they are significantly related to past firm measures in at least one panel of table 3-9. As a matter of fact, the current firm size and dividend payout ratio are positively related to all past performance indicators, suggesting that firms that performed well in the past will be larger today (Wintoki *et al*., 2012), and have the financial capacity to distribute more dividends to their shareholders (Budiarso, 2017).

3.4.2.3. Regression results for test of strict exogeneity

Tables 3-10, 3-11, 3-12 and 3-13 display the findings generated from the FEM estimations of equation 3.9, where seven specifications of each of the performance measures (ROA, ROE, EPS, and Tobin's q) were regressed against different subsets of ownership identities and

control variables. This is based on the test of strict exogeneity outlined in section 3.3.4.1.

Table 3-10: FE Regression Results for Test of Strict Exogeneity for ROA.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ROA	**ROA**	**ROA**	**ROA**	**ROA**	**ROA**	**ROA**
MAN	0.013	0.036	0.037	0.038	0.036	0.014	0.008
	(0.54)	(1.21)	(1.24)	(1.26)	(1.21)	(0.54)	(0.31)
FOR2	0.007	0.009	0.006	0.007	0.005	0.013	0.015
	(0.37)	(0.33)	(0.23)	(0.26)	(0.21)	(0.56)	(0.62)
INS	-0.019	-0.021	-0.023	-0.019	-0.020	-0.022	-0.021
	(1.33)	(1.19)	(1.32)	(1.11)	(1.17)	(1.37)	(1.28)
GOV	-0.019	-0.020	-0.019	-0.068	-0.019	-0.070	-0.056
	(0.36)	(0.26)	(0.25)	(1.09)	(0.25)	(1.17)	(0.95)
FAM2	0.065	0.063	0.063	0.066	0.065	0.061	0.053
	(0.87)	(1.37)	(1.38)	(1.41)	(1.27)	(0.76)	(0.67)
LNSIZE	**0.014**	0.014	0.014	0.014	0.014	**0.014**	0.001
	(4.62)* **	(1.56)	(1.56)	(1.54)	(1.56)	**(4.53)*** **	(0.32)
LNAGE	-0.006	-0.007	-0.007	-0.006	-0.007	-0.006	0.022
	(0.51)	(0.32)	(0.32)	(0.30)	(0.31)	(0.49)	(0.26)
LEV	**-0.120**	**-0.120**	**-0.120**	**-0.120**	**-0.120**	**-0.120**	**-0.115**
	(10.40)* **	**(9.07)*** **	**(9.06)*** **	**(9.03)*** **	**(9.05)*** **	**(10.44)*** **	**(9.17)*** **
DIVPAY	**0.059**	**0.058**	**0.058**	**0.059**	**0.058**	**0.059**	**0.040**
	(5.66)* **	**(4.59)*** **	**(4.61)*** **	**(4.65)*** **	**(4.59)*** **	**(5.73)*** **	**(3.77)*** **
ASTO	**0.033**	**0.033**	**0.033**	**0.033**	**0.033**	**0.033**	**0.044**
	(6.69)* **	**(1.98)** **	**(1.99)** **	**(1.99)** **	**(1.98)** **	**(6.73)*** **	**(6.93)*** **
GDPG	0.032	0.027	0.023	0.029	0.026	0.033	0.060
	(0.25)	(0.22)	(0.19)	(0.24)	(0.21)	(0.26)	(0.49)
MAN_{t+1}	**0.042**					0.045	**0.044**
	(1.73)*					(1.80)	**(1.78)***
$FOR2_{t+1}$		-0.006				**-0.006**	-0.014
		(0.21)				**(0.25)***	(0.57)
INS_{t+1}			0.005			0.009	0.008
			(0.28)			(0.57)	(0.52)
GOV_{t+1}				0.096		**0.101**	0.082
				(1.54)		**(1.68)***	(1.40)
$FAM2_{t+1}$					-0.005	0.017	0.014
					(0.14)	(0.21)	(0.18)
$LNSIZE_{t+1}$							**0.023**
							(6.62)* **
$LNAGE_{t+1}$							-0.034
							(0.33)
LEV_{t+1}							**-0.038**
							(1.98) **
$DIVPAY_{t+1}$							**0.044**
							(3.96)* **
$ASTO_{t+1}$							**-0.021**
							(3.10)* **
$GDPG_{t+1}$							0.066
							(0.50)

Notes: Table 3-10 reports the results from the FE regressions of ROA on the current and leads of ownership (manager (MAN), foreign (FOR2), institutional (INS), government (GOV) and family (FAM2)) and the control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), dividend payout (DIVPAY), asset turnover (ASTO) and GDP growth (GDPG)). (t+1) is a subset of lead values of the ownership and control variables. *, ** and *** indicate significance at 10%, 5% and 1% respectively for the t-test. Items in boldface are significant at the 10% level or higher.

Source: Own estimation (2022)

Table 3-11: FE Regression Results for Test of Strict Exogeneity for ROE.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ROE	**ROE**	**ROE**	**ROE**	**ROE**	**ROE**	**ROE**
MAN	**0.136**	**0.156**	**0.156**	**0.160**	**0.156**	**0.139**	**0.132**
	(2.49)**	**(2.81)*****	**(2.81)*****	**(2.87)*****	**(2.80)*****	**(2.51)****	**(2.45)****
FOR2	0.067	0.050	0.066	0.069	0.066	0.058	0.059
	(1.60)	(1.19)	(1.52)	(1.65)	(1.56)	(1.38)	(1.46)
INS	**-0.059**	**-0.060**	-0.060	**-0.057**	**-0.061**	**-0.059**	**-0.059**
	(1.77)*	**(1.79)***	(1.72)	**(1.74)***	**(1.83)***	**(1.70)***	**(1.66)***
GOV	0.074	0.076	0.073	-0.059	0.074	-0.057	-0.030
	(0.52)	(0.53)	(0.52)	(0.49)	(0.52)	(0.47)	(0.26)
FAM2	0.083	0.081	0.081	0.087	0.084	0.085	0.076
	(1.07)	(1.08)	(1.09)	(1.20)	(1.19)	(1.23)	(1.14)
LNSIZE	0.015	0.015	0.015	0.014	0.015	0.014	-0.009
	(1.20)	(1.21)	(1.20)	(1.16)	(1.20)	(1.17)	(0.96)
LNAGE	0.022	0.022	0.022	0.023	0.022	0.023	-0.214
	(0.56)	(0.55)	(0.54)	(0.57)	(0.54)	(0.59)	(1.04)
LEV	**-0.069**	**-0.069**	**-0.069**	**-0.070**	**-0.069**	**-0.070**	**-0.077**
	(3.11)**	**(3.09)*****	**(3.09)*****	**(3.14)*****	**(3.10)*****	**(3.15)*****	**(3.56)*****
DIVPAY	**0.140**	**0.140**	**0.140**	**0.142**	**0.140**	**0.142**	**0.109**
	(6.17)**	**(6.16)*****	**(6.18)*****	**(6.25)*****	**(6.18)*****	**(6.23)*****	**(5.28)*****
ASTO	**0.101**	**0.101**	**0.101**	**0.101**	**0.101**	**0.101**	**0.125**
	(4.43)**	**(4.44)*****	**(4.43)*****	**(4.44)*****	**(4.44)*****	**(4.42)*****	**(4.54)*****
GDPG	0.153	0.142	0.148	0.157	0.148	0.154	0.208
	(0.61)	(0.57)	(0.60)	(0.64)	(0.59)	(0.62)	(0.86)
MAN_{t+1}	0.037					0.040	0.040
	(0.71)					(0.76)	(0.82)
$FOR2_{t+1}$		0.027				0.024	0.008
		(0.61)				(0.53)	(0.19)
INS_{t+1}			-0.001			0.009	0.006
			(0.03)			(0.29)	(0.22)
GOV_{t+1}				**0.261**		**0.262**	**0.227**
				(2.56)**		**(2.54)****	**(2.25)****
$FAM2_{t+1}$					-0.006	0.011	0.007
					(0.08)	(0.13)	(0.07)
$LNSIZE_{t+1}$							**0.043**
							(2.45)**
$LNAGE_{t+1}$							0.292
							(1.18)
LEV_{t+1}							-0.009
							(0.18)
$DIVPAY_{t+1}$							**0.073**
							(3.68)***
$ASTO_{t+1}$							-0.043
							(1.62)
$GDPG_{t+1}$							0.099
							(0.43)

Notes: Table 3-11 reports the results from the FE regressions of ROE on the current and leads of ownership (manager (MAN), foreign (FOR2), institutional (INS), government (GOV) and family (FAM2)) and the control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), dividend payout (DIVPAY), asset turnover (ASTO) and GDP growth (GDPG)). (t+1) is a subset of lead values of the ownership and control variables. *, ** and *** indicate significance at 10%, 5% and 1% respectively for the t-test. Items in boldface are significant at the 10% level or higher.

Source: Own estimation (2022)

Table 3-12: FE Regression Results for Test of Strict Exogeneity for EPS.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	EPS	**EPS**	**EPS**	**EPS**	**EPS**	**EPS**	**EPS**
MAN	-0.014	-0.013	-0.014	-0.013	-0.013	-1.130	**-0.016**
	(1.83)	(1.55)	(1.54)	(1.47)	(1.53)	(1.53)	**(2.04)****
FOR2	**0.037**	**0.045**	**0.036**	**0.037**	**0.037**	**4.952**	**0.045**
	(2.36)**	**(2.78)*****	**(2.23)****	**(2.38)****	**(2.35)****	**(2.99)*****	**(2.68)*****
INS	-0.016	-0.017	-0.011	-0.016	-0.016	-0.076	-0.012
	(1.49)	(1.55)	(1.23)	(1.49)	(1.51)	(0.77)	(1.28)
GOV	-0.011	-0.012	-0.011	-0.018	-0.011	-1.133	-0.013
	(0.39)	(0.43)	(0.39)	(0.56)	(0.39)	(0.34)	(0.41)
FAM2	0.012	0.012	0.012	0.012	0.005	0.741	0.003
	(0.47)	(0.47)	(0.47)	(0.48)	(0.21)	(0.34)	(0.11)
LNSIZE	**0.007**	**0.007**	**0.007**	**0.007**	**0.007**	**0.753**	0.003
	(2.43)**	**(2.43)****	**(2.46)****	**(2.44)****	**(2.44)****	**(2.43)****	(1.63)
LNAGE	-0.008	-0.008	-0.008	-0.008	-0.008	-0.733	-0.100
	(0.65)	(0.66)	(0.64)	(0.65)	(0.65)	(0.55)	(0.86)
LEV	-0.012	-0.012	-0.012	-0.012	-0.012	-1.438	-0.010
	(1.27)	(1.27)	(1.24)	(1.27)	(1.27)	(1.42)	(1.43)
DIVPAY	**0.028**	**0.028**	0.029	**0.029**	**0.028**	0.027	0.019
	(1.89)*	**(1.90)***	(1.91)	**(1.90)***	**(1.89)***	(0.94)	(1.35)
ASTO	-0.000	-0.000	-0.001	-0.000	-0.000	0.056	0.004
	(0.07)	(0.06)	(0.08)	(0.07)	(0.07)	(0.08)	(0.55)
GDPG	-0.137	-0.134	-0.133	-0.137	-0.137	-0.095	-0.120
	(1.12)	(1.10)	(1.09)	(1.12)	(1.13)	(0.99)	(0.96)
MAN_{t+1}	0.001					0.383	0.000
	(0.13)					(0.54)	(0.05)
$FOR2_{t+1}$		-0.014				-1.178	-0.018
		(1.01)				(0.86)	(1.35)
INS_{t+1}			-0.010			0.009	-0.011
			(0.96)			(0.34)	(1.12)
GOV_{t+1}				0.013		1.049	0.006
				(0.39)		(0.29)	(0.16)
$FAM2_{t+1}$					0.017	1.961	0.015
					(1.41)	(1.54)	(1.21)
$LNSIZE_{t+1}$							**0.007**
							(2.66)***
$LNAGE_{t+1}$							0.114
							(0.84)
LEV_{t+1}							-0.012
							(0.70)
$DIVPAY_{t+1}$							**0.024**
							(2.83)***
$ASTO_{t+1}$							**-0.010**
							(2.48)**
$GDPG_{t+1}$							-0.010
							(0.14)

Notes: Table 3-12 reports the results from the FE regressions of EPS on the current and leads of ownership (manager (MAN), foreign (FOR2), institutional (INS), government (GOV) and family (FAM2)) and the control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), dividend payout (DIVPAY), asset turnover (ASTO) and GDP growth (GDPG)). (t+1) is a subset of lead values of the ownership and control variables. *, ** and *** indicate significance at 10%, 5% and 1% respectively for the t-test. Items in boldface are significant at the 10% level or higher.

Source: Own estimation (2022)

Table 3-13: *FE Regression Results for Test of Strict Exogeneity for Tobin's q.*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	TQ	**TQ**	**TQ**	**TQ**	**TQ**	**TQ**	**TQ**
MAN	-0.120	0.034	0.029	0.036	0.042	-0.015	-0.169
	(0.43)	(0.14)	(0.12)	(0.15)	(0.18)	(1.92)	(0.61)
FOR2	0.212	0.173	0.195	0.205	0.201	**0.045**	0.208
	(0.96)	(0.93)	(0.89)	(0.93)	(0.91)	**(2.74)*****	(1.16)
INS	0.129	0.119	0.144	0.120	0.119	-0.011	0.147
	(0.69)	(0.65)	(0.87)	(0.65)	(0.64)	(1.21)	(0.94)
GOV	-0.251	-0.253	-0.257	-0.377	-0.255	-0.019	-0.085
	(0.38)	(0.38)	(0.39)	(0.66)	(0.39)	(0.59)	(0.18)
FAM2	-0.273	-0.287	-0.286	-0.280	-0.029	0.006	-0.279
	(0.61)	(0.67)	(0.67)	(0.66)	(0.07)	(0.24)	(0.68)
LNSIZE	-0.063	-0.063	-0.063	-0.064	-0.063	**0.007**	-0.094
	(0.76)	(0.77)	(0.76)	(0.77)	(0.76)	**(2.45)****	(1.37)
LNAGE	-0.773	**-0.777**	**-0.777**	**-0.777**	**-0.780**	-0.008	-1.903
	(1.95)	**(1.96)***	**(1.95)***	**(1.96)***	**(1.96)***	(0.64)	(1.66)
LEV	**3.759**	**3.760**	**3.761**	**3.759**	**3.761**	-0.012	**4.430**
	(2.28)**	**(2.28)****	**(2.28)****	**(2.28)****	**(2.28)****	(1.26)	**(3.14)*****
DIVPAY	**0.928**	**0.927**	**0.927**	**0.929**	**0.928**	0.029	**0.688**
	(5.48)***	**(5.49)*****	**(5.49)*****	**(5.49)*****	**(5.49)*****	(1.91)	**(5.82)*****
ASTO	**0.495**	**0.496**	**0.496**	**0.497**	**0.496**	-0.000	**0.543**
	(2.36)**	**(2.35)****	**(2.35)****	**(2.36)****	**(2.35)****	(0.06)	**(2.85)*****
GDPG	1.457	1.406	1.444	1.427	1.420	-0.128	1.447
	(1.20)	(1.16)	(1.18)	(1.18)	(1.17)	(1.04)	(1.17)
MAN_{t+1}	0.282					0.001	0.235
	(1.11)					(0.07)	(1.04)
$FOR2_{t+1}$		0.046				-0.016	0.029
		(0.19)				(1.16)	(0.13)
INS_{t+1}			-0.051			-0.011	-0.084
			(0.32)			(1.07)	(0.50)
GOV_{t+1}				0.238		0.012	0.355
				(0.41)		(0.34)	(0.61)
$FAM2_{t+1}$					-0.669	0.017	-0.593
					(1.32)	(1.35)	(1.15)
$LNSIZE_{t+1}$							0.006
							(0.14)
$LNAGE_{t+1}$							1.549
							(1.05)
LEV_{t+1}							**-2.762**
							(3.12)***
$DIVPAY_{t+1}$							**0.543**
							(4.30)***
$ASTO_{t+1}$							**-0.266**
							(2.13)**
$GDPG_{t+1}$							**3.161**
							(2.04)**

Notes: Table 3-13 reports the results from the FE regressions of Tobin's q on the current and leads of ownership (manager (MAN), foreign (FOR2), institutional (INS), government (GOV) and family (FAM2)) and the control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), dividend payout (DIVPAY), asset turnover (ASTO) and GDP growth (GDPG)). (t+1) is a subset of lead values of the ownership and control variables. *, ** and *** indicate significance at 10%, 5% and 1% respectively for the t-test. Items in boldface are significant at the 10% level or higher.

Source: Own estimation (2022)

In table 3-10, the coefficient estimates for the future values of managerial ownership (in specifications 1 and 7), foreign ownership (in specification 6) and government ownership (in specification 6) are significantly different from zero, whereas table 3-11 shows that forward values of government ownership (in specifications 4, 6 and 7) is the only ownership variable that significantly differs from zero. Contrastingly, tables 3-12 and 3-13 do not present any evidence of significant future values of ownership variables. With the exception of family ownership and institutional ownership, the results of the test of strict exogeneity suggests that future realisations of ownership variables are, in fact, related to current performance and, therefore, cannot be considered strictly exogenous.

In addition, the future values of specific control variables are significant for certain performance measures, such as firm size for ROA, ROE and EPS; leverage for ROA and Tobin's q; the dividend payout ratio for all performance measures; the asset turnover ratio for ROA, EPS and Tobin's q; and the GDP growth rate for Tobin's q. Based on the viewpoint of Wintoki *et al*. (2012: 596), these findings imply that neither of these control variables "are strictly exogenous and instead adjust in response to firm performance".

Thus, although the lags of ROA, ROE, EPS and Tobin's q do not have a significant effect on all control and ownership variables in table 3-13, and the leads of all the ownership and control variables are not significant in every specification of tables 3-10, 3-11, 3-12 and 3-13; the fact that all control and ownership variables (except institutional ownership) display a certain level of significance in either of the tests suggests that they have a certain degree of endogeneity with firm performance. Accordingly, all variables are treated as endogenous, thereby reinforcing the prevalence of the endogeneity bias within the ownership structure- financial performance relationship of this chapter.

Taking into consideration the conditions for selecting an appropriate estimation technique, discussed in sections 3.3.5 and 3.3.6, in conjunction with the results of the tests of dynamic completeness, reverse causality and strict exogeneity; the FEM procedure is considered as an unsuitable and biased technique for modelling equations 3.1 and 3.2. As such, this chapter employs the system GMM for estimation purposes. Schultz *et al*. (2010: 161) described this method as reliable since it is "robust to dynamic endogeneity, simultaneity and unobservable heterogeneity," i.e., the three sources of endogeneity.

3.4.3. System GMM Regression Results for the Ownership Structure and Financial Performance Analysis

3.4.3.1. The base model

Table 3-14 documents the regression results from equation 3.1 of the base model that was estimated with the system GMM of equation 3.11. As explained in section 3.4.2.1, two lags of financial performance were appended in the system GMM estimations. In contrast to the previous regressions, this procedure uses the dummy variables of foreign ownership and family ownership defined in table 3-2.

Table 3-14: GMM Regression Results for the Linear Relationship between Ownership Structure and Financial Performance.

	ROA	**ROE**	**EPS**	**Tobin's q**
Financial Performance$_{t-1}$	**0.302**	**0.337**	**0.244**	**0.635**
	(7.42)***	**(7.94)*****	**(5.04)*****	**(13.15)*****
Financial Performance$_{t-2}$	**0.060**	0.030	0.032	0.014
	(1.96)*	(0.90)	(1.56)	(1.18)
MAN	0.059	**0.204**	-0.012	**-0.409**
	(1.25)	**(2.42)****	(0.84)	**(2.60)*****
FOR1	0.024	**0.077**	0.006	0.047
	(1.33)	**(2.69)*****	(0.82)	(0.97)
INS	-0.022	-0.083	**-0.031**	-0.013
	(0.71)	(1.27)	**(1.86)***	(0.11)
GOV	-0.018	0.132	0.015	0.327
	(0.17)	(0.66)	(0.33)	(0.80)
FAM1	0.006	0.077	-0.013	**-0.404**
	(0.14)	(0.49)	(1.18)	**(3.24)*****
LNSIZE	**0.025**	**0.031**	0.005	**-0.059**
	(2.41)**	**(1.85)***	(1.12)	**(2.04)****
LNAGE	-0.015	-0.021	0.002	0.024
	(1.61)	(1.64)	(0.56)	(0.99)
LEV	-0.068	0.156	0.017	0.172
	(1.31)	(1.62)	(0.58)	(1.19)
DIVPAY	**0.139**	**0.295**	**0.070**	**0.911**
	(3.00)***	**(3.63)*****	**(2.48)****	**(5.09)*****
ASTO	**0.035**	**0.096**	0.007	0.064
	(2.17)***	**(3.62)*****	(1.03)	(1.04)
GDPG	0.236	2.017	0.046	-4.910
	(0.35)	(0.92)	(0.15)	(0.89)
AR(1) p-value	0.000***	0.000***	0.072*	0.000***
AR(2) p-value	0.195	0.130	0.904	0.307
Hansen J p-value	0.568	0.502	0.936	0.184

Notes: Table 3-14 reports the impact of the lagged financial performance, ownership (manager (MAN), foreign (FOR1), institutional (INS), government (GOV) and family (FAM1)) and control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), dividend payout (DIVPAY), asset turnover (ASTO) and GDP growth (GDPG)) on current financial performance (ROA, ROE EPS, Tobin's q). LN refers to the natural logarithm. All regressions are estimated using system GMM with robust standard errors. AR(1) and AR(2) are the respective first and second order tests for serial correlation in the first-differenced residuals. Hansen J is the test for over-identification of the instruments. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Source: Own estimation (2022)

The first lag of the financial performance measures (ROA, ROE, EPS and Tobin's q) has positive significant coefficients, while the second lag only displays significance for ROA. This implies that current financial performance is affected by past financial performance, particularly in the immediate prior year.

Except for government ownership, the ownership identities exhibit a significant influence on at least one performance indicator. With regards to the impact of managerial ownership on firm performance, the findings differ in the case of the accounting-based measures to those of market-based measures, in which managerial ownership positively impacts ROE but erodes Tobin's q. The positive relation between managerial shareholding and ROE is supported by Ongore (2011), while the negative relation with Tobin's q is in line with Dube (2018).

The positive impact of managerial ownership can be attributed to incentive alignment and managerial commitment as discussed in the convergence of interest hypothesis, whereas the negative impact may be a consequence of managerial entrenchment as per the management entrenchment hypothesis. The conflicting findings may suggest that while higher managerial ownership enhances ROE, it could signal to investors that managers have more control over the firm's operations, potentially leading to concerns about entrenched management and decreased efficiency. According to Chen (2013), market investors are unwilling to ignore potential managerial expropriation linked to higher managerial ownership. Given that Tobin's q is influenced by market sentiment (Chen and Yu, 2013), the market's possible apprehension regarding managerial ownership may diminish Tobin's q, thus explaining the negative linkage.

Under other conditions, Fabisik *et al*. (2019) argued that the negative association between managerial ownership and Tobin's q is dependent on stock liquidity (Fang, Noe and Tice, 2009). Managerial ownership generally reduces stock liquidity since managerial shareholders are insiders who are better informed than potential investors (Chemmanur and Fulghieri, 1999) and may only be willing to sell their stock under conditions that are acceptable to them (Fabisik *et al*., 2019), thereby decreasing stock liquidity.

Similarly, when foreign investors own at least 10% of the total shareholding, foreign ownership also unveils a positive influence on the ROE of JSE-listed firms. This coincides with the findings of Marashdeh (2014) where a positive relationship between foreign ownership and firm performance was found in Jordan, but only when firm performance was measured with ROE. Following the work of Kharatyan (2016), who postulated that firms with higher ROE typically possess competitive advantages over their counterparts, the positive coefficient of

ROE and foreign ownership can be attributed to the transfer of scarce and valuable resources by foreign investors (Ghebrihiwet and Motchenkovab, 2017) to JSE-listed firms, supporting the resource-based theory.

In contrast, negative coefficients are observed between institutional ownership and firm performance; however, it is only statistically significant for EPS. Considering that institutional ownership constitutes for the largest proportion of shareholding on the JSE (37.7% in table 3-4), the negative impact may stem from the entrenchment effect, in which institutional investors enable entrenched managers for their own private benefit (Pound, 1988). Similarly, studies by Mashayekhi and Bazaz (2008), Zeitun (2009) and Dube (2018) also observed negative relations between institutional ownership and firm financial performance. The insignificant effects of institutional ownership on the other financial performance indicators (ROA, ROE and Tobin's q) aligns with King IV's observation of the lack of involvement by institutional investors (Zhang, 2016). This suggests that institutional owners in the South African market are not fulfilling their prescribed responsibilities as outlined by CRISA and King IV.

Family ownership shares a negative relationship with Tobin's q, where family owners own at least 20% of the total shareholding. These findings are in line with Klein *et al*. (2005), who discovered a negative association between family ownership and the Tobin's q of Canadian firms. Similar to the aforementioned ownership types, the negative influence from family shareholders may also be a consequence of the entrenchment effect, where family shareholders make decisions in the interest of family members rather than the financial wellbeing of the firm (Abdullah *et al*., 2019). In addition, firms with a significant level of family ownership are known to deviate from the standard corporate governance practices, which may be detrimental to their financial performance (Anderson and Reeb, 2003).

Contrary to the abovementioned ownership variables, there is no evidence of a significant relationship between government ownership and the financial performance of JSE-listed firms. This corroborates the findings of the South African study by Komati (2017), who explained that the average of 7.28% of government shareholding on the JSE, reported for 2004-2014, was insufficient to have any noticeable impact on the efficiency and profitability of firms. Accordingly, based on the average governmental shareholding recorded in table 3-4, it can also be assumed that an average of 5.1% is not enough to experience the effects of government shareholders. Government ownership may be minimal on the JSE due to the fact that most SOEs, aside from Telkom, are unlisted companies.

Turning to the control variables, on the one hand, firm size, the dividend payout ratio, and the asset turnover ratio explain firm performance across the different measures, as depicted by their statistically significant coefficients in table 3-14. On the other hand, firm age, leverage, and GDP growth are statistically insignificant, inferring that they have no impact on firm performance. The results show that firm size exerts a positive effect on ROA and ROE, but a negative effect on Tobin's q. The positive impact suggests that larger companies are more diversified and employ better technology that could contribute positively to firm profitability (Voulgaris and Lemonakis, 2014). In contrast, the negative effect can be interpreted as the diseconomies of scale that is reflected on the firm's market valuation (Zavala and Salgado, 2019). As the size of the firm increases, it experiences inefficiencies (diseconomies of scale) that will cause its market value to diminish.

The dividend payout ratio positively impacts all financial performance indicators, supporting the view of Jiraporn *et al.* (2011) mentioned in section 3.4.1 (correlation analysis), whereby larger dividend payouts increase the level of external monitoring, which in turn, enhances the performance of firms. The asset turnover ratio has a positive effect on firm performance (ROA and ROE), which implies that greater asset use efficiency contributes to enhanced performance (Baik *et al*., 2013). This coincides with the expectations of the relationship between the asset turnover ratio and firm performance outlined in section 3.3.2.3. However, table 3-14 suggests that the efficient utilization of company assets may only benefit the financial performance of firms, but not its market valuation, as per the insignificance of EPS and Tobin's q.

Table 3-14 also documents the results of the Arellano-Bond autocorrelation test and Hansen test of overidentification, outlined in section 3.3.5.3. The first order (AR (1)) test yields p-values that are less than the 10% level of significance for all financial performance measures, thus signalling a rejection of the null hypothesis, while the second order (AR (2)) test returns p-values that are greater than the 10% level of significance, resulting in the failure to reject the null hypothesis. These findings validate the efficacy of the GMM analysis (Roodman, 2009) because the residuals in AR (1) are correlated, whereas there is no AR (2) serial correlation, hence, satisfying the exogeneity assumption (Phung, 2015). Regarding the Hansen test of overidentification, the insignificant p-values in table 3-14 leads to the inability to reject the null hypothesis which stipulates that the instruments used in the GMM analysis are valid (Wintoki *et al*., 2012). Therefore, both specification tests reinforce the validity and reliability of the system GMM results in table 3-14.

3.4.3.2. The test of non-linearity

Based on the evidence of non-linearity presented in section 3.2 of the empirical evidence, it is important to acknowledge that the impact of ownership structure on financial performance may vary according to the proportion of shareholding held by each ownership type. Thus, this chapter conducts non-linearity tests specified by a combination of the quadratic test in equation 3.2 and the SLM test introduced in section 3.3.3.2. These tests are performed for managerial, foreign, institutional, and family ownership. Government ownership is not included within this analysis since no significant relationship was detected in table 3-14. This indicates that government ownership exhibits no effect (linear or non-linear) on firm performance.

Table 3-15 (page 120) displays the results of the quadratic regression from equation 3.2 under the system GMM of equation 3.11. In contrast to section 3.4.3.1, continuous variables for foreign ownership and family ownership are used in this section as the dummy variables cannot be converted into quadratic terms. Moreover, it is not possible to estimate optimal levels of ownership for a dummy variable because of its binary nature (Barreto and Howland, 2010), as stipulated in section 3.3.2.2.

Table 3-15: GMM Regression Results for the Non-Linear Relationship between Ownership Structure and Financial Performance.

	ROA	ROE	EPS	Tobin's q
Financial Performance$_{t-1}$	**0.292**	**0.265**	**0.270**	**0.604**
	(5.67)***	**(6.49)*****	**(2.70)*****	**(15.36)*****
Financial Performance$_{t-2}$	0.052	-0.019	0.034	0.011
	(1.34)	(0.48)	(0.62)	(1.04)
MAN	0.316	0.694	0.026	-0.408
	(1.71)	(1.41)	(0.58)	(0.68)
MAN^2	-0.326	-0.795	-0.043	-0.113
	(1.16)	(1.11)	(0.70)	(0.10)
FOR2	0.015	**0.885**	0.010	0.009
	(0.70)	**(2.66)*****	(1.30)	(0.12)
FOR2^2	0.037	**-1.116**	0.039	0.036
	(0.56)	**(2.34)****	(0.66)	(0.10)
INS	-0.087	-0.820	-0.041	-0.487
	(0.26)	(1.16)	(0.90)	(0.80)
INS^2	0.134	0.910	0.024	0.447
	(0.33)	(1.13)	(0.52)	(0.72)
FAM2	0.007	1.359	-0.037	0.535
	(0.01)	(1.40)	(0.36)	(0.25)
FAM2^2	0.234	-3.142	0.058	-2.650
	(0.13)	(1.34)	(0.26)	(0.62)
LNSIZE	**0.026**	0.019	0.002	-0.022
	(2.27)**	(0.80)	(0.47)	(0.43)
LNAGE	-0.017	-0.018	0.004	-0.021
	(1.62)	(1.21)	(0.80)	(0.61)
LEV	0.046	-0.150	0.027	-0.314
	(0.81)	(1.17)	(1.03)	(0.93)
DIVPAY	**0.186**	**0.246**	**0.069**	**0.789**
	(3.67)***	**(2.60)*****	**(1.73)***	**(2.64)*****
ASTO	**0.030**	**0.085**	0.005	-0.045
	(1.77)*	**(2.64)*****	(0.74)	(0.62)
GDPG	1.589	-0.804	-0.085	-6.502
	(1.29)	(0.76)	(0.22)	(1.34)
AR(1) p-value	0.000***	0.000***	0.085*	0.000***
AR(2) p-value	0.229	0.279	0.975	0.332
Hansen J p-value	0.787	0.768	0.987	0.632

Notes: Table 3-15 reports the impact of the lagged financial performance, ownership (manager (MAN), foreign (FOR2), institutional (INS)) and family (FAM2)), quadratic ownership (manager (MAN²), foreign (FOR2²), institutional (INS²) and family (FAM2²)) and control variables on current financial performance. AR(1) and AR(2) are the respective first- and second-order tests for serial correlation in the first-differenced residuals. Hansen J is the test for overidentification of the instruments. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Source: Own estimation (2022)

In line with table 3-14, table 3-15 confirms the validity of the GMM instruments and estimates as the specification tests demonstrate that the system GMM results and instruments are valid. Aside from the lack of significance of the impact of firm size on ROE and Tobin's q, the results largely corroborate the effects of the control variables on the financial performance of firms that are reported in the previous section. The insignificant coefficients for the squared variables of managerial, institutional, and family ownership suggests that these ownership identities have a linear relationship with firm performance, as depicted in table 3-14. In contrast, the significant

coefficients of the foreign ownership variable and its quadratic term insinuate that a non-linear relationship exists between foreign ownership and firm performance, in respect of ROE only.

Non-linear relationships are classified as either U-shaped or inversely U-shaped. Based on the positive linear coefficient of foreign ownership in conjunction with its negative quadratic term documented in table 3-15; the non-linear relationship found in this chapter is characterised as an inverse U-shaped relationship. Accordingly, this suggests that the initial increase in foreign shareholding elevates the ROE of JSE-listed firms. However, when the concentration of foreign ownership exceeds a certain level of total shareholding, foreign investors begin to erode the ROE of firms.

To verify the presence of the non-linear relationship between foreign ownership and ROE, this chapter also implements the SLM test. In addition to validating non-linearity, this test also approximates the optimal value of foreign shareholding for JSE-listed firms. The SLM test is not performed for the other ownership forms (managerial, institutional and family ownership), as the quadratic test confirmed their linear nature.

The results for the SLM test are presented in table 3-16 below. Following the IMF definition of foreign ownership, as specified in sections 3.3.2.2 and 3.3.3.2, firms with less than 10% of foreign shareholding are excluded from the SLM analysis. As such the minimum and maximum values of foreign ownership are adjusted to 10% and 99.7% (maximum foreign ownership in table 3-4).

Table 3-16: U-Test Regression Results of the SLM Test.

	ROE
Slope at $FOR2_{min}$	0.661***
	(2.729)
Slope at $FOR2_{max}$	-1.341**
	(-2.091)
U test statistic	2.09**
Extreme point	0.396
95% Fieller interval	[0.310; 0.784]

This table reports the results of the SLM test for an inverse U-shaped relationship between ROE and foreign ownership. $FOR2_{min}$ and $FOR2_{m}$ refer to the minimum and maximum values of foreign ownership with the former defined as 10%. 10% is used as the minimum value for foreign ownership in accordance with the IMF guidelines. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

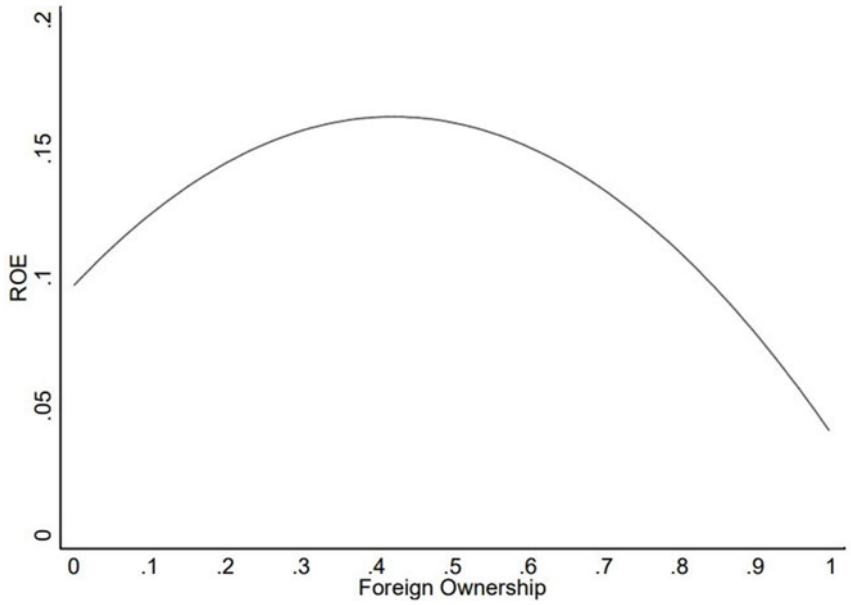
Source: Own estimation (2022)

The above table verifies the findings of table 3-15 of the presence of an *inverse* U-shaped relationship between foreign ownership and the ROE of JSE-listed firms. This is supported by the positive slope reported at the minimum level (0.661) and the negative slope (-1.341) reported at the maximum level of foreign ownership. Moreover, the extreme point (0.396) and

the Fieller interval (0.310 to 0.784) fall within the bounds of the minimum and maximum percentages of foreign ownership (0.1 to 0.997), thereby violating the conditions of a U-shape in equation 3.3. For that reason, the null hypothesis expressed in equation 3.4 for an inverse U-shape cannot be rejected, whereas the alternative hypothesis in equation 3.5 for a U-shaped relationship is rejected. As the slope at $FOR2_{min}$ is greater than 0 ($\alpha + 2\lambda(FOR2_{min}) = 0.662$) and the slope at $FOR2_{max}$ is less than 0 ($\alpha + 2\lambda(FOR2_{max}) = -1.34$), the constraints of an inverse U-shaped curve are met.

The extreme point of 0.396 reflects the optimal level of foreign ownership. As foreign ownership rises, the ROE of JSE-listed non-financial companies initially improves, but once the level of foreign ownership exceeds 39.6%, the influence of foreign ownership turns negative, as displayed in figure 3-1 below. An inverse U-shaped relationship between foreign ownership and firm performance coincides with several studies reviewed in section 3.2.2.2 (such as Gurbuz and Aybars, 2010; Sueyoshi *et al.*, 2010; Greenaway *et al*. 2014; Viet, 2013; Gupta *et al.* 2021), while the optimal level of 39.6% of foreign ownership is close to the 39% reported for Ukraine (Akimova and Schwodiauer, 2004), 40% in Japan (Ferris and Park, 2005) and 43% in Vietnam (Phung, 2015).

Figure 3-1: U-shaped Relationship between Foreign Ownership and ROE.



Source: Own construction (2022)

As mentioned in section 2.4.2, the agency theory considers foreign shareholders as effective monitors (Choi and Park, 2019) who necessitate transparent financial and corporate governance (Nugroho *et al*., 2020), which in turn leads to increased firm performance. In addition, as per the resource-based theory, foreign shareholders can also enhance company performance

through the transfer of managerial proficiencies, advanced technology, and scarce skills, thus providing firms with competitive advantages that result in superior financial performance (Gurbuz and Aybars, 2010). These attributes of foreign shareholders may explain their positive impacts on firm performance, however, in spite of these benefits, once foreign shareholders surpass a certain percentage of ownership, they bear an entrenchment effect on minority shareholders, which sequentially erodes firm performance (Morck *et al*., 1988).

The increase in financial performance that JSE-listed firms experience with foreign ownership may be a result of the implementation of more stringent corporate governance practices enforced by foreign shareholders (Gillan and Stark, 2003). In addition, foreign firms in South Africa are considered as more technologically advanced than their domestic counterparts (Kollamparambil and Jogee, 2018), thus highlighting the presence of a competitive advantage in foreign firms. The foreign firm's advancement in technology may emerge from foreign investors sharing their technical knowledge as well as introducing cutting-edge technology (Belderbos, 2003; Sazali, Raduan, Jegak and Haslinda, 2010).

In addition to the entrenchment effect, the negative impact from foreign ownership may also be a consequence of the liability of foreignness. Zaheer (1995: 343) characterised the liability of foreignness as "all additional costs a firm operating in a market overseas incurs that a local firm would not incur". According to Hymer (1976), local firms also have competitive advantages over foreign counterparts, such as broader access to market information, a more stable business environment, and no exposure to foreign exchange uncertainties. As such, the performance of foreign firms may be impaired as they must compensate for the liability of foreignness (Barbosa and Louri, 2005).

Gurbuz and Aybars (2010: 358) observed the issue of liability of foreignness in Turkey by acknowledging that "local bonds and relationships among domestic companies, their owners and their managers provide some advantages to domestically-owned firms that cannot be attained by majority foreign-owned companies". This can also be pertinent to the South African market since local owners are likely to be more knowledgeable and acquainted with the dynamics of the South African environment, including corporate governance structures, the target market, business practices and the legal and regulatory frameworks. Therefore, when foreign ownership exceeds 39.6% of total shareholding for firms listed on the JSE, the effect of entrenchment and the liability of foreignness may be responsible for foreign ownership deteriorating firm performance. Based on the optimal level of foreign ownership, it is suggested

that local shareholders constitute at least 61% of the total ownership to retain optimum firm performance and prevent the expropriation of minority local shareholders (Phung, 2015).

As seen in section 3.2.2.2, similar patterns of an inverse U-shaped effect of foreign ownership were observed in firms operating in China (Greenaway *et al*., 2014), Vietnam (Viet, 2013; Phung, 2015), India (Gupta *et al*., 2021), Ukraine (Akimova and Schwodiauer, 2004), and Turkey (Gurbuz and Aybars, 2010). This suggests that South Africa shares similarities with these developing countries, in terms of excessive foreign ownership eroding firm performance. Regarding institutional ownership, South Africa aligns with Iran (Mashayekhi and Bazaz, 2008) and Jordan (Zeitun, 2009), experiencing negative impacts of institutional investors due to corporate governance deficiencies faced within these countries. The adverse effects of family ownership are consistent with observations from Pakistan (Abdullah *et al*., 2019), Thailand (Buachoom, 2017; Al Farooque *et al*., 2020) and Ghana (Kotey *et al*., 2019). South Africa's resemblance to Ghana (Darko *et al*., 2016) and Jordan (Zeitun, 2009) is further underscored by the insignificant impact of government ownership, attributed to low shareholding. Nevertheless, while South Africa shows similarities with these countries, differences are also evident in others, as seen in section 3.2.

South Africa's uniqueness is reflected through its effects of managerial ownership, which positively influences financial performance (ROE) but negatively impacts market performance (Tobin's q). This discrepancy may indicate that, although managerial ownership enhances firm performance, South African market participants harbour a negative perception of managerial ownership due to entrenchment.

Overall, the findings from this chapter suggest that, apart from managerial ownership, South Africa shares similarities with certain developing countries regarding the impact of ownership structure on financial performance.

3.5. CHAPTER SUMMARY AND CONCLUSION

The aim of this chapter is to evaluate the relationship between ownership identities (managerial, foreign, institutional, government, and family) and the financial performance of 267 non-financial firms listed on the JSE from 2004-2021. This chapter provides an empirical review of the impact of the ownership types on firm performance, which gives prominence to three strands of examination, i.e., linear relationships, non-linear relationships, and endogeneity. Therefore, the secondary objectives of this chapter are to establish if endogeneity

exists and whether the relationship between ownership structure and financial performance is either linear or non-linear. In addition, this chapter also estimates the optimal value of ownership required for optimum firm performance. As previously stated, since the non-linearity and endogeneity of ownership structures are not addressed in earlier South African research, the secondary objectives of this chapter make an original contribution to the field.

In order to gain insight on the issue of endogeneity between the ownership- performance nexus, this chapter conducted three endogeneity tests, namely the test of dynamic completeness, test of reverse causality, and the test of strict exogeneity. The results generated from all tests provided evidence of an endogeneity bias between the ownership structure- firm performance relationship in the South African market. This outcome is expected based on the increasing attention that the endogeneity issue has gained surrounding ownership and performance-based research (for example Bhattacharya and Graham, 2007; Shyu, 2011; Fauzi and Locke, 2012; Din *et al*., 2021).

This chapter therefore utilised the system GMM estimation approach to examine the relationship between ownership (managerial, foreign, institutional, government and family) and financial performance (ROA, ROE, EPS and Tobin's q) due to its capacity to eliminate the endogeneity bias and produce reliable estimates. The results produced when modelling the linear specification found significant effects sourced from managerial, foreign, institutional, and family ownership, which aligned with the theoretical foundations of the agency theory and the resourced-based theory. In particular, managerial ownership shared a positive relation with ROE, but a negative relation with Tobin's q; foreign ownership positively affected ROE; institutional ownership negatively impacted EPS; and family ownership deteriorated Tobin's q. The positive effects were associated with incentive alignment and competitive advantages, whereas the negative effects were connected mainly to entrenchment.

For the purpose of detecting a non-linear relationship, this chapter employed quadratic equations in conjunction with the SLM test for increased robustness. The SLM test has not yet been applied in this context, and so this application provides an original contribution to the empirical work around optimal ownership structures. Both the quadratic equations and SLM tests displayed evidence of non-linearity between the relationship of foreign ownership and ROE, in which the SLM test estimated an optimal value of 39.6%. In particular, the non-linear relationship between foreign ownership and ROE resembled an inverse U-shape, whereby foreign ownership benefited firm performance as long as the level of shareholding was below 39.6%. However, when foreign ownership surpassed 39.6%, firm performance (ROE)

declined. Managerial, institutional, and family ownership were presumed to have a linear relationship with firm performance due to the lack of significance of its quadratic terms. Conversely government ownership exerted no significant influence on the financial performance of firms, for which this chapter attributed to the low level of government shareholding in JSE-listed firms.

CHAPTER FOUR: THE CONSTRUCTION OF A CORPORATE GOVERNANCE INDEX AND SUBINDICES

4.1. INTRODUCTION

The two firm fundamentals that are of central focus to this dissertation are the financial performance and corporate governance of firms. Accordingly, chapter three addressed the relationship between the ownership identities (managerial, foreign, institutional, government, and family) and the financial performance of firms listed on the JSE. A similar procedure is undertaken in order to investigate the relationship between ownership structure and corporate governance, however, before the investigation can be conducted; a reliable and valid measure for the corporate governance of JSE-listed firms needs to be established.

According to Da Silva and Leal (2005: 4), there has been an ongoing debate on "how to measure the quality of firm corporate governance". In particular, there are two major competing models in the extant literature of corporate governance: (i) the equilibrium variable model; and (ii) the compliance index model (Ntim, 2009; Areneke, 2018; Kobuthi, 2018). On the one hand, the equilibrium variable model is a rendition of the individual effects of corporate governance mechanisms, and therefore utilises a variety of isolated elements (for example board structure, auditing, financial disclosures, shareholder rights and risk management) to quantify the quality of corporate governance in firms (Albassam, 2014). On the other hand, the compliance index model explores the effects of corporate governance as a bundle and proceeds to construct an index that is aggregated by a set of corporate governance practices (Beiner, Drobetz, Schmid and Zimmermann, 2006; Black *et al*., 2017).

Following the global proliferation of corporate governance codes, the compliance index model gained substantial recognition within corporate governance literature, as firms adopted the recommended provisions as a set rather than individually (Shabbir and Padget, 2005). For example, the King Reports outline broad corporate governance provisions which further encompasses a set of sub-provisions. Therefore, in order to be in compliance with the King Reports, JSE-listed firms need to implement a bundle of provisions. An index that aggregates a set of corporate governance mechanisms may therefore be a more suitable proxy compared to a single corporate governance mechanism in isolation, as it provides a more holistic understanding of the overall effectiveness of corporate governance (Srivastava, Das and Pattanayak, 2019). This is supported by the study of Black *et al*. (2003: 8) who found that "the

elements of the corporate governance index have more predictive power when aggregated into an index".

In addition to the construction of an overall corporate governance index, the compliance index model also involves the construction of various subindices which represents the subcategories of corporate governance (Ntim, 2009). These subindices comprise of individual distinct corporate governance elements that are aggregated to produce the overall index (Black *et al*., 2006). This infers that the development of subindices is necessary as it may elucidate the variation in overall corporate governance across firms (Kowalewski *et al*., 2008). For this reason, the construction of corporate governance indices is considered as a highly labour-intensive approach (Hussainey, Schleicher and Walker, 2003; Beattie, McInnes and Fearnley, 2004). Nonetheless, Ntim (2009) argued that the approach is still advantageous because it establishes a country-specific corporate governance measure, as indices are predicated on distinct provisions that are relevant to a particular country.

Hence, for the purpose of ascertaining an accurate measure for the corporate governance in JSE-listed firms, which can thereafter be used to aid the study of the ownership-corporate governance nexus in chapter five; the overarching aim of this chapter is to construct a corporate governance index and corresponding subindices that capture the major sections of the King Reports (King II, King III, and King IV), such as board characteristics, accounting and auditing, and risk management. These areas have been consistently identified as crucial aspects of corporate governance since the inception of the original King Report (King I), as mentioned in chapter two (section 2.3). This is because the involvement of the board of directors, audit committees, and risk management committees are integral in preventing corporate governance failures (Turley and Zaman, 2004). The encapsulation of King Codes ensures that the constructed index is distinct in its coverage of corporate governance practices under the South African framework, specifically. Based on the fact that South Africa lacks a formal corporate governance indicator, the indices constructed in this study contributes greatly towards understanding the levels of compliance with good corporate governance practices and may thus provide important implications for policymakers and practitioners.

To the author's knowledge, there are only two South African studies on this subject, namely those conducted by Ntim (2009), Ntim (2013) and Waweru (2014). The unpublished study of Ntim (2009) constructed a corporate governance index based on the recommendations of the King II report for the top 100 JSE-listed firms from 2002-2006. Ntim (2013) adopted the identical constructure procedure from his 2009 study in order to create a corporate governance

index for 169 JSE-listed firms, from 2002 to 2007. In contrast, Waweru (2014) developed an index that captured the corporate governance quality of the 50 largest South African firms and 49 largest Kenyan firms from 2006-2010. The index was therefore predicated on governance factors featured in the Institute of Shareholder Services (ISS) and the King III reports.

The studies of Ntim (2009), Ntim (2013) and Waweru (2014) suffered from limitations stemming from their insufficient sample size, timeframe, and the lack of robustness tests. For instance, the top 100 sampled firms in Ntim's (2009) study only accounted for approximately 34% of the JSE population (i.e., 291 listed non-financial firms) during the study period, thus limiting the generalisability of the results for other JSE-listed firms. Similarly, Waweru (2014) stated that his results could not be applied to other smaller firms in both South Africa and Kenya due to the study sample only constituting large companies. The five-year sample period is also comparatively short (Ntim, 2009), and may fail to adequately capture underlying patterns and rare events, such as the issuance of different King Reports. Finally, the failure to perform robustness tests by all studies, gives rise to doubts regarding the reliability and validity of their indices as corporate governance measures. These constraints indicate that both studies offer an incomplete understanding of the quality of corporate governance in South African firms.

Although the extant literature demonstrated that the construction of corporate governance indices is feasible, there is still an ongoing concern surrounding "what they actually measure", as the robustness of the indices and subindices were rarely addressed in previous studies (Black *et al*., 2017: 397). The absence of robustness tests raises concerns about the dependability of the results in existing studies (Ntim, 2009). To manage such concerns, this chapter therefore performs adequate robustness checks on the constructed index and subindices. Sullivan (2011) inferred that a robust instrument should be a reliable and valid measure of the underlying aspect. In particular, a reliable index consists of items that are internally consistent and reflects the same underlying aspect, while a valid index accurately captures the aspect it is intended to assess (George and Mallery, 2003; Heale and Twycross, 2015; Hajjar, 2018). Establishing both reliability and validity during the development of the index ensures that it is a robust and useful instrument for effectively measuring the targeted concept (Bruin, 2010). Therefore, to provide a complete assessment on the robustness of the constructs, this study implements separate reliability and validity statistical tests, such as the Cronbach's alpha and the Principal Component Analysis (PCA, as defined in chapter one), respectively.

The dearth of studies that use compliance index models in the South African environment, in conjunction with the absence of robustness tests within this strand of literature leads to the necessity of this study, which aims to construct a reliable and valid index that reflects the level of compliance of corporate governance practices among companies listed on the JSE. This is achieved by answering the following research questions:

IV. Is the constructed corporate governance index and corresponding subindices reliable measures of corporate governance compliance in JSE-listed firms?

V. Is the constructed corporate governance index and corresponding subindices valid measures of corporate governance compliance in JSE-listed firms?

This chapter commences by providing a theoretical overview of two empirical models of corporate governance, followed by a review on existing literature that encompasses researcher-constructed corporate governance indices. Subsequently, a detailed explanation of the construction methodology is provided, after which the Cronbach's alpha test and PCA are extensively discussed. Thereafter, the chapter ceases with the analysis of the test results.

4.2. EMPIRICAL LITERATURE ON CORPORATE GOVERNANCE INDICES

There are two main empirical models identified in corporate governance literature: the equilibrium variable model and the compliance index model. Whilst the previous section provided a brief overview of these models, this section aims to provide a more robust discussion of the two models. The section therefore commences with a brief overview of the central theoretical arguments underlying both models, followed by a discussion of the superiority of the compliance index framework. Thereafter, the empirical evidence on corporate governance indices from compliance index models, in particular, is reviewed. Lastly, this section concludes with the summary of results.

4.2.1. The Equilibrium Variable Model versus the Compliance Index Model

As previously mentioned, the equilibrium variable and the compliance index models are the two preeminent competing frameworks that exist for the quantification of corporate governance (Ntim, 2009). The equilibrium variable model is the traditional approach that was popularised before the worldwide proliferation of recommended codes of corporate governance in the 1990s (Areneke, 2018). Prior to the propagation of the codes, corporate governance mechanisms were determined primarily by firm-specific needs and requirements (Danielson

and Karpoff, 1998; Albassam, 2014). The equilibrium variable model is therefore based on the assumption that internal corporate governance structures (such as board compositions, CEO duality, audit independence, etc) are derived individually within a firm (Agrawal and Knoeber, 1996; Ntim, 2009). This infers that each firm has its own optimal corporate governance structure, which is internally determined without any external interference (Gyakari, 2009). As such, to measure the quality of corporate governance in firms, the equilibrium variable model explores the individual effects of corporate governance practices (Albassam, 2014).

In contrast, the compliance index model "assumes that a company's governance mechanisms are externally imposed" (Ntim, 2009: 91), therefore, implying that firms adopt corporate governance structures as a bundle, rather than individually (Shabbir and Padget, 2005; Gillan, 2006). This was specifically the case following the major corporate failures of the late 1980s and early 1990s (Areneke, 2018), which led to the global diffusion of corporate governance codes (such as, Cadbury Codes and King Codes) where firms implemented a set of corporate governance practices (Kobuthi, 2018). The cornerstone of the compliance index model thus posits that firms are affected by several mechanisms with possible interactive effects in an integrated framework (Gillan, Hartzell and Starks, 2003; Albassam, 2014). According to Biswas (2012), elements of corporate governance are likely to interact with each other, thus implying that it is improbable that individual mechanisms provide a complete understanding of the effects of corporate governance. Consequently, rather than focusing on governance elements in isolation, the compliance index model proposes the construction of a corporate governance index which encapsulates a broad set of corporate governance provisions (Beiner *et al*., 2006; Bebchuk, Cohen and Ferrell, 2009; Srivastava *et al*., 2019).

As discussed in chapter two (section 2.3), South Africa possesses an advanced corporate governance system due to the hybrid nature of the King Code of Good Corporate Governance. Although the compliance of the King Codes is not mandatory by law, the importance of implementing these practices in firms were elevated in 2017, following the JSE's enforcement of certain King IV provisions as a condition for listed firms to maintain their listings on the JSE (Giles, 2017). Hence, the theoretical underpinnings of the compliance index model exemplify its suitability for the South African market since JSE-listed firms are strongly encouraged to apply the provisions of the King Reports (Ntim, 2009; Waweru, 2014). The following subsection therefore reviews empirical evidence on compliance index models in the form of constructed corporate governance indices across various countries.

4.2.2. Empirical Evidence on Constructed Corporate Governance Indices

Gompers *et al*. (2003) are among the pioneers who utilise self-constructed corporate governance indices to facilitate research surrounding the relationship between corporate governance and firm performance in the U.S. In particular, the constructed index was predicated on the compliance of 24 corporate governance provisions[18] published by the Investor Responsibility Research Centre. These provisions were primarily centralised on anti-takeover and shareholder's rights, which were further divided into four broad categories: (i) delay, (ii) protection, (iii) voting, and (iv) other. Accordingly, these categories translated into four subindices that aggregated the overall corporate governance index. Gompers *et al*. (2003) applied a binary scoring technique, where a score of one point was awarded for the presence of each provision, and zero otherwise. The authors claimed that although the index did not provide a full assessment on the relative effects of various provisions, "it has the advantage of being transparent and easily reproducible" (Gompers *et al*., 2003: 8).

The study of Gompers *et al*. (2003) gained widespread recognition in the strand of corporate governance literature, leading to the construction of indices by several other researchers. The American studies of Gillan *et al.* (2003) and Bebchuk *et al*. (2009) developed their corporate governance indices by applying the construction procedures of Gompers *et al*. (2003). Studies in other countries, however, modified certain aspects of Gompers *et al's*. (2003) method in order to account for different governance systems, market dynamics, as well as data availability. For example, Beiner *et al*. (2006) created a compliance index to examine the corporate governance- firm value nexus in Switzerland. In contrast to Gompers *et al*. (2003), Beiner *et al*. (2006) extracted data from questionnaires that were answered by firm executives. Specifically, the index was based on survey responses of 38 compliance questions across five subindices pertaining to the Swiss Code of Best Practice: (i) corporate governance commitment; (ii) shareholder's rights; (iii) transparency; (iv) board of directors and executive management; and (v) auditing and reporting, where the number of questions differed across the five categories. All 38 elements were equally weighted within the index, suggesting that they contributed equally towards the quality of corporate governance. Moreover, instead of the binary coding system adopted by Gompers *et al*. (2003), Beiner *et al*. (2006) used a five-scale

[18] The provisions are as follows: Blank Check, Classified Board, Special Meeting, Written Consent, Compensation Plans, Contracts, Golden Parachutes Indemnification, Liability, Severance, Bylaws, Charter, Cumulative Voting, Secret Ballot, Supermajority, Unequal Voting, Antigreenmail, Directors' Duties, Fair Price, Pension Parachutes, Poison Pill, Silver Parachutes, Antigreenmail Law, Business Combination Law, Cash-Out Law, Directors' Duties Law, Fair Price Law, and Control Share Acquisition Law.

range system, in which firms assigned scores between 1-5, thus allowing the index to capture various levels of compliance (i.e., full, partial, and none). The index was thereafter transformed to a scale of 0-100, where higher values suggested a greater degree of compliance, which in turn inferred a higher quality of corporate governance. As a robustness check, the authors developed another index that equally weighted the five subindices rather than the 38 elements individually. Since a positive corporate governance- firm value nexus was found when using both indices, Beiner *et al*. (2006) reported that the constructs were reliable as the overarching results of the study remained the same.

To ensure accuracy in the study of FDI's impact on corporate governance, Ananchotikul (2007) designed an index reflecting the quality of corporate governance of 365 firms listed on the Thai Stock Exchange. This index enclosed 78 variables across five widespread subindices of corporate governance, such as board structure, board responsibility, conflict of interest, shareholder rights, and disclosure and transparency. Similar to Gompers *et al*. (2003), Ananchotikul (2007) applied binary coding and collected public company information to construct the corporate governance index, arguing that survey questionnaires used by Beiner *et al*. (2006) were susceptible to misreporting and low response rates, which may diminish the reliability of the index. In further contrast to Beiner *et al*. (2006), this study assigned weights based on the degree of information obtained in each category instead of equal weightages. Nevertheless, Ananchotikul (2007) also applied the equally weighted system on an additional index and observed no significant changes, suggesting that weighted and unweighted indices produce similar results. Moreover, this also confirmed the strong reliability of the corporate governance index, as per Beiner *et al*. (2006).

When examining corporate governance determinants in Brazil, Silveira, Leal and Barros (2009) constructed a corporate governance index that was aggregated by four subindices (such as disclosure, board structure and operation, ethics and conflicts of interest, and shareholder rights) of 24 individual variables. Since the index was scored using a binary scheme, for which a favourable answer earned one point, and zero for vice versa, the highest possible score for the overall index translated to 24 points. In accordance with Gompers *et al*. (2003) and Ananchotikul (2007), this index was also based on publicly available information sourced from firm filings and annual reports. Silveira *et al*. (2009: 174) applied an equally weighted system to the elements of the corporate governance index, arguing "that this procedure is probably less questionable than imposing more complex weighting schemes". The authors tested a weighted version of the index, in which different weights were assigned subjectively to specific

variables. As per the aforementioned studies, the overall results remained the same irrespective of the weightage system, thus evidencing the robustness of the constructed index.

A South African study by Ntim (2009) constructed a compliance index for the purpose of examining the corporate governance- performance nexus of 100 JSE-listed firms, from 2002-2006. The index was augmented on 50 provisions that covered six areas of the King II report (i.e., board and directors, risk management, internal audit and control, accounting and auditing, integrated sustainability reporting, and compliance and enforcement), where all compliance information was extracted directly from firm annual reports. The study adopted binary coding and an unweighted (i.e., equally weighted) scheme across all 50 provisions. Ntim (2009) claimed that an unweighted index prevented the possibility of biasedness towards a certain set of corporate governance elements as there was no subjective allocation of weights. Although the index was equally weighted across provisions, the 50 provisions were not equally distributed across the six subindices. Specifically, the board and director's subindex singlehandedly enclosed 27 of the 50 provisions as this supported the premise of the King II report, in which majority of the King Codes focus on the board of directors as they are an integral component of the corporate governance system. In contrast to the studies above, Ntim (2009) did not assess the robustness of the constructed index. In a subsequent study, Ntim (2013) employed the same construction approach to devise a corporate governance index for his investigation into the relationship between governance and financial performance among 169 South African listed firms spanning from 2002 to 2007.

A subsequent study by Waweru (2014) extended his analysis to Kenya, developing an index that measured the quality of corporate governance for firms in both South Africa and Kenya, from 2006-2010. In order to ensure that the index was pertinent to both countries, Waweru (2014) incorporated specific corporate governance factors which aligned with the provisions published in the ISS and the King III reports. Similar to the composition of Ntim (2009), this index was aggregated by 51 variables which were distributed across six broad sections of corporate governance (i.e., board; charter or laws; audit; director composition; progressive practices; and ownership) and scored through a binary coding system. Similar to Ntim (2009), Waweru (2014) also did not perform diagnostic checks to examine the robustness of the index.

Munisi and Randøy (2013) developed a corporate governance index to assess listed companies across various Sub-Saharan African countries, excluding South Africa, Zimbabwe, Côte d'Ivoire, and Mozambique. This index covered corporate governance practices related to the board of directors, audit committee, disclosure and transparency, remuneration committee, and

shareholder's rights. Similar to Ntim (2009), Munisi and Randøy (2013) utilized binary coding and an equal weighted system, and also failed to conduct robustness tests to assess the reliability of the index. In a subsequent study, Munisi (2020) employed this index to investigate the relationship between ownership structure and corporate governance.

Similar to Waweru (2014), the study by Ibrahimpašić (2012) also aimed to construct a corporate governance index that was well-suited for two countries, specifically Czech and Croatia. For this reason, the author entrenched the index with a broad set of global Organization for Economic Cooperation and Development (OECD) recommendations relating to board structure and functioning, conflict of interest, shareholder's rights, and disclosure and transparency. In particular, the information was obtained through surveys consisting of 40 binary corporate governance questions, which were answered by company executives. Unlike the studies above, Ibrahimpašić (2012: 31) placed greater emphasis on robustness by assessing the "internal consistency of items in a model" using three statistical tests: (i) Cronbach's alpha; (ii) Kaiser-Meyer-Olkin; and (iii) Bartlett's test. The overall findings from these tests illustrated that the elements were consistent with the underlying aspect of corporate governance, thus suggesting an adequate level of robustness from the constructed index.

In accordance with Ibrahimpašić (2012), Biswas (2012) and Otman (2014) also used survey-based OECD information to construct corporate governance indices for firms in Bangladesh and the UAE, respectively. Both studies aggregated their indices with an unweighted scheme across five broad areas, i.e., ownership structure and investor rights, financial transparency and information disclosure in the annual report, board, management structure and process, auditing, and corporate responsibility and compliance. Biswas (2012) applied a binary scoring system to his index, while Otman (2014) implemented the five-scale rating used by Beiner *et al.* (2006) as a way to account for the varying compliance requirements of different corporate governance practices. Moreover, Biswas (2012) failed to perform further tests to examine index robustness, whereas Otman (2014) validated the reliability of his index with results from the Cronbach's alpha test.

The use of Cronbach's alpha as a measure of robustness extended to later studies surrounding researcher- constructed corporate governance indices. An Egyptian study by Shahwan (2015) explained that an alpha coefficient greater than 0.70 suggests that an instrument has an acceptable degree of internal consistency with the other elements in the construct, signifying strong reliability. As such, the corporate governance index constructed in Shahwan's (2015) study was considered to be a reliable instrument because it obtained a Cronbach's alpha value

of 0.75. The index enclosed 15 questions distributed across four broad sections of corporate governance, such as, disclosure and transparency, composition of the board of directors, shareholder's rights and investor relations, and ownership and control structure. Shahwan (2015) claimed to eliminate the risk of third-party responses by ensuring that all questions were answered with public information from annual reports and firm websites. The index rating was based on the binary scoring method and followed an unweighted structure. In line with Ananchotikul (2007) and Ntim (2009), Shahwan (2015) explained that weighted and unweighted indices are closely correlated, therefore no significant difference can be expected.

In addition to Waweru (2014), Kobuthi (2018) also created a corporate governance index to measure the level of corporate governance compliance for firms in Kenya. However, instead of the ISS, Kobuthi's (2018) index was underpinned on the Capital Markets Authority provisions for firms listed on the NSE, namely, board operations and control, rights of shareholders, stakeholder relations, ethics and social responsibilities, accountability, risk management and internal audit, transparency and disclosure, supervision, and enforcement. Moreover, this index relied on survey questionnaires answered by CEOs, resulting in an 87.5% response rate. Kobuthi (2018) scored the index using an ordinal scale that ranged from 0-1 in intervals of 0.25, to account for partial levels of compliance. Using the Cronbach's alpha test, this study confirmed the reliability of the main index and the seven subindices by obtaining alpha coefficients ranging from 0.715 to 0.881. Taking into consideration the drawbacks associated with survey questionnaires, as highlighted by Ananchotikul (2007) and Shahwan (2015), Kobuthi (2018) performed a content validity test to assess the reliability of the survey responses. The results inferred that the survey was appropriate as the test produced a score of 0.887, which exceeded the acceptable threshold of 0.70 (Oso and Onen, 2009). The study of Kobuthi (2018) is therefore unique to other survey-based studies as it verified the quality of the survey responses.

Black *et al*. (2017) aimed to examine the robustness of corporate governance indices developed for firms in Brazil, India, Korea and Turkey. The indices for Brazil, Korea and India were dependent on survey questionnaires, whereas public data from annual reports were used for Turkey. All main indices held four equally weighted subindices: (i) board structure; (ii) disclosure; (iii) board procedure and ownership; and (iv) shareholder rights. However, considering that corporate governance systems differ across countries, the elements within each subindex vary based on the country in question. Most elements were scored using binary variables, except for ownership components, which were scored with continuous variables.

Similar to the above studies, Black *et al*. (2017) used Cronbach's alpha to assess the reliability of the indices, for which the alpha coefficients suggested that most sub- and main indices, for most countries, were adequately reliable. In contrast to the previous studies, Black *et al*. (2017) also implemented the PCA to examine the construct validity of the instruments, i.e., whether the instruments adequately capture the underlying concept of corporate governance (Heale and Twycross, 2015). Contradicting the Cronbach's alpha, the PCA found that certain indices were not valid constructs of corporate governance, thus diminishing the overall robustness of the measures. This study is unique as it explored robustness from the lens of both reliability and validity, thus providing a more holistic diagnostic examination.

4.2.3. Summary of the Theoretical and Empirical Literature on Corporate Governance Indices

There are two competing models that are prominent within the literature of corporate governance: (i) equilibrium variable model; and (ii) compliance index model. The equilibrium variable framework explores the individual effects of corporate governance elements in isolation, whereas the compliance index model recommends the construction of corporate governance indices that aggregate a set of provisions (Beiner *et al*., 2006). The compliance index model is the most suitable framework for the South African market, as JSE-listed firms are governed by a *set* of King Code provisions. Section 4.2.1 therefore supports the rationale for adopting a compliance index model in this study.

The existing literature pertaining to corporate governance indices shows that all studies constructed their indices based on codes of best practice or governance guidelines. The most common subindices within each index encompassed the characteristics of board structure, shareholder rights, and disclosure and transparency. While the construction methodologies vary across the studies, the main criterions identified during the construction phase of the index remain consistent. In particular, the weightage, scoring system and the source of governance information were addressed in majority of the studies and therefore lay the methodological foundation for the next section.

The quality of robustness tests, however, "raises questions with respect to the reliability of the results of prior studies" (Ntim, 2009: 126). Earlier studies (such as Beiner *et al*. 2006; Ananchotikul, 2007; Silveira *et al*., 2009) performed robustness checks by altering the weightages across the indices in an attempt to decipher whether the overall results are affected. Later studies (such as Ibrahimpašić, 2012; Otman, 2014; Shahwan, 2015; Kobuthi, 2018)

adopted statistical tests, most notably the Cronbach's alpha, to assess the reliability (i.e., internal consistency) of the indices. The only study to date (known to the author) that addressed both reliability and validity is that of Black *et al*. (2017), who used the Cronbach's alpha to measure reliability and the PCA approach to address validity. The construction of corporate governance indices in South Africa is still in its infancy, with only two existing studies by Ntim (2009) and Waweru (2014). The results of both studies are questionable due to their small sample size, short study period and failure to perform robustness examinations on their constructs, which further motivates the objectives of this chapter.

4.3. RESEARCH METHODOLOGY FOR THE CORPORATE GOVERNANCE INDEX AND SUBINDICES

The empirical evidence in section 4.2.2 highlighted the different methodological processes that were undertaken in the construction phase of the corporate governance indices. Therefore, considering both the potential advantages and drawbacks of the procedures outlined in the existing studies, this section aims to formulate an appropriate construction methodology for developing the corporate governance index and subindices for JSE-listed firms specifically, based on the compliance of provisions from the King Reports (King II, King III and King IV). This section also provides a comprehensive discussion on the statistical robustness tests, namely the Cronbach's alpha and PCA, that are imperative in answering the research questions of this chapter.

This section is threefold, comprising of the data and sample period, construction procedures, and the statistical tests adopted to establish the robustness of the indices and subindices.

4.3.1. Data Description and Sample Period

This chapter is based on the data sample used in chapter three, i.e., 3246 annual observations with respect to 267 non-financial JSE-listed firms. However, due to the unavailability of the certain corporate governance data, the final data sample for this chapter resulted in 266 non-financial firms and 3168 observations, from 2014-2021. The structure of this unbalanced panel is presented in table B-1 of appendix B (page 321).

Chapter three (section 3.3.1.1) provides detailed justifications for the selected sample period of this study. In particular, the sample includes time periods preceding, concurrent with, and after the 2008 financial crisis. This therefore enables the developed constructs to encompass

the various stages of corporate governance compliance, as several countries continuously revamped their governance systems to address the company failures which transpired amid the crisis (Kang, Lee and Na, 2010; Hopt, 2013). In the South African context, the sample period provides coverage of corporate governance provisions from three editions of King Reports (i.e., King II from 2004-2008; King III from 2009-2016; and King IV from 2017), which were released subsequently in response to the financial crisis, domestic corporate failures, and fraud (Seakamela, 2011; Dzingai and Fakoya, 2017). Additionally, the timeframe also captures the several amendments made to the JSE Listing Requirements, which may impact the corporate governance structures of JSE-listed firms. For example, in 2017, the JSE Listing Rules enforced the compliance of certain King IV provisions for listed firms (Giles, 2017). The chosen sample period thus aids the construction of a comprehensive corporate governance index for the South African environment.

4.3.2. Construction Methodology for the Corporate Governance Index and Subindices

This subsection begins with a discussion of the data source, scoring method, and the corporate governance provisions that are used to construct the main index and subindices. Thereafter, the weighting system of the index is explained.

4.3.2.1. Data source

When constructing corporate governance indices, studies in section 4.2.2 either relied on survey responses from company administrators or executives (such as Beiner *et al*., 2006; Ibrahimpašić, 2012; Biswas, 2012; Otman, 2014; Kobuthi, 2018), or public data extracted from annual reports or fillings (such as Gompers *et al*., 2003; Ananchotikul, 2007; Ntim, 2009; Waweru, 2014; Shahwan, 2015). Although survey questionnaires "can be designed to acquire in-depth information on a company", the self-assessment of corporate governance is challenging as it encompasses subjects that are sensitive to the firm's welfare (Ananchotikul, 2007: 7). Therefore, self-selection and poor response rates can be expected (Shahwan, 2015). Furthermore, if companies with weak corporate governance were to report inaccurate information, then the survey ratings would fail to accurately measure the quality of corporate governance.

In comparison to survey questionnaires, annual reports are regarded as valuable resources of corporate information (Alattar and Al-Khater, 2007). The Companies Act (1973) and the JSE Listings Requirements requests that all listed firms issue annual reports. Moreover, within these annual reports, the JSE Listing Requirements requires all firms to disclose their level of

compliance with the provisions of the King Reports. The consistent and mandatory nature of annual reports therefore enlists them as a reliable and valid source of corporate governance information (Botosan, 1997; Ntim, 2009). Hence, to circumvent the potential risks associated with survey-based information, the index and subindices for this study is built on corporate governance information that was published in the annual reports of JSE-listed firms, in accordance with the work of Ntim (2009) and Waweru (2014). In other words, all questions pertaining to the compliance of King provisions are answered with public information from annual reports, which are retrieved from the IRESS database.

4.3.2.2. Scoring system

In accordance with several studies reviewed in section 4.2.2 (Silveira *et al*. 2009; Ntim, 2009; Waweru, 2014; Shahwan, 2015), a binary coding system is adopted to score the index. This scoring procedure involves manually reading each firm's annual report and thereafter awarding one point if the firm complied with the corporate governance provisions in the King Reports, and 0 otherwise (Silveira *et al*., 2009). Moreover, as per Ntim (2009), if the firm failed to disclose the compliance of any corporate governance provisions, the value of zero is awarded.

The corporate governance index for this study is predicated on 20 compliance questions (variables), which are raised by relevant provisions in King Reports (King II, King III and/or King IV), as discussed in greater detail below. Accordingly, for each of the 18 years covered (2004-2021), the highest possible score that a firm can attain is 20 points. Following Beiner *et al*. (2006), the individual scores for each of the 266 firms are thereafter converted into a percentage, in which a firm's total score in a particular year can vary between zero (0%) to 20 (100%), where 0% indicates no compliance with any provisions of the King Reports, and 100% infers full compliance, thus reflecting optimal corporate governance compliance.

4.3.2.3. Variables for the corporate governance index and subindices

As stated above, the corporate governance index is based on the provisions outlined specifically in King II, King III and/or King IV, as these reports were issued during the course of the study sample period (i.e., 2004-2021). Moreover, irrespective of the version of the King Report, the three broad major aspects of corporate governance (i.e., board of directors, audit committees, and risk management committees) remain constant within each report. For this reason, the corporate governance index is modelled through 20 compliance variables relating to the functioning of the board of directors, audit committees, and risk management committees. This results in the following subcategories: (i) Board Characteristics and Structure; (ii) Accounting

and Auditing; and (iii) Risk Management and Internal Audit. Accordingly, as per the existing studies reviewed in section 4.2.2, these subcategories form the subindices enclosed in the main index. The three subindices are further disaggregated by their corresponding categorical variables in order to encapsulate the level of compliance for each subindex. In particular, there are 12 variables distributed across the first subindex, four across the second, and four across the third.

Table 4-1 presents the corporate governance variables that constitute each subindex, along with the corresponding compliance questions and scoring rules for each question/variable. The table consists of three panels. In particular, panel A includes 12 provisions concerning board characteristics and structure, while panels B and C encloses four provisions each, which pertain to accounting and auditing, and risk management and internal audit, respectively. The variables defined in table 4-1 are thereafter discussed.

Table 4-1: Variable Definitions and Scoring Rules for the Corporate Governance Index and Subindices.

Variables	Acronyms	Questions	Scoring rule
Panel A: Board Characteristics and Structure (BCS) subindex			
Board Independence	BIND	Are majority of the board of directors independent non-executive directors (NEDs)?	1 if independent NEDs are ≥ 50%; 0 otherwise
Board Size	BS	Are there a minimum of four members?	1 if BS ≥ 4
CEO Duality	DUAL	Are the roles of chairman and CEO split?	1 if yes; 0 otherwise
Board Chairman	BCM	Is the Chairman of the firm an independent non-executive director?	1 if yes; 0 otherwise
Company Secretary	CSEC	Does a strong and supportive office of a company secretary exist?	1 if yes; 0 otherwise
Frequency of Board Meetings	FBM	How many board meetings take place every year?	1 if FBM ≥ 4; 0 otherwise
Nomination Committee	NOMC	Does a nomination committee exist?	1 if yes; 0 otherwise
Nomination Independence	NIND	Does the nomination committee consist of a majority of independent NEDs?	1 if yes; 0 otherwise
Remuneration Committee	REM	Does a remuneration committee exist?	1 if yes; 0 otherwise
Remuneration Independence	RIND	Does the remuneration committee consist only of independent NEDs?	1 if yes; 0 otherwise
Remuneration Chairman	REMC	Is the Chairman of this committee an independent non-executive director?	1 if yes; 0 otherwise
Remuneration Committee Meetings	REMM	Is there a record of attendance of meetings is disclosed?	1 if yes; 0 otherwise
Panel B: Accounting and Auditing (AA) subindex			
Audit Committee	AUDC	Does an audit committee exist?	1 if yes; 0 otherwise
Audit Committee Independence	AUDI	Does the audit committee consist of at least two independent NEDs?	1 if NEDs ≥ 2; 0 otherwise
Audit Chairman	ACM	Is the Chairman of this committee an independent non-executive director, who is also not the same chairman of the main board?	1 if yes; 0 otherwise
Audit Committee Meetings	AUDM	Is there a record of attendance of meetings is disclosed?	1 if yes; 0 otherwise
Panel C: Risk Management and Internal Audit (RMI) subindex			
Risk Management Committee	RMC	Does a risk management committee exist?	1 if yes; 0 otherwise
Disclosure of Company Risks	DCRM	Does the company disclose the actual and potential future non-systematic risks?	1 if yes; 0 otherwise
Disclosure of Policy on Risks Management	DPRM	Does the company disclose how current and future assessed risks will be managed?	1 if yes; 0 otherwise
Disclosure Policy on Internal Control	DPI	Does the company provide a narrative of existing internal control/audit?	1 if yes; 0 otherwise

Source: Own construction (2022)

A. Board Characteristics and Structure (BCS) Subindex

Panel A reflects the first subindex aggregated in the main corporate governance index, which is the characteristics and structure of a firm's board. This coincides with the studies reviewed in section 4.2.2, where the first category of the constructed index related to board characteristics

(such as Ananchotikul, 2007; Ntim, 2009; Ibrahimpašić, 2012; Kobuthi, 2018). As discussed in the agency theory in chapter two (section 2.2.1), the board of directors are regarded as internal mechanisms that align the interests of managers and shareholders, thereby minimizing agency costs (Jensen and Meckling, 1976). Furthermore, they are also responsible for appointing high-ranking employees (such as the CEO), defining corporate missions, designing, and implementing company strategies, allocating capital, setting performance targets for management, and monitoring management (Frederick, 2011; Munisi and Randøy, 2013; Badru, Ahmad-Zaluki and Wan-Hussin, 2018). Therefore, taking into consideration these core roles played by the board of directors, Filatotchev and Boyd (2009) deemed board structures as the most important determinant of the quality of internal corporate governance systems.

The importance of the board is also emphasised in King Reports, where the dynamics of the board are accentuated as the prime focus of the corporate governance structures in JSE-listed firms (Mangena and Chamisa, 2008). Existing studies showed that a firm's board consists of various characteristics that determine its level of effectiveness, such as board independence (Arcot and Bruno, 2007), size (Alqatan, Chbib and Hussainey, 2019), composition (Ntim, 2009), non-executive chairman (Garay and González, 2008), number of annual meetings (Xie, Davidson and DaDalt, 2003), amongst other factors. Therefore, following prior literature and the recommendations stipulated in the King Reports, this subindex incorporates 12 board variables to capture the compliance of board-related provisions, and ascertain its contribution to the quality of corporate governance in JSE-listed firms. Each of these variables are discussed below.

A.1. <u>Board Independence (BIND)</u>

Boards ordinarily comprise of executive directors, NEDs, and independent NEDs. Executive directors are considered as insiders who are involved in the day-to-day management of the company (Donaldson, 2016). NEDs are independent of management and are responsible for imparting objective opinions and judgment to board decisions (Zabria, Ahmadb and Wah, 2016). A NED, however, may represent a major shareholder which often interferes with the independence process of their judgement. In contrast, an independent NED is not a representative of major shareholders and thus, does not have a direct or indirect link, with the company, aside from sitting on the board (Deloitte and Touche, 2014).

In order for a board to achieve independence, majority of the board of directors are required to be independent NEDs (Ntim, 2009). Khanchel (2007) identified the independence of board

committees as one of the most imperative factors of strong corporate governance. According to Farag and Mallin (2019), independent NEDs provide an impartial oversight of managerial actions and constructive criticism to the board of directors and management. In addition, they ensure that firms comply with the required disclosure provisions, thereby improving firm transparency (Chen and Jaggi, 2000). Ntim (2009) further claimed that a board with a majority of independent NEDs ensures that minority interests are adequately protected. As such, the King Reports (i.e., King II, III, and IV) and the JSE Listing Requirements recommend a unitary board structure for JSE-listed firms, in which majority of the board of directors are independent NEDs (Waweru, 2014). Thus, the BIND variable in table 4-1 aims to capture the compliance of this provision within the corporate governance index.

A.2. Board Size (BS)

The size of the board is another critical aspect of corporate governance that significantly impacts the quality of decisions and coordination within the organization. According to Haniffa and Hudaib (2006), large boards provide increased monitoring and opportunities to secure critical business resources. However, larger boards can also lead to issues such as free-riding and slower decision-making (Lipton and Lorsch, 1992; Ntim, 2009). Although King II, King III, and King IV do not recommend a specific number of directors for a board, it presents a general principle stating that every board must be of a size that enables it to be effective (Ntim, 2009; Tshipa, 2015; PricewaterhouseCoopers, 2017). Nonetheless, the JSE Listing Requirements necessitate listed companies to maintain a minimum of four directors to retain an active listing on the JSE. Therefore, the BS variable in table 4-1 aims to measure the compliance of this requirement in JSE-listed firms.

A.3. CEO Duality (DUAL)

Customarily, the chairman is responsible for managing the affairs of the board (Bashir and Mirza, 2022), whereas the CEO is tasked with the day-to-day management of firms (Boland and Hofstrand, 2009). In the case of CEO duality, the same person assumes the roles of both CEO and chairman of the board, thus forming a combined leadership structure (Rashid, 2010). CEO duality has been a controversial practice (Rechner and Dalton, 1991), which is criticised by the proponents of agency theory. It was argued that duality may provide the CEO with a wider power base, thus increasing their incentives to pursue personal interests at the expense of the firm (Jensen and Meckling, 1976; Rashid, 2013). Furthermore, CEO duality reduces the monitoring roles of the board, thus exacerbating agency costs (Moscu, 2013). The agency

theory, therefore, is in support of the separation of the roles of CEO and chairman (Haniffa and Rahman, 2005).

This is also predicated by the King Code, as King II, King III and King IV recommend "a separation of the roles of the chairperson (who should be an independent NED) and the role of the CEO" (Waweru, 2014: 459) for JSE-listed firms, emphasizing that to achieve good governance, the two positions must be kept separate (Boutros, 2015). As such, in 2019, Eskom, an organisation already well known for its weak corporate governance system, faced substantial adversity when the chairman, Jabu Mabuza, was also appointed as the interim CEO, thereby defying the King Code of Good Corporate Governance (Magubane, 2019). Hence, in order to subsume the level of CEO duality compliance in JSE-listed firms, the DUAL variable is included in the corporate governance index.

A.4. Board Chairman (BCM)

Due to the oversight functions of independent NEDs and their capacity to provide independent judgement to the board of directors and management, global codes of corporate governance emphasised the necessity of the independent NEDs being present on a firm's board (Seakamela, 2011), as per the discussion of the BIND variable. Such functions are regarded as being largely pertinent when an independent NED is appointed as a chairman (Deloitte and Touche, 2014). According to Ntim (2009), to establish an equilibrium of power and authority in firm decision-making, the chairman of the board should be an independent NED. An independent chairman may serve as an effective unbiased mediator, ensuring that "all voices have a fair hearing" (IoDSA, 2011: 1). For this reason, King II, King III, and King IV recommend that it is beneficial for JSE-listed firms to appoint an independent NED as a chairman of the board.

A.5. Company Secretary (CSEC)

Over the past decade, the function of company secretaries has gained momentum within the field of corporate governance (Wanjiku, 2012). Lee (2018) claimed that the company secretary is responsible for the serene adoption and compliance of corporate governance practices in firms. Moreover, it is the duty of the company secretary to continually review and implement new developments of corporate governance (Maltas, 2000) in order to maintain a high level of governance of the company and its board. In conjunction with relevant specialists, the company secretary is also responsible for ensuring that the board of directors are well informed of the latest guidelines in this area (Nicholson and Kiel, 2004).

The King Committee therefore regards company secretaries as custodians of efficient internal corporate governance practices (Ntim, 2009). As such, to ensure the effective functioning of the board, King II, King III, and King IV suggest that companies appoint a secretary to support the board of directors and the compliance of corporate governance (Bouwman, 2012). In addition, recognizing the important roles of company secretaries, the JSE amended its listing requirements in 2017, and mandated the compliance of the King IV provision that recommends the presence of company secretaries in firms (Giles, 2017). This infers that listed firms are required to appoint company secretaries in order to maintain an active listing on the JSE.

A.6. Frequency of Board Meetings (FBM)

In addition to the above factors, the frequency of meetings held by the board may represent the intensity of a board's activities and its effectiveness in monitoring management (Vafeas, 1999a; Elvin and Hamid, 2015). Ceteris paribus, a higher occurrence of board meetings leads to a higher quality of monitoring, which may increase firm performance (Ntim, 2009). King II and King III recommended at least four board meetings per year, whereas the King IV does not address the minimum number of meetings to be held per year (PricewaterhouseCoopers, 2017). Nonetheless, the corporate governance index constitutes the provision, as it infers whether the board meets and reviews the firm's operations and strategic decisions (Srivastava *et al*., 2019).

A.7. Nomination Committee (NOMC)

For at least two decades, nomination committees have been put forward in corporate governance codes across several countries (Pierce and Waring, 2004). A nomination committee is responsible for nominating qualified candidates for appointment to the board of directors (Pirzada, Mustapha and Alfan, 2017). Specifically, the main objective of this committee is to identify the requisite skills required for new board directors, and thereafter accordingly nominate suitable candidates (Soana and Crisci, 2017). According to Kaufman and Englander (2005), the nomination committee possesses the authority to choose nominees that are internal or external of the firm. In order to improve board independence and board quality, Vefeas and Theodorou (1998) claimed that the committee prefers independent directorial candidates, which in turn reduces agency costs (Ntim, 2009). The importance of nomination committees is recognized by the King Committee, in which King II, King III and King IV advocated for its formation in JSE-listed firms. Therefore, the NOMC variable is included in the corporate governance index to account for whether these committees have been established in firms.

A.8. Nomination Independence (NIND)

As mentioned in the previous discussion, the nomination committee is responsible for the appointment of new board members and is thus a crucial determinant of the quality of the board (Shen, Ponomareva and Uman, 2021). This responsibility should be placed in the hands of an independent nominating committee (Vafeas, 1999b; Eminet and Guedri, 2010), as a nomination committee that consists of independent members is less prone to be inveigled by the CEO or other directors in the director appointment process (Pirzada *et al*., 2017). This increases the recruitment of external directors with necessary expertise and reputations for exercising their control over the executive directors (Ruigrok, Peck, Tacheva, Greve and Hu, 2006). Accordingly, in addition to the establishment of a nomination committee in JSE-listed firms, the King Reports (King II, III and IV) also suggests that nomination committees should comprise of all NED, of which the majority should be independent, i.e., independent NEDs (Ntim, 2009; PricewaterhouseCoopers, 2017).

A.9. Remuneration Committee (REM)

The assessment and decision surrounding the compensation of directors and senior management is conducted by the remuneration committee (Conyon, 1997). The remuneration committee constructs optimal remuneration packages to attract, retain and motivate management to perform their duties efficiently (Ezzamel and Watson, 1998). Hence, the existence of this committee reduces the agency issue by providing incentives that align the interests of managers and shareholders (Weir and Laing, 2000). Moreover, a remuneration committee signals the commitment of firms in ensuring that appropriate remuneration is awarded for exemplary performance, which in turn enhances the firm's legitimacy (Appiah and Chizema, 2015). King II, King III and King IV therefore recommend the establishment of remuneration committees in all JSE-listed firms. Following the amendment of JSE Listing Requirements in 2017, the appointment of remuneration committees became mandatory for listed firms (Giles, 2017). Therefore, the REMC variable is incorporated in the index in order to account for whether these committees have been established in JSE-listed firms.

A.10. Independent Remuneration (RIND)

In 1993, the Securities and Exchange Commission (SEC) introduced a regulation for the composition of independent remuneration committees (Cybinski and Windsor, 2013). These mandates were prompted by conflicts of interest that arose when executives participated in remuneration committees (Vafeas, 2005). According to Gregory-Smith (2012), the more

influence executive directors have on the remuneration committee, the higher probability that they will distort their pay above the optimal level. Hence, to avoid inflated pay outcomes and conflicts of interests, the remuneration committee should consist of independent NEDs (Cadbury, 1993). Accordingly, to maintain the integrity of the decision-making process, the King Reports (King II, III, and IV) suggested that remuneration be determined by a committee that consists only of independent NEDs (PricewaterhouseCoopers, 2017) as a way of avoiding overcompensation, which is not in the best interests of shareholders (Conyon and Peck, 1998; Ntim, 2009). The RIND variable attempts to capture whether the remuneration committee is fully independent.

A.11. Remuneration Chairman (REMC)

The chairman of the remuneration committee has an important role in forming remuneration schemes through negotiations with management and staff (Appiah and Chizema, 2015). Accordingly, the independent remuneration chairman is critical in preventing a ritualistic remuneration process (Anderson and Bizjak, 2003) in order to enable the long-term survival of the firm. Moreover, Kanapathippillai, Johl and Wines (2016) claimed that an independent director will influence the disclosure of executive remuneration in annual reports, thereby increasing transparency. Hence, in addition to the recommendation above, the King II, King III and King IV also suggests that the remuneration committee should be chaired by an independent NED.

A.12. Remuneration Committee Meetings (REMM)

In order to enhance transparency and minimise information asymmetry, the King Reports also recommend that the attendance of remuneration committee meetings is recorded and fully disclosed in annual reports (Ntim, 2009; PricewaterhouseCoopers, 2017).

B. Accounting and Auditing (AA) Subindex

In line with studies reviewed in section 4.2 (such as Beiner *et al*. 2006; Ntim, 2009; Biswas, 2012; Waweru, 2014), an accounting and auditing subindex is incorporated within the corporate governance index, as displayed in panel B of table 4-1. According to La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998: 1140), "accounting plays a potentially crucial role in corporate governance". In conjunction with accounting, there is also a significant necessity for auditing in corporate governance, which verifies accounting information (Hung, 2000; Gao and

Han, 2021) and prevents opportunistic manipulation of financial statements by management (El Diri, 2017). The most notable corporate failures were attributed to fraudulent financial reporting (Smith and Marx, 2020), which inferred that audit firms failed to perform their duties accurately. As such, the King Reports (King II, III, and IV) provides recommendations regarding accounting and auditing practices for JSE-listed firms to implement in order to improve their quality of financial reporting. The index therefore attempts to integrate these aspects using the variables discussed below.

B.1. Audit Committee (AUDC)

According to Waweru (2014), the audit committee is responsible for overseeing the internal and external audit functions and reviewing firm's financial statements. The presence of audit committees enhances internal monitoring, which may minimize the occurrence of financial fraud and agency costs (Klein, 1998; Ntim, 2009). King II, King III, and King IV recommend the existence of audit committees in all JSE-listed firms (PricewaterhouseCoopers, 2017). Mangena and Chamisa (2008) stated that JSE-listed companies with audit committees were less likely to be suspended compared to those without audit committees. Therefore, the amended JSE Listing Requirements, in 2017, mandated the establishment of audit committees in all listed companies (Giles, 2017). This infers that JSE-listed firms could face delisting if they failed to appoint an audit committee.

B.2. Audit Committee Independence (AUDI)

Similar to the board, nomination and remuneration committees, an independent audit committee is more likely to contribute to good corporate governance (Engel, Hayes and Wang, 2010). According to Tusek (2015), the independence of an audit committee is considered as the most crucial factor to enable increased monitoring of the financial reporting practices of companies and ensuring the overall effectiveness of the committee (Carcello, Neal, Palmrose and Scholz, 2011; Saeed, Ali, Riaz and Khan, 2022). It is expected that independent NEDs on the audit committee play a role in the detection and prevention of opportunistic earnings management (Iriyadi, 2019). Moreover, in the event of disputes with management, independent audit committees are more likely to support external auditors rather than being influenced by managers (Cohen, Hoitash, Krishnamoorthy and Wright, 2014).

The inclusion of independent directors increases the audit committee's level of independence (Krishnan, 2005; Chan and Li, 2008). In order for an audit committee to be considered as independent in South Africa, the King III and IV stipulated that all members of the audit

committees should be independent NEDs (PriceWaterhouseCoopers, 2011; Sewpersadh, 2019), whereas King II suggested that majority should be independent NEDs. Due to the sample period of this study, the AUDI variable considers the composition with majority independent NEDs as acceptable.

B.3. Audit Chairman (ACM)

The independence of the chairman plays a significant role in enhancing the monitoring responsibilities of committees (Safari, 2017). Hence, to further maximise the independent functions of the audit committee, the committee should be chaired by an independent NED, who is not the chairman of the main board (Ntim, 2009). This is congruent with the provisions in King II, King III, and King IV; therefore, ACM is aggregated in the corporate governance index.

B.4. Audit Committee Meetings (AUDM)

Similar to the disclosure requirements for a record of meeting attendance of remuneration committee members, the King Reports also proposes that an attendance register for audit committee meetings be published in annual reports (Ntim, 2009; PricewaterhouseCoopers, 2017).

C. Risk Management and Internal Audit (RMI) Subindex

The third subindex included in the corporate governance index deals with risk management and internal audit, as per panel C of table 4-1. Risk management involves the detection and assessment of existing and potential risk spheres, followed by an agenda of mitigation, termination, tolerance, or transfer of risk factors (Stoneburner, Goguen and Feringa, 2002). Corporate governance and risk management are interrelated (Chatterjee and Bose, 2007). As a matter of fact, another contributing factor of the corporate governance business failures during the financial crisis stemmed from the inability to manage the risk of the companies (Kallamu, 2015).

Sarens and De Beelde (2006) claimed that internal audit activity may contribute to the improvement of risk management and control of companies. Internal auditing refers to the "independent evaluation activity within the organization primarily concerned with accounting and financial fields" (Al-Jabali, Abdalmanam and Ziadat, 2011: 166). This is supported by Karagiorgos, Drogalas, Eleftheriadis and Christodoulou (2009), who recognized the assurance and consulting role of internal auditing in corporate governance and simultaneously in risk

assessment. Accordingly, the King Committee "placed emphasis on the need for companies to have a well-resourced internal audit and control units" (Ntim, 2009: 62) and thus made several recommendations for JSE-listed firms to improve their level of effectiveness in corporate governance through the risk management and internal audit functions. The variables of the risk management and internal audit subindex are discussed below.

C.1. Risk Management Committee (RMC)

Risk management committees are regarded as an imperative oversight committee (Kallamu, 2015). The primitive function of these committees involves the monitoring of the risk and internal control in companies (Ng, Chong and Ismail, 2013). In addition, members of the risk management committee are expected to inform senior management of the organisations risk and assess the appropriateness of the risk management procedures (Subramaniam, McManus and Zhang, 2009). The establishment of a risk management committee may also signal the firms commitment to achieving a high quality of corporate governance (Harrison, 1987). Hence, the King Reports (King II, III, and IV) suggested that JSE-listed firms should consider allocating a risk management committee for the oversight of risk management (IoDSA, 2016).

C.2. Disclosure of Company Risks (DCRM)

Details surrounding a company's risk is not only crucial to shareholders and managers, but also to other stakeholders (Subramaniam *et al*., 2009). For example, information on the organisations risk is useful to creditors when reviewing the firm's acuity to fulfil its financial obligations. In addition, it is also beneficial for suppliers in relation to their decisions about credit agreements (Korosec and Horvat, 2005). Thus, firms should disclose all the risks that they are currently faced with (Ching, Rahim and Chuing, 2019). Correspondingly, the King Reports recommend that all companies should provide a narrative on the nature of its current and potential future risks (Ntim, 2009; Moloi, 2014; IoDSA, 2016).

C.3. Disclosure Of Policy on Risks Management (DPRM)

Similar to the disclosure of company risks, the provision of information on how companies intend to manage existing risks, as well as plans on preventing future potential risk, is important to shareholders, managers and other stakeholders. Therefore, King II, King III and King IV propose that companies disclose their strategies and policies for managing risks as this provides an understanding of the dynamics of their risk governance (Sityata, Botha and Dubihlela, 2021).

C.4. <u>Disclosure Policy on Internal Control Systems (DPI)</u>

According to Al-Zwyalif (2015: 59), "good corporate governance cannot exist without internal control". Internal control is the process implemented to protect a firm from loss or misuse of its assets (Khan, 1994). The disclosure of internal control system refers to the reporting of controls that firms implement over financial reporting and other business processes (Sarens and D'Onza, 2016). Agyei-Mensah (2016) claimed that transparency through the disclosure of internal control reports reduces the agency cost and information asymmetry issue within a company. Furthermore, this enables stakeholders to examine that management is adequately overseen, so that the interests of shareholders and other stakeholders are protected (Darmadi, 2013). Naser, Al-Hussaini, Al-Kwari and Nuseibeh (2006) also hypothesized that disclosure of internal control information to the public may assist firms with legitimizing their activities to society. Therefore, the King Reports recommend the disclosure of existing internal control systems (Ntim, 2009; KPMG, 2014).

4.3.2.4. Weighting scheme

When constructing a corporate governance index, Satnalika and Rao (2016: 245) asserts that the assignments of weights to "different components will play a major role". The empirical evidence in section 4.2.2 identified two weighting schemes: (i) unweighted; and (ii) weighted. The unweighted scheme refers to equal weighting, where all corporate governance variables are assigned identical weightage (Beiner *et al*., 2006; Biswas, 2012). This implies that all corporate governance elements have an equal contribution in the overall corporate governance index (Silveira *et al*., 2009). In contrast, the weighted scheme involves the allocation of different weights to variables in the index, in which each weightage is dependent on the value of information provided by each variable, as seen in the study of Ananchotikul (2007).

Although the unweighted scheme faces criticism because it assumes that all corporate governance practices are of equal importance (Ntim, 2009), several studies in section 4.2.2 (such as Gompers *et al*., 2003; Ntim, 2009; Biswas, 2012; Shahwan, 2015) preferred this approach as it avoids the risk of subjectivity. The weighted approach, however, is exposed to subjectivity risk due to the fact that there is no definitive theoretical or quantitative basis to determine how weights should be accurately assigned to the various components of corporate governance (Black *et al.,* 2006). As a consequence, the weightage allocation is often based on subjective judgements that are biased towards a particular set of corporate governance practices (Ntim, 2009).

Moreover, as discussed in section 4.2.2, Ananchotikul (2007), Ntim (2009) and Shahwan (2015) argued that no significant difference arises from the weighted and unweighted techniques as they produce very similar results. Therefore, this study adopts the unweighted scheme, in which the scores for the corporate governance index and subindices are calculated by assigning equal weightings to each of the variables in table 4-1.

Despite the fact that the 20 variables are to be equally weighted, the unweighted scheme leads to different weightage across the subindices since the number of variables within the subindices differs, as seen in table 4-1. In particular, the first subindex carries a weight of 60% of the main index as 12 out of the 20 questions pertain to board characteristics and structure. As previously mentioned, this is due to the emphasis that the King Reports place on board functions as a major aspect of corporate governance in firms (Mangena and Chamisa, 2008). Moreover, this coincides with the structure of Ntim's (2009) corporate governance index, where 27 of the 50 provisions pertained specifically to the board of directors, as discussed in section 4.2.2. The remaining weightage of 40% is equally distributed across the accounting and auditing subindex (20%) and the risk management and internal audit subindex (20%).

Based on these weighting allocations, the composition of the subindices is expressed in equations 4.1-4.3. Thereafter, equation 4.4 represents the composition of the main corporate governance index.

Equation 4.1 represents the board characteristics and structure subindex:

$$\boldsymbol{BCS_{it}} = \frac{\sum_i^n \boldsymbol{\eta p_{it}}}{\sum_i^n \boldsymbol{MSA_{it}}} \tag{4.1}$$

where i = 1…N and t = 1…18; BCS_{it} is the board characteristics and structure subindex; p_{it} is the set of scores obtained by firms for all 12 variables (board independence, board size, CEO duality, board chairman, company secretary, frequency of board meetings, nomination committee, nomination independence, remuneration committee, remuneration independence, remuneration chairman, and remuneration committee meetings); and MSA_{it} is the maximum possible score that can be awarded to firms for all variables in panel A. As per the scoring rules in table 4-1, MSA_{it} equates to 12 points for the first subindex.

Equation 4.2 expresses the accounting and auditing subindex:

$$\boldsymbol{AA_{it}} = \frac{\sum_i^n \boldsymbol{\eta q_{it}}}{\sum_i^n \boldsymbol{MSB_{it}}}$$

(4.2)

where i = 1…N and t = 1…18; AA_{it} is the accounting and auditing subindex; q_{it} constitutes the scores that firms obtained for the four variables enclosed in the subindex (audit committee, audit committee independence, audit chairman, and audit committee meetings); and MSB_{it} is the maximum possible score that firms can attain for all variables in panel B of table 4-1. Based on the scoring method in table 4-1, MSB_{it} is four points.

Equation 4.3 expresses the risk management and internal audit subindex:

$$\boldsymbol{RMI_{it} = \frac{\sum_i^n \eta z_{it}}{\sum_i^n MSC_{it}}}$$

(4.3)

where i = 1…N and t = 1…18; RMI_{it} is the risk management and internal audit subindex; z_{it} is the set of scores that firms attained for all variables presented in panel C of table 4-1 (risk management committee, disclosure of company risks, disclosure of policy on risks management, disclosure policy on internal control); and MSC_{it} is the highest possible score that can be awarded to firms for the variables within the risk management and internal audit subindex. Based on the scoring method in table 4-1, MSC_{it} is four points.

Based on the aggregation of the three subindices, the composition of the main corporate governance index is specified in equation 4.4:

$$\boldsymbol{CGI_{it} = \frac{\sum_i^n \eta p_{it}}{\sum_i^n MS_{it}} + \frac{\sum_i^n \eta q_{it}}{\sum_i^n MS_{it}} + \frac{\sum_i^n \eta z_{it}}{\sum_i^n MS_{it}}}$$

(4.4)

where i = 1…N and t = 1…18; CGI_{it} is the corporate governance index; p_{it}, q_{it}, z_{it} are defined as per previous usage; and MS_{it} is the maximum possible score that can be awarded to firms for all variables in table 4-1 (i.e., 20 points).

4.3.3. Methodology to Assess the Reliability and Validity of the Index and Subindices

As seen in section 4.2.2, several studies did not examine the robustness of their constructs, thus raising concerns surrounding the degree to which their index actually captured the underlying corporate governance of firms (Black *et al*., 2017). Based on the work of Hajjar (2018: 48), it is suggested that an index "must be both reliable and valid" in order to be considered as robust. Previous studies determined reliability by testing the internal consistency of the constructed indices. This is due to the fact that internal consistency is an important form of reliability which "ascertains the degree to which instrument items are homogenous and reflect the same

underlying constructs" (Kobuthi, 2018: 49). Similarly, the validity of an index can be established through the examination of construct validity (Hajjar, 2018), which refers to the extent to which the index captures the underlying concept that it intends to measure (Heale and Twycross, 2015). As such, to answer the research questions of this chapter, this section outlines the estimation techniques used to test the internal consistency and construct validity of the CGI, AA, BCS and RMI.

In particular, for the assessment of internal consistency, the Cronbach's alpha method is adopted as per the extant literature in section 4.2.2 (such as Ibrahimpašić, 2012; Otman, 2014; Shahwan, 2015; Kobuthi, 2018). This method is considered as the most popular measure of internal consistency (Cortina, 1993; Hajjar, 2018), in which it involves an estimation of the inter-item correlation among the elements of an index (Rattray and Jones, 2007; Heo, Kim and Faith, 2015). With regards to the analysis of construct validity, this study implements the PCA technique, as per Black *et al*. (2017). The implementation of these techniques together is further supported by Sijtsma (2009: 115), who claimed that the Cronbach's alpha often goes "hand-in-hand" with the PCA approach in order to provide a complete assessment on reliability and validity. These tests are explained in the subsequent sections.

4.3.3.1. Cronbach's alpha

Cortina (1993: 98) described Cronbach's alpha as "one of the most important and pervasive statistics in research involving test construction and use". It is a robustness technique that is commonly adopted in research surrounding the construction of multi-item measures (Vaske, Beaman and Sponarski, 2017) such as the corporate governance indices, as seen in section 4.2.2. In particular, the Cronbach's alpha method assesses how well a set of individual elements measures an underlying broad aspect (Taber, 2018; Peterson, 2018). This approach is therefore regarded as a suitable estimate for internal consistency of the variables enclosed in the subindices (BCS, AA and RMI) and the CGI (Black *et al*. 2017).

Equation 4.5 shows that the Cronbach's alpha is determined by the average intercorrelation between elements and the number of elements composed within the construct (Shahwan, 2015; Taber, 2018).

$$\boldsymbol{\alpha = \frac{n r_i}{1 + (n - 1)\, r_i}} \tag{4.5}$$

where i= 1.....n; α is the Cronbach's alpha of either CGI, BCS, AA or RMI*; n* is the number of corporate governance elements/variables; and r_i is the average intercorrelation between the corporate governance variables.

The value of the Cronbach's alpha ranges from 0 to 1 (Marano and Grima, 2018). According to several existing studies (such as Sekaran and Bougie, 2010; Black *et al*., 2017; Kobuthi, 2018; Nawi, Tambi, Samat and Mustapha, 2020), constructs that attain alpha coefficient values greater than 0.70 are highly reliable, whereas values above 0.60 are moderately reliable, and values below 0.50 indicate low reliability. Hence, if the variables collectively contribute to measuring similar widespread facets of corporate governance, a positive correlation with a strong Cronbach's alpha coefficient (i.e., $\alpha \geq 0.70$) is expected, where a higher coefficient suggests a more reliable measure (Cooper and Schindler, 2006; Kamel and Shahwan, 2014). Conversely, a low coefficient (i.e., $\alpha \leq 0.50$) infers that the variables fail to capture the underlying abstraction of corporate governance (Nawi *et al*., 2020).

Equation 4.5 suggests that the Cronbach's alpha increases as the number of elements (n) and average intercorrelations (r) increase (Sijtsma, 2009). Piedmont (2014) suggests that the preferred average intercorrelation for a set of elements are between 0.20-0.40 (i.e., $0.20 \leq r \leq 0.40$), as this signifies that although the variables are standardised, they still comprehend a unique variance, thereby ensuring they are not too similar in form and relations with each other. Moreover, Taber (2018) also argued that extremely high average intercorrelations can imply that the variables are not sufficiently distinct and are thus capturing identical underlying abstractions. For corporate governance indices and subindices, Black *et al*. (2017) therefore recommends that one must include elements that are interrelated, yet not too akin to each other, thus inducing positive but not exceedingly strong average intercorrelations.

As briefly mentioned, although the Cronbach's alpha test is a prominent approach in assessing the reliability of constructed indices, it is an incomplete rendition since it mainly centres on the internal consistency portion of reliability. Thus, in order to expand the examination of robustness to the inferences of validity, the PCA approach is adopted, as discussed below.

4.3.3.2. Principal Component Analysis (PCA)

Developed by Pearson (1901) and Hotelling (1933), the PCA is a statistical technique that is useful for examining the construct validity of a "set of variables predicting a common phenomenon" (Le, 2007: 31). This approach has therefore been frequently implemented in previous research surrounding the development of indices and scales to measure broad

underlying aspects (Peterson, 2018; Elgin, Basbug and Yalaman, 2020). However, to the author's knowledge, Black *et al*. (2017) is the only study that utilised the PCA to assess the validity of corporate governance indices. The scarcity of this method within corporate governance literature is attributed to previous studies focusing solely on index reliability, while neglecting to examine the validity of their indices. Hence, to address this research gap, this study adopts the PCA approach to assess the construct validity of CGI, BCS, AA and RMI.

PCA is based on the extraction of principal components from eigenvectors and eigenvalues of a sample correlation matrix (Gina, 2012). This method therefore begins with an eigen-decomposition of the correlation matrix between the corporate governance variables, which generates eigenvalues and corresponding orthogonal[19] eigenvectors (Alagidede and Mangenge, 2016). The eigenvectors are the linear combinations of the original corporate governance variables, whereas the eigenvalues reflect the scaling factor and the explanatory strength of the eigenvectors (Xiang and Gong, 2008; Mishra, 2009; Black *et al*., 2017).

Following Kaiser's (1970) selection criteria, principal components are retained only from eigenvectors that have eigenvalues above one[20], as these components are characterised by incremental explanatory power and are thus able to elucidate the "variation of more than one variable" in the underlying index (Bro and Smilde, 2014: 2824). Kaiser's (1970) selection criteria was implemented in several existing studies (such as Le, 2007; Gina, 2012; Black *et al*., 2017; Todorov, Fournier and Gerber, 2018) as it concurs with the assumption of principal components. i.e., they account for majority of the variance of the original variables in a construct (Broschat, 1979). Streiner (1994) suggested that principal components should possess the capacity to elucidate at least 50% of the total variance.

The eigen-decomposition process is expressed in equations 4.6 - 4.8, where the eigenvalues are defined by equation 4.6 as follows:

$$(\boldsymbol{R} - \boldsymbol{\lambda_i I_i}) = \mathbf{0} \tag{4.6}$$

where i=1……n; R is the intercorrelation matrix of corporate governance variables in either CGI, BCS, AA or RMI; I_i is a $i \times i$ identity matrix; and λ_i is the eigenvalues of matrix R**.**

[19] The eigenvectors are rotated using the varimax rotation method to preserve the orthogonality of the components, while maximizing the sum of variances of the squared loadings (Jolliffe, 2002; Schmitt, 2011; Black *et al*., 2017).

[20] Eigenvectors with eigenvalues less than one exhibit weak explanatory power and are therefore excluded from further analysis (Kaiser, 1970; Le, 2007).

The orthogonal eigenvectors associated with λ_i are expressed in the subsequent equation:

$$(\boldsymbol{R} - \boldsymbol{\lambda_i})\, \boldsymbol{x_i} = \mathbf{0} \tag{4.7}$$

where x_i is the eigenvector of matrix *R* corresponding to λ_i.

Based on Kaiser's (1970) selection criteria, the principal components are extracted by the following condition:

$$\boldsymbol{PC_i} = \boldsymbol{x_i},\ \boldsymbol{\lambda_i} \geq \mathbf{1} \tag{4.8}$$

where PC_i is the principal component retained from the *i*th eigenvector (x_i) for which the eigenvalue (λ_i) is greater than equal to one.

Equation 4.6 obtains eigenvalues that are ordered in a descending format ($\lambda_1 \geq \lambda_2 \geq \ldots \lambda_k$, where $k \geq 1$), in which the eigenvector with the largest eigenvalue (λ_1) is considered as the first principal component (PC1), followed by the eigenvector with the second largest eigenvalue (λ_2) as the second principal component (PC2), and so forth (Balci and Atalay, 2002; Le, 2007; Black *et al*., 2017). The PCA assumes that PC1 accounts for the largest portion of variance, therefore explaining most of the information in the construct, after which PC2 subsumes the second largest variance, and so on (Le, 2007; Cambón and Estévez, 2016). Based on the ordered eigenvalues, the first few principal components are expected to constitute majority of the variance in the underlying index, thereby containing most of the information from the original variables (Broschat, 1979). For this reason, this approach places greater emphasis on principal components with high variances compared to those with a low variance (Thompson, Eyden and Gupta, 2015). Ilesanmi and Tewari (2020) further stated that PCA aims to retain a minimum number of principal components that account for maximum variance.

Although variance is an important aspect of PCA, the principal components are primarily interpreted based on the original variables which they "load" on, i.e., component loadings (Todorov *et al*., 2018: 4). Component loadings represent the correlation between original variables and principal components, thus illustrating the variation in the variables that is explained by a particular principal component (Bro and Smilde, 2019). The loading profiles for principal components are important, as it determines whether the components carry a unique effect in the underlying constructs of CGI, BCS, AA and RMI (Kim and Kim, 2012).

The loadings for principal components are estimated using the following equation:

$$\boldsymbol{w_i = \frac{\lambda_i}{\sum_{i=1}^{n} \lambda_i} = \frac{\lambda_i}{n}}$$

(4.9)

where w_i is the loading by the principal components; n is the number of corporate governance variables in either CGI, BCS, AA or RMI; and λ_i is defined as per the previous usage.

It is common for principal components to load and cross-load across more than one variable, thereby forming a cluster of loaded variables, where the magnitude of each loading represents the relative contribution of the individual variable to the principal component (Broschat, 1979). According to Black *et al*. (2017), variables with component loadings greater than 0.40 are reliable as they are positively intercorrelated as a group, thus suggesting that they fit well with other elements across the principal component (Okoro, Musonda and Agumba, 2019). On the contrary, variables with loadings below 0.40 are too weakly correlated and therefore regarded as an unsuitable fit (Bumgarner, 2007). Accordingly, this study applies a cut-off of 0.40 (i.e., $w_i \geq 0.40$), where variables for each principal component are only significant if their loading exceeds 0.40.

The PCA recommends for the cluster of variable loadings to be unique for each principal component to ensure that the indices measure distinct, but consistent constructs of the underlying concept, i.e., corporate governance compliance (Black *et al*., 2017; Bjorklund, 2019). The distinctiveness amongst the principal components indicates that each component provides unique information and is therefore not redundant (Kim and Kim, 2012). Redundant components are purposeless as its value is identical to the values of the other components in the construct (Jolliffe, 2002). Hence, to qualify as valid constructs, CGI, BCS, AA, and RMI should contain distinct principal components that converge to describe the broad aspects of overall corporate governance (Edwards, 2004).

4.4. ROBUSTNESS RESULTS OF THE CORPORATE GOVERNANCE INDEX AND SUBINDICES

The aim of this section is to present and analyse the findings produced by the robustness tests outlined in section 4.3.3. The analysis therefore begins with a discussion of the Cronbach's alpha of the main index (CGI) and subindices (BSC, AA, RMI). Thereafter, the results produced by the PCA for each of the measures are explained in detail.

4.4.1. Regression Results for Cronbach's Alpha

The first objective of this chapter is to evaluate the reliability of the main corporate governance index (CGI) and the corresponding subindices (BCS, AA and RMI), which is estimated by the Cronbach's alpha, as per equation 4.5. Table 4-2 presents information on the analysis of the Cronbach's alpha, in which the average correlation among elements (r) and the number of elements (n) were used to generate the Cronbach's alpha coefficient for internal consistency of each measure.

Table 4-2: Regression Results for Cronbach's Alpha.

	r	n	Cronbach's alpha (α)
CGI	0.198	20	0.832
BCS	0.190	12	0.738
AA	0.368	4	0.700
RMI	0.380	4	0.710

Notes: This table reports the average correlation among elements (r); the number of corporate governance variables (n); and the Cronbach's alpha (α) across the elements in the main corporate governance index (CGI), board characteristics and structure (BCS) subindex, accounting and auditing (AA) subindex, and the risk management and internal audit (RMI) subindex. Items in boldface are α values that exceed 0.70.

Source: Own estimation (2022)

As per the discussion in section 4.3.3.1, instruments with an alpha coefficient above 0.70 are considered as strong and reliable measures (Shahwan, 2015), whereas values between 0.50 - 0.60 are moderately reliable (Albakhiti, 2018). Following these coefficient boundaries, the Cronbach's alpha values for the constructs in table 4-2 reflect a strong degree of reliability and internal consistency among the corporate governance variables in the main index and subindices, that range from 0.700 to 0.832.

In particular, the Cronbach's alpha is the highest across CGI indicating that 83.2 % of the 20 variables in the index are reliable and reflect similar underlying constructs of corporate governance. However, the alpha value on its own is an incomplete reflection of reliability and thus should be interpreted with the number of items and average correlations of the index (Cortina, 1993). The inter-element correlation for CGI is narrowly below the preferred range of 0.20 - 0.40 (Piedmont, 2014), implying that its high alpha coefficient is driven by the

substantial number of elements within the index (i.e., 20), rather than the inter-element correlation (Black *et al*., 2017). The low average inter-element correlations of CGI, combined with its strong alpha value infers that the variables encapsulate distinct consistent aspects of corporate governance, whilst still collectively measuring similar aspects of governance; thereby maintaining internal consistency among the elements in the index (Cooper and Schindler, 2006; Black *et al*., 2017). For this reason, CGI is considered as a reliable measure for the compliance of corporate governance in JSE-listed firms.

Turning to the subindex level, table 4-2 shows that BCS, AA and RMI are reliable measures of the three underlying aspects of corporate governance as their Cronbach's alpha coefficients are greater than 0.70. These alpha values are lower than that of CGI as Tavakol and Dennick (2011) claimed that the Cronbach's alpha of a construct decreases as the number of elements within the index declines. Hence, this is expected since the number of elements enclosed in each subindex is lower than that of the overall main index (Cortina, 1993; Black *et al*., 2017).

The alpha scores of AA and RMI are induced through the inter-item correlation estimates, as these indices only contain four variables and exhibit desired inter-item correlations. Nonetheless, these subindices are still regarded as strong reliable measures due to their Cronbach's alpha values as Briggs and Cheek (1986) argued that instruments with inter-element correlations between 0.20 - 0.40 paired with strong alpha coefficients successfully balance homogeneity and interrelatedness of elements.

The alpha coefficient of BCS exceeds that of AA and RMI and is a result of the size of the index as it encloses 12 elements and has a low inter-element correlation, suggesting that even though there is a higher degree of uniqueness among the 12 variables, they still measure the same underlying constructs of board characteristics and structure. Therefore, regardless of these disparities between the number of elements and strength of average correlation, BCS, AA and RMI are considered as reliable measures of the corporate governance compliance pertaining to the board of directors, audit committees and risk management committees, respectively.

Overall, the results from table 4-2 suggests that CGI and the three subindices are strongly reliable measures of the constructs of corporate governance, as well as the specific components that constitute corporate governance. The Cronbach's alpha values of CGI recommends that the corporate governance index be constructed across individual elements. Nevertheless, the subindices are still important as they are reliable measures of the distinct aspects of corporate

governance, and thus independently reflect the compliance of the governance practices by the board of directors, audit committees and risk management committees, which collectively contributes to the broad compliance of corporate governance. Thus, the CGI, BCS, AA and RMI are necessary in order to fully understand the quality of corporate governance in JSE-listed firms.

4.4.2. Regression Results for the PCA

Table 4-3 presents the results generated from the PCA approach previously detailed in section 4.3.3.2, which includes the eigenvalues, explained variance and the component loadings of each construct. Specifically, panels A, B, C, D, and E pertain to the PCA of CGI, BCS, AA, and RMI, respectively. As per the Kaiser's (1970) selection criteria, this table only reports principal components with eigenvalues above one[21].

Table 4-3: Component Loadings for Principal Components of the Indices.

	PC1	**PC2**	**PC3**	**PC4**	**PC5**	**PC6**	**PC7**
Panel A: CGI							
$\boldsymbol{\lambda_i}$	4.971	1.588	1.503	1.162	1.146	1.097	1.033
Explained $\boldsymbol{\sigma^2}$	0.249	0.080	0.075	0.058	0.057	0.055	0.052
BIND	**0.466**	-0.250	-0.201	0.020	0.283	0.325	0.252
BS	0.105	0.175	0.312	-0.253	0.078	**0.555**	0.030
DUAL	0.130	-0.042	0.060	**0.727**	-0.039	0.174	-0.081
BCM	**0.431**	-0.347	-0.142	0.178	0.374	0.272	0.211
CSEC	0.086	0.054	0.053	0.001	0.082	-0.295	**0.829**
FBM	0.376	0.307	0.358	-0.272	-0.041	0.058	0.172
NOMC	**0.661**	-0.245	0.004	-0.156	-0.266	-0.097	-0.195
NIND	**0.664**	-0.369	-0.025	-0.265	-0.196	-0.112	-0.138
REM	0.296	-0.126	**0.567**	**0.444**	-0.136	0.117	0.010
RIND	**0.465**	-0.511	0.185	-0.184	0.084	-0.105	0.063
REMC	**0.615**	-0.400	0.209	-0.098	0.088	-0.129	-0.048
REMM	**0.568**	0.032	**0.447**	0.173	-0.149	-0.249	0.011
AUDC	0.235	0.355	**0.441**	-0.235	-0.005	0.358	-0.008
AUDI	**0.682**	0.267	-0.192	0.010	**0.423**	-0.083	-0.195
ACM	**0.661**	0.263	-0.172	-0.012	**0.437**	-0.069	-0.208
AUDM	**0.511**	**0.419**	0.096	0.091	0.117	-0.289	-0.068
RMC	**0.599**	0.210	0.013	0.182	-0.013	-0.053	-0.012
DCRM	**0.658**	0.120	-0.406	0.042	-0.408	0.225	0.090
DPRM	**0.645**	0.127	-0.406	0.018	-0.421	0.211	0.127
DPI	0.287	0.355	-0.116	0.019	-0.136	-0.206	0.166
Panel B: BCS							
$\boldsymbol{\lambda_i}$	3.184	1.255	1.140	1.055	1.003		
Explained $\boldsymbol{\sigma^2}$	0.265	0.105	0.095	0.088	0.084		
BIND	**0.493**	-0.359	0.239	0.396	0.164		
BS	0.104	0.328	-0.152	0.380	**0.701**		
DUAL	0.138	0.214	**0.700**	-0.160	0.042		

[21] The full list of eigenvalues for all components are available in table B-2 of appendix B (page 321).

BCM	**0.485**	-0.365	**0.415**	0.344	0.108
CSEC	0.090	0.094	-0.104	**0.602**	-0.638
FBM	0.350	**0.407**	-0.358	0.287	0.088
NOMC	**0.718**	-0.078	-0.212	-0.295	0.066
NIND	**0.755**	-0.222	-0.254	-0.246	0.038
REM	**0.402**	**0.583**	0.381	-0.086	-0.080
RIND	**0.632**	-0.184	-0.054	-0.005	-0.092
REMC	**0.734**	-0.061	-0.032	-0.083	-0.099
REMM	**0.600**	**0.483**	-0.028	-0.062	-0.164
Panel C: AA					
$\boldsymbol{\lambda_i}$	2.105				
Explained $\boldsymbol{\sigma^2}$	0.526				
AUDC	0.317				
AUDI	**0.885**				
ACM	**0.879**				
AUDM	**0.700**				
Panel D: RMI					
$\boldsymbol{\lambda_i}$	2.153				
Explained $\boldsymbol{\sigma^2}$	0.538				
RMC	**0.615**				
DCRM	**0.899**				
DPRM	**0.896**				
DPI	0.405				

Notes: This table reports the component loadings of seven principal components retained in the CGI (PC1-PC7); five principal components retained in the BCS (PC1-PC5); one principal component retained in AA (PC1); and one principal component retained in RMI (PC1). Items in boldface are component loadings that exceed 0.40. The eigenvalues (λ_i) and explained variance (σ^2) are stated for each principal component. See table 4-1 for full definitions.

Source: Own estimation (2022)

Panel A infers that seven principal components are extracted from the 20 corporate governance variables for CGI as the associated eigenvectors have eigenvalues greater than one[22]. The seven principal components explain 62.55% of the total variance in the index, which is sufficient according to Streiner (1994), as mentioned in section 4.3.3.2. Moreover, in line with PCA's expectations of variance, it is evident that the explained variance (24.9%) of the first principal component (PC1) is significantly larger than that of the other principal components. Based on the acceptable threshold of component loading (i.e., $w_i \geq 0.40$) stated in section 4.3.3.2, panel A shows that PC1 is significantly loaded on 13 out of the 20 variables in CGI. This is in accordance with previous studies that observed the first principal components contributing to the largest portion of the variation and loadings on original variables (such as Wahaba, Bakheitb and Al-Alawi, 2005; Black *et al*., 2017; Bjorklund, 2019).

Since PC1 loads on 65% of the corporate governance variables across the three subindices (i.e., seven in BCS, three in AA and three in RMI), it singlehandedly represents majority of the

[22] Table B-2 in appendix B presents the eigenvalues of all 20 components of CGI.

aspects of overall corporate governance, where each loaded variable reflects their defined roles outlined in table 4-1. Moreover, although PC1 is not loaded on REM and AUDC, which measures whether JSE-listed firms form remuneration and audit committees, PC1 is still significantly loaded on the provisions relating to these committees (such as RIND, REMC, REMM, AUDI, ACM and AUDM), thus inferring that the compliance of REM and AUDC are indirectly captured through other loaded variables.

The second principal component (PC2) loads on AUDM only, indicating that this component captures the disclosure of attendance registers of audit meetings, as specified in table 4-1. Considering that PC2 accounts for the second largest portion of explained variance (8%) in CGI, this component is expected to encompass more than one corporate governance variable, as depicted in the study of Black *et al*. (2017). Furthermore, because the PC1 already assimilates the general role of AUDM in overall corporate governance, the cross-loading by PC2 may be redundant, and thus purposeless in the CGI (Reise, Moore and Haviland, 2010).

In contrast to PC1, the third principal component (PC3) overtly encapsulates the significance of forming remuneration and audit committees with loadings greater than 0.40 on REM and AUD. In addition, PC3 also strongly loads on REMM, which implies that the existing remuneration committees are guaranteed to disclose a record of their meeting attendance. Nevertheless, in accounting for 7.5% of total variation in CGI, PC3 is primarily regarded as a rendition of the presence of audit and remuneration committees in firms.

The existence of remuneration committees is also prevalent in the fourth principal component (PC4), where the component loads on REM, as well as DUAL, covering 5.8% of explained variance. As shown in table 4-1, DUAL disseminates whether the roles of the CEO and chairman are separate. According to Broye, François and Moulin (2017: 336), separate roles require "payment of incentive compensation for the chairman in addition to that defined for the CEO". This implies that independent positions increase the prevalence of remuneration committees, as separate compensation packages need to be strategically designed in a manner that incentivizes both the CEO and chairman, whilst still taking the company's interests into consideration (Bosch, 1995; Broye *et al*., 2017). As such, REM may be viewed as a complement to DUAL, thus explaining the combined loading by PC4. Despite the cross-loading bared on REM by PC3 and PC4, both principal components are still distinct in that their loading combinations depict different aspects of underlying corporate governance.

The fifth principal component (PC5) annotates 5.7% of total variation in CGI, loading strongly on AUDI and ACM, where both variables relate to the independence of the NEDs and chairperson of the audit committee, respectively. For this reason, PC5 is regarded as a constituent of the independence of the audit committee. In line with the King Reports, the combined loadings for AUDI and ACM suggest that both provisions need to be satisfied in order for the committee to be regarded as independent (Deloitte and Touche, 2014). Notably, although AUDI and ACM are cross loaded on PC1 and PC2; the components are still distinct to each other as PC2 captures the independence factor of the audit committee, whereas PC1 assimilates the broad roles of AUDI and ACM in overall corporate governance.

The sixth principal component (PC6), which contributes to 5.5% of total variance, loads on BS thereby capturing whether the board size recommendations are followed. PC6 is distinct as no other principal components load on BS. Similarly, PC7 is also unique as it is the only principal component to load on CSEC, thus reflecting the presence of company secretaries in firms. No components load on FBM and DPI, implying that provisions pertaining to the frequency of board meetings and disclosure of internal controls are not imperative in explaining the variation of overall corporate governance compliance across JSE-listed firms.

Altogether, panel A shows that variables from different subindices broadly load for one or more of the seven principal components, thus suggesting that CGI measures overall corporate governance as it encloses "a broad set of general aspects of governance" (Black *et al*., 2017: 406). These results support the findings of the Cronbach's alpha for CGI in table 4-2. Moreover, with the exception of PC2, the cluster of variable loadings for each component represents different information in the index, thus implying that the principal components are unique to each other. As discussed in section 4.3.3.2., the specificity observed between the principal components confirms that CGI captures distinct consistent areas of corporate governance and is thus regarded as a valid construct of broad corporate governance compliance for JSE-listed firms.

Turning to the PCA of the subindices, panel B shows that five principal components are retained for the BCS subindex, indicating that these components have eigenvalues greater than one, as seen in table B-2 of appendix B (page 321). The total variation (63.7%) explained by the five principal components is adequate as it exceeds 50% (Streiner, 1994). In particular, the PC1 contributes to the largest portion of variance (26.5%), loading on five out of the 12 variables of the BCS subindex. Specifically, this component loads on all variables relating to nomination and remuneration committees and two variables pertaining to board independence

(BIND and BCM). For this reason, it is assumed that PC1 primarily reflects the compliance of nomination and remuneration committees, but also captures board independence. Since the board of directors participate in the appointment of subcommittees (Wijethilake, Ekanayake and Perera, 2015), the combined loadings for PC1 may imply that independent boards are more likely to establish nomination and remuneration committees that comply with the applicable provisions of King Reports. Aside from REM, the PC1 of the BCS subindex captures the same board variables as the PC1 of the CGI in panel A. This reinforces the notion that the subindices capture an important underlying area of broad corporate governance (Black *et al*., 2017).

PC2 explains 10.5% of variation in BCS, where the component loads on FBM, REM and REMM. As explained for the PC3 in CGI (panel A), the combined loading for REM and REMM implies that remuneration committees consistently disclose their meetings attendance register. The additional loading on FBM by PC2 may suggest that boards who meet more frequently are likely to encourage a higher meeting frequency for their subcommittees (Raghunandan and Rama, 2007). As such, an increase in remuneration committee meetings may consequentially lead to the disclosure of more attendance registers. Therefore, based on the combined loadings for this component, PC2 is regarded as a representation of board and remuneration meetings.

Panel B demonstrates that PC3 loads strongly on DUAL and BCM, elucidating 9.5% of total variance. As noted in table 4-1, both variables relate to the status of the chairperson of the board, where DUAL constitutes whether the chairman and CEO are distinct, and BCM encloses if the chairman is an independent NED. Considering that CEO duality involves the position of the chairman being fulfilled by the CEO, i.e., an executive non-independent member (Rashid, 2010); the combined loadings of DUAL and BCM infers that an independent chairman is indicative of separate CEO and chairperson positions. PC3 is therefore considered as a reflection of the qualities of the chairman.

Turning to the last two principal components, panel B shows that PC4 strongly loads on CSEC, whereas PC5 is loaded on BS. Since there are no combination loadings on either principal component, PC4 and PC5 capture the general aspect of these variables, as defined in table 4-1. Individual loadings for CSEC and BS were also observed for the principal components (P7 and P6) of CGI in panel A.

Overall, the BCS subindex yields sufficient construct validity as each principal component retains distinctive corporate governance information that is coherent with the aspects of board

structure provisions. For this reason, the BCS subindex is considered as an appropriate measure of the underlying corporate governance compliance regarding board committees in JSE-listed firms.

The PCA for the AA subindex in panel C presents the first principal component only, as PC1 is the only component with an eigenvalue above one. With the exception of AUDC, PC1 significantly loads on all variables in the subindex, thereby implying that the component inherently captures provisions specific to the audit committees. This was also observed for PC1 in CGI, where the loading on AUDC was insignificant. As explained for CGI, despite the insignificant loading, PC1 still subsumes information on AUDC as loadings on the remaining variables (i.e., AUDI, ACM and AUDM) conveys that an audit committee is, in fact, appointed. Altogether, the results in panel B suggests that there is a coherence to the variables in the AA subindex, as they converge on PC1 to encapsulate the overall governance of audit committees. Moreover, the combination loadings of this subindex matched the variable loadings by PC1 of CGI, thereby verifying that the AA subindex captures a section of overall corporate governance compliance. Therefore, the construct validity of this subindex is acceptable.

The results from panel D for the RMI subindex are similar to that of panel C, in that PC1 also loads on three out of the four variables. In particular, in accounting for 53.8% of total variation of RMI, PC1 reflects the underlying governance of the risk management committee as it strongly loads on RMC, DCRM and DPRM. Congruent with the CGI, the insignificant loading on DPI implies that it is not imperative in explaining variation in risk committees across firms. Nevertheless, the RMI subindex is regarded as a valid construct of the underlying compliance of risk committees. Moreover, similar to AA, the RMI subindex also demonstrates identical component loadings to those by PC1 of CGI.

4.5. CHAPTER SUMMARY AND CONCLUSION

This chapter provides a theoretical review of the two dominant empirical models surrounding corporate governance: (i) equilibrium variable model and (ii) compliance index model. The discussion surrounding these models solidify the compliance index framework as the most appropriate model to measure corporate governance in the South African market as JSE-listed firms are guided by a set of King Codes of Good Corporate Governance. The focus of this chapter is therefore the construction of a corporate governance index that is predicated on provisions of the King Reports (King II, III, IV). This represents a novel contribution made by

this chapter to the understanding of corporate governance quality among JSE-listed firms, as South Africa currently lacks a formal corporate governance indicator. With this contribution, governing authorities, policymakers, investors, and other market participants are provided with direct information regarding a firm's level of adherence to the King Code.

The chapter commences by first reviewing existing literature surrounding corporate governance indices, in an effort to analyse the criterions present during the construction phase of the index. The literature surrounding this subject identified three major criterions, i.e., source of compliance information (public reports vs surveys), index scoring system (binary vs ordinal) and weightage techniques (unweighted vs weighted). Moreover, the construction of a broad corporate governance index necessitated the development of subindices, most commonly board structure, shareholder rights, and disclosure and transparency subindices.

This chapter used publicly available information on the compliance of King Reports, in order to create a corporate governance index for 266 JSE-listed firms from 2004-2021. In particular, the main corporate governance index (CGI) was predicated on 20 compliance questions pertaining to the three main pillars of the King Code of Good Corporate Governance, which resulted in three subindices, i.e., board structure and characteristics (BCS), accounting and auditing (AA) and risk management and internal audit (RMI). The binary coding technique was applied to score the index and three subindices, where firms earned one point for compliance of a King provision, and zero otherwise. The index was structured using an unweighted scheme, in which all 20 corporate governance variables are assigned identical weightage. The selection of these specific criterions stems from the work of Silveira *et al*. (2009), Ntim (2009), Biswas (2012), and Shahwan (2015), all of whom applied equal weightages with a binary scoring system (these are reviewed extensively in section 4.2.2).

To verify the strength of instruments, previous studies performed robustness checks through an alteration of weightages across indices (Beiner *et al*. 2006; Ananchotikul, 2007; Silveira *et al*., 2009), and statistical tests such as the Cronbach's alpha (Ibrahimpašić, 2012; Otman, 2014; Shahwan, 2015; Black *et al*., 2017; Kobuthi, 2018) and the PCA (Black *et al*., 2017). The Cronbach's alpha is an estimate of the internal consistency of the elements index and thus represents the reliability of the construct (Biswas, 2012; Peters, 2014), whereas the PCA reflects construct validity (Dacakis, Oates and Douglas, 2017), estimating the degree to which the elements measure the overall aspect of the index. Based on the postulations of Sullivan (2011) and Hajjar (2018), in which credible valuable instruments should be both reliable and valid measures, the Cronbach's alpha "goes hand-in-hand with PCA" (Sijtsma, 2009: 114). To

the author's knowledge, Black *et al*. (2017) is the only known study that addressed both the reliability and validity with the use of Cronbach's alpha and PCA, respectively. Therefore, following the work of Black *et al*. (2017), this study provides a complete examination on the robustness of CGI, BCS, AA, and RMI by implementing both the Cronbach's alpha test and the PCA.

The results of the Cronbach's alpha analysis finds that CGI and the three subindices are strongly reliable measures of the underlying aspects of corporate governance compliance, as each measure obtained an alpha coefficient that satisfied the reliability benchmark ($\alpha \geq 0.70$) of this study. The findings produced by the PCA supported the construct validity of the CGI, BCS, AA, and RMI, as the principal components for each measure exhibited uniqueness to each other, thereby indicating that they capture distinct consistent areas of corporate governance. The results of this chapter therefore confirm the robustness of the constructed index and subindices, for which CGI, BCS, AA, and RMI are established as reliable and valid constructs of the corporate governance compliance in JSE-listed firms. Based on these findings, this chapter makes an original contribution in terms of providing a more accurate measure for evaluating the quality of corporate governance in South African companies.

It should be noted that certain studies reviewed in section 4.2.2, such as the South African studies of Ntim (2009) and Waweru (2014), failed to perform robustness tests altogether, thus raising questions on the usefulness of their indices and subindices. Therefore, the implementation of the Cronbach's alpha and PCA within this chapter represents an original contribution to the empirical work surrounding corporate governance research. Based on the results of the Cronbach's alpha and PCA, the following chapter utilises the CGI, BCS, AA, and RMI in the investigation of the impact of ownership identity (managerial, foreign, institutional, governance and family) on the corporate governance of JSE-listed firms.

CHAPTER FIVE: THE IMPACT OF OWNERSHIP STRUCTURE ON THE CORPORATE GOVERNANCE OF FIRMS

5.1. INTRODUCTION

Corporate governance is a broad term that describes the processes, customs, policies, laws, and institutions that directs corporations in the way they act, administer, and control their operations (Yegon, Sang and Kirui, 2014). These systems are critical for ensuring that a company is managed in a responsible, transparent, and accountable manner (Iskander and Chamlou, 2000; Mallin, 2016; Yusuf, Bambale and Abdullahi, 2018). Good corporate governance practices can also enhance financial performance, protect stakeholder interests, and ensure compliance with applicable laws and regulations (Alnaser, Shaban and Al-Zubi, 2014).

Although research on corporate governance has been growing steadily since the 1990s, it gained significant momentum in the early 2000s following a series of high-profile corporate scandals, involving U.S companies such as Enron, WorldCom, and Tyco in 2001, and Bear Stearns and the Lehman Brothers in 2008 (Claessens and Yurtoglu, 2013; Dibra, 2016). These corporate failures, together with the 2008 financial crisis, showed that over-focusing on financial results, while disregarding other aspects of business, can lead to company failure (Kiliç, Kuzey and Uyar, 2015). Moreover, the corporate collapses also revealed serious flaws in the corporate governance systems of several companies and raised public awareness about the importance of good governance practices (Kirkpatrick, 2009; Solomon, 2020).

As such, in the aftermath of these events, the volume of corporate governance research significantly grew, as academics, governments, policymakers and practitioners focused on understanding how companies can improve their governance structures in order to prevent the reoccurrence of a financial crisis (Claessens and Yurtoglu, 2013; Kowalewski, 2016; Radebe, 2017). The body of research explores a wide range of topics, including the determinants and dimensions of corporate governance quality (for example Shleifer and Vishny, 1997; Adams and Ferreira, 2009; Franck and Sundgren, 2012; Farag, Mallin and Ow-Yong, 2018), where factors such as board composition, auditors, management incentives, and financial performance are frequently recognised as determinants of corporate governance.

Conversely, Desender (2009) identified the ownership structure as one of the main dimensions of corporate governance, as owners are an increasingly important, and influential group that

governs the actions of managers and organises both internal and external control practices (Connelly *et al*., 2010). This was corroborated by Eng and Mak (2003) and Ntim and Soobaroyen (2013), who proclaimed that the ownership structure has important implications for corporate governance as individual shareholders may provide insights to decision-makers on how to enhance corporate governance practices (Zhou, 2001; Wahl, 2006). As a matter of fact, Akimova and Schwodiauer (2004) considered the ownership structure as one of the solutions to corporate governance inefficiencies. Accordingly, in the aftermath of the financial crisis, the ownership structure emerged as a useful tool for aiding the recovery of firms and strengthening corporate governance systems (Hartzell *et al*., 2014; Kao *et al*., 2019; Yang and Shyu, 2019).

However, although existing literature may acknowledge the pertinence of the ownership structure in corporate governance, most studies often assumed that ownership was a form of corporate governance, rather than an influential factor. These studies therefore adopted ownership categories as corporate governance proxies when investigating the relationships between corporate governance and other firm fundamentals. This is evident in several studies reviewed in chapter three (section 3.2), where managerial ownership (Haniffa and Hudaib, 2006; Mohd, 2010; Mohd, 2020), foreign ownership (Sueyoshi *et al*., 2010; Marashdeh, 2014), institutional ownership (Aljifri and Moustafa, 2007), and government ownership (Darko *et al*., 2016) were utilized as indicators of corporate governance while studying the relationship between corporate governance and firm performance. Therefore, the direct influence of the ownership structure on corporate governance practices is not well understood (Muka, 2010), as there are very few studies that actually examine the effect of different ownership identities on corporate governance practices itself. As a matter of fact, to the author's knowledge, this subject matter does not exist within the context of South Africa.

The South African market presents a highly unique environment to investigate the relationship between ownership structure and corporate governance due to its distinct institutional and corporate governance system, along with the recent occurrence of publicised corporate failures. As detailed in chapter two (section 2.3), due to the extensive social, economic, and political reforms experienced in the 1990s, South Africa encompasses a distinct corporate governance framework (Handley, 2005). South African companies are governed by the King Code of Good Corporate Governance, which provides voluntary guidelines and principles for effective corporate governance practices (Ntim *et al*., 2012). The King Code is unique as it incorporates certain elements of Anglo-American countries (West, 2009; Andreasson, 2011), in that it

expects South African firms to fulfil the interests of shareholders, but also advocates for diversity as a way of addressing the socio-economic inequalities during apartheid (Ntim, 2009; Chitah, 2021). For this reason, the South African corporate governance model is referred to as a "hybrid" framework (Gyapong, 2016: 426), as it combines elements of the shareholder and stakeholder model (Ntim, 2009). As discussed in chapter two (section 2.3), the first King Report (King I) was introduced in South Africa in 1994. Thereafter, three subsequent reports were published in 2002 (King II), 2009 (King III) and 2016 (King IV) (Tshipa *et al*., 2018).

However, these legislations do not guarantee that firms implement the recommended corporate governance practices (Aguilera and Cuervo-Cazurra, 2009). This may explain the high-profile domestic corporate failures that South Africa continues to experience (Ntim, 2009; Segal, 2017). For instance, the recent business collapses (such as Steinhoff in 2017; VBS Bank in 2018; Tongaat Hulett in 2019; SAA in 2020; and Eskom in 2022) were largely attributed to weak corporate governance practices surrounding directors and senior management, as well as reporting anomalies and weak monitoring strategies (Mahlaka, 2020; Haasbroek *et al*., 2020; Brederode, 2023). These failures have subsequently resulted in increased scrutiny directed towards the corporate governance systems of firms listed on the JSE (Seedat, 2019; Natesan, 2019). According to Lateef and Akinsulore (2021), the COVID-19 pandemic further exposed the ineffective governance practices that exist in African countries. In addition, as a result of South Africa's grey-listing in February 2023, South African firms are now subject to more rigorous due diligence (Haldane, 2022), which may draw greater attention to the weaknesses of the country's corporate governance practices.

Hence, given the current economic climate, the need for strong corporate governance in South Africa is likely to remain a key area of concern, as additional business failures may be detrimental to the South African economy (Binge and Boshoff, 2020). This therefore prompts the necessity of a study like this in the South African environment, as understanding the impacts of different ownership types on corporate governance can facilitate the composition of ownership structures that enhance firm compliance with the King Codes, which may, in turn, help prevent the reoccurrence of corporate collapses.

As discussed in chapter four, a significant challenge in corporate governance research is the complexity of measuring corporate governance at the firm level (Ntim, 2009; Areneke, 2018; Kobuthi, 2018). Following the global proliferation of corporate governance codes, firms adopted corporate governance provisions as a set rather than individually (Shabbir and Padget, 2005). Tariq and Abbas (2013) therefore suggested that the level of compliance with

governance codes may serve as reliable indicators of the standard of corporate governance practices in firms. For this reason, many researchers began quantifying corporate governance with a compliance index model, which encompasses the construction of an index that aggregated a set of corporate governance provisions (such as Gompers *et al*., 2003; Ananchotikul, 2007; Ntim, 2009; Waweru, 2014). According to Black *et al*. (2003), when combined into an index, the individual elements of the corporate governance index exhibit greater predictive power, as explained in chapter four.

To guarantee a precise representation of corporate governance in JSE-listed firms, chapter four constructed four compliance index measures of corporate governance, which are adopted as proxies in this chapter, namely, the corporate governance index (CGI), board structure and characteristics (BCS), accounting and auditing (AA), and risk management and internal audit (RMI). These indicators are unique to the South African environment as they are based on the corporate governance provisions from the King II, King III, and King IV reports. The CGI is the main index which consists of 20 corporate governance provisions relating to the aspects of board characteristics and structure, accounting and auditing, and risk management and internal audit. The BCS, AA, and RMI are subindices that constitute provisions specific to their individual categories. As discussed in chapter four (sections 4.1 and 4.2.2), Ntim (2009) and Waweru (2014) are the only known South African studies that adopted compliance index models. However, both studies concentrated on the corporate governance- firm performance nexus and did not examine the impacts of the ownership structure on the corporate governance compliance of JSE-listed firms. In addition, the reliability of Ntim's (2009) and Waweru's (2014) compliance indices are limited due to the lack of robustness tests.

Additional complexity is enclosed in the examination of the ownership- corporate governance nexus as it is unclear if ownership structure is influenced by the corporate governance practices of a firm, i.e., whether corporate governance shares a reverse relationship with the ownership structure, as certain ownership types (for example, foreign and institutional investors) often prefer investing in firms that have strong corporate governance systems (Chung and Zhang, 2011; Saini and Singhania, 2017). As stated in chapter three (section 3.3.4.1), the possibility of a reverse relationship raises the issue of endogeneity (Stančík, 2007).

The ownership and corporate governance structures of JSE-listed firms reflects several vital aspects of the South African economy (Dzingai and Fakoya, 2017; National Treasury, 2017). As such, both aspects are important considerations for public policy developments (Ntim, 2009; Cameron, 2012). Although there is an abundance of corporate governance literature in

the South African market, there is no study to date that has examined the impact of ownership structure on the corporate governance of JSE-listed firms, whilst using compliance index models, and accounting for potential endogeneity across the firms in the sample.

By addressing this research gap, this study can offer valuable insights into the identity of owners who may either enhance or weaken the quality of a firm's corporate governance system, board structure, audit quality and risk management practices. The findings of this study therefore hold significant importance for governments, policymakers, and firm owners as it may enable them to develop and implement policies that encourage increased ownership by those who enhance corporate governance, while restricting those who undermine it. The implementation of such policies can contribute to mitigating the risk of future corporate failures. Hence, the overarching objective of this chapter is to determine the impact of the different ownership identities (managerial, foreign, institutional, government, and family) on the corporate governance compliance of firms listed on the JSE. This is accomplished by addressing the following research questions:

VI. Does endogeneity exist between ownership identity (managerial, foreign, institutional, government, and family) and the corporate governance of firms?

VII. What is the effect of ownership identity on the corporate governance index?

VIII. What is the impact of ownership identity on the corporate governance subindices?

This chapter begins by presenting a review of the existing literature on the topic, followed by the description of the methodological approach employed for the chapter, and concludes with the examination of the obtained findings.

5.2. EMPIRICAL EVIDENCE ON THE IMPACT OF OWNERSHIP STRUCTURE ON CORPORATE GOVERNANCE

The purpose of this section is to review the existing literature that explores how ownership structure affects the quality of corporate governance in companies. This section also includes studies that explored the relationship between ownership and subcategories of corporate governance (such as board characteristics, audit quality, disclosures, etc). Similar to chapter three (section 3.2), the empirical evidence presented in this section is arranged according to the category of ownership (i.e., managerial, foreign, institutional, government and family).

However, in contrast to chapter three, there is less evidence available in the context of the ownership- corporate governance nexus.

5.2.1. Empirical Evidence on Managerial Ownership and Corporate Governance

Managerial ownership is a strong corporate governance mechanism as it converges the interests of managers with those of shareholders (Serly and Zulvia, 2019), as explained by the agency theory in chapter two (sections 2.2.1 and 2.4.1). A large body of literature has therefore been devoted to the corporate governance roles of managerial ownership; however, the manner in which these two mechanisms interact has rarely been addressed. The aim of this section is to therefore provide a review of the limited literature available on the relationship between managerial ownership and corporate governance practices in firms.

Similar to the King Reports, the Cadbury Report (1992)[23] for the U.K emphasized the importance of an independent board as a corporate governance mechanism that ensures the board of directors objectively execute their duties (Pass, 2004). Considering that the primary responsibility of independent directors is the monitoring of managers, the convergence of interest hypothesis (section 2.4.1) predicts that the demand for independent directors decrease when managerial ownership is highly concentrated, due to the incentive alignment between managers and shareholders (Jensen, 1993; Fama and Jensen, 1983). Peasnell, Pope and Young (2003) aimed to test the validity of this hypothesis by examining the impact of managerial ownership on the board composition of non-financial firms listed on the LSE, from 1991-1995. Using the 2SLS method to accommodate for potential endogeneity, the findings revealed a non-linear U-shaped relationship. This suggests that, on the one hand, low levels of managerial ownership required an increased number of independent directors, in line with the convergence hypothesis theory. On the other hand, high managerial ownership levels led to a decrease of independent directors, due to the incentive alignment effects. As per the management entrenchment hypothesis, managers become entrenched at large levels of shareholding, thereby increasing the need for external discipline from independent directors (Morck *et al*., 1988).

Similarly, Lasfer (2006) studied the relationship between managerial ownership and corporate governance factors relating to board structure (such as the board size, CEO duality, proportion of NEDs, and the appointment of a NED as a chairman). This study was also based on non-financial companies on the LSE, from 1996 to 1997, and approximated with the 2SLS

[23] Accordingly, a key corporate governance provision of Cadbury was that boards should contain at least three independent directors.

approach. Lasfer (2006) found that as managerial shareholding increased from 0.4% to 47%, the compliance with the board structure provisions of the Cadbury Report decreased from 81% to 37%. Overall, the results revealed that managerial ownership exerted a negative impact on all corporate governance measures, suggesting that managers with high ownership, "entrench their position, and reduce the monitoring power of the board" (Lasfer, 2006: 1025). In particular, entrenched managers diminish the monitoring functions of the board by either consolidating the roles of CEO and chairman or designating an executive director as the chairman. The dual roles lead to managers having greater influence over board decisions. Therefore, the findings of Lasfer (2006) cast doubt on the effectiveness of the board as a corporate governance mechanism when managerial ownership is high.

Turning to the accounting and transparency aspects of corporate governance, an American study by Gelb (2000) explored the effect of managerial ownership on the accounting disclosure ratings of non-financial firms, from 1981-1993. Voluntary disclosures are imperative corporate governance mechanisms, as it reduces information asymmetry and increases financial reporting transparency for shareholders (Witherell, 2003; Raithatha and Bapat, 2014). The ratings for the informativeness of disclosure practices were derived from the Association for Investment Management and Research Corporate Information Committee Reports which covered three segments: (i) annual report rating; (ii) quarterly report rating; and (iii) investors relations rating. Using multivariate regressions, the study found negative relationships between managerial shareholding and the ratings for the annual and quarterly reports, whereas no relationship was observed for investors relations rating. The negative relationship supports the agency theory as "firms with higher agency costs presumably adopt more open disclosure policies" to satisfy the transparency demands of shareholders (Gelb, 2000: 170). Since managerial ownership mitigates agency costs, the requirements for accounting disclosures are minimised, thus explaining the inverse relation (Jensen and Meckling, 1976).

Baek, Johnson and Kim (2009) also investigated the relationship between managerial ownership and corporate disclosure scores for 374 firms included in the S&P 500 index. In particular, the disclosure scores were based on S&P's transparency and disclosure data for three areas: (i) investor relations disclosure; (ii) financial transparency and information disclosure; and (iii) board and management structure disclosure. Results generated with OLS regressions showed that managerial ownership was negatively associated with the board and management process and investor relations disclosures but exerted no effect on the financial transparency score. Therefore, supporting the findings of Gelb (2000), Baek *et al*. (2009) concluded that a

negative relationship existed between managerial ownership and overall disclosure because firms with concentrated managerial ownership structures experienced lower agency costs and therefore required less frequent corporate disclosures.

An Indonesian study by Utomo, Pamungkas and Machmuddah (2018) and a Nigerian study by Asiriuwa, Akperi, Uwuigbe, Uwuigbe, Nassar, Ilogho and Eriabe (2019) examined the effects of managerial ownership on the quality of financial reporting in firms. Both studies proxied the quality of financial reporting with accounting conservatism, which Basu (1997: 4) defined as "the accountant's tendency to require a higher degree of verification to recognize good news as gains than to recognize bad news as losses". Based on the results of hypothesis testing, Utomo *et al*. (2018) found that managerial ownership positively influenced the financial reporting quality in firms listed on the Indonesia Stock Exchange from 2014-2016. The authors explained that since managerial owners often undertake monitoring roles, they will demand the use of strong conservatism principles. In contrast, the regression analysis of Asiriuwa *et al*. (2019) revealed an insignificant relationship between managerial ownership and financial reporting quality of 15 banks listed on the Nigerian Stock Exchange from 2013- 2017. This may be due to the fact that banks are already subjected to extensive internal and external supervision, and thus do not require managerial owners to perform monitoring duties (Hardy, 2006).

The studies reviewed in this section provide evidence of a linkage between managerial ownership and corporate governance, specifically in areas such as board structure, disclosure and transparency practices, and financial reporting quality. This suggests that managerial ownership has the capacity to influence the quality of corporate governance in firms and should thus be further evaluated alongside other key areas of corporate governance.

In addition to the scarcity of existing literature on managerial ownership and corporate governance, this subsection is further limited to mainly older studies that are more than five years old. The lack of recent literature also extends to the subsequent empirical reviews concerning foreign, institutional, government, and family ownership's impact on corporate governance. This implies that this topic has not received recent attention by researchers, as they may be influenced by the ongoing trend of linking ownership structures to firm performance since it is a subject with an overwhelming body of existing literature compared to the ownership- corporate governance nexus. However, the absence of recent literature does not suggest that this topic is irrelevant, but it instead reflects a current research gap that requires exploration in order to increase awareness and stimulate further research in this field.

5.2.2. Empirical Evidence on Foreign Ownership and Corporate Governance

According to Douma *et al*. (2006), foreign owners play a vital role in the improvement of corporate governance systems in emerging economies, as these investors usually require higher standards of corporate governance practices (Gillan and Stark, 2003). However, similar to the foreign ownership- firm performance nexus, the agency theory and resource-based theory provide contradicting arguments on the relation between foreign ownership and corporate governance. On the one hand, an increase in the quality of corporate governance may arise from the transfer of advanced governance practices and increased monitoring. On the other hand, corporate governance systems may weaken due to the entrenchment of large foreign investors (Munisi, 2020). Thus, this section aims to establish a connection between the theoretical propositions and the existing literature on the foreign ownership- corporate governance nexus.

The study of Ananchotikul (2007) reviewed in chapter four (section 4.2.2) is also pertinent to this chapter, as the author's primary objective was to investigate the effects of foreign ownership (corporation and institutional) on the corporate governance index of 365 Thai firms. Potential endogeneity problems were directly addressed using the instrumental variables (IV) approach. Ananchotikul (2007) found a negative relationship between foreign corporate ownership and the corporate governance index, explaining that these foreign owners seek private benefits and thus favour weak corporate governance because it allows them to exploit minority shareholders for their own benefit. This is consistent with the agency theory in chapter two, as foreign corporate shareholders are highly concentrated and can therefore become entrenched. On the contrary, foreign institutional investors, who hold minority shareholding in firms, positively influences the corporate governance of firms in order to "avoid being expropriated by large shareholders" (Ananchotikul, 2007: 19). Overall, the combined ownership measure depicted a negative relationship with corporate governance due to the dominance of foreign corporate shareholders.

In contrast, a Japanese study conducted by Ahmadjian (2007) discovered a positive association between foreign ownership and corporate governance, which was proxied by the Japan Corporate Governance Index Research Institute (JCGR). The JCG index was predicated on the compliance of Anglo-American standards covering survey questions pertinent to "performance objectives and CEO accountability, structure and function of boards of directors, internal management and control, and transparency and disclosure" (Ahmadjian, 2007: 140). Although a positive correlation is found, there is no evidence of causation as the results were based on

descriptive statistics. It is therefore unclear as to whether foreign owners influence firms to comply with Anglo-American provisions or gravitate towards companies that are already in compliance with the respective provisions. However, Ahmadjian (2007) documented that the functioning of the board of directors was a major focus of foreign owners, therefore suggesting that some level of the causation may have stemmed from the influence of foreign investors.

This was confirmed by the study of Desender, Aguilera, Lópezpuertas-Lamy and Crespi (2016) who found that concentrated levels of foreign ownership positively affected the dynamics of board monitoring for non-financial companies listed on the Tokyo Stock Exchange, from 2006-2012. The results were generated through the use of FEM and IV methods in order to accommodate potential endogeneity issues. Desender *et al*. (2016) claimed that the monitoring behaviour of independent directors were dependent on the percentage of foreign shareholding held in firms, arguing that large levels of foreign ownership incentivized independent directors to execute monitoring duties in an effort to prevent entrenchment and protect shareholders interests.

Ozsoz, Gurarda and Ates (2014) explored the relationship between ownership structure and the corporate governance index (CGR) of firms listed on the ISE, in Turkey. At the time of the study, Turkey was one of eight countries equipped with a formal corporate governance index for listed firms. With the use of OLS and GMM approaches, the findings revealed a positive association between foreign ownership and CGR scores. The author attributed this to the fact that most of the foreign capital in Turkey originated from developed countries (such as Switzerland, Netherlands, Italy, U.S and France), that had superior corporate governance ratings to that of Turkey. This implies that foreign owners transfer their corporate governance practices to the host country, as per the resource-based theory in chapter two.

Focusing on the transparency aspect of corporate governance, An (2015) explored whether foreign shareholders improved the transparency and quality of financial reports of firms in Korea. This study was based on 509 non-financial firms listed on the Korean Stock Exchange from 2000-2005. Similar to Utomo *et al*. (2018) and Asiriuwa *et al*. (2019) from the previous section, financial reporting quality was proxied by conservatism. The author regarded conservatism as an imperative measure of financial reporting quality in developing economies as conservatism diminishes management's capacity to manipulate financial statements. With the use of the FEM, the results depicted a positive relationship between foreign ownership and conservatism, thus suggesting that an increase in foreign shareholders improved firm

transparency and produced a higher quality of financial reporting. According to An (2015), foreign shareholders enhance conservatism as a way to minimise information asymmetry.

With the exception of Ananchotikul (2007), this section provides overwhelming evidence of a positive relationship between foreign ownership and corporate governance, and thus foreign shareholders can be considered as important participants of the corporate governance system. Based on the agency theory and resource-based theory, this result is expected; however, the reason for the positive relation is mixed. For example, Desender *et al*. (2016) attributed their findings to an indirect impact, whilst Ozsoz *et al*. (2014) attribute their result to the superior practices of investee countries, and An (2015) attributed their result to information asymmetry prevention.

5.2.3. Empirical Evidence on Institutional Ownership and Corporate Governance

Stemming from their prominent levels of ownership in firms, the OECD's principles for Corporate Governance recognises institutional shareholders as a major determinant of the quality of corporate governance practices (Filatotchev and Wright, 2011). Similarly, Gillan and Starks (2007) claimed that institutional investors are integral constituents in corporate governance systems, as they are highly involved in corporate governance activities (Goyer and Jung, 2011). This coincides with the issuance of the CRISA, that acts as a guide for institutional shareholders on how to use their rights to improve the corporate governance of their investee firms (Pillay, 2021). As such, the pre-eminent roles of institutional owners raise questions on the manner in which they actually influence the corporate governance standards adopted by firms. This section therefore provides a review on the extant literature surrounding the relationship between institutional ownership and corporate governance.

Focusing on the remuneration aspect of corporate governance, an American study by Hartzell and Starks (2000) examined the relationship between institutional shareholding and director compensation for 1500 firms, from 1991-1997. Results generated from the REM depicted an inverse relation between the level of institutional ownership and director remuneration. However, the author also reported a positive linkage between institutional investors and performance sensitivity of executive compensation. This infers that the increased monitoring activities performed by institutional investors has a considerable influence on the board's decisions on the structure of executive compensation.

Turning to board characteristics, Li, Lam, Qian and Fang (2006) examined the impact of institutional ownership on 433 firms in Hong Kong. With the implementation of the Partial

Least-Squares (PLS) technique, the findings suggested that institutional shareholders improved the quality of corporate governance as they were positively associated with independent directors and leadership diversity, and negatively related to CEO duality. According to Li *et al*. (2006: 273) "reducing CEO duality and increasing the proportion of outside directors on a board can improve monitoring". This supports the premise of the agency theory in section 2.4.3, in which institutional owners have a greater incentive to enhance monitoring activities because they are large shareholders (Shleifer and Vishny, 1986; Jiang and Yamada, 2011). Moreover, the results of this study are similar to Feldmann and Schwarzkopf (2003), who found that institutional ownership was positively related to a higher proportion of independent directors on the board and audit committees of American firms.

Alshabibi (2021) expanded his analysis of institutional ownership and board characteristics across 15 countries, with a sample of 517 publicly listed firms for the period 2006 to 2012. Through the application of the FEM, this study found that a positive relationship existed between institutional shareholders and board structure as these investors increased the degree of independence in board and audit committees. Moreover, considering that the study incorporates the pre-crisis, crisis, and post-crisis periods, Alshabibi (2021: 3) further documented that the effects of institutional shareholders were dependent on economic conditions, as they assumed greater responsibilities in corporate governance "during and after a crisis period compared to their roles and influence before a crisis begins". This may be due to the fact that the fiscal crisis directed substantial attention to the corporate governance system, as discussed in chapter two (section 2.3).

Contradicting the results of the studies above, Al-Sartaw and Sanad (2019) found that institutional ownership negatively influenced the board characteristics of 39 listed firms in Bahrain. The authors attributed this to the fact that institutional shareholders assume active monitoring roles in firms, which may relinquish the need for the adoption of recommended board practices, such as frequent board meetings and independence of boards, thus decreasing the overall level of corporate governance in firms. Nonetheless, the results suggested that the negative impact on board practices are compensated by the increased levels of monitoring by institutional shareholders.

Using an aggregated index of 50 governance provisions, Chung and Zhang (2011) examined the relation between institutional investors and the corporate governance of U.S companies, from 2001-2006. Implementing the 2SLS method to account for potential endogeneity, this study found that institutional owners improved the corporate governance compliance of firms.

In addition, the authors also provided evidence of endogeneity, in which the proportion of institutional shareholding increased with the compliance of corporate governance, thereby indicating reverse causality. According to Chung and Zhang (2011: 254), "firms with better governance structure attract more institutional investors". In particular, the findings stipulated that corporate governance provisions relating to shareholder rights and board composition were most effective in attracting institutional investors.

Liu, Laing, Cao and Zhang (2018) examined the impact of institutional ownership on the information transparency of firms in China. The data sample of this study consisted of 1761 A-shares of publicly listed firms on the SHSE from 2002-2015. Using the 3SLS procedure to account for endogeneity, the study discovered that institutional investors exerted a positive influence on the accounting and corporate governance transparency of firms. The authors claimed that the improved corporate transparency stemmed from institutional shareholders effectively monitoring company management, as per the agency theory.

The studies reviewed in this section suggests that institutional ownership positively influenced the quality of corporate governance in firms. Moreover, studies by Hartzell and Starks (2000), Li *et al*. (2006), Liu *et al*. (2018) and Al-Sartaw and Sanad (2019) supported the premise of the agency theory in chapter two (section 2.4.3), in which institutional investors increased the monitoring of management, thereby resulting in the improvement of corporate governance. In addition, Chung and Zhang (2011) provided evidence of endogeneity, where firms with better corporate governance structures attracted more institutional shareholders. This therefore deems panel data models that account for endogeneity as important for the analysis of the institutional ownership structure- corporate governance nexus.

5.2.4. Empirical Evidence on Government Ownership and Corporate Governance

As discussed in chapter two (section 2.4.4), government ownership may be considered detrimental to corporate governance, as there is a lack of incentive to control agency problems (Shleifer, 1998). Nonetheless, there is limited evidence provided in the context of government ownership and corporate governance. In particular, to the author's knowledge, Borisova, Brockman, Salas, Zagorchev (2012), Al-Janadi, Rahman and Alazzani (2016) and Gaio and Pinto (2018) are the only existing studies that investigated the impact of state ownership on corporate governance. This section provides a review of these studies below.

In support of the agency theory, the study of Borisova *et al*., (2012) observed a negative relationship between government shareholding and the quality of corporate governance for

1327 companies from 14 European Union (EU) countries, from 2003-2008. The quality of corporate governance was measured by a corporate governance quotient score, board independence, board committee, board entrenchment, board transparency, and CEO power. Based on the REM, the authors claimed that the results stemmed from the fact that the political objectives of the government deterred firms from the best practices of corporate governance.

A negative government ownership- corporate governance linkage was also discovered by Al-Janadi *et al*. (2016) for 87 Saudi-listed companies. In particular, with the use of multivariate regression analysis, this study documented that state shareholding negatively impacted corporate governance components such as board size, NEDs, audit committee, and audit quality. According to Al-Janadi *et al*. (2016), government shareholders in Saudi Arabia dominates majority of the SOEs with large concentrations of ownership. This results in government owners having the capacity to decrease the effectiveness of the roles of the board, NEDs, and audit committees, thus weakening the overall quality of corporate governance in Saudi-listed firms.

Gaio and Pinto (2018) explored the impact of government ownership on the quality of financial reporting in European firms in the 2003-2010 period. Similar to Utomo *et al*. (2018), Asiriuwa *et al*. (2019), and An (2015), this study measured financial reporting quality through conservatism. To account for endogeneity, Gaio and Pinto (2018) adopted the Heckman (1979) two-stage procedure, which produced findings that depicted a negative relationship between government ownership and conservatism. The authors claimed that the government protection and political connection of these firms resulted in a lower incentive to improve financial reporting quality. This is in line with Bushman, Piotroski and Smith (2004), who claimed that government shareholding undermined the financial transparency across several countries.

Overall, the evidence overwhelmingly suggests that government ownership impedes the quality of corporate governance in firms. Based on the theoretical arguments of the agency theory in section 2.4.4, these results are expected as these shareholders are too detached from the firm, and thus attempt to implement governmental objectives at the expense of shareholder objectives (Shleifer, 1998; Firth *et al*., 2007).

5.2.5. Empirical Evidence on Family Ownership and Corporate Governance

According to Ward (1991), family firms are more likely to deviate from the standards of best practice of corporate governance. However, similar to government ownership, there is a significant dearth of literature examining the impact of family ownership on corporate governance, with only two existing studies that explored this subject in the context of board characteristics, as reviewed below.

The first paper to evaluate the family ownership- board structure nexus was Bartholomeusz and Tanewski (2006), who studied 100 firms listed on the Australian Stock Exchange (ASX) in 2002. Using the 2SLS method, in which the authors assumed that all board variables were endogenous regressors, the results showed a negative relationship between family shareholding and board characteristics. In particular, this study found that family companies contained a lower proportion of independent directors compared to non-family firms. In addition, Bartholomeusz and Tanewski (2006: 264) documented that it was more common for family-owned firms to allow "the CEO and the chairperson roles to be occupied by the same person". Altogether, these results suggest that Australian family firms contain weak corporate governance systems due to the lack of external discipline.

A latter study by Hasan, Rahman and Hossain (2014) corroborated the findings of Bartholomeusz and Tanewski (2006), when investigating the relationship between family ownership and the corporate governance of 68 non-financial firms listed on the DSE in Bangladesh. Findings generated through OLS regressions showed that an increase in the proportion of family ownership resulted in decreased independence and size of the board. In line with the agency theory, the authors attributed the negative relationship to family owners discouraging the inclusion of more independent members on the board as a way to maintain their control in the business.

The evidence provided by Bartholomeusz and Tanewski (2006) and Hasan *et al*. (2014) documented negative relationships between family ownership and corporate governance, specifically, the authors found that family ownership decreased the independence of boards. This coincides with the postulations of the entrenchment perspective of the agency theory, as highlighted in section 2.4.5, in which family-owned firms establish boards that do not interfere with their decisions (Chen and Jaggi, 2000; Anderson and Reeb, 2004).

5.2.6. Summary of Empirical Evidence on Ownership Structure and Corporate Governance

In contrast to the empirical evidence of the ownership structure- financial performance nexus in chapter three (provided in section 3.2), there is less existing literature available in the context of ownership structure and corporate governance. Furthermore, this section is predominantly limited to older studies, most of which were conducted more than five years ago. Nonetheless, these constraints do not diminish the significance of the topic, but it instead highlights a research gap that needs exploration to increase awareness and encourage further research in this domain.

The literature reviewed in this section produced varied results, which are largely dependent on the type of ownership that is examined (i.e., managerial, foreign, institutional, government and family). The existing studies on managerial ownership (section 5.2.1) provided evidence demonstrating the managerial owner's ability to influence corporate governance, specifically in terms of individual measures of board, transparency, and financial reporting practices. In contrast, the empirical literature on foreign ownership provides a more holistic analyses, with the use of corporate governance indices in emerging markets (Ananchotikul, 2007; Ahmadjian, 2007; Ozsoz *et al*., 2014). As discussed in chapter four, the usage of corporate governance indices provides more reliable results as the index accounts for different aspects of corporate governance. Aside from Ananchotikul (2007), the studies reviewed in section 5.2.2 inferred positive relationships between foreign ownership and corporate governance, thus supporting the theoretical postulations of the agency theory and resource-based theory.

Similar to foreign ownership, the existing literature on institutional ownership in section 5.2.3 also suggested a positive linkage with corporate governance. Congruent with the agency theory, most of the authors attributed their results to the increased monitoring that was induced by institutional shareholders (Hartzell and Starks, 2000; Li *et al*., 2006; Liu *et al*., 2018; Al-Sartaw and Sanad, 2019). From the studies reviewed in section 5.2.3, Chung and Zhang (2011) are the only authors who adopted a corporate governance index in their analysis, whilst others used individual corporate governance measures such as compensation (Hartzell and Starks, 2000), board characteristics (Li *et al*., 2006; Al-Sartaw and Sanad, 2019; Alshabibi, 2021) and transparency (Liu *et al*., 2018).

In comparison to the aforementioned ownership types, the empirical evidence based on government ownership and family ownership is more limited. Nonetheless, the existing

literature produced findings that aligned with the agency framework, where both ownership forms negatively affected corporate governance. In particular, the studies on government ownership suggested that the inverse relationship stemmed from the pursuance of political objectives at the expense of shareholder interests, whilst evidence on family ownership depicted family firms as having less board independence in order to retain control. None of the studies reviewed in sections 5.2.4 and 5.2.5 utilized corporate governance indices, as they relied on individual indicators of corporate governance.

Altogether, the body of literature reviewed in this section provides a foundation for the potential relationship between ownership types (managerial, foreign, institutional, government, and family) and corporate governance, which further motivates the aim of this chapter under the context of the South African market. Moreover, several studies adopted estimation approaches that accounted for potential endogeneity (such as 2SLS and 3SLS), as this bias is a common issue within both ownership and corporate governance literature. This highlights the significance of establishing whether endogeneity exists between ownership structure and corporate governance, which to the author's knowledge, has not been previously probed in the South African environment. The chapter fills this research gap by addressing the first research question, offering an original contribution to the body of existing literature. Furthermore, the first research question of this chapter is pivotal in ensuring the robustness of the results generated by the second and third research questions.

5.3. RESEARCH METHODOLOGY FOR OWNERSHIP STRUCTURE AND CORPORATE GOVERNANCE

This section aims to provide a detailed discussion of the data and research methodology employed to answer the research questions posed in this chapter. The data set and the sample period utilized in this study is first described. This section thereafter discusses the variables and empirical models used to estimate the relationship between the ownership structure (managerial, foreign, institutional, government and family) and corporate governance. Subsequently, a discussion of the endogeneity tests used to address the first research question, is presented. Lastly, this section provides an explanation of alternative estimation techniques that can be utilised to answer the second and third research questions.

5.3.1. Data and Sample Period

This chapter employs the data sample utilised in chapter four, which encloses 266 non-financial companies listed on the JSE from 2004-2021, resulting in 3168 observations[24]. The discussion in chapter three (section 3.3.1.1), which highlighted the justification for the selected timeframe also extends to this chapter, particularly in the context of corporate governance in South Africa. In particular, since the sample encompasses periods prior, during, and after the 2008 financial crisis, it accounts for the different phases of corporate governance, as several countries restructured their corporate governance systems following the major company failures which occurred during the crisis (Kang *et al*, 2010; Hopt, 2013).

In the case of South Africa, the sample period provides coverage of the different corporate governance provisions published in three versions of King Reports (King II from 2004-2008; King III from 2009-2016; and King IV from 2017), as mentioned in chapter three (section 3.3.1.1). The ongoing revisions of the King Reports may have caused continuous changes to corporate governance structures in JSE-listed firms throughout 2004-2021. Moreover, companies may have exhibited a greater degree of corporate governance compliance in the wake of 2017, after the JSE Listings Requirements declared that certain provisions of King IV are mandatory for firms listed on the JSE (Giles, 2017). The selected sample period therefore aids a comprehensive analysis of the ownership structure- corporate governance nexus in South Africa.

5.3.2. Variables for Ownership Structure and Corporate Governance Analysis

This section aims to discuss all the variables (i.e., dependent, explanatory, and control) that are utilized in this chapter.

5.3.2.1. Dependent variables for ownership structure and corporate governance analysis

As previously discussed in chapter four, corporate governance may either be estimated by an equilibrium variable model or the compliance index model. From the existing literature presented in section 5.2, the compliance index model was only observed in four studies, for which corporate governance indices were used (such as Ananchotikul, 2007; Ahmadjian, 2007; Chung and Zhang, 2011; and Ozsoz *et al*., 2014). Despite the scarcity of constructed corporate governance indices in the existing literature, this approach is still regarded as a more reliable

[24] The structure of the unbalanced panel is presented in table B-1 of appendix B (page 321).

proxy compared to individual governance variables, as per the rationales discussed in chapter four (section 4.2.1).

In particular, constructed indices enable the aggregation of a broad set of corporate governance provisions (Beiner *et al*., 2006; Bebchuk *et al*., 2009; Srivastava *et al*., 2019). This approach aligns with the dynamics of the South African governance system since JSE-listed firms are encouraged to adopt the King Codes of Good Corporate Governance as a set, rather than individually. Furthermore, the results of the robustness tests conducted in chapter four (section 4.4), namely the Cronbach's alpha and the PCA, indicate that the index exhibits sufficient levels of reliability and validity. Hence, the first dependent variable used in the analyses of this chapter is the main index (CGI), which serves as a broad measure of corporate governance compliance. As previously discussed, the CGI constitutes 20 corporate governance provisions that are related to board, audit, and risk management characteristics.

It is widely recognised that the quality and compliance of corporate governance systems is dependent on the characteristics of various elements, that are subcategories of corporate governance (such as board structure, audit, risk, transparency, etc.) (Tipurić, Dvorski and Delić, 2020; Kiranmai and Mishra, 2022). As such, several studies reviewed in section 5.2 made use of individual sub categorical indicators that represented different areas of corporate governance, specifically with respect to board characteristics (such as Peasnell *et al*., 2003; Lasfer, 2006; Desender *et al*., 2016; Al-Sartaw and Sanad, 2019; Alshabibi, 2021, etc.), and audit and transparency factors (such as Gelb, 2000; Baek *et al*., 2009; An, 2015; Liu *et al*., 2018; Gaio and Pinto, 2018). The analysis of corporate governance subcategories may provide a deeper understanding of the underlying factors that contribute to the success of corporate governance in firms.

For this reason, in addition to CGI, this chapter also adopts the three corresponding compliance subindices that were constructed in chapter four, namely, board characteristics and structure (BCS), accounting and auditing (AA), and risk management and internal audit (RMI) as dependent variables. BCS contains 12 board provisions, AA encloses four audit provisions, and RMI consists of four risk management provisions. These subindices aggregate the components of the CGI, and its usage is appropriate for the South African corporate governance system, as they reflect the major areas of the King Reports, as detailed in chapter four (section 4.3.1.2). Furthermore, similar to CGI, the results of the Cronbach's alpha and the PCA verify the reliability and validity of the subindices, thus supporting the usage of subindices over individual sub categorical measures.

Table 5-1 briefly outlines the dependent variables used in this chapter. A more detailed description of each measure is contained in chapter four (section 4.3).

Table 5-1: Explanation of Dependent Variables.

Dependent variable	Acronyms	Explanation
Main Corporate Governance	CGI	The ratio of scores for BCS, AA and RMI to 20 points (see equation 4.4)
Board Characteristics and Structure	BCS	The ratio of scores for 12 board variables to 12 points (see equation 4.1)
Accounting and Auditing	AA	The ratio scores for of four audit variables to four points (see equation 4.2)
Risk Management and Internal Audit	RMI	The ratio of scores for four risk and audit variables to four points (see equation 4.3)

Source: Own construction (2023)

5.3.2.2. Explanatory variables for ownership structure and corporate governance analysis

The ownership identities of interest (managerial, foreign, institutional, government, and family) remain constant throughout this thesis. Hence, all explanatory ownership variables (MAN, FOR1, FOR2, INS, GOV, FAM1 and FAM2) used to test the ownership structure-financial performance nexus in chapter three (table 3-2 in section 3.3.2.2) are also implemented in this chapter.

The agency theory considers managerial ownership to be a strong corporate governance mechanism, as it converges the interests of managers with those of shareholders (Serly and Zulvia, 2019). This suggests that a positive relationship will occur between managerial ownership and corporate governance. In terms of foreign ownership, the agency theory provides contrasting viewpoints. On the one hand, the monitoring roles undertaken by foreign investors may increase corporate governance quality. Foreign investors usually demand higher standards of corporate governance practices to reduce information asymmetry issues (Gillan and Stark, 2003; Nugroho *et al*., 2020). However, on the other hand, corporate governance systems may weaken due to the entrenchment of large foreign investors (Munisi, 2020). Thus, the expected relationship between foreign ownership and corporate governance is unclear.

Institutional shareholders, owing to their substantial shareholding, possess the capacity to enhance corporate governance practices (Celik and Isaksson, 2013). According to Gillan and Starks (2007), institutional investors play a pivotal role in corporate governance systems, actively engaging in governance activities (Goyer and Jung, 2011). Consequently, a positive association is expected between institutional ownership and corporate governance. On the contrary, government ownership is widely regarded as deleterious to corporate governance.

This is primarily due to a lack of incentives to mitigate agency issues, weaker accountability for financial performance, facilitated access to financing, absence of exposure to corporate control markets, and diminished shareholder monitoring (Shleifer, 1998; Gnan *et al*., 2011). This suggests that a negative relation may exist between government ownership and corporate governance.

Family-owned enterprises frequently depart from best practices corporate governance (Ward, 1991), often establishing boards that preserve their control in decision-making (Chen and Jaggi, 2000; Anderson and Reeb, 2004). Specifically, boards in family firms are typically dominated by family members or close associates, resulting in a scarcity of independent directors who could represent the interests of minority non-family shareholders (Meng, 2009). As such, the expectant relationship between family ownership and corporate governance is negative.

5.3.2.3. Control variables for ownership structure and corporate governance analysis

As seen in chapter three (section 3.3.2.3), the inclusion of control variables is imperative as they are factors that may affect the dependent variable; howbeit, they are not the key areas of interest (Hünermund and Louw, 2020). Accordingly, the control variables for this chapter are chosen based on evidence of their impact on corporate governance in firms, in which they were observed to affect either broad aspects, or individual categories of governance.

The financial performance and corporate governance of companies are influenced by similar factors; therefore, many control variables from section 3.3.2.3 are also utilised in this chapter. Since firm profitability may influence corporate governance structures (Christensen, Kent and Stewart, 2014), this section implements profitability indicators that were dependent variables in chapter three (i.e., ROA, ROE, and Tobin's q) as control variables. The other control variables used in this chapter, such as firm size, firm age, leverage, GDP growth, industry and year dummies, were also previously implemented in chapter three as control variables.

A list of the control variables utilised in this chapter is contained in table 5-2, followed with an explanation of each control variable in relation to corporate governance.

Table 5-2: Explanation of Control Variables.

Control variable	Acronyms	Explanation
Firm size	LNSIZE	The natural log of net assets.
Firm age	LNAGE	The natural log of the number of years since the establishment of the firm to the observation date.
Leverage ratio	LEV	The ratio of long- and short-term debt to total assets.
Return on assets	ROA	The ratio of net income to total assets.
Return on equity	ROE	The ratio of net income to the average common stockholder's equity.
Tobin's q	TQ	The ratio of the market value to the replacement value of assets.
GDP growth	GDPG	The ratio of the change in GDP to current GDP.
Industry dummies	ID	Each dummy variable is equal to one if the firm is in the corresponding industry and zero otherwise.
Year dummies	YD	Each dummy variable is equal to one if the observation refers to the corresponding year and zero otherwise.

Source: Own construction (2023)

- **Firm Size (LNSIZE)**

According to Garvis (2009), there are significant differences in corporate governance practices based on firm size. As such, in line with previous literature presented in section 5.2 (such as Gelb, 2000; Peasnell *et al*., 2003; Desender *et al*., 2016), this chapter adopts firm size as a control variable to offset its potential effects on corporate governance. Smaller companies encounter different challenges in board formation and compliance (Hampel Committee Report, 1998). In particular, compared to large firms, Thurman (2000) claimed that smaller companies found it more difficult to enlist qualified board of directors, as they "offer lower reputation and compensation rewards but higher time commitments and different kinds of risk" (Garvis, 2009: 190). In addition, smaller firms may not be as incentivised to comply with recommended practices since regulators, and the media, are generally more focused on larger companies (Chesbrough, Vanhaverbeke, Bakici and Lopez, 2011). For instance, weak corporate governance in small companies may not be considered as newsworthy compared to large well-known firms (Garvis, 2009). For these reasons, a positive relation between firm size and corporate governance is expectant.

- **Firm Age (LNAGE)**

Following the work of Li *et al*. (2006), Liu *et al*. (2018) and Al-Sartaw and Sanad (2019) from section 5.2, this chapter utilised firm age as a control variable as the corporate governance systems of companies change over time (Filatotchev, Toms and Wright, 2006). On the one hand, Biswas (2013: 17) postulated that mature firms are more likely to implement superior corporate governance systems, as "they have had more time to improve their governance in

response to internal needs or investor pressure". On the other hand, to compete with older firms for their survival, younger companies may demonstrate a higher quality of governance (Biswas, 2013), thus inferring a negative association between firm age and corporate governance. Loderer, Stulz and Waelchli (2012) also argued that corporate governance in firms deteriorates over the years due to organizational rigidities, where older companies are unwilling to adapt to contemporary practices of corporate governance. Due to the mixed propositions, the expected relationship is unclear.

- **Leverage Ratio (LEV)**

Previous studies (such as Peasnell *et al*., 2003; Lasfer, 2006; Borisova *et al*., 2012; Alshabibi, 2021) implemented the leverage ratio as a control variable in order to negate any systematic influence that financial leverage may exert on the corporate governance practices of firms. In particular, higher levels of financial leverage have been associated with improved corporate governance due to the fact that increased debt bears a greater degree of monitoring and control from the creditors, regulators, and shareholders (Liao, Mukherjee and Wang, 2015; Ehikioya, Omankhanlen, Omodero and Mac-Ozigbo, 2021). The existence of a strong corporate governance system in firms may be required by debt holders to secure their repayments (Stiglitz and Weiss, 1981). Moreover, as a company's debt portfolio increases, their finances and operations become increasingly subjected to the inspection of creditors. Therefore, Gurarda, Ozsoz and Ates (2016) claimed that highly leveraged firms tend to behave more conservatively and are more compliant to corporate governance policies in order to avoid the scrutiny of creditors. The expected relationship between leverage and corporate governance is therefore positive.

- **Return on Assets (ROA)**

ROA is included as one of the profitability control variables that may influence the quality of corporate governance in firms, as per several studies reviewed in section 5.2 (such as Peasnell *et al*., 2003; Lasfer, 2006; Desender *et al*., 2016). Profitable firms may have stronger corporate governance systems as they possess the financial capacity required to comply with high-cost provisions relating to external membership, CEO duality, frequent meetings and disclosures (Kwok, 1998; Nana, 2014). ROA in particular, demonstrates how efficiently a company utilises its assets to generate a profit (Sucuahi and Cambarihan, 2016). According to Chen, Chen and Wu (2010), firms with higher profits, in terms of ROA, have greater resources to allocate

towards their financial reporting and internal controls. Accordingly, a positive relationship is expected to occur between ROA and corporate governance.

- **Return on Equity (ROE)**

In light of the differences between ROA and ROE discussed in chapter three (section 3.3.2.1), ROE is also adopted as a control variable, in line with Ozsoz *et al*. (2014) and Al-Janadi *et al*. (2016). ROE encompasses the firm's ability to generate profits from shareholders equity, thus capturing shareholder value (Hirdinis, 2019; Magni, 2021). Hence, a weak ROE may result in large shareholders pressuring firms to appoint more independent NEDs and demanding stricter corporate governance controls (Hermalin and Weisbach, 1998; Bhagat and Black, 2002; Schultz *et al*., 2010). Furthermore, the number of board meetings may rise in response to poor performance (Christensen *et al*., 2014). In the same vein, corporate governance controls may be relaxed when the ROE is favourable, with earnings being redirected to profitable investment opportunities (Kania, 2005). Thus, a negative relationship is expected between ROE and corporate governance.

- **Tobin's q (TQ)**

According to Beiner *et al*. (2006), companies with greater market values are more likely to adopt high quality corporate governance practices. As specified in chapter three (section 3.3.2.1), Tobin's q is the most common market-based indicator which reflects expectations of prospective firm earnings and growth opportunities (Hu and Izumida, 2008; Javid and Iqbal, 2010). As such, larger Tobin's q estimates are associated with higher growth opportunities (Drobetz, Schillhofer and Zimmermann, 2004; Abdo and Fisher, 2007). Javid and Iqbal (2010) claimed that firms with potential growth opportunities often require external financing to fund these investments. To obtain any external financing, "they are forced to improve their corporate governance" systems (Beiner *et al*., 2006: 272). Black *et al*. (2003) and Kowalewski *et al*. (2008) therefore postulated that companies with high Tobin's q ratios have a greater incentive to implement stronger corporate governance systems in order to attract investors, thus raising capital for growth opportunities (Klapper and Love, 2003; Gompers *et al*., 2003). Hence, in line with Gillan *et al*. (2003) and Lasfer (2006), this study chapter Tobin's q as a control variable, with an expectation of a positive linkage to corporate governance.

- **GDP Growth (GDPG)**

According to Jacob (2019: 3), "macroeconomics is presumed to have a role to play in the governance of companies", as a country's level of growth may impact the development of its corporate governance system (Chan and Cheung, 2011). In particular, Ugur and Ararat (2006) argued that the macroeconomic environment has a significant influence on the quality of corporate governance in firms from emerging markets. Hence, in addition to the microeconomic control variables discussed above, elements of the macroeconomy should be considered when analysing a company's corporate governance system (Dignam and Galanis, 2008). As per chapter three (section 3.3.2.3), the South African GDP growth rate is adopted as a macroeconomic control variable in this chapter, in line with Borisova *et al*. (2012). According to Doidge, Karolyi, Lins, Miller and Stulz (2004), there is a reluctance to commit to governance provisions during an economic decline, as the cost of compliance increases since companies may be incurring losses. In contrast, Merikas and Merika (2006) asserts that a rising GDP supports the improvement of firm corporate governance. The expected relationship between corporate governance and GDP growth is therefore unclear.

- **Industry Dummies (ID)**

The structure and effectiveness of corporate governance practices varies systematically across industries due to the differences in industry-specific characteristics, as well as the governance costs and benefits associated with each industry (Maher and Andersson, 1999; Elsayed, 2007). In particular, Gillan *et al*. (2003) asserts that the success of corporate governance structures is dependent on the industry's growth opportunities, business operations, competitive environment and product uniqueness. In this case, firms may adopt corporate governance practices which align with the dynamics of their industry group. Thus, coinciding with Desender *et al*. (2016), Liu *et al*. (2018), and Al-Sartaw and Sanad (2019) from section 5.2, this chapter adopts industry dummy variables to account for industry-specific characteristics. As per table 5-2, the value of one is used if the firm is in the industry or 0 otherwise.

- **Year Dummies (YD)**

It is widely known that corporate governance standards have altered over time, particularly during and after the period of the financial crisis, in which governance systems were substantially restructured (Tomasic and Akinbami, 2011). Furthermore, corporate governance mandates continue to undergo revisions every few years in order to emulate the current state of the financial and economic environment (Emeagwali, 2017). Thus, in line with Borisova *et*

al. (2012), Desender *et al*. (2016) and Liu *et al*. (2018), this chapter includes year dummy variables to control for year-specific heterogeneity and autocorrelation, as explained in chapter three (section 3.3.2.3).

5.3.3. Empirical Model for Ownership Structure and Corporate Governance Analysis

The variables listed in section 5.3.2 are therefore combined into a specific model for examining the impact of ownership categories on the corporate governance compliance of firms, as expressed in equation 5.1 below. In order to answer the second and third research questions of this chapter, equation 5.1 is estimated for the main corporate governance index, and each of the three subindices.

$$\boldsymbol{Y_{it} = \beta_0 + \beta_1 O_{it} + \eta z_{it} + \gamma d_{it} + e_{it}} \quad (5.1)$$

where i = 1…N and t = 1…18; Y_{it} is either CGI, BCS, AA, or RMI*;* O_{it} is the set of ownership variables (managerial, foreign dummy, institutional, government and family dummy); z_{it} is the group of control variables (firm size, firm age, leverage ratio, ROA, ROE, Tobin's q and GDP growth rate)*;* d_{it} is the industry and time dummies*;* and e_{it} encloses the random error term.

5.3.4. Estimation Procedure for Ownership Structure and Corporate Governance Analysis

Similar to the relationship between ownership structure and financial performance covered in chapter three, the issue of endogeneity is also prominent in corporate governance research, as indicated by the empirical evidence. Consequently, in order to select an appropriate estimation method, it is necessary to first determine whether endogeneity is present or absent in the nexus between the ownership structure and corporate governance compliance in South Africa.

5.3.4.1. Endogeneity in corporate governance

In addition to strongly supporting the notion that "corporate governance mechanisms are endogenously determined", Bekiris (2013: 360) further proposed the existence of strong interrelationships among ownership structures and the subcategories of corporate governance, such as board structure (Mak and Li, 2001; Belkhir, 2009). This concurs with the underlying presumptions of previous studies reviewed in section 5.2 (such as Peasnell *et al*., 2003; Chung and Zhang, 2011; Ozsoz *et al*., 2014; Desender *et al*., 2016; Liu *et al*., 2018), where authors adopted estimation techniques that accounted for the endogeneity bias. As such, this section adopts a methodological process similar to that of chapter three, and thus examines endogeneity

emerging from dynamic endogeneity (i.e., current dependent variables are determined by past independent variables), simultaneity (when two variables are co-determined), and unobserved heterogeneity (where the linkage between variables is impacted by an unobservable component) (Schultz *et al*., 2010; Wintoki *et al*., 2012; Li *et al*., 2021).

The dynamic nature of corporate governance is well recognised in the body of corporate governance literature, thus emphasizing the prevalence of dynamic endogeneity (Wintoki *et al*., 2012; Tshipa, 2017). Dynamic endogeneity, within the ownership- corporate governance nexus, infers that previous corporate governance compliance levels of firms may influence the current ownership structure and other firm-specific variables. For example, past low governance scores may dissuade prospective investors from acquiring a firm's shares, thus affecting the current ownership composition, firm-specific elements, and the overall corporate governance structure.

In addition to the ownership structure, simultaneity is also "the most common endogeneity problem in corporate governance" (Tshipa, 2017: 15). This indicates that the relationship between ownership types and corporate governance may be influenced by shareholder preference for firms with strong corporate governance compliance levels, thus describing a possible reverse relationship between the ownership identities (managerial, foreign, institutional, government and family) and corporate governance, as evidenced by Chung and Zhang (2011) for institutional owners (section 5.2.3). With regards to unobserved heterogeneity on this subject, unobservable firm attributes, which are difficult to measure, may impact a firm's ownership structure, company-specific elements, and corporate governance quality (Schultz *et al*., 2010; Tshipa, 2017). For instance, although managerial ability is unobservable (Wintoki *et al*., 2012), it is still regarded as an influential factor of the corporate governance practices in firms (Safiullah, Hassan and Kabir, 2022)

Therefore, in order to determine whether any of the above endogeneity issues are present between ownership structure and corporate governance, this section adopts the endogeneity tests seen in chapter three (section 3.3.4.1): (i) test of dynamic completeness; (ii) test of reverse causality; and (iii) test of strict exogeneity. Although the testing procedures used in chapter three is maintained in this chapter, the equations for each test are modified to address the specificity of the ownership- corporate governance relationship. Section 3.3.4.1 provides comprehensive discussions on each endogeneity test. This section therefore only demonstrates the relevant subject-specific elements of each test, as shown below.

- **Test of Dynamic Completeness**

The equations below encompass the OLS models for each corporate governance index, in which two lags of corporate governance compliance are applied to equation 5.2, and four lags in equation 5.3, as per Wintoki *et al.* (2012).

$$\boldsymbol{Y_{it} = \beta_0 + w_k \sum_{k=1}^{k=4} Y_{i,t-k} + \eta z_{it} + \gamma d_{it} + e_{it}} \tag{5.2}$$

$$\boldsymbol{Y_{it} = \beta_0 + w_k \sum_{k=3}^{k=4} Y_{i,t-k} + \eta z_{it} + \gamma d_{it} + e_{it}} \tag{5.3}$$

where i = 1…N and t = 1…18; Y_{it} is either CGI, BCS, AA, or RMI*;* O_{it} is the set of ownership variables (managerial, foreign dummy, institutional, government and family dummy); z_{it} is the group of control variables (firm size, firm age, leverage ratio, ROA, ROE, Tobin's q and GDP growth rate)*;* d_{it} is the industry and time dummies*;* and e_{it} encloses the random error term.

- **Test of Reverse Causality**

Equation 5.4 is an OLS regression for the current ownership and firm specific variables:

$$\boldsymbol{CV_{it} = \beta_0 + \beta_1 Y_{i,t-1} + \sum_{i=1}^{n} \eta z_{i,t-1} + \gamma d_{it} + e_{it}} \tag{5.4}$$

where i = 1…N and t = 1…18; CV_{it} is either of the current values ownership or control variables. Y_{it-1} is the previous compliance of CGI, BCS, AA, or RMI of firm i in period $t-1$. d_{it} and e_{it} are defined as per the previous usage. $z_{i,t-1}$ is the set of control values of firm i in period $t-1$.

If previous corporate governance compliance ($Y_{i,t-1}$) is significant for any current variable in equation 5.4; reverse causality exists, indicating that corporate governance compliance determines these variables and not vice versa.

- **Test of Strict Exogeneity**

Based on the postulation that previous corporate governance compliance influences the future ownership structure, equation 5.5 depicts the FEM regression of current compliance against the current and future values of ownership and control variables.

$$\boldsymbol{Y_{it}} = \boldsymbol{\beta}_{\mathbf{0}} + \boldsymbol{\beta_1}\, \boldsymbol{O_{it}} + \Omega \boldsymbol{Q_{i,t+1}} + \boldsymbol{\eta z_{it}} + \boldsymbol{\gamma d_{it}} + \boldsymbol{e_{it}} \tag{5.5}$$

where $i = 1 \ldots N$ and $t = 1 \ldots 18$. Y_{it} is either CGI, BCS, AA, or RMI. $Q_{i,t+1}$ is a subset of future values of ownership and the control variables. z_{it}, d_{it} and e_{it} are defined as per the previous usage.

Any level of significance in future ownership values may suggest that: (i) the endogeneity of the explanatory variable is a consequence of unobservable effects; and (ii) future realisations of the ownership and control variables are related to the current compliance of corporate governance in firms.

5.3.4.2. *System GMM for the ownership structure and corporate governance analysis*

In accordance with the premise of chapter three, if no endogeneity is found through the tests of dynamic completeness, reverse causality, and strict exogeneity; the FEM is selected to estimate equation 5.1. In contrast, in the event that the endogeneity bias is detected in these tests, the system GMM model is adopted (along with the relevant specification tests, i.e., Arellano-Bond autocorrelation test and the Hansen test of over-identification). Detailed explanations of the system GMM and its specification tests can be found in section 3.3.5.

The system GMM for this chapter is specified in equation 5.6 below:

$$\begin{bmatrix} \boldsymbol{Y_{it}} \\ \triangle \boldsymbol{Y_{it}} \end{bmatrix} = \boldsymbol{\beta_0} + \boldsymbol{\alpha_1} \begin{bmatrix} \boldsymbol{Y_{i,t-1}} \\ \triangle \boldsymbol{Y_{i,t-2}} \end{bmatrix} + \boldsymbol{\alpha_2} \begin{bmatrix} \boldsymbol{Y_{i,t-2}} \\ \triangle \boldsymbol{Y_{i,t-2}} \end{bmatrix} + \boldsymbol{\beta_1} \begin{bmatrix} \boldsymbol{O_{it}} \\ \triangle \boldsymbol{O_{it}} \end{bmatrix} + \boldsymbol{\eta} \begin{bmatrix} \boldsymbol{z_{it}} \\ \triangle \boldsymbol{z_{it}} \end{bmatrix} + \boldsymbol{\gamma d_{it}} + \boldsymbol{v_{it}} \tag{5.6}$$

where $i = 1 \ldots N$ *and* $t = 1 \ldots 18$; $\triangle Y_{it} = Y_{it} - Y_{i,t-1}$; $\triangle Y_{i,t-1} = Y_{i,t-1} - Y_{i,t-2}$; $\triangle Y_{i,t-2} = Y_{i,t-2} - Y_{i,t-3}$. The potential instruments that can be used for the differenced equations are $Y_{i,t-k}; O_{i,t-k}; z_{i,t-k}$, *where* $k > 2$.

Although the corporate governance index and subindices are latent unobservable variables, the GMM is suitable, as the parameters of the latent variables are determined using the observed data (Gallant, Giacomini and Ragusa, 2013).

5.4. RESULTS FOR OWNERSHIP STRUCTURE AND CORPORATE GOVERNANCE

This section aims to present and discuss the results produced from the methodological approaches described in section 5.3. The discussion therefore commences with a descriptive analysis, after which the findings of the endogeneity tests are deliberated. This section thereafter ends with an explanation of the results from the system GMM estimation.

5.4.1. Descriptive Analysis

This section begins by examining the summary statistics of the corporate governance, ownership categories, and control variables present in the sample. The analysis also explores the annual average values of each corporate governance compliance indicator. Thereafter, the section ends with a correlation analysis of all variables.

Table 5-3 presents the summary statistics for the variables used in the sample, whilst table 5-4 depicts the correlation matrix.

Table 5-3: Summary Statistics of all Variables from 2004-2021.

	Mean	Std. Dev.	Min	Max
CGI	0.773	0.182	0.150	1.000
BCS	0.750	0.191	0.000	1.000
AA	0.894	0.219	0.000	1.000
RMI	0.724	0.313	0.000	1.000
Managerial Ownership	0.140	0.201	0.000	0.965
Foreign Ownership	0.181	0.199	0.000	0.997
Institutional Ownership	0.379	0.252	0.000	0.999
Government Ownership	0.051	0.076	0.000	0.421
Family Ownership	0.007	0.041	0.000	0.763
Firm size	20.575	2.061	1.665	26.155
Firm age	3.548	0.993	0.000	7.609
Leverage	0.175	0.167	0.000	2.055
ROA	0.061	0.132	-0.860	1.375
ROE	0.128	0.236	-0.991	1.160
TQ	1.146	0.995	-0.384	10.829
GDP Growth	0.021	0.027	-0.064	0.056

Notes: Table 5-3 reports the summary statistics for the corporate governance compliance measures (CGI, BCS, AA and RMI), ownership types (managerial, foreign, institutional, government and family) and control variables (firm size, firm age, leverage ratio, ROA, ROE, TQ and GDP growth) for the period 2004 to 2021. Std. Dev. is the standard deviation, min is the minimum and max is the maximum.

Source: Own estimation (2023)

The descriptive statistics for the ownership and control variables in table 5-3 bear a close resemblance to those in table 3-4 of chapter three (section 3.4.1). The minor discrepancies in the mean and standard deviation values that exist between the two tables may be due to the fact that this chapter uses a smaller sample with less observations. In addition, with the exception

of leverage, the minimum and maximum values are identical to those found in table 3-4. As such, the discussions on the descriptive statistics of ownership and control variables that were presented in section 3.4.1 are also applicable to this section. Most notably, as per table 3-4, institutional ownership accounts for the largest proportion of shares on the JSE, while foreign ownership is the second largest ownership type. This is followed by managerial ownership and government ownership, respectively. Finally, the lowest percentage of ownership is exhibited by family shareholders. A more detailed analysis of all variables is provided in 3.4.1.1. The remainder of this section is therefore solely centred on the descriptive statistics of the corporate governance compliance measures (i.e., CGI, BCS, AA and RMI).

Table 5-3 indicates that the mean estimate of CGI is 77.3%, implying that, on average, JSE-listed firms complied with 77.3% of the 20 corporate governance provisions enclosed in CGI, as described in chapter four (table 4-1). This suggests that, over the sample period, most companies implemented comprehensive corporate governance frameworks with regards to board, audit and risk management practices. This is further confirmed by the mean values of the subindices, in which BCS, AA, and RMI exhibit average compliance levels of 75%, 89.4%, and 72.4%, respectively. Despite the fact that AA demonstrates the highest average, the mean estimate of BCS bears greater significance since it accounts for 60% of CGI, as seen in chapter four (section 4.3.2).

In particular, the mean value of BCS conveys that companies applied nine out of 12 of the board provisions aggregated in BCS, thus indicating that majority of JSE-listed firms have boards that are structured in a manner that is consistent with the recommendations of the King Reports (i.e., King II, III, and IV). As inferred in chapter four (section 4.3.2.3), the implementation of audit and risk management provisions are only possible if firms have established audit and risk management committees. Hence, given that the mean estimates of AA and RMI exceed 70%, it can be inferred that, on average, most companies have formed audit and risk management committees.

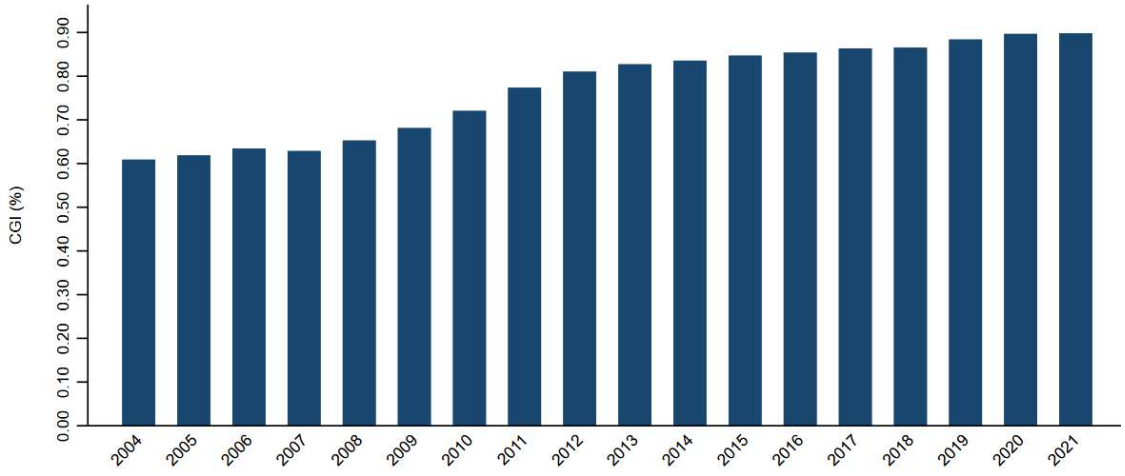
Nonetheless, table 5-3 also provides evidence of weak corporate governance compliance in certain JSE-listed firms. Similar to Ntim (2009), large dispersions observed between the minimum and maximum values demonstrates a significant degree of variability in the compliance levels of corporate governance across firms. For instance, the CGI measure ranged from a maximum of 100% (i.e., full compliance) to a minimum of 15%, which depicts a relatively low compliance of only three out of 20 provisions. Despite the growing significance of corporate governance during the sample period, the minimum values of the corporate

governance indicators reveal that there are still listed companies that are not compliant with several provisions of the King Reports.

With regards to the subindices, BCS, AA and RMI range from a maximum of 100% to a minimum of 0%. Hence, on the one hand, there are companies that fully comply to all the provisions enclosed in the three subindices. On the other hand, however, some JSE-listed firms are completely non-compliant with all aspects of BCS, AA or RMI, as demonstrated by the minimum value (0%). In spite of the JSE Listing Rules warning that firms could face suspension or delisting in 2017 for not appointing a company secretary, remuneration committees, and audit committees, the minimum values of BCS and AA reveals that there are still listed companies that are not compliant with the mandatory rules of the JSE.

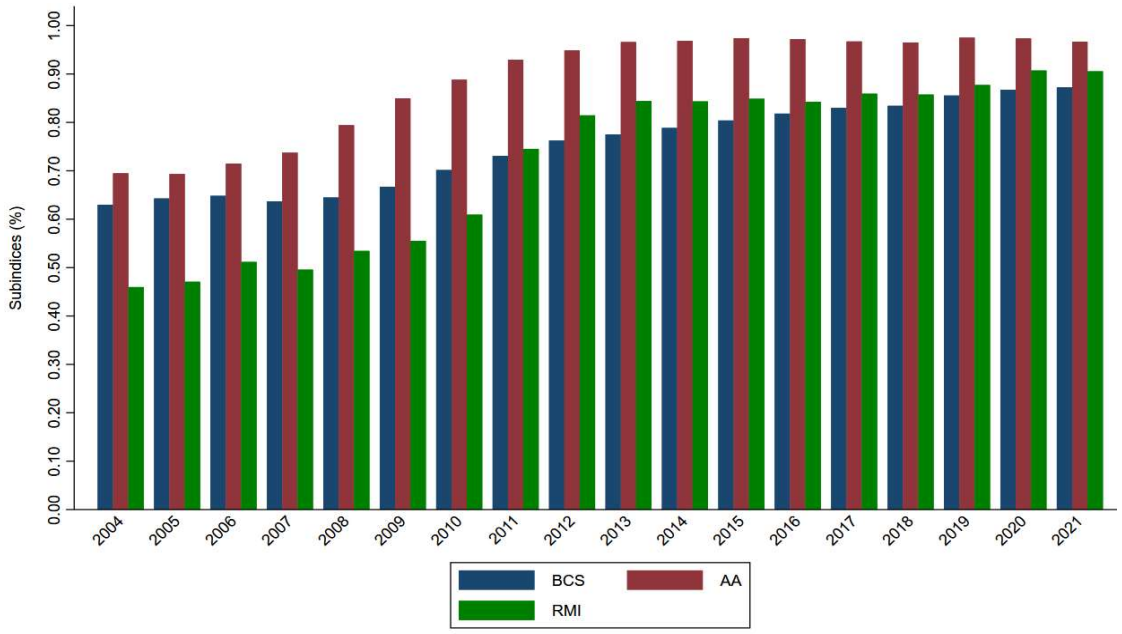
Nonetheless, despite the substantial variations in the levels of compliance, figures 5-1 and 5-2 suggest that the adoption of corporate governance standards have improved over time. Figure 5-1 illustrates average compliance levels across JSE-listed firms based on the mean values of CGI over the sample period, whilst figure 5-2 depicts the same statistics for BCS, AA, and RMI. Both graphs are derived from estimates presented in table C-1 of appendix C (page 322), which contains the computed mean estimates for CGI and the subindices, from 2004-2021.

Figure 5-1: Average CGI for the Sample of JSE-listed Firms from 2004-2021.



Source: Own construction (2023)

Figure 5-2: Average BCS, AA, and RMI for the Sample of JSE-listed Firms from 2004-2021.



Source: Own construction (2023)

It is clear from figures 5-1 and 5-2 that the average compliance of corporate governance provisions in JSE-listed firms has increased over time, as both graphs depict an upward trajectory between 2004-2021. The positive linkage between compliance levels and time is consistent with existing corporate governance literature from emerging markets (such as Bauer *et al*., 2004; Shabbir and Padgett, 2005; Cui, Evans, Wright and Crowe, 2008; Ntim, 2009). In the case of South Africa, the continuous refinement of the King Reports and the JSE Listing Requirements are regarded as contributing factors to the improvement of corporate governance in South African firms (CLSA, 2000; Deutsche Bank, 2002; Ntim, 2009).

Secondly, with the exception of RMI, both graphs illustrate minor fluctuations across the corporate governance indicators from 2004-2007. However, amidst the financial crisis, 2008 depicts significant increases in the mean of CGI (from 62.8% in 2007 to 65.2% in 2008), AA (from 73.6% in 2007 to 79.3% in 2008) and RMI (from 49.6% in 2007 to 53.5% in 2008). Considering that the issue of weak corporate governance was raised after the initial market crash in 2007 (Hasan and Ahmed, 2011), companies may have subsequently implemented additional provisions in an effort to strengthen their governance structures, thus explaining the substantial rise observed in 2008. Aside from the financial crisis, RMI may have continued to increase as the introduction of new innovations, practices, and technology may have increased the need for risk management in companies (Eceiza, Kristensen, Krivin, Samandari and White, 2020).

Thereafter, as the year in which King III was released, 2009 experienced the largest yearly percentage increase for CGI, BCS, and AA, accompanied by a moderate increase for RMI. Nevertheless, in 2010, the mean of RMI displays a notable increase, specifically of 5.4%, which may be attributed to the increased level of attention that firms directed towards risk governance following the financial crisis (OECD, 2014; Nguyen and Dang, 2022). Finally, from 2010 to 2021, a steady upward trend is observed for all measures, with evidence of minor fluctuations. In contrast to the release of King III in 2009, the release of the King IV in 2016 does not result in rapid increases in compliance levels, as seen in figures 5-1 and 5-2. After the JSE mandated certain King IV provisions in May 2017, there were slight increases in CGI (85.4% in 2016 to 86.3% in 2017), BCS (81.8% in 2016 to 83% in 2017) and RMI (84.3% in 2016 to 85.9% in 2017). However, a decline was observed in AA (97.2% in 2016 to 96.7% in 2017).

Table 5-4: Correlation Matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) CGI	1.000															
(2) BCS	0.903	1.000														
(3) AA	0.703	0.462	1.000													
(4) RMI	0.768	0.482	0.505	1.000												
(5) Managerial Ownership	-0.288	-0.282	-0.135	-0.227	1.000											
(6) Foreign Ownership	0.295	0.261	0.176	0.258	-0.313	1.000										
(7) Institutional Ownership	0.051	0.012	0.054	0.088	-0.261	-0.283	1.000									
(8) Government Ownership	0.358	0.331	0.166	0.317	-0.335	0.245	-0.051	1.000								
(9) Family Ownership	-0.039	-0.006	-0.035	-0.078	0.031	-0.079	-0.052	-0.063	1.000							
(10) Firm Size	0.531	0.432	0.363	0.501	-0.422	0.390	0.006	0.513	-0.071	1.000						
(11) Firm Age	0.273	0.248	0.158	0.230	-0.258	0.199	0.087	0.287	-0.010	0.385	1.000					
(12) Leverage	0.089	0.105	0.013	0.061	-0.024	0.045	0.006	0.087	-0.001	0.025	0.068	1.000				
(13) ROA	-0.037	-0.036	-0.031	-0.020	0.001	0.043	-0.043	0.046	-0.013	0.141	0.078	-0.216	1.000			
(14) ROE	-0.045	-0.047	-0.034	-0.021	0.029	0.060	-0.086	0.057	-0.018	0.116	0.092	-0.110	0.715	1.000		
(15) Tobin's q	0.019	0.025	-0.027	0.028	-0.078	0.090	-0.078	0.102	-0.023	0.119	0.070	-0.008	0.320	0.367	1.000	
(16) GDP Growth	-0.281	-0.221	-0.244	-0.244	0.014	-0.046	-0.126	-0.103	-0.035	-0.135	-0.061	-0.087	0.134	0.158	0.139	1.000

Notes: This table shows the correlation coefficients between corporate governance measures, ownership types and control variables for the period of 2004 to 2021.

Source: Own estimation (2023)

As expected, table 5-4 indicates that BCS, AA and RMI are strongly correlated to CGI as the three subindices represent the main aspects of overall corporate governance, as discussed in chapter four (section 4.3.2).

In line with the results of Ntim (2009), the negative correlations between managerial ownership and CGI, BCS, AA, and RMI imply that firms with high levels of managerial shareholding may have deficient corporate governance systems. Similarly, family ownership also exhibits negative correlations with the corporate governance indicators, albeit in lower magnitudes than those of managerial ownership. This coincides with studies reviewed in section 5.2.5 (such as Bartholomeusz and Tanewski, 2006; Hasan *et al*., 2014), in which negative relations between family ownership and board characteristics were found in Bangladesh and Australia

In contrast to managerial and family ownership, the corporate governance measures are positively correlated to foreign, institutional and government ownership variables. The positive foreign ownership- corporate governance linkage coincides with the Asian studies of Ahmadjian (2007), An (2015) and Desender *et al*. (2016), and the Turkish study by Ozsoz *et al*. (2014) in section 5.2.3. The positive correlations between institutional ownership and the corporate governance indicators concur with Li *et al*. (2006) and Liu *et al*. (2018) in China, and by Chung and Zhang (2011) in the U.S.

Firm size is also positively correlated to the corporate governance indicators. These results are consistent with Gompers *et al.* (2003) and Brown and Caylor (2006), where authors found positive relationships between the firm size and corporate governance indices for S&P 500 firms. Since larger firms have superior access to external capital, they have a greater capacity to employ and retain qualified board of directors, high quality auditors, risk management experts and other necessary personnels required for effective corporate governance systems (Chibber and Majumdar, 1999; Thurman, 2000; Wooten, 2003; Kleffner, Lee and McGannon, 2003).

The positive association between firm age and the corporate governance measures concurs with Black *et al*. (2006) and Haque, Arun and Kirkpatrick (2011), as both studies observed similar findings in Korea and Bangladesh, respectively. This may be attributed to older firms having more time to develop and improve their corporate governance frameworks (Biswas, 2013), as explained in section 5.3.2.3. Similarly, the correlation coefficients between leverage and the corporate governance measures are also positive. This is in line with Ozsoz *et al*. (2014), who

claimed that highly leveraged firms tend to behave more conservatively and are more compliant to corporate governance policies in order to avoid the scrutiny of creditors.

Conversely, ROA and ROE share inverse correlations with CGI, BCS, AA and RMI. This could be due to the fact that corporate governance controls may be relaxed when firms are achieving strong financial performance (Kania, 2005). By contrast, in the event of financial losses, shareholders may pressure firms into implementing stricter corporate governance practices (Hermalin and Weisbach, 1998; Bhagat and Black, 2002; Schultz *et al*., 2010). The Tobin's q ratio also exhibits positive correlations with CGI, BCS, and RMI, but is negatively associated to AA. As a market-based measure, firms with large Tobin's q values are often linked to higher growth opportunities, which are usually financed with external funding (Drobetz *et al*., 2004; Abdo and Fisher, 2007; Javid and Iqbal, 2010). Therefore, as a way to attract external investors, these firms may increase their corporate governance compliance levels (Beiner *et al*., 2006), as discussed in section 5.2.5.

Similar to ROA and ROE, the negative correlation between Tobin's q and AA may arise when the roles of auditing committees decrease as the firm experiences high market values. This phenomenon may also explain the negative correlations between GDP growth and the corporate governance indicators. As discussed in chapter three (section 3.4.1), when GDP increases, companies can produce more output and are thus more profitable (Rasyid and Linda, 2019), as seen by the positive correlations between GDP and ROA and ROE. Hence, when the economy is expansive, firms generate substantial profits, which may subsequently decrease the demand for stronger corporate governance systems.

Majority of the correlations between the ownership and control variables in table 5-4 are similar to those reported in chapter three, for the ownership structure- performance nexus. In particular, the signs of the correlation coefficients between all ownership variables and firm size, firm age, ROA, ROE, and Tobin's q are consistent with the results in table 3-5. For this reason, the discussion pertaining to the correlation results in chapter three (section 3.4.1.1) can also be applied to this section. There are, however, discrepancies relating to certain ownership types with leverage and GDP growth. For instance, table 5-4 demonstrates a negative correlation between family ownership and leverage, and a positive correlation between managerial ownership and GDP growth, whereas table 3-5 displayed correlations of opposing directions for both variables. These disparities may be attributed to the differences in sample sizes and the number of observations.

In summary, based on the ownership- corporate governance nexus, managerial and family ownership exhibit negative correlations with the corporate governance compliance indicators, whereas the other ownership variables (such as foreign, institutional and government) are positively correlated to all governance measures. Firm size, firm age and leverage are positively related to all corporate governance measures, whereas ROA, ROE, and GDP growth exhibit negative correlations. Tobin's q is the only variable that varies in correlations across the governance indicators as it is negative for AA, and positive for the others. Most of the correlations between the ownership and control variables closely resemble the coefficients presented in table 3-5, with minor discrepancies from leverage and GDP growth.

5.4.2. Regression Results for Endogeneity Tests

This section aims to analyse the findings generated by the three endogeneity tests, namely, the test of dynamic completeness, the test of reverse causality, and the test of strict exogeneity.

5.4.2.1. Regression results for test of dynamic completeness

The analysis in chapter three (section 3.4.2.1) indicated that two lags were adequate for capturing the persistence of profitability over time. Accordingly, this section follows the same testing procedure to verify the sufficiency of two lags for the corporate governance indicators. The results are presented in table 5-5, where panel A estimates equation 5.2 with four lags, and panel B estimates equation 5.3 with the third and fourth lag only.

Table 5-5: Regression Results of the Test of Dynamic Completeness.

	Panel A				Panel B			
	CGI	**BCS**	**AA**	**RMI**	**CGI**	**BCS**	**AA**	**RMI**
Corporate Governance$_{t-1}$	**0.781**	**0.729**	**0.662**	**0.732**				
	(29.597)***	**(24.643)*****	**(13.636)*****	**(23.619)*****				
Corporate Governance$_{t-2}$	**0.065**	**0.102**	**0.081**	**0.084**				
	(2.012)*	**(3.146)*****	**(1.812)***	**(2.675)*****				
Corporate Governance$_{t-3}$	0.025	0.044	-0.044	0.004	**0.575**	**0.586**	**0.341**	**0.479**
	(0.932)	(1.598)	(1.728)	(0.195)	**(16.375)*****	**(19.087)*****	**(9.085)*****	**(15.060)*****
Corporate Governance$_{t-4}$	0.001	0.014	0.014	-0.026	**0.089**	**0.138**	0.034	0.013
	(0.051)	(0.707)	(0.659)	(1.540)	**(2.669)*****	**(4.713)*****	(1.207)	(0.472)
Firm Size	**0.002**	**0.002**	**0.003**	**0.007**	**0.008**	**0.006**	**0.008**	**0.025**
	(1.808)*	**(1.998)****	**(1.801)***	**(2.640)*****	**(5.418)*****	**(4.610)*****	**(3.600)*****	**(7.026)*****
Firm Age	-0.001	-0.003	-0.001	0.005	-0.003	-0.004	-0.006	0.003
	(0.410)	(1.345)	(0.424)	(0.898)	(1.022)	(1.435)	(1.388)	(0.434)
Leverage	0.013	**0.026**	-0.022	0.009	0.012	**0.035**	**-0.045**	0.007
	(1.516)	**(2.487)****	(1.462)	(0.438)	(0.938)	**(2.521)*****	**(2.268)*****	(0.247)
ROA	**0.047**	**0.061**	-0.020	0.044	0.031	**0.051**	-0.026	-0.037
	(2.856)***	**(2.849)*****	(0.524)	(1.394)	(1.103)	**(1.913)***	(0.494)	(0.647)
ROE	-0.011	-0.013	0.002	-0.003	-0.011	-0.011	0.003	0.015
	(1.327)	(1.263)	(0.118)	(-0.163)	(0.845)	(0.798)	(0.136)	(0.514)
Tobin's q	0.001	-0.001	0.001	0.004	0.001	0.001	-0.004	0.005
	(0.383)	(0.474)	(0.332)	(1.084)	(0.382)	(0.350)	(1.059)	(0.787)
GDP Growth	-0.001	0.000	-0.001	**-0.003**	-0.000	-0.000	-0.001	-0.002
	(-1.391)	(0.314)	(-1.123)	**(2.335)****	(0.711)	(0.189)	(0.594)	(0.937)
R^2	0.868	0.851	0.664	0.742	0.701	0.692	0.348	0.490

Notes: This table reports the results from OLS regressions of lags of corporate governance (Corporate Governance$_{t-i}$ is the ith period lagged corporate governance indicator) and the control variables (firm size, firm age, leverage ratio, ROA, ROE, TQ and GDP growth) on current corporate governance (CGI, BCS, AA, and RMI). Panels A and B show the results with lags for years 1 to 4 and lags for years 3 and 4, respectively. All test statistics are based on robust, firm-clustered standard errors. Year and industry dummies are included in all specifications. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Source: Own estimation (2023)

Panel A demonstrates the statistical significance of the first and second lags across all dependent variables (CGI, BCS, AA and RMI), while the third and fourth lags are insignificant for all corporate governance measures. As such, panel A reveals that the first and second lags are essential for all corporate governance proxies. Moreover, the results in panel A indicate the presence of the endogeneity bias, as past levels of corporate governance compliance (from the preceding year and two years ago) have an influence on the current compliance levels for all four measures.

Following the exclusion of the first and second lags in panel B, the third lag turns significant for CGI, BCS, AA and RMI, while the fourth lag becomes significant for CGI and BCS. The fact that the third and fourth lags become significant when the recent lags are dropped suggests that, although the later lags do contain important information, most of this information is already captured by the more recent lags (year one and two). These findings are broadly consistent with Wintoki *et al*. (2012), as highlighted in chapter three (section 3.4.2.1).

Based on these results, it can be deduced that the inclusion of two lags adequately addresses the dynamic components inherent in the relationship between the ownership identities and corporate governance compliance. As such, equation 5.6 includes two lags to capture these dynamic effects.

5.4.2.2. Regression results for test of reverse causality

Table 5-6 displays the results of the OLS regression analysis for equation 5.4. This model regresses the current ownership variables (managerial, foreign, institutional, government, and family) and control variables against the past corporate governance and control variables, from one year earlier. The four panels of table 5-6 (A, B, C and D) correspond to the one-year lag of CGI, BCS, AA and RMI, respectively. Table 5-6 can be found on pages 210 and 211.

Table 5-6: OLS Regression Results for Test of Reverse Causality.

	MAN	FOR2	INS	GOV	FAM2	LNSIZE	LEV	ROA	ROE	TQ	GDPG
Panel A: CGI											
CGI_{t-1}	**-0.112**	**0.157**	**-0.106**	**0.041**	-0.005	0.267	0.013	-0.016	0.028	0.025	-0.000
	(4.025) ***	**(6.016)*****	**(3.132)*****	**(4.626)*****	(0.586)	(1.449)	(0.730)	(0.959)	(1.093)	(0.245)	(0.527)
$LNSIZE_{t-1}$	-0.036	**0.031**	**-0.007**	**0.016**	**-0.002**	**0.928**	**0.003**	0.002	0.002	**0.026**	-0.000
	(13.096)	**(13.558)*****	**(2.604)*****	**(17.356)*****	**(4.190)*****	**(24.642)*****	**(1.991)****	(1.464)	(0.972)	**(2.726)****	(1.351)
$LNAGE_{t-1}$	**-0.022**	**0.009**	**0.023**	**0.008**	0.001	0.017	0.003	**0.006**	**0.009**	**0.055**	0.000
	(6.450)***	**(2.234)****	**(4.269)*****	**(5.787)*****	(1.295)	(0.885)	(1.059)	**(2.517)****	**(1.816)***	**(2.578)*****	(1.306)
LEV_{t-1}	**0.034**	-0.004	0.036	**0.013**	0.001	0.098	**0.589**	**-0.056**	**-0.085**	**-1.230**	-0.000
	(1.809)*	(0.208)	(1.415)	**(1.727)***	(0.446)	(1.286)	**(7.425)*****	**(3.447)*****	**(2.625)*****	**(2.443)****	(0.357)
ROA_{t-1}	0.072	**-0.072**	0.080	**-0.020**	-0.000	0.186	-0.025	**0.345**	**0.149**	**0.554**	-0.000
	(1.557)	**(1.895)***	(1.378)	**(1.696)***	(0.006)	(0.973)	(0.587)	**(5.844)*****	**(2.232)****	**(1.666)***	(0.582)
ROE_{t-1}	**0.059**	0.039	**-0.054**	**0.014**	0.002	0.335	**0.043**	**0.073**	**0.437**	**0.408**	-0.000
	(2.522)**	(1.601)	**(1.756)***	**(1.902)***	(0.558)	**(2.570)****	**(1.705)***	**(3.038)*****	**(11.424)*****	**(2.383)****	(1.181)
TQ_{t-1}	**-0.007**	0.003	**-0.009**	0.001	-0.000	**0.039**	**-0.041**	**0.018**	**0.025**	**0.456**	0.000
	(2.791)***	(1.000)	**(2.169)****	(0.788)	(1.121)	**(3.670)*****	**(2.560)****	**(6.614)*****	**(4.221)*****	**(4.390)*****	(0.563)
$GDPG_{t-1}$	-0.094	-0.109	**0.641**	-0.034	0.001	-0.764	0.016	-0.139	-0.016	-0.182	-0.001
	(0.520)	(0.584)	**(2.354)****	(0.484)	(0.203)	(0.527)	(0.103)	(1.240)	(0.073)	(0.194)	(1.437)
Panel B: BCS											
BCS_{t-1}	**-0.125**	**0.121**	**-0.114**	**0.047**	0.004	0.175	0.019	-0.016	0.003	0.087	-0.000
	(5.469)***	**(5.434)*****	**(4.123)*****	**(6.115)*****	(0.782)	(1.236)	(1.298)	(1.172)	(0.118)	(0.990)	(0.952)
$LNSIZE_{t-1}$	**-0.036**	**0.033**	**-0.008**	**0.016**	**-0.002**	**0.933**	**0.003**	0.002	0.003	**0.024**	-0.000
	(13.797)***	**(15.385)*****	**(2.887)*****	**(18.518)*****	**(4.987)*****	**(26.242)*****	**(2.001)****	(1.365)	(1.433)	**(2.665)*****	(1.211)
$LNAGE_{t-1}$	**-0.022**	**0.009**	**0.024**	**0.007**	0.001	0.018	0.003	**0.006**	**0.009**	**0.054**	0.000
	(6.294)***	**(2.226)****	**(4.364)*****	**(5.655)*****	(1.184)	(0.903)	(1.021)	**(2.543)****	**(1.877)***	**(2.538)****	(1.321)
LEV_{t-1}	**0.036**	-0.004	0.038	0.012	0.001	0.099	**0.589**	**-0.056**	**-0.084**	**-1.233**	-0.000
	(1.954)*	(0.218)	(1.489)	(1.645)	(0.278)	(1.299)	**(7.416)*****	**(3.429)*****	**(2.590)*****	**(2.448)****	(0.357)
ROA_{t-1}	0.073	**-0.076**	0.082	**-0.021**	0.000	0.178	-0.025	**0.345**	**0.147**	**0.556**	-0.000
	(1.615)	**(2.018)****	(1.415)	**(1.750)***	(0.065)	(0.934)	(0.590)	**(5.851)*****	**(2.211)****	**(1.670)***	(0.593)
ROE_{t-1}	**0.057**	**0.042**	**-0.056**	**0.015**	0.002	**0.341**	**0.043**	**0.073**	**0.438**	**0.408**	-0.000
	(2.458)**	**(1.740)***	**(1.831)***	**(2.018)****	(0.505)	**(2.587)*****	**(1.719)***	**(3.025)*****	**(11.447)*****	**(2.377)****	(1.168)
TQ_{t-1}	**-0.007**	0.003	**-0.009**	0.001	-0.000	**0.040**	**-0.041**	**0.018**	**0.026**	**0.455**	0.000
	(2.877)***	(1.133)	**(2.200)****	(0.815)	(1.222)	**(3.730)*****	**(2.563)****	**(6.598)*****	**(4.240)*****	**(4.391)*****	(0.528)
$GDPG_{t-1}$	-0.069	-0.130	**0.663**	-0.043	0.000	-0.793	0.013	-0.136	-0.016	-0.202	-0.001
	(0.384)	(0.700)	**(2.442)****	(0.614)	(0.033)	(0.539)	(0.079)	(1.212)	(0.069)	(0.216)	(1.437)

	MAN	FOR2	INS	GOV	FAM2	LNSIZE	LEV	ROA	ROE	TQ	GDPG
Panel C: AA											
AA_{t-1}	0.023	**0.034**	-0.039	**-0.019**	-0.004	0.015	-0.018	-0.001	0.023	-0.110	-0.000
	(1.145)	**(1.983)****	(1.620)	**(3.311)*****	(0.694)	(0.157)	(1.302)	(0.071)	(1.154)	(1.327)	(0.165)
$LNSIZE_{t-1}$	**-0.040**	**0.036**	**-0.010**	**0.018**	**-0.002**	**0.938**	**0.004**	0.002	0.003	**0.030**	-0.000
	(15.737)***	**(17.093)*****	**(3.830)*****	**(21.770)*****	**(5.059)*****	**(29.271)*****	**(2.490)****	(1.121)	(1.184)	**(2.971)*****	(1.308)
$LNAGE_{t-1}$	**-0.024**	**0.011**	**0.022**	**0.008**	0.001	0.020	0.003	**0.006**	**0.009**	**0.055**	0.000
	(6.780)***	**(2.624)*****	**(4.107)*****	**(6.204)*****	(1.283)	(0.951)	(1.135)	**(2.453)****	**(1.873)***	**(2.629)*****	(1.320)
LEV_{t-1}	0.029	0.002	0.032	**0.014**	0.001	0.108	**0.590**	**-0.056**	**-0.084**	**-1.228**	-0.000
	(1.577)	(0.083)	(1.262)	**(1.962)****	(0.379)	(1.421)	**(7.450)*****	**(3.496)*****	**(2.588)*****	**(2.448)****	(0.456)
ROA_{t-1}	0.079	**-0.078**	0.083	**-0.024**	0.000	0.172	-0.027	**0.345**	**0.149**	**0.546**	-0.000
	(1.778)*	**(2.021)****	(1.425)	**(2.004)****	(0.002)	(0.900)	(0.632)	**(5.842)*****	**(2.224)****	**(1.650)***	(0.555)
ROE_{t-1}	**0.055**	**0.041**	**-0.055**	**0.016**	0.002	**0.341**	**0.044**	**0.073**	**0.437**	**0.414**	-0.000
	(2.389)**	**(1.668)***	**(1.774)***	**(2.152)****	(0.570)	**(2.553)****	**(1.733)***	**(3.018)*****	**(11.413)*****	**(2.414)****	(1.198)
TQ_{t-1}	**-0.008**	0.004	**-0.009**	0.001	-0.000	**0.041**	**-0.041**	**0.017**	**0.026**	**0.456**	0.000
	(3.051)***	(1.235)	**(2.276)****	(1.058)	(1.135)	**(3.724)*****	**(2.559)****	**(6.581)*****	**(4.217)*****	**(4.410)*****	(0.504)
$GDPG_{t-1}$	-0.091	-0.088	**0.622**	-0.038	-0.000	-0.745	0.011	-0.140	-0.007	-0.220	-0.001
	(0.513)	(0.476)	**(2.273)****	(0.548)	(0.027)	(0.515)	(0.068)	(1.253)	(0.030)	(0.235)	(1.437)
Panel D: RMI											
RMI_{t-1}	-0.021	**0.062**	0.012	**0.012**	**-0.012**	**0.174**	0.006	-0.003	**0.027**	-0.009	-0.000
	(1.377)	**(4.801)*****	(0.610)	**(2.302)****	**(1.723)***	**(1.822)***	(0.630)	(0.361)	**(1.757)***	(0.179)	(0.156)
$LNSIZE_{t-1}$	**-0.038**	**0.033**	**-0.012**	**0.017**	**-0.001**	**0.927**	**0.003**	0.002	**0.002**	**0.028**	-0.000
	(13.908)***	**(14.536)*****	**(4.217)*****	**(18.168)*****	**(3.360)*****	**(25.182)*****	**(2.025)****	(1.185)	**(0.699)**	**(2.767)*****	(1.379)
$LNAGE_{t-1}$	**-0.023**	**0.011**	**0.022**	**0.008**	0.001	0.019	0.003	**0.006**	**0.009**	**0.055**	0.000
	(6.745)***	**(2.555)****	**(4.053)*****	**(6.042)*****	(1.339)	(0.924)	(1.099)	**(2.461)****	**(1.859)***	**(2.619)*****	(1.318)
LEV_{t-1}	0.030	-0.001	0.032	**0.014**	0.001	0.102	**0.589**	**-0.056**	**-0.085**	**-1.229**	-0.000
	(1.614)	(0.027)	(1.242)	**(1.873)***	(0.551)	(1.350)	**(7.432)*****	**(3.484)*****	**(2.625)*****	**(2.444)****	(0.425)
ROA_{t-1}	**0.076**	**-0.074**	0.087	**-0.021**	-0.001	0.188	-0.025	**0.345**	**0.150**	**0.552**	-0.000
	(1.664)*	**(1.923)***	(1.469)	**(1.796)***	(0.144)	(0.987)	(0.591)	**(5.833)*****	**(2.255)****	**(1.655)***	(0.546)
ROE_{t-1}	**0.058**	0.039	**-0.057**	**0.014**	0.002	**0.331**	**0.043**	**0.073**	**0.436**	**0.409**	-0.000
	(2.465)**	(1.576)	**(1.840)***	**(1.940)***	(0.743)	**(2.544)****	**(1.701)***	**(3.018)*****	**(11.411)*****	**(2.383)****	(1.199)
TQ_{t-1}	**-0.007**	0.003	**-0.009**	0.001	-0.000	**0.039**	**-0.041**	**0.018**	**0.025**	**0.456**	0.000
	(2.910)***	(1.063)	**(2.353)****	(0.877)	(0.863)	**(3.618)*****	**(2.560)****	**(6.591)*****	**(4.200)*****	**(4.395)*****	(0.538)
$GDPG_{t-1}$	-0.102	-0.094	**0.637**	-0.030	-0.000	-0.731	0.018	-0.140	-0.012	-0.182	-0.001
	(0.570)	(0.506)	**(2.317)****	(0.436)	(0.011)	(0.510)	(0.111)	(1.249)	(0.053)	(0.194)	(1.436)

Notes: This table reports the results from OLS regressions of lags of corporate governance (CGI, BCS, AA and RMI) and the control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), Return on Assets (ROA), Return on Equity (ROE), Tobin's q (TQ) and GDP growth (GDPG)) on the current ownership (manager (MAN), foreign (FOR2), institutional (INS), government (GOV) and family (FAM2)) and control variables for CGI, BCS, AA, and RMI in Panels A–D, respectively. Year and industry dummies are included in all specifications. See section 5.3.2 for the complete definitions of all variables. *, ** and *** indicate significance at 10%, 5% and 1% respectively for the t-statistics. Items in boldface are significant at the 10% level or lower.

Source: Own estimation (2023)

The results in table 5-6 are largely consistent with the presence of reverse causality as panels A, B, C, and D detect significant relationships between several ownership variables and past corporate governance measures. For instance, foreign ownership and government ownership are significantly related to all past corporate governance indicators, whereas managerial and institutional ownership exhibit significant associations with CGI and BCS, and family ownership with RMI.

In particular, foreign ownership shares a positive linkage with past CGI, BCS, AA and RMI. This implies that foreign investors prefer investing in firms that have previously complied with corporate governance provisions as these investors demand higher corporate governance standards (Gillan and Stark, 2003). This also supports the work of Saini and Singhania (2017: 1328), who claimed that "foreign investors tend to invest in better governed firms in emerging markets". Similarly, government ownership is positively associated with past CGI, BCS and RMI, but exhibits a negative relation with AA. On the one hand, this suggests that government shareholders are attracted to better-governed companies, as these firms tend to pursue a more socially responsible agenda which aligns with governmental objectives (Ntim and Soobaroyen, 2013). On the other hand, government shareholders may avoid investing in firms with strong auditing practices as they are less willing to be extensively monitored by high-quality auditors (Sarhan, Ntim and Al-Najjar, 2019), since this may prevent them from pursuing social objectives.

The negative linkages that managerial ownership and institutional ownership share with past BCS implies that companies that have previously implemented a high degree of board provisions are likely to have lower levels of ownership by managers and institutions (Farinha, 2003; Laser, 2006). Similarly, institutional investors may also prefer investing in firms with less independent boards in order to exert more control on management decisions (Al-Sartaw and Sanad, 2019). The study of Al-Sartaw and Sanad (2019) in section 5.2.3 indicated that institutional shareholders may not require strict compliance with board practices, as they have the capacity to perform active monitoring duties on their own which, in turn, may grant them more authority over the firm. Since the managerial and institutional variables are not significantly related to past AA or RMI, their inverse linkage to CGI may stem from their negative associations with BCS.

In a similar vein, family shareholders also desire to exert and retain control over investee firms (Faghfouri, 2013). As such, the concentration of family ownership may be low in firms with established risk management practices, as this entails a greater degree of transparency and

objective control of business operations, and thus "a loss of privacy and authority" **(**Mitter, Postlmayr and Kuttner, 2020: 239); thereby explaining the negative association between family ownership and RMI. Hence, these findings evince reverse causality, in which the previous compliance of corporate governance influences the percentage of managerial, foreign, institutional, government and family ownership, but not vice versa.

With the exception of firm size in panel D, the control variables are not significantly related to any past corporate governance measures. As discussed in section 5.4.1.1, the significant positive relation between firm size and past RMI may be attributed to the fact that larger firms have greater financial resources (Chibber and Majumdar, 1999), which can aid the implementation of the recommended risk management systems.

5.4.2.3. Regression results for test of strict exogeneity

The FEM estimations of equation 5.5 are presented in tables 5-7, 5-8, 5-9 and 5-10. In these tables, the equation regresses seven different variations of each corporate governance measure (CGI, BCS, AA and RMI) against different subsets of control and ownership variables.

Table 5-7: FE Regression Results for Test of Strict Exogeneity for CGI.

	(1) CGI	(2) CGI	(3) CGI	(4) CGI	(5) CGI	(6) CGI	(7) CGI
MAN	**-0.097**	**-0.115**	**-0.132**	**-0.115**	**-0.115**	**-0.108**	**-0.093**
	(3.288)***	**(3.145)*****	**(3.415)*****	**(3.139)*****	**(3.142)*****	**(3.421)*****	**(3.129)*****
FOR2	0.007	0.006	**0.083**	0.009	0.008	**0.064**	0.002
	(0.288)	(0.272)	**(3.021)*****	(0.333)	(0.322)	**(2.519)****	(0.103)
INS	0.011	0.012	**0.037**	0.012	0.012	**0.036**	0.005
	(0.620)	(0.671)	**(2.069)****	(0.684)	(0.674)	**(2.053)****	(0.326)
GOV	0.025	0.025	**0.264**	0.017	0.025	**0.215**	0.033
	(0.312)	(0.312)	**(3.143)*****	(0.274)	(0.307)	**(3.357)*****	(0.527)
FAM2	-0.088	-0.081	-0.030	-0.081	-0.064	-0.073	-0.059
	(1.409)	(1.383)	(0.289)	(1.380)	(1.497)	(0.949)	(1.391)
LNSIZE	**0.012**	**0.013**	**0.030**	**0.012**	**0.013**	**0.030**	0.011
	(2.416)**	**(2.411)****	**(3.666)*****	**(2.402)****	**(2.404)****	**(3.638)*****	(2.224)
LNAGE	**0.093**	**0.093**	**0.205**	**0.093**	**0.093**	**0.204**	-0.261
	(4.617)***	**(4.677)*****	**(7.766)*****	**(4.674)*****	**(4.670)*****	**(7.711)*****	(1.659)
LEV	-0.039	-0.038	**-0.054***	-0.038	-0.038	**-0.056**	-0.003
	(1.463)	(1.431)	**(-1.921)***	(1.439)	(1.430)	**(1.992)****	(0.142)
ROA	-0.008	-0.008	-0.031	-0.008	-0.008	-0.030	0.004
	(0.294)	(0.303)	(1.012)	(0.312)	(0.312)	(0.974)	(0.153)
ROE	0.002	0.001	**-0.029**	0.002	0.002	**-0.029**	-0.001
	(0.101)	(0.085)	**(1.695)***	(0.093)	(0.100)	**(1.739)***	(0.060)
TQ	0.002	0.002	0.004	0.002	0.002	0.004	0.003
	(0.737)	(0.756)	(1.340)	(0.750)	(0.747)	(1.314)	(1.352)
GDPG	-0.188	-0.191	**-0.006**	-0.192	-0.191	**-0.006**	-0.246
	(1.228)	(1.260)	**(5.389)*****	(1.265)	(1.261)	**(5.349)*****	(1.361)
MAN_{t+1}	-0.032					-0.038	-0.024
	(1.050)					(0.980)	(0.813)
$FOR2_{t+1}$		0.004				0.032	0.005
		(0.211)				(1.398)	(0.234)
INS_{t+1}			**0.035**			**0.036**	0.005
			(1.915)*			**(1.970)****	(0.315)
GOV_{t+1}				0.016		0.099	0.011
				(0.242)		(1.363)	(0.160)
$FAM2_{t+1}$					-0.032	0.069	-0.037
					(0.649)	(0.940)	(0.700)
$LNSIZE_{t+1}$							0.003
							(1.045)
$LNAGE_{t+1}$							**0.435**
							(2.184)**
LEV_{t+1}							**-0.050**
							(2.266)**
ROA_{t+1}							**-0.051**
							(2.379)**
ROE_{t+1}							0.010
							(0.666)
TQ_{t+1}							-0.002
							(0.357)
$GDPG_{t+1}$							-0.137
							(0.469)

Notes: Table 5-7 reports the results from the FE regressions of CGI on the current and leads of ownership (manager (MAN), foreign (FOR2), institutional (INS), government (GOV) and family (FAM2)) and the control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), Return on Assets (ROA), Return on Equity (ROE), Tobin's q (TQ), and GDP growth (GDPG)). (t+1) is a subset of lead values of the ownership and control variables. *, ** and *** indicate significance at 10%, 5% and 1% respectively for the t-test. Items in boldface are significant at the 10% level or higher.

Source: Own estimation (2023)

Table 5-8: FE Regression Results for Test of Strict Exogeneity for BCS.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	BCS	**BCS**	**BCS**	**BCS**	**BCS**	**BCS**	**BCS**
MAN	**-0.117**	**-0.141**	**-0.140**	**-0.141**	**-0.141**	**-0.117**	**-0.110**
	(4.965)* **	**(7.177)*** **	**(7.124)*** **	**(7.199)*** **	**(7.169)*** **	**(4.986)*** **	**(4.660)*** **
FOR2	0.015	0.018	0.017	0.016	0.016	0.015	0.013
	(0.892)	(0.842)	(1.033)	(0.925)	(0.966)	(0.731)	(0.599)
INS	-0.005	-0.004	-0.009	-0.004	-0.004	-0.009	-0.014
	(0.430)	(0.330)	(0.628)	(0.359)	(0.315)	(0.639)	(0.977)
GOV	0.022	0.022	0.022	0.044	0.022	0.044	0.063
	(0.477)	(0.470)	(0.473)	(0.834)	(0.472)	(0.823)	(1.190)
FAM2	0.037	0.046	0.046	0.046	0.043	0.040	0.047
	(0.529)	(0.660)	(0.652)	(0.648)	(0.515)	(0.479)	(0.571)
LNSIZE	0.004	0.004	0.004	0.004	0.004	0.004	0.002
	(1.359)	(1.425)	(1.379)	(1.448)	(1.401)	(1.415)	(0.591)
LNAGE	**0.087**	**0.088**	**0.088**	**0.088**	**0.088**	**0.087**	**-0.323**
	(8.054)* **	**(8.113)*** **	**(8.099)*** **	**(8.104)*** **	**(8.120)*** **	**(8.009)*** **	**(-4.098)*** **
LEV	-0.025	-0.024	-0.024	-0.023	-0.024	-0.024	0.024
	(1.602)	(1.537)	(1.558)	(1.507)	(1.543)	(1.571)	(1.252)
ROA	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	0.006
	(0.294)	(0.314)	(0.324)	(0.312)	(0.317)	(0.289)	(0.261)
ROE	0.003	0.003	0.003	0.004	0.003	0.004	0.002
	(0.273)	(0.256)	(0.273)	(0.287)	(0.268)	(0.281)	(0.162)
TQ	0.003	0.003	0.003	0.003	0.003	0.003	0.003
	(1.447)	(1.484)	(1.474)	(1.486)	(1.476)	(1.463)	(1.175)
GDPG	-0.081	-0.086	-0.086	-0.083	-0.085	-0.079	-0.151
	(0.392)	(0.417)	(0.420)	(0.403)	(0.414)	(0.385)	(0.739)
MAN_{t+1}	**-0.042**					**-0.041**	**-0.039**
	(1.871)*					**(-1.814)***	**(1.679)***
$FOR2_{t+1}$		-0.001				0.001	-0.003
		(0.059)				(0.036)	(0.134)
INS_{t+1}			0.010			0.006	0.004
			(0.696)			(0.430)	(0.265)
GOV_{t+1}				-0.045		-0.044	-0.047
				(0.861)		(0.825)	(0.893)
$FAM2_{t+1}$					0.007	-0.006	-0.003
					(0.083)	(0.075)	(0.033)
$LNSIZE_{t+1}$							-0.000
							(0.010)
$LNAGE_{t+1}$							**0.504**
							(5.257)* **
LEV_{t+1}							**-0.069**
							(3.566)* **
ROA_{t+1}							**-0.063**
							(2.797)* **
ROE_{t+1}							0.008
							(0.624)
TQ_{t+1}							-0.000
							(0.013)
$GDPG_{t+1}$							-0.158
							(0.771)

Notes: Table 5-8 reports the results from the FE regressions of BCS on the current and leads of ownership (manager (MAN), foreign (FOR2), institutional (INS), government (GOV) and family (FAM2)) and the control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), Return on Assets (ROA), Return on Equity (ROE), Tobin's q (TQ) and GDP growth (GDPG)). (t+1) is a subset of lead values of the ownership and control variables. *, ** and *** indicate significance at 10%, 5% and 1% respectively for the t-test. Items in boldface are significant at the 10% level or higher.

Source: Own estimation (2023)

Table 5-9: FE Regression Results for Test of Strict Exogeneity for AA.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	AA	**AA**	**AA**	**AA**	**AA**	**AA**	**AA**
MAN	**-0.087**	**-0.102**	**-0.102**	**-0.105**	**-0.101**	**-0.086**	**-0.081**
	(1.884)*	**(2.134)****	**(2.154)****	**(3.113)*****	**(2.113)****	**(1.856)***	**(1.732)***
FOR2	**-0.073**	-0.046	**-0.075**	0.005	-0.072	-0.045	-0.049
	(1.665)*	(1.182)	**(1.690)***	(0.185)	(1.640)	(1.178)	(1.262)
INS	0.033	0.032	**0.044**	**0.076**	0.034	**0.045**	0.043
	(1.127)	(1.100)	**(1.700)***	**(3.669)*****	(1.157)	**(1.722)***	(1.583)
GOV	-0.017	-0.020	-0.017	**0.154**	-0.017	-0.060	-0.054
	(0.116)	(0.139)	(0.118)	**(1.727)***	(0.117)	(0.566)	(0.518)
FAM2	**-0.364**	**-0.359**	**-0.358**	**-0.355**	**-0.344**	**-0.341**	**-0.338**
	(3.305)***	**(3.332)*****	**(3.299)*****	**(2.961)*****	**(3.791)*****	**(3.646)*****	**(3.693)*****
LNSIZE	**0.018**	**0.018**	**0.018**	**0.037**	**0.018**	**0.018**	**0.019**
	(1.663)*	**(1.653)***	**(1.679)***	**(8.630)*****	**(1.666)***	**(1.650)**	**(1.753)***
LNAGE	**0.120**	**0.120**	**0.121**	**0.195**	**0.120**	**0.120**	**-0.245**
	(3.145)***	**(3.153)*****	**(3.175)*****	**(12.010)*****	**(3.158)*****	**(3.143)*****	**(1.087)**
LEV	-0.064	-0.063	-0.063	**-0.086*****	-0.063	-0.064	-0.032
	(1.101)	(1.089)	(1.086)	**(3.262)**	(1.089)	(1.108)	(0.648)
ROA	0.026	0.025	0.026	0.007	0.026	0.025	0.037
	(0.464)	(0.444)	(0.466)	(0.193)	(0.458)	(0.455)	(0.679)
ROE	-0.010	-0.010	-0.011	-0.028	-0.010	-0.010	-0.010
	(0.267)	(0.253)	(0.272)	(1.319)	(0.267)	(0.265)	(0.273)
TQ	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	0.003
	(0.239)	(0.227)	(0.234)	(0.580)	(0.236)	(0.238)	(0.356)
GDPG	**-0.672**	**-0.681**	**-0.673**	**-0.005**	**-0.675**	**-0.680**	**-0.725**
	(11.676)***	**(11.922)*****	**(11.965)*****	**(4.045)*****	**(11.846)*****	**(11.534)*****	**(8.073)*****
MAN_{t+1}	-0.024					-0.029	-0.024
	(0.526)					(0.637)	(0.516)
$FOR2_{t+1}$		-0.045				-0.051	-0.049
		(1.157)				(1.324)	(1.212)
INS_{t+1}			-0.020			-0.025	-0.023
			(0.711)			(0.856)	(0.768)
GOV_{t+1}				**0.178**		0.079	0.078
				(1.983)**		(0.686)	(0.656)
$FAM2_{t+1}$					-0.028	-0.041	-0.039
					(0.297)	(-0.429)	(0.415)
$LNSIZE_{t+1}$							-0.002
							(0.217)
$LNAGE_{t+1}$							0.450
							(1.515)
LEV_{t+1}							-0.039
							(0.989)
ROA_{t+1}							0.004
							(0.093)
ROE_{t+1}							-0.006
							(0.197)
TQ_{t+1}							-0.008
							(0.849)
$GDPG_{t+1}$							-0.012
							(0.020)

Notes: Table 5-9 reports the results from the FE regressions of AA on the current and leads of ownership (manager (MAN), foreign (FOR2), institutional (INS), government (GOV) and family (FAM2)) and the control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), Return on Assets (ROA), Return on Equity (ROE), Tobin's q (TQ) and GDP growth (GDPG)). (t+1) is a subset of lead values of the ownership and control variables. *, ** and *** indicate significance at 10%, 5% and 1% respectively for the t-test. Items in boldface are significant at the 10% level or higher.

Source: Own estimation (2023)

Table 5-10: FE Regression Results for Test of Strict Exogeneity for RMI.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	RMI	**RMI**	**RMI**	**RMI**	**RMI**	**RMI**	**RMI**
MAN	-0.049	-0.052	-0.052	-0.051	-0.053	-0.044	-0.054
	(1.023)	(1.302)	(1.300)	(1.282)	(1.327)	(0.916)	(1.118)
FOR2	**0.065**	0.025	**0.067**	**0.067**	**0.065**	0.028	0.023
	(1.886)*	(0.576)	**(1.952)***	**(1.950)***	**(1.886)***	(0.650)	(0.525)
INS	0.039	0.041	0.029	0.041	0.039	0.029	0.027
	(1.537)	(1.638)	(0.993)	(1.616)	(1.557)	(0.971)	(0.913)
GOV	0.077	0.083	0.077	0.010	0.077	0.014	0.029
	(0.819)	(0.874)	(0.820)	(0.094)	(0.814)	(0.131)	(0.262)
FAM2	-0.189	-0.186	-0.188	-0.185	-0.103	-0.104	-0.100
	(1.312)	(1.301)	(1.311)	(1.288)	(0.612)	(0.614)	(0.591)
LNSIZE	**0.033**	**0.034**	**0.033**	**0.033**	**0.034**	**0.033**	**0.028**
	(6.182)***	**(6.244)*****	**(6.164)*****	**(6.109)*****	**(6.198)*****	**(6.135)*****	**(4.262)*****
LNAGE	**0.081**	**0.081**	**0.081**	**0.082**	**0.081**	**0.081**	-0.090
	(3.648)***	**(3.663)*****	**(3.638)*****	**(3.680)*****	**(3.634)*****	**(3.629)*****	(-0.558)
LEV	**-0.056**	**-0.056**	**-0.056***	**-0.057**	**-0.056***	**-0.058**	-0.056
	(1.782)*	**(1.777)***	**(1.792)**	**(1.827)***	**(1.769)**	**(1.842)***	(1.441)
ROA	-0.045	-0.043	-0.045	-0.045	-0.045	-0.044	-0.035
	(0.966)	(0.937)	(0.973)	(0.976)	(0.973)	(0.955)	(0.748)
ROE	0.008	0.007	0.008	0.008	0.008	0.007	-0.001
	(0.318)	(0.274)	(0.323)	(0.291)	(0.324)	(0.259)	(-0.019)
TQ	0.004	0.004	0.004	0.004	0.004	0.003	0.005
	(0.895)	(0.881)	(0.897)	(0.881)	(0.880)	(0.843)	(0.830)
GDPG	-0.025	-0.016	-0.028	-0.033	-0.026	-0.026	-0.049
	(0.060)	(0.039)	(0.067)	(0.079)	(0.063)	(0.061)	(0.117)
MAN_{t+1}	-0.008					-0.006	0.019
	(0.168)					(0.138)	(0.400)
$FOR2_{t+1}$		**0.070**				**0.073**	**0.083**
		(1.651)*				**(1.703)***	**(1.867)***
INS_{t+1}			0.019			0.028	0.039
			(0.649)			(0.939)	(1.303)
GOV_{t+1}				0.136		0.138	0.118
				(1.262)		(1.280)	(1.083)
$FAM2_{t+1}$					-0.151	-0.151	-0.138
					(0.930)	(0.924)	(0.847)
$LNSIZE_{t+1}$							**0.017**
							(2.582)***
$LNAGE_{t+1}$							0.212
							(1.075)
LEV_{t+1}							-0.002
							(0.058)
ROA_{t+1}							-0.067
							(1.425)
ROE_{t+1}							0.030
							(1.122)
TQ_{t+1}							-0.001
							(0.093)
$GDPG_{t+1}$							-0.198
							(0.471)

Notes: Table 5-10 reports the results from the FE regressions of RMI on the current and leads of ownership (manager (MAN), foreign (FOR2), institutional (INS), government (GOV) and family (FAM2)) and the control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), Return on Assets (ROA), Return on Equity (ROE), Tobin's q (TQ) and GDP growth (GDPG)). (t+1) is a subset of lead values of the ownership and control variables. *, ** and *** indicate significance at 10%, 5% and 1% respectively for the t-test. Items in boldface are significant at the 10% level or higher.

Source: Own estimation (2023)

The results presented in table 5-7 display significant coefficients associated with the future values of institutional ownership, as seen in specifications 3 and 6, whereas table 5-8 shows that the coefficient estimates for the forward values of managerial ownership (in specifications 1, 6 and 7) are significantly different from zero. Similar results are observed for foreign ownership in table 5-10, where the coefficient estimates for the future values of foreign ownership are significantly different from zero, as seen under specifications 2, 6 and 7. In the case of government ownership, table 5-9 shows that the fourth specification of future government shareholding differs from zero. With the exception of family ownership, these findings imply that the future realisations of the ownership variables are connected to the current level of corporate governance compliance, and thus cannot be considered entirely exogenous. On the one hand, the findings of this section are comparable to chapter three (section 3.4.2.3) in that family ownership was also found to be insignificant for the current values of all corporate governance compliance measures. On the other hand, it differs in relation to institutional ownership, as chapter three did not observe any significance from the forward values of institutional ownership.

Tables 5-7, 5-8, and 5-10 also reveal that various future control variables are significant for certain corporate governance measures. These control variables include firm age, leverage, and ROA, which are associated with CGI and BCS; and firm size, ROA, ROE and GDP growth in conjunction with RMI. Similar to the results discussed in chapter three (section 3.4.2.3), these findings suggest that the aforementioned control variables adjust in response to corporate governance compliance and are therefore not strictly exogenous.

Based on the results of the tests of dynamic completeness, reverse causality and strict exogeneity, all ownership and control variables exhibit a certain level of significance, thus indicating that they have a certain degree of endogeneity with corporate governance. As such, all variables are treated as endogenous, thereby reinforcing the prevalence of the endogeneity bias within the ownership structure- corporate governance relationship of this chapter. Accordingly, this chapter employs the system GMM for estimation purposes, as the FEM procedure is considered as unsuitable and biased in the presence of endogeneity, as discussed in chapter three (section 3.3.4.1) and section 5.3.4.2.

5.4.3. System GMM Regression Results for the Ownership Structure and Corporate Governance Analysis

This section aims to answer the second and third research questions of this chapter by analysing the impact of the ownership types on the main corporate governance index (CGI) and its subindices (BCS, AA and RMI). Table 5-11 therefore presents the regression results from equation 5.1, which is estimated with the system GMM of equation 5.6. In contrast to sections 5.4.1 and 5.4.2, this section utilised the dummy variables of foreign ownership and family ownership that are defined in chapter three (table 3-2).

Table 5-11: GMM Regression Results for the Impact of Ownership Structure on Corporate Governance.

	CGI	**BCS**	**AA**	**RMI**
Corporate Governance$_{t-1}$	**0.472**	**0.705**	**0.494**	**0.514**
	(2.599)***	**(5.721)*****	**(5.242)*****	**(2.913)*****
Corporate Governance$_{t-2}$	**0.229**	0.120	**0.172**	**0.234***
	(1.779)*	(1.284)	**(2.452)****	**(1.762)***
MAN	-0.016	**-0.047**	-0.002	-0.006
	(0.444)	**(1.705)***	(0.028)	(0.070)
FOR1	**0.040**	0.014	**0.049**	0.025
	(1.885)*	(1.110)	**(1.717)***	(0.921)
INS	-0.010	0.007	0.011	-0.013
	(0.266)	(0.335)	(0.297)	(-0.210)
GOV	0.061	0.128	0.041	0.135
	(0.415)	(1.085)	(0.239)	(0.415)
FAM1	-0.021	0.060	0.008	-0.221
	(0.364)	(0.278)	(0.102)	(0.917)
LNSIZE	0.001	0.002	**-0.024**	**0.034**
	(0.121)	(0.324)	**(-1.969)****	**(2.909)*****
LNAGE	0.002	-0.006	0.008	**-0.018**
	(0.345)	(1.579)	(1.181)	**(1.742)***
LEV	0.038	0.044	0.050	0.086
	(0.836)	(1.306)	(0.762)	(0.680)
ROA	0.179	-0.096	**0.451**	-0.250
	(1.047)	(0.922)	**(2.080)****	(0.526)
ROE	-0.168	0.017	-0.171	0.079
	(1.550)	(0.324)	(1.387)	(0.303)
TQ	0.012	**0.010**	0.014	0.006
	(1.358)	**(2.117)****	(1.317)	(0.588)
GDPG	-2.434	0.991	-3.055	-9.834
	(0.370)	(0.256)	(0.691)	(1.009)
AR(1) p-value	0.035**	0.001***	0.000*	0.068*
AR(2) p-value	0.178	0.372	0.411	0.195
Hansen J p-value	0.397	0.433	0.367	0.745

Notes: Table 5-11 reports the impact of the lagged corporate governance, ownership (manager (MAN), foreign (FOR1), institutional (INS), government (GOV) and family (FAM1)) and control variables (firm size (LNSIZE), firm age (LNAGE), leverage (LEV), Return on Assets (ROA), Return on Equity (ROE), Tobin's q (TQ) and GDP growth (GDPG)) on current corporate governance (CGI, BCS, AA and RMI). LN refers to the natural logarithm. All regressions are estimated using system GMM with robust standard errors. AR(1) and AR(2) are the respective first and second order tests for serial correlation in the first-differenced residuals. Hansen J is the test for over-identification of the instruments. *, ** and *** indicate significance at 10%, 5% and 1%, respectively.

Source: Own estimation (2023)

The initial lag of all corporate governance indicators (CGI, BCS, AA and RMI) is found to be statistically significant and positive in the determination of current corporate governance compliance, whereas the second lag is insignificant for BCS but positively significant for CGI, AA and RMI. This indicates that the prior compliance of King Report provisions (King II, King III, or King IV) in JSE-listed firms, particularly within the previous two years, has a positive influence on the company's current level of compliance.

Regarding the ownership identities, managerial ownership and foreign ownership are the only identities that display significant relationships with the corporate governance of JSE-listed firms. In particular, managerial ownership exhibits a negative effect on BCS, suggesting that managerial shareholders decrease the compliance of board-related governance provisions from the King Reports. The inverse relation is consistent with the extant literature reviewed in section 5.2.1, more specifically the study by Lasfer (2006) on the managerial ownership- board structure nexus, who found that entrenched managers decrease board monitoring. These findings are also akin to the correlation statistics reported by Ntim (2009), in which director shareholding was negatively correlated to the proportion of NEDs on the boards of JSE-listed companies. The management entrenchment hypothesis, presented in chapter two (section 2.4.1), further supports the negative linkage between managerial ownership and BCS, as entrenched managers may reduce the efficacy of the board in order to pursue their private interests without interference from the board of directors (Farinha, 2003; Lasfer, 2006). Although these findings cast a doubt on the board's effectiveness in the presence of managerial ownership, the negative effect becomes inconsequential when examining corporate governance in its entirety, as demonstrated by the insignificant negative coefficient between CGI and managerial ownership.

In contrast to managerial ownership, foreign investors, who hold at least 10% of total shares (FOR1), positively impact the corporate governance compliance of JSE-listed firms, as captured by both CGI and AA. The impact of foreign ownership on CGI may thus stem from its underlying effect on the AA subindex. Nonetheless, the positive coefficient between foreign ownership and CGI coincides with previous studies reviewed in section 5.2.3 (such as Ahmadjian, 2007; Ozsoz *et al*., 2014; Desender *et al*., 2016), that reported positive relationships between foreign shareholding and corporate governance indices. The positive linkage with AA aligns with the findings of An (2015), who concluded that foreign ownership improved the transparency and quality of financial reports of firms in Korea. Additionally, these results are also consistent with the propositions of the agency theory mentioned in chapter

two (section 2.4.2), in which foreign investors mitigate information asymmetry by improving financial transparency.

The lack of significant effects of institutional ownership on the corporate governance index and its subindices is consistent with King IV's observation concerning the limited involvement of institutional investors in the corporate governance of firms, as highlighted in chapter two (section 2.4.3). This implies that institutional investors in the South African market may not be fully adhering to their prescribed responsibilities stipulated in the CRISA and King IV report. As such, this may explain the occurrence of corporate failures on the JSE, despite institutional ownership representing the largest proportion of shareholding on the JSE during the sample period (37.7% as shown in table 5-3). These findings can also be linked to the presence of pressure-insensitive investors, who have no business relationships with their investee firms (Srivardhan, 2009; Azmi *et al*., 2021) and may thus be uninterested in participating in the corporate governance operations.

Turning to the control variables, table 5-11 demonstrates that firm size, firm age, ROA and Tobin's q are statistically significant in the determination of corporate governance in JSE-listed firms, whereas the leverage ratio, ROE, and GDP growth are statistically insignificant. With respect to firm size, a negative relationship is found with AA, in a result that contradicts the positive correlation documented in table 5-4. Such a disparity may arise from potential interactions with other variables, such as foreign ownership. This may therefore imply that the positive foreign ownership- AA nexus may only be prevalent in smaller firms, as the influence of foreign investors is often limited in larger firms due to the complexity of ownership structures and corporate governance mechanisms (Gilson, 2006; Filatotchev, Jackson and Nakajima, 2013). Furthermore, Cheffins and Black (2005) claimed that larger firms also have a greater capacity to resist the demands of foreign investors through various defensive strategies. In contrast to AA, there is a positive relationship between firm size and RMI. This may be attributed to larger firms having greater access to financial resources, which enable them to implement risk management systems and employ and retain risk management experts (Thurman, 2000; Wooten, 2003; Kleffner *et al*., 2003).

The firm age variable, however, displays a negative association with RMI. This result may indicate that older companies may lack proper risk management structures. In comparison to board and audit committees, risk management committees are a more recent addition that reflects the growing importance of risk management in corporate governance (Tao and Hutchinson, 2013). Prior to the introduction of risk management committees, members of audit

committees were often responsible for majority of the tasks related to risk management (Fraser and Henry, 2007; Brown, Steen and Foreman, 2009; Braiotta, Gazzaway, Colson and Ramamoorti, 2010).

Due to their tendency to resist change and avoid radical innovation; older firms may be reluctant to undertake new recommendations, such as establishing risk management committees, and may prefer to instead retain their existing systems (Westhead and Wright, 1998; George and Bock, 2012). Desai (2008) also argued that older companies are less inclined to take risks and as a result, they may not prioritize the implementation of contemporary risk management practices.

Table 5-11 depicts a positive relationship between ROA and AA, which is consistent with the findings of Chen *et al.* (2010) and Chung, Firth, Kim and Pang (2014), where both studies reported that companies with higher ROA produced superior financial reporting and audit quality, in the U.S and Korea, respectively. As mentioned in section 5.2.3.2, Chen *et al*. (2010) claimed firms with stronger financial performance may possess more resources to allocate towards their financial reporting and internal controls, which, in turn, could lead to high compliance with audit provisions. A positive linkage is also observed between Tobin's q and BCS. This is in line with earlier studies (such as Yermack, 1996; Bhagat and Black, 2002; Adams and Ferreira, 2009) that reported a positive relationship between the firm's Tobin's q ratio and the degree of board independence, board size and CEO duality. This may be attributed to the fact that as a firm's value increases, it is able to attract more experienced and skilled external directors to join its board (Borokhovich, Brunarski and Parrino, 1997).

Lastly, the resultant p-values from the AR (1) test for autocorrelation in CGI, BCS, AA and RMI fall below the 10% level of significance, while the p-values from the AR (2) test are above the 10% level of significance for all measures. This indicates that the residuals in AR (1) are correlated, whereas there is no serial correlation at the second lag, thus satisfying the assumption of exogeneity (Roodman, 2009; Phung, 2015). Table 5-11 also reports the results of the Hansen test of overidentification, where the insignificant p-values across CGI, BCS, AA and RMI suggests that the instruments used in the system GMM analysis are valid (Wintoki *et al*., 2012). The results from both specification tests strengthen the credibility of the findings displayed in table 5-11.

5.5. CHAPTER SUMMARY AND CONCLUSION

The aim of this chapter is to investigate the impact of ownership identity (managerial, foreign, institutional, government and family) on the corporate governance compliance of JSE-listed firms which, to the best of the author's knowledge, has not been previously explored in the South African context. As such, by addressing the research gap, this chapter makes an original and potentially critical contribution to the fields of corporate governance and ownership research.

This chapter begins by presenting an empirical review of the scarce literature surrounding this topic, which demonstrates mixed results across various ownership categories. Nonetheless, the existing body of literature on this subject still provided evidence of significant relationships between ownership types and elements of corporate governance, which further emphasizes the importance of conducting a study like this in the South African environment. The literature review in this chapter also noted the variations in proxies used to measure corporate governance, as some studies relied on compliance index models, while others employed individual indicators bearing on board characteristics, audit quality, transparency, etc.

The discussions provided in chapter four affirmed that the compliance index model was most suited for measuring corporate governance in South African firms, as it facilitated the aggregation of a range of corporate governance provisions specified in the King Reports. As such, the chosen corporate governance proxies for this chapter, specifically a broad index (CGI), and three subindices (BCS, AA and RMI), were constructed in chapter four. The CGI measured the compliance of broad corporate governance provisions, whereas BCS, AA, and RMI captured those specific to board characteristics, accounting and audit, and risk management and internal audit, respectively. The focus of this chapter therefore extends to understanding the impacts of ownership structure on corporate governance in its entirety, as well as the isolated effects on individual subcategories of corporate governance, i.e., board characteristics, audit quality and risk management practices.

In order to address the endogeneity bias, which is prominent in extant corporate governance and ownership research, this chapter conducted three endogeneity tests, specifically the tests of dynamic completeness, reverse causality and strict exogeneity. The results from all tests found the presence of an endogeneity bias within the ownership- corporate governance relationship in the South African market. Given the identified endogeneity bias, this chapter employed the system GMM approach due to its ability to mitigate endogeneity and generate robust estimates, thus ensuring the reliability of the findings.

The results produced by the system GMM analysis revealed significant effects exhibited from managerial and foreign ownership, which aligns with the theoretical underpinnings of the agency theory. In particular, managerial ownership had a negative impact on BCS, which is attributed to entrenched managers potentially limiting the board's ability to provide effective oversight (Farinha, 2003; Lasfer, 2006). In contrast, foreign ownership shared a positive relation with CGI and AA, which is associated with the foreign investors mitigating information asymmetry by improving financial transparency. No significant effects were observed from institutional, government and family ownership.

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.1. INTRODUCTION

A firm's ownership structure refers to the way in which equity and control are distributed among different individuals or entities (Wahl, 2006). The evolution of finance resulted in increased globalisation and increasingly open markets, which consequently led the ownership of companies to become widely dispersed among various types of owners (Yammeesri, 2003; Zhang and Kyaw, 2017); most notably, institutional, managerial, family, foreign, government, and company shareholders (Zraiq and Fadzil, 2018; Laporšek *et al*., 2021). The identities of owners have important implications for the financial performance of firms, as certain owners can provide firms with competitive advantages and help mitigate agency problems (Wahl, 2006). However, the impacts of different ownership types may not always be known, as they are distinct from each other. Furthermore, the effect of ownership structure on firm financial performance may not always be linear and can vary depending on the percentage of shareholding.

Aside from financial performance, the ownership structure also holds significant importance in corporate governance, as owners possess the ability to influence the compliance of corporate governance policies (Zhou, 2001; Zheka, 2003; Wahl, 2006; Mashele, 2021). However, the predominant literature on ownership structures still primarily lies on its impact on financial performance, while overlooking its effects on corporate governance. Moreover, although ownership structure and financial performance studies have been conducted in emerging markets, those undertaken in the South African context fail to consider the likelihood of non-linear relationships and/or issues of endogeneity.

Therefore, the dearth of literature in the South African environment led to the rationale for conducting this study, which aims to examine the impact of ownership structure (managerial, foreign, institutional, government and family ownership) on the financial performance and corporate governance of JSE-listed companies. As a result, this study makes significant contributions to the research fields of ownership structures, financial performance, and corporate governance, providing insight that is valuable to policymakers, managers, investors, and firm owners.

The research objectives developed are as follows:

I. Does endogeneity exist between any of the ownership categories (managerial, foreign, institutional, government and family) and the financial performance of firms?

II. Is the relationship between the ownership categories and financial performance linear or non-linear?

III. If the relationship is non-linear, what is the optimal level of ownership?

IV. Is the constructed corporate governance index and corresponding subindices reliable measures of corporate governance compliance in JSE-listed firms?

V. Is the constructed corporate governance index and corresponding subindices valid measures of corporate governance compliance in JSE-listed firms?

VI. Does endogeneity exist between ownership identity (managerial, foreign, institutional, government and family) and the corporate governance of firms?

VII. What is the effect of ownership identity on the corporate governance index?

VIII. What is the impact of ownership identity on the corporate governance subindices?

The uniqueness of this study in the South African market lies in the country's distinct ownership policies and unique hybrid corporate governance framework, which were discussed in chapter one (section 1.2). As such, a study encompassing the impacts of ownership structure in the South African environment is necessary. This chapter draws the study to completion by summarizing the theoretical and empirical propositions presented, and thereafter discusses the findings obtained for each objective, in conjunction with the conclusions drawn. Finally, the chapter ends by providing the limitations of the study alongside the recommendations for future research in this field.

6.2. SUMMARY OF THEORETICAL AND EMPIRICAL LITERATURE

The objective of chapter two in this study is to provide a theoretical framework, that begins with an explanation of ownership structure theories, followed by an overview of the South African corporate governance system, and subsequently a discussion of the ownership categories (managerial, foreign, institutional, government and family) on the JSE. Thereafter, the succeeding chapters covering the ownership structure- financial performance nexus

(chapter three), construction of corporate governance indices (chapter four), and the ownership structure- corporate governance relationship (chapter five) provide empirical evidence related to each aspect, in conjunction with the study's own empirical analysis predicated on South African data.

6.2.1. Theoretical framework

Much of the literature on ownership structures are linked to the agency theory and the resource-based theory. The agency theory describes the conflict of interests between managers, who are theorized to seek high rewards while minimising their effort, and the owners, who aim to maximise their shareholder value (Jensen, 1986). As a consequence of the different interests, managers do not always act in the best interests of shareholders, rather they act on behalf of their own self-interests, resulting in an agency problem (Jensen, 1986; Yammeesri, 2003). To remedy this problem, the objectives of managers need to be aligned with those of shareholders (Lacoste, 2010). This can be achieved through increased monitoring by the board of directors and large shareholders, as well as offering share option schemes to managers (Rediker and Seth, 1995; Shleifer and Vishny, 1997; Adams *et al*., 2010; Mawanza, 2014). The resource-based theory refers to the competitive advantages that firms obtain from strategic resources that are scarce, inimitable, and irreplaceable (Barney, 1991; Hall, 1993; Penrose, 2009). Fernandez and Nieto (2006) notes that a firm's resource endowment depends on its ownership typology. This is due to the resource heterogeneity that exists among the different ownership identities (Douma *et al*., 2006). Both theories recognised that the ownership structure can impact the financial performance and corporate governance of firms.

South Africa is governed by the King Code of Good Corporate Governance, which provides recommendations for corporate governance practices that are outlined in a series of reports (Andreasson, 2011). The reports, namely King I, King II, King III, and King IV, were published in 1994, 2002, 2009, and 2016 respectively (Bhikha, 2014; Natesan, 2020). The compliance of King Codes is not guaranteed since they are voluntary initiatives (Aguilera and Cuervo-Cazurra, 2009). To encourage compliance in JSE-listed firms, the JSE issued a set of Listing Rules that require firms to meet a list of standards, which closely append the provisions in the King Reports (Ntim, 2009). An original contribution of this study lies in the recognition that further encouragement can also emanate from the shareholders/owners of JSE-listed firms, as they have the authority to influence how firms implement corporate governance policies (Zhou, 2001; Wahl, 2006; Ntim and Soobaroyen, 2013). This stems from their capacity to govern the actions of managers, as well as their role in organizing various internal and external control

practices (Connelly *et al*., 2010). As such, Laporšek *et al*. (2021) claimed that the optimal combination of ownership structures can enhance the likelihood of implementing effective corporate governance practices in firms.

Under the agency theory, managerial ownership is considered as an important corporate governance mechanism that converges the interests of managers and shareholders, and thus reduces agency costs (Serly and Zulvia, 2019). Accordingly, the King IV report recommends that managers hold shares in the firm (Zondi and Sibanda, 2015; Anyango, 2018). However, the agency theory acknowledges that high levels of managerial shareholding may induce an entrenchment effect, where managerial owners cultivate their private interests at the expense of minority shareholders.

Similarly, foreign ownership can minimize agency costs since foreign investors often undertake monitoring roles in firms but are also susceptible to the entrenchment effect under large levels of shareholding (Phung, 2015; Choi and Park, 2019). In addition to monitoring duties, foreign investors are also recognised as providers of scarce resources, such as cutting-edge technologies, sophisticated skills and advanced corporate governance practices (Belderbos, 2003; Luo and Wang, 2012). As a matter of fact, Douma *et al*. (2006) and Rhee and Wang (2009) asserted that foreign ownership is critical for improving corporate governance in emerging markets. This may be due to the fact that foreign owners are more likely to demand higher corporate governance standards in comparison to domestic shareholders (Gillan and Stark, 2003). Considering the benefits sourced from foreign ownership, the current policy on FDI does not place any restrictions on foreign shareholding in South African firms (National Treasury, 2011; Peerbhai *et al*., 2021).

Institutional owners are highly incentivized to undertake monitoring roles and reduce agency costs as they often own large stakes in companies (Jensen and Meckling, 1976; Myers and Majluf, 1984; Jabeen and Ali, 2017). In addition, these investors also have the capacity to improve corporate governance mechanisms by replacing low performing managers and implementing stronger disclosure policies (Celik and Isaksson, 2013). Such appealing improvements may even result in firms attracting new investors (Sivathaasan and Udayakumara, 2015; Hwang and Jung, 2016). In 2011, the King III released the CRISA to guide institutional shareholders on ways of executing their investments, using their rights to improve corporate governance, and integrating ESG issues into their investment decisions (Pillay, 2021).

In contrast to other ownership identities, government owners are motivated by social and/or political objectives, rather than firm profits or shareholder wealth (Phung, 2015). According to the agency theory, government ownership is harmful to firm performance as government shareholders are too detached from the firm (Shleifer, 1998). Contrarily, the resource-based theory posits that government ownership provides firms with political resources, and easier access to capital and profitable government contracts (Ntim, 2009; Peng *et al*., 2016; Habtoor *et al*., 2019). Shleifer (1998) claimed that government-linked firms frequently exhibited inadequate corporate governance mechanisms due to a lack of incentive to control agency problems. This is because they have weaker accountability for financial performance, easier access to financing and are rarely monitored by other shareholders (Gnan *et al*., 2011).

Compared to other organisational forms, family-owned firms face less agency conflict since families either manage the firm directly or closely monitor management (Anderson and Reeb, 2003). Although family firms often deviate from established corporate governance standards (Ward, 1991), this does not necessarily lead to increased agency costs because the family shareholder is the internal monitor (Arcot and Bruno, 2012). However, entrenchment, relational, and altruistic aspects surrounding self-control problems, excessive generosity and nepotism contribute to agency costs (Gómez-Mejía *et al*., 2001; Schulze *et al.*, 2003b). Nonetheless, the resource-based theory suggests that family firms possess a unique bundle of resources which are specific to family firms only, referred to as "familiness" (Habbershon and Williams, 1999: 11; Arregle *et al*., 2007). This includes loyalty, willingness to work long hours and easy development of tacit knowledge (Gedajlovic *et al*., 2012).

Overall, the propositions of the ownership theories offered mixed implications regarding the impacts of ownership structure on the financial performance and corporate governance of firms. As previously mentioned, majority of ownership-based studies have traditionally emphasized their influence on financial performance, often neglecting the dimension of corporate governance. Consequently, the theoretical frameworks within these studies were primarily centred around ownership impacts solely within the realm of financial performance.

Thus, this study offers an original contribution to the theoretical literature by integrating ownership structure theories with dimensions of both financial performance and corporate governance.

6.2.2. Empirical Findings on Financial Performance and Corporate Governance

The first firm fundamental analysed in this study is the financial performance of firms listed on the JSE. The empirical literature consists of studies that employ either linear or non-linear models to examine the relationship between ownership categories (managerial, foreign, institutional, government and family) and the financial performance of firms.

The studies which adopted linear approaches displayed mixed results, with authors reporting positive, negative, or insignificant relationships between ownership types and financial performance. Regarding the positive findings, the active monitoring activities conducted by foreign, institutional, and family owners were identified as significant drivers of the positive effects (Wang and Shailer, 2017; Komati, 2017; Dube, 2018). Furthermore, authors also attribute the positive effects of foreign, family, and government ownership to the presence and transfer of unique resources. Lastly, the convergence of interest hypothesis provides an explanation for the positive relationships observed in the studies of managerial ownership (Ongore, 2011; Fauzi and Locke, 2012; Din *et al*., 2021), as well as certain family ownership studies (Rajput and Joshi, 2015; Wang and Shailer, 2017).

In contrast, studies that have found evidence of negative relationships between ownership types and financial performance attribute their findings primarily to the entrenchment effect, specifically in the cases of managerial, foreign and family ownership. These studies suggest that at higher levels of ownership, these owners prioritize their own interests over maximizing shareholder value, leading to detrimental outcomes for firm performance (Phung and Le, 2013; Dube, 2018). Additionally, studies by Buachoom (2017) and Kotey *et al*. (2019) have linked negative findings of family ownership to reduced managerial compensation and nepotism, respectively. On the contrary, other studies indicate that the adverse effects of institutional ownership are rooted in opportunistic behaviours among these investors, while negative effects of government ownership stem from the government's pursuit of social objectives rather than shareholder wealth. The inconclusive findings for this subject align with the conflicting arguments proposed by the agency theory and the resource-based theory.

Furthermore, the mixed evidence is consistent with the notion that the impact of ownership structure on firm performance may depend on the percentage of shareholding held by each owner. This is seen by the studies that adopted non-linear approaches, which has subsequently evidenced non-linear relationships between ownership identities and firm performance. With the exception of managerial ownership, a common theme that emerges from the studies reviewed, is that the shape of the non-linear curves are either U- or inverse U-shaped. For

instance, the non-linear effects of foreign ownership and family ownership are defined by inverse U-shaped curves. This implies that both foreign and family ownership initially improve firm performance, but as the level of shareholding surpasses a specific threshold value, firm performance begins to decline. In contrast, most studies on government ownership reported U-shaped relationships, suggesting that as government shareholding becomes more concentrated, governments tend to provide increased support to firms. The findings pertaining to institutional ownership were mixed, with Wardhana and Tandelilin (2011) indicating a U-shaped relationship, whereas Daryaei and Fattahi (2020) documented an inverse U-shape. Similarly, inconclusive findings are also observed for managerial ownership, as authors report U-shaped, inverse U-shaped, as well as S-shaped, W-shaped, and four turning point curves.

The second firm fundamental which is the focus of this study, is the corporate governance of firms. The empirical review on this subject is twofold. First, chapter four reviews studies that have developed indices to measure the corporate governance of companies. Thereafter, chapter five examines studies concerning the relationship between ownership types (managerial, foreign, institutional, government and family) and corporate governance. The empirical literature surveyed on corporate governance indices reveals two recurring themes. Firstly, authors construct their indices using codes of best practice or corporate governance guidelines as the foundation. Secondly, the most frequently observed subindices included within each index are related to board structure, shareholder rights, and disclosure and transparency characteristics. Moreover, authors provide support for the use of corporate governance indices, explaining that these instruments are more reliable than individual indicators of corporate governance, as firms tend to adopt corporate governance practices as a bundle, rather than individually (Shabbir and Padget, 2005; Gillan, 2006). Despite this, the empirical literature concerning the ownership structure- corporate governance nexus shows that only a subset of studies employed indices to measure corporate governance, while the majority used individual corporate governance indicators.

Nonetheless, these studies yield varied results, which are largely dependent on the type of ownership that is examined. In particular, studies on managerial ownership offer mixed results, indicating that managerial shareholding has negative effects on board independence and accounting disclosures, but a positive effect on the quality of financial reporting. With respect to foreign ownership, aside from Ananchotikul (2007), studies consistently find that foreign shareholding positively influences the corporate governance of firms, aligning with the propositions of the agency theory and resource-based theory. Similarly, studies on institutional

ownership also suggests a positive relationship with corporate governance, with most authors attributing their findings to the increased monitoring induced by institutional shareholders (Hartzell and Starks, 2000; Li *et al*., 2018; and Al-Sartaw and Sanad, 2019). In contrast, the limited empirical literature surrounding government ownership and family ownership indicated that both categories of ownership have a negative impact on corporate governance. Consistent with the agency theory, the studies examining government ownership attribute the inverse relationship to the pursuance of political objectives at the expense of shareholder interests, whilst studies on family ownership depict family firms as having less independent boards in order to maintain control.

6.3. SUMMARY OF RESEARCH FINDINGS

The research findings are discussed in relation to their overarching objectives, which is to explore the impact of ownership structure (managerial, foreign, institutional, government and family) on the financial performance and corporate governance of firms listed on the JSE. Accordingly, the first subsection commences with a discussion of the three research objectives pertaining to financial performance. Thereafter, the second subsection elucidates the remaining three research objectives, which centre on corporate governance.

6.3.1. The Impact of Ownership Structure on Financial Performance

The study of ownership's (managerial, foreign, institutional, government and family) impact on the financial performance of firms (ROA, ROE, EPS and Tobin's q) coincides with the first three research objectives of this study and is based on a sample of 267 non-financial firms listed on the JSE, from 2004 until 2021.

The first objective of chapter three was to establish whether endogeneity exists between ownership structure and the financial performance of firms. This was achieved by conducting endogeneity tests, namely, the tests of dynamic completeness, reverse causality and strict exogeneity. Although the findings of the endogeneity tests are not consistent across all variables, evidence of endogeneity is still discovered. In particular, endogeneity is first detected by the test of dynamic completeness, where results reveal that current financial performance is influenced by previous financial performance. The test of reverse causality thereafter indicates that the current ownership proportions of managerial and family owners are impacted by the company's past financial performance. Lastly, the test of strict exogeneity demonstrates that

future values of managerial, foreign, and government ownership are linked to the current financial performance of firms.

Hence, except for institutional ownership, all variables retain a certain level of endogeneity in at least one of the tests, thereby confirming the presence of the endogeneity bias within the ownership structure -performance relationship explored chapter three. Accordingly, all variables are considered as endogenous, leading to the adoption of the system GMM methodology to estimate the relationship between ownership structure and financial performance. The detection of endogeneity between ownership identities and the financial performance of firms on the JSE represents an original contribution made by this research, as previous South African studies did not investigate the presence of the endogeneity bias. In particular, the observed endogeneity indicates that the current ownership structure of JSE-listed firms are influenced by the past financial performance of firms, as certain shareholders prefer investing in firms that have a record of generating superior profits.

The second research objective of this chapter aims to establish whether the relationship between ownership structure and financial performance is either linear or non-linear. The results produced indicates that managerial, institutional and family ownership share a linear relationship with financial performance. In contrast, a non-linear relationship is observed between foreign ownership and financial performance, while no significant impact is detected from government ownership. Regarding the linear relationships, a positive linkage is found between managerial ownership and ROE, which is attributed to the convergence of interest between managers and shareholders. In contrast, negative linear relations are observed between managerial ownership and Tobin's q; institutional ownership and EPS; and family ownership and Tobin's q. These negative linkages are primarily attributed to the entrenchment effect. In addition, the negative relationship between managerial ownership and Tobin's q is also explained by stock liquidity, since Tobin's q is related to concurrent liquidity (Fang *et al*., 2009; Fabisik *et al*., 2019). As inferred by Fabisik *et al*. (2019), managerial shareholders can decrease stock liquidity, as they possess insider information and may thus only be willing to sell their stock under conditions that are acceptable to them (Chemmanur and Fulghieri, 1999).

The non-linear relationship observed between foreign ownership and financial performance is characterised by an inverse U-shaped curve, specifically when measuring financial performance using ROE. This indicates that an initial increase in foreign shareholding leads to an improvement in the ROE of companies listed on the JSE. However, once the level of foreign ownership surpasses a certain threshold, foreign investors begin to erode the ROE of these

firms. The third research objective therefore aims to determine the optimal threshold level of shareholding for the ownership identities that exhibit non-linear relationships with financial performance. Accordingly, in the case of foreign ownership, the results produced from the SLM test reports a threshold value of 39.6%. This suggests that foreign ownership positively impacts ROE as long as the level of shareholding remains below 39.6%. However, once foreign ownership exceeds this threshold, the ROE of firms decline. The positive effects of foreign ownership are attributed to increased monitoring and access to competitive resources, whereas the negative effects, observed beyond the threshold, are explained by the entrenchment effect and liability of foreignness.

This study makes an original contribution to the field of ownership structures in South Africa by accounting for potential non-linear relationships with firm performance, which was not addressed in existing South African studies. Furthermore, by utilizing a non-linear model such as the SLM test, this study also offers a novel contribution to the empirical work on ownership structures, as this technique has not been previously applied in this context. With these contributions, researchers and policymakers will be able to more precisely evaluate the impact of ownership categories on financial performance across different shareholding levels, identifying which levels benefit or harm financial performance.

6.3.2. The Construction of the Corporate Governance Index and Subindices

The fourth research objective coincides with the construction of an index and subindices, that serve as reliable and valid measures of the corporate governance compliance of 266 JSE-listed firms, from 2004-2021. This is achieved by first, formulating an appropriate construction methodology for the development of the index and subindices, and thereafter conducting appropriate robustness tests to examine the reliability and validity of these constructs.

The main construction criterions addressed in this chapter (chapter four) pertain to the source of corporate governance information, the scoring system, and weighting scheme applied to the constructed measures. The main corporate governance index (CGI) and subindices are predicated on publicly available compliance information of King Reports (King II, King III, and/or King IV). In particular, the CGI is aggregated by 20 compliance questions that pertain to the three main areas of the King Reports, thereby resulting in three subindices: (i) board structure and characteristics (BCS); (ii) accounting and auditing (AA); and (iii) risk management and internal audit (RMI). The CGI and its subindices are scored using a binary coding technique, whereby firms receive one point for complying with a King provision and

zero points otherwise. Lastly, CGI, BCS, AA, and RMI are structured with an unweighted scheme, where all compliance questions are assigned equal weightage.

Since South Africa does not currently have a formal corporate governance indicator in place, the development of this index and its subindices represents a novel contribution made by this thesis towards better understanding the quality of corporate governance in JSE-listed firms. With this contribution, governing authorities, policymakers, investors, and other market participants receive direct evidence on the level of corporate governance compliance exhibited by South African firms with the King Code of Good Corporate Governance.

To examine the robustness of CGI, BCS, AA and RMI, the Cronbach's alpha test and the PCA are implemented. To the best of the author's knowledge, the robustness of corporate governance indices was not addressed in previous South African studies. Therefore, the application of the Cronbach's alpha and PCA within this study constitutes an original contribution to the empirical work surrounding corporate governance. The Cronbach's alpha represents the reliability of the constructed instruments (Biswas, 2012; Peters, 2014), whereas the PCA reflects the instrument's construct validity (Dacakis *et al*., 2017). The findings produced by the Cronbach's alpha test reveals that CGI and the three subindices are highly reliable measures of corporate governance, as each measure obtains an alpha coefficient that aligns to the reliability benchmark ($\alpha \geq 0.70$). Similarly, the results of the PCA support the construct validity of CGI, BCS, AA and RMI, as the principal components for each instrument demonstrated uniqueness to each other, thus indicating that they capture distinct consistent aspects of corporate governance. The results therefore confirm that CGI, BCS, AA and RMI are reliable and valid constructs of corporate governance for JSE-listed firms. These findings also represent a novel contribution in terms of providing a more accurate measure for assessing the quality of corporate governance.

6.3.3. The Impact of Ownership Structure on Corporate Governance

The study of ownership identity (managerial, foreign, institutional, government and family) impacts on the corporate governance of firms (CGI, BCS, AA and RMI) coincides with the fifth and sixth research objectives and is based on 266 non-financial firms listed on the JSE between 2004-2021.

Similar to chapter three, the first objective of chapter five was to determine whether the endogeneity bias exists between ownership types and the corporate governance compliance of firms. This was accomplished by evaluating the findings of the tests of dynamic completeness,

reverse causality and strict exogeneity. The test of dynamic completeness identifies endogeneity by revealing that previous levels of corporate governance compliance impact current compliance levels. Similarly, the results from the reverse causality test indicate that current values of all ownership categories are influenced by prior levels of corporate governance compliance. Lastly, the test of strict exogeneity demonstrates a connection between the future realisations of managerial, foreign, institutional, government ownership and the present levels of corporate governance compliance in firms. All variables are therefore treated as endogenous, resulting in the use of the system GMM technique to estimate the sixth research objective.

The sixth research objective focuses on investigating the impact of ownership identity (managerial, foreign, institutional, government and family) on the corporate governance compliance (CGI, BCS, AA and RMI) of JSE-listed firms. The system GMM analysis reveals significant effects from managerial ownership and foreign ownership. In particular, managerial ownership has a negative impact on BCS, which is associated with entrenched managers who limit the monitoring role of the board in order to pursue their own interests without board interference (Farinha, 2003; Lasfer, 2006). In contrast, foreign ownership shares a positive relation with CGI and AA, which is attributed to foreign investors improving financial transparency. No significant impacts were observed from institutional, government and family ownership.

The insignificant relationship between institutional investors and the corporate governance measures implies that, despite holding the largest proportion of shares on the JSE, these investors are not actively engaged in improving corporate governance systems, as expected by the CRISA and King IV report. This can be linked to the presence of pressure-insensitive investors, who have no business relationships with their investee firms.

The relationship between ownership structure and corporate governance, to the best of the author's knowledge, has not been previously explored within the South African environment. By filling the research gap, the study makes an original contribution to both corporate governance and ownership research domains. Specifically, the negative effect of managerial ownership indicates that these shareholders deviate from the expectations of the King IV, where this type of ownership is purposed to converge the interests of managers and shareholders. Contrarily, the positive influence exhibited by foreign ownership aligns with the South African government's objective to increase the inflow of FDI for the overall well-being of the country.

6.4. CONCLUSION

As mentioned, the goal of this research was to examine the impact of ownership structure (managerial, foreign, institutional, government and family) on the firm fundamentals of South African companies, specifically the financial performance and corporate governance compliance of firms. The results from the study are in favour of Wahl (2006), who postulates that the identities of share owners have important implications for the financial performance and corporate governance of firms. The findings from the financial performance and corporate governance analyses therefore provide evidence demonstrating that the ownership types are significant in explaining both the financial performance and corporate governance compliance of firms. In particular, the analysis reveals that managerial ownership and foreign ownership have impacts on both financial performance and corporate governance of JSE-listed firms. Conversely, institutional ownership and family ownership only affect financial performance, while government ownership displays no significant effect on financial performance or corporate governance.

The study finds that managerial ownership exhibits both positive and negative effects on JSE-listed firms. On the one hand, it improves profitability (ROE) by aligning the interests of managers and owners. On the other hand, it reduces the market value of firms (Tobin's q) and the firm's compliance with corporate governance provisions pertaining to the board of directors (BCS). The decline in market value indicates a potential decrease in liquidity, due to managerial shareholders unwillingness to sell their shares. This suggests that while managerial owners prioritize firm profits, they are less inclined to comply with corporate governance provisions or sell their shares. The results concerning foreign ownership indicates a U-shaped relationship with firm performance (ROE) and a positive relationship with the compliance of corporate governance provisions (CGI and AA). This study therefore provides evidence in favour of increasing foreign ownership on the JSE and coincides with the South African government's objective of attracting more FDI to stimulate the country's economy. However, the U-shaped pattern suggests that foreign owners are susceptible to entrenchment effects and the liability of foreignness, particularly when their level of shareholding exceeds 39.6%. In such cases, foreign investors erode the ROE of firms, as they begin pursuing their own interests at the expense of minority shareholders, and/or incur costs associated with being unfamiliar with the host environment.

As mentioned, institutional ownership and family ownership are significant in explaining financial performance but display no effects on the corporate governance compliance of JSE-

listed firms. In particular, institutional, and family owners have negative impacts on EPS and Tobin's q, respectively. The adverse effects of both ownership categories can be attributed to the entrenchment effect. In the case of institutional investors, this study observes that they hold the largest proportion of shares on the JSE and can thus enable entrenched managers to pursue their own private benefits. Regarding family ownership, where the analysis considers family owners specifically with at least 20% shareholding, the entrenched family owners undertake decisions that prioritizes the interests of family members rather than the financial well-being of the firm.

6.5. POLICY IMPLICATIONS AND RECOMMENDATIONS

This study makes several original contributions relevant to the development of policies related to managerial, foreign, institutional and family shareholding on the JSE. In addition, it also provides valuable recommendations for companies in South Africa.

As noted in chapter two (section 2.4.1), the King IV encourages managerial ownership through a provision that recommends managers hold shares as a way to converge the interests of shareholders and managers in South African firms. While the observed positive relationship between managerial ownership and ROE supports this provision; the negative relationship with BCS suggests that policymakers incorporate a sub-clause to King IV that emphasizes the compliance with board -related corporate governance provisions when managers acquire shares. Additionally, firm owners can include conditions in managerial share option schemes that require managers to comply with board -related provisions in order to be eligible for share ownership.

South Africa maintains a relatively open investment regime for FDI, and therefore has an FDI policy that does not impose limitations on the proportion of foreign ownership in domestic firms. However, the inverse-U shaped relationship observed between foreign ownership and ROE, with the optimal shareholding level of 39.6%, infers the need for regulatory constraints on foreign shareholding on the JSE. Hence, although the inflow of international capital should still be encouraged, the existing FDI policy should introduce a legislative cap on the percentage of foreign ownership permitted in JSE-listed firms to mitigate the potential adverse effects associated with high levels of foreign ownership.

The current FDI policy is primarily tailored to leverage the advantages of foreign investment to stimulate the country's economic growth and financial market, but overlooks the potential

benefits associated with improving corporate governance. The lack of attention to this area could be because the subject matter is still in its infancy, with no existing research in South Africa. This study therefore offers an original contribution by providing evidence of a positive relationship between foreign ownership and corporate governance compliance (CGI and AA), suggesting that the inflow of FDI can improve the corporate governance landscape in South Africa. Based on these findings, policymakers should seek to formulate policies that are specifically tailored to increase the involvement of foreign investors in the corporate governance processes of firms. In particular, these policies should aim to integrate foreign shareholders in the decision-making, planning, and implementation of corporate governance practices.

With regards to institutional investors, the results demonstrating their negative impact on EPS and insignificant impact on corporate governance compliance imply that these investors are not fulfilling their responsibilities under the CRISA and King IV framework. This study therefore makes novel contributions to the formation of strategies and policies aimed at increasing the involvement of institutional investors in corporate governance practices. Since the CRISA and King IV are voluntary codes, their effectiveness depends on the institutional investor's individual commitment to corporate governance, and the demand from stakeholders to adopt these codes. With a deeper understanding of the benefits of effective corporate governance in relation to investment returns, stakeholders such as clients and beneficiaries may demand that institutional investors consider and prioritize corporate governance principles within their investment strategies. Hence, the government should aim to raise awareness among these stakeholders by allocating funds to facilitate educational campaigns and seminars that emphasize the role of good corporate governance practices in enhancing investment returns and shareholder wealth.

Regulatory authorities can also develop policies that require clients and beneficiaries to include corporate governance engagement as a key criterion for assessing the performance of institutional investors. This may incentivize institutional investors to increase their participation in corporate governance matters. Additionally, policymakers can integrate relevant CRISA principles into the JSE Listing Rules, thereby making it mandatory for institutional investors to actively participate and enhance the corporate governance of companies listed on the JSE. In this case, to safeguard their listing status, companies may apply further pressure on institutional investors to ensure that they undertake roles to strengthen corporate governance. Furthermore, the integration of certain CRISA principles into the JSE

Listing Rules can help neutralise the observed negative relationship between institutional ownership and firm performance (EPS), as the activities of these investors may be subjected to increased monitoring by firms, thus reducing the possibility of pursuing personal interests.

The findings regarding government ownership indicate low levels of government shareholding on the JSE, primarily because most South African SOEs are not listed. Given the significant governance challenges, financial constraints, and public controversy faced by these entities, it is suggested that the government consider privatizing them through JSE listings as a means to address these issues. By undergoing SOE listings, these companies would be obligated to adhere to the JSE's listing regulations, potentially leading to improved transparency, corporate governance compliance, and overall professionalism.

As previously mentioned, family ownership possesses distinct challenges and resources compared to other ownership types. The government should therefore establish a regulatory environment that accounts for the specific needs and obstacles faced by firms with significant family ownership. To address the negative relation between family ownership and Tobin's q that is attributed to entrenchment, policymakers can create corporate governance guidelines specifically tailored to the distinct characteristics of family-owned firms, which seek to improve board independence, transparency, accountability and long-term performance. Additionally, policymakers can also develop support mechanisms customised for family-owned firms, which offers guidance, training, and mentorship programs to assist family owners in adopting best practices, improving corporate governance structures, and ultimately enhancing overall firm performance.

6.6. LIMITATIONS AND FUTURE RESEARCH RECOMMENDATIONS

While the findings of this study are valuable and make novel contributions to the fields of ownership structure, firm performance and corporate governance research in South Africa, it still suffers from limitations which are acknowledged in this section. Nevertheless, these limitations present interesting avenues for future research that may extend beyond the scope of this study but have the potential to contribute to the expansion of knowledge in this field. Accordingly, this section discusses the limitations and future research recommendations.

Due to practical constraints, the index and subindices constructed in chapter four were restricted to three specific categories of corporate governance: board structure and characteristics; accounting and audit; and risk management and internal audit. In particular, the

corporate governance variables were manually extracted from the annual reports of the sampled companies, which is a highly labour-intensive process and thus posed practical time limitations within the scope of this research. Consequently, the variables included in the index had to be streamlined to a number large enough to make a significant contribution, while ensuring the study's completion within the designated PhD timeframe. While board structure and characteristics, accounting and audit, and risk management and internal audit are fundamental components of the King Reports, they alone may not provide a complete representation of the corporate governance compliance in JSE-listed firms. Future research in the corporate governance field can therefore aim to incorporate additional corporate governance dimensions (such as ethics, sustainability, diversity, etc) into their indices to achieve a more holistic understanding of corporate governance compliance in firms.

Considering that certain provisions (company secretary, board size, remuneration committee, and audit committee) became mandated from 2017, the variability of the corporate governance measures may have decreased due to this standardization, potentially reducing the likelihood of identifying a significant relationship. For future research, it may be advisable to exclude mandated corporate governance practices from constructed indices. This is because firms automatically comply with these provisions to avoid delisting, and the compliance of mandated provisions may not be influenced by external factors. Therefore, excluding mandated practices could help provide a clearer analysis on the compliance of voluntary provisions, which can be influenced by external factors.

The current study was undertaken solely in South Africa, and while South Africa possesses certain traits common to other African countries, its financial system is widely recognized as the most advanced among African nations (Van Wyk, Botha and Goodspeed, 2015). As a result, the generalizability of the findings to other African countries may be limited. Thus, it is recommended that future research incorporate cross-sectional data from other African countries to offer more widely applicable results. This may also enhance the current understanding of the ownership structures impact on corporate governance and financial performance across different African markets.

In terms of institutional ownership, this study recognized that they constitute two groups: pressure-sensitive and pressure-insensitive institutional investors. Given the distinct characteristics of each group, an interesting avenue for further research lies in examining the impacts of these two categories separately. By conducting separate analyses for each group,

researchers can uncover the specific factors that contribute to the overall impact of institutional ownership and discern which type of institutional owner tends to offer greater benefits to firms.

Although this study examines the non-linear relationship between ownership structure and financial performance, its examination regarding corporate governance is limited to a linear specification only. Future research in this domain can therefore investigate the non-linear relationships between ownership structure and corporate governance, with the aim of identifying ownership levels that either enhance or diminish corporate governance. This research can provide valuable insights to policymakers and firm owners, as it may aid the implementation of legislative caps on ownership levels that erode the corporate governance of firms.

The results of this study provide evidence supporting the relationship between ownership structure and both financial performance and corporate governance in firms. Considering the extensive literature depicting significant relationships between corporate governance and financial performance, future research can aim to link all three aspects together by studying the moderating role of ownership structure in the effect of corporate governance on firm performance. This research can therefore detect the specific impacts of corporate governance that are influenced by ownership types, thus providing a more nuanced understanding on the interconnectedness between the three aspects.

The ownership structure has important implications for several firm fundamentals that go beyond financial performance and corporate governance yet are strongly linked to them. Whilst Dube (2018) found that ownership was significantly related to the capital structure of JSE-listed firms, his study only considered the top one, two, three, five and 10 shareholders, which may not accurately represent the overall ownership structure and its impact on capital structure. Therefore, opportunities for further research lie in studying the ownership structure- capital structure nexus, where ownership categories are constituted by the total number of shares held by owners. In addition, studies by Dam and Scholtens (2012), Oh, Cha and Chang (2015) and Nurleni and Bandang (2018) provide evidence that ownership structures impact the CSR activities of firms. This is because a firm's commitment to CSR is dependent on the type of owners within the firm and their motivations (Oh, Chang and Martynov, 2011). Thus, the linkage between ownership structure and CSR is a further area of research, especially in the context of South Africa, where this subject matter has not yet been explored.

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APPENDIX

Appendix A

Table A-1: JSE Securities Exchange List of Non-Financial Firms.

	JSE Ticker	Company Name	ICB Industry Name
1	1TM	1Time Holdings Ltd	Consumer Services
2	ACE	Accentuate Ltd	Industrials
3	ADI	Adaptit Holdings Ltd	Technology
4	AIP	Adcock Ingram Holdings Ltd	Health Care
5	ADR	Adcorp Holdings Ltd	Industrials
6	AVL	Advanced Health Ltd	Health Care
7	ADH	Advtech Ltd	Consumer Services
8	AFE	Aeci Ltd	Basic Materials
9	AFR	Afgri Ltd	Consumer Goods
10	ATR	Africa Cellular Towers Ltd	Telecommunications
11	AOO	African & Overseas Ent Ltd	Consumer Services
12	ABK	African Brick Centre Ltd	Industrials
13	AME	African Media Entertainment	Consumer Services
14	AFX	African Oxygen Ltd	Basic Materials
15	ARI	African Rainbow Minerals Ltd	Basic Materials
16	AFT	Afrimat Ltd	Industrials
17	AGI	Ag Industries Ltd	Industrials
18	AHL	Ah-Vest Ltd	Consumer Goods
19	ALH	Alaris Holdings Ltd	Telecommunications
20	AET	Alert Steel Holdings Ltd	Consumer Services
21	ALM	Alliance Mining Corp Ltd	Technology
22	ALT	Allied Technologies Ltd	Telecommunications
23	AEL	Altron Ltd-A	Technology
24	AVV	Alviva Holdings Ltd	Technology
25	AER	Amalgamated Electronic Corp	Industrials
26	AMS	Anglo American Platinum Ltd	Basic Materials
27	ANG	Anglogold Ashanti Ltd	Basic Materials
28	ARH	Arb Holdings Ltd	Industrials
29	ACL	Arcelormittal South Africa	Basic Materials
30	ART	Argent Industrial Ltd	Industrials
31	ASC	Ascendis Health Ltd	Health Care
32	APN	Aspen Pharmacare Holdings Lt	Health Care
33	ASR	Assore Ltd	Basic Materials
34	ARL	Astral Foods Ltd	Consumer Goods
35	APK	Astrapak Ltd-Uts	Industrials
36	AEG	Aveng Ltd	Industrials
37	AVI	Avi Ltd	Consumer Goods
38	AYO	Ayo Technology Solutions Ltd	Technology
39	BWI	B&W Instrumentation and Elec	Industrials
40	BAW	Barloworld Ltd	Industrials
41	BSR	Basil Read Holdings Ltd	Industrials
42	BAU	Bauba Resources Ltd	Basic Materials
43	BEE	Beget Holdings Ltd	Technology
44	BEG	Beige Holdings Ltd	Consumer Goods
45	BEL	Bell Equipment Ltd	Industrials

46	BID	Bid Corp Ltd	Consumer Goods
47	BVT	Bidvest Group Ltd	Industrials
48	BLU	Blue Label Telecoms Ltd	Telecommunications
49	BCF	Bowler Metcalf Limited	Industrials
50	BIK	Brikor Ltd	Industrials
51	BSS	Bsi Steel Ltd	Basic Materials
52	BCX	Business Connexion Group	Technology
53	CAC	Cafca Ltd	Industrials
54	CGR	Calgro M3 Holdings Ltd	Industrials
55	CVH	Capevin Holdings Ltd	Consumer Goods
56	CTA	Capital Appreciation Ltd	Technology
57	CRG	Cargo Carriers Ltd	Industrials
58	CTK	Cartrack Holdings Ltd	Technology
59	CSB	Cashbuild Ltd	Consumer Services
60	CAT	Caxton And Ctp Publishers An	Consumer Services
61	CRD	Central Rand Gold Ltd	Basic Materials
62	CRM	Ceramic Industries Ltd	Industrials
63	CSP	Chemical Specialities Ltd	Industrials
64	CMP	Cipla Medpro South Africa Lt	Health Care
65	CLH	City Lodge Hotels Ltd	Consumer Services
66	CLS	Clicks Group Ltd	Consumer Goods
67	CLR	Clover Industries Ltd	Consumer Goods
68	CGN	Cognition Holdings Ltd	Technology
69	COM	Comair Ltd	Consumer Services
70	CMH	Combined Motor Holdings Ltd	Consumer Services
71	CMA	Command Holdings Ltd	Industrials
72	CCL	Compu-Clearing Outsourcing	Technology
73	CIL	Consolidated Infrastructure	Industrials
74	CNL	Control Instruments Group Pt	Consumer Services
75	CBH	Country Bird Holdings Ltd	Consumer Goods
76	CKS	Crookes Brothers Ltd	Consumer Goods
77	CSG	Csg Holdings Ltd	Industrials
78	CUL	Cullinan Holdings Ltd	Consumer Services
79	COH	Curro Holdings Ltd	Consumer Services
80	DCT	Datacentrix Holdings Ltd	Technology
81	DTC	Datatec Ltd	Technology
82	DTA	Delta Emd Ltd	Basic Materials
83	DGC	Digicore Holdings Ltd	Industrials
84	DCP	Dis-Chem Pharmacies Pty Ltd	Consumer Goods
85	DGH	Distell Group Holdings Ltd	Consumer Goods
86	DAW	Distribution & Warehousing	Industrials
87	DON	Don Group Limited	Consumer Services
88	DLV	Dorbyl Ltd	Consumer Services
89	DRD	Drdgold Ltd	Basic Materials
90	EMH	E Media Holdings Ltd	Consumer Services
91	EEL	Efora Energy Ltd	Oil and Gas
92	ELR	Elb Group Ltd	Industrials
93	ELI	Ellies Holdings Ltd	Industrials
94	ENV	Enviroserv Holdings Ltd	Industrials
95	ENX	Enx Group Ltd	Industrials
96	EOH	Eoh Holdings Ltd	Technology
97	ESR	Esor Ltd	Industrials
98	ETO	Etion Ltd	Technology
99	EXL	Excellerate Holdings Ltd	Industrials
100	EXG	Extract Group Ltd	Industrials

101	EXX	Exxaro Resources Ltd	Oil and Gas
102	FBR	Famous Brands Ltd	Consumer Services
103	FRT	Faritec Holdings Ltd	Technology
104	GML	Gemfields Group Ltd	Basic Materials
105	GIJ	Gijima Group Ltd	Technology
106	GFI	Gold Fields Ltd	Basic Materials
107	GDN	Gooderson Leisure Corp Ltd	Consumer Services
108	GND	Grindrod Ltd	Industrials
109	GRF	Group Five Ltd	Industrials
110	HWW	Hardware Warehouse Ltd	Consumer Services
111	HAR	Harmony Gold Mining Co Ltd	Basic Materials
112	HSP	Holdsport Ltd	Consumer Services
113	AMA	Home Of Living Brands Holdin	Consumer Services
114	HIL	Homechoice International Plc	Consumer Services
115	HWN	Howden Africa Holdings Ltd	Industrials
116	HDC	Hudaco Industries Ltd	Industrials
117	HUG	Huge Group Ltd	Telecommunications
118	HLM	Hulamin Ltd	Basic Materials
119	IFH	Ifa Hotels & Resorts Ltd	Consumer Services
120	ILA	Iliad Africa Ltd	Consumer Services
121	ILV	Illovo Sugar Pty Ltd	Consumer Goods
122	ILE	Imbalie Beauty Ltd	Consumer Goods
123	IMP	Impala Platinum Holdings Ltd	Basic Materials
124	IPL	Imperial Logistics Ltd	Industrials
125	IRA	Infrasors Holdings Ltd	Basic Materials
126	ISB	Insimbi Industrial Holdings	Basic Materials
127	IWE	Interwaste Holdings Ltd	Industrials
128	IVT	Invicta Holdings Ltd	Industrials
129	IQG	Iquad Group Ltd	Industrials
130	ISA	Isa Holdings Ltd	Technology
131	ITE	Italtile Ltd	Consumer Services
132	JSC	Jasco Electronics Holdings	Technology
133	JDG	Jd Group Ltd	Consumer Services
134	KAL	Kaap Agri Ltd	Consumer Services
135	KGM	Kagiso Media Ltd	Telecommunications
136	KIR	Kairos Industrial Holdings	Industrials
137	KAP	Kap Industrial Holdings Ltd	Industrials
138	KDV	Kaydav Group Ltd	Industrials
139	KEH	Keaton Energy Holdings Ltd	Oil and Gas
140	KEL	Kelly Group Sa Pty Ltd	Industrials
141	KIO	Kumba Iron Ore Ltd	Basic Materials
142	LAB	Labat Africa Ltd	Industrials
143	LEW	Lewis Group Ltd	Consumer Services
144	LBR	Libstar Holdings Ltd	Consumer Goods
145	LHC	Life Healthcare Group Holdin	Health Care
146	LHG	Litha Healthcare Group Ltd	Health Care
147	LUX	Luxe Holdings Ltd	Consumer Services
148	MMP	Marshall Monteagle Plc	Industrials
149	MAS	Masonite Africa Ltd	Industrials
150	MSM	Massmart Holdings Ltd	Consumer Services
151	MDI	Master Drilling Group Ltd	Basic Materials
152	MZR	Mazor Group Ltd	Industrials
153	MRF	Merafe Resources Ltd	Basic Materials
154	MML	Metmar Ltd	Basic Materials
155	MTX	Metorex Ltd	Basic Materials

156	MFL	Metrofile Holdings Ltd	Industrials
157	MIX	Mix Telematics Ltd	Technology
158	MOB	Mobile Industries Ltd	Industrials
159	MND	Mondi Ltd	Basic Materials
160	MNY	Moneyweb Holdings Ltd	Consumer Services
161	MNK	Montauk Holdings Ltd	Oil and Gas
162	MOR	Morvest Group Ltd	Industrials
163	MPT	Mpact Ltd	Industrials
164	MRP	Mr Price Group Ltd	Consumer Services
165	MTN	Mtn Group Ltd	Telecommunications
166	MUR	Murray & Roberts Holdings	Industrials
167	MST	Mustek Ltd	Technology
168	MTG	Muvoni Technology Group Ltd	Industrials
169	MVL	Mvelaphanda Resources Ltd	Basic Materials
170	NPK	Nampak Ltd	Industrials
171	NTC	Netcare Ltd	Health Care
172	NCS	Nictus Ltd	Consumer Services
173	NPH	Northam Platinum Holdings Lt	Basic Materials
174	NVS	Novus Holdings Ltd	Industrials
175	NUT	Nutritional Holdings Ltd	Health Care
176	NWL	Nu-World Holdings Ltd	Consumer Services
177	OCE	Oceana Group Ltd	Consumer Goods
178	OLI	O-Line Holdings Ltd	Industrials
179	OMN	Omnia Holdings Ltd	Basic Materials
180	OLG	Onelogix Group Ltd	Industrials
181	PAM	Palabora Mining Co Ltd	Basic Materials
182	PCN	Paracon Holdings Ltd	Technology
183	PBG	Pbt Group Ltd	Technology
184	PEM	Pembury Lifestyle Group Ltd	Consumer Services
185	PPH	Pepkor Holdings Ltd	Consumer Services
186	PET	Petmin Ltd	Basic Materials
187	PHM	Phumelela Gaming & Leisure	Consumer Services
188	PIK	Pick N Pay Stores Ltd	Consumer Goods
189	PWK	Pick'n Pay Holdings Ltd	Consumer Goods
190	PFG	Pioneer Foods Group Ltd	Consumer Goods
191	PPC	Ppc Ltd	Industrials
192	PFB	Premier Fishing And Brands L	Consumer Goods
193	PMV	Primeserv Group Ltd	Industrials
194	PKH	Protech Khuthele Hold Ltd	Industrials
195	PSV	Psv Holdings	Industrials
196	QFH	Quantum Foods Holdings Ltd	Consumer Goods
197	RAC	Racec Group Ltd	Industrials
198	RNG	Randgold & Exploration Co	Basic Materials
199	RAR	Rare Holdings Ltd	Industrials
200	RBX	Raubex Group Ltd	Industrials
201	RBA	Rba Holdings Ltd	Consumer Services
202	RCL	Rcl Foods Ltd/South Africa	Consumer Goods
203	RLO	Reunert Ltd	Industrials
204	RTO	Rex Trueform Group Ltd	Consumer Services
205	RFG	Rfg Holdings Ltd	Consumer Goods
206	RLF	Rolfes Holdings Ltd	Basic Materials
207	RBP	Royal Bafokeng Platinum Ltd	Basic Materials
208	SAL	Sallies Ltd	Basic Materials
209	SNV	Santova Ltd	Industrials
210	SAN	Sanyati Holdings Ltd	Industrials

211	SAP	Sappi Limited	Basic Materials
212	SOL	Sasol Ltd	Basic Materials
213	SHG	Sea Harvest Group Ltd	Consumer Goods
214	SKY	Sea Kay Holding Ltd	Industrials
215	SEB	Sebata Holdings Ltd	Technology
216	SDH	Securedata Holdings Ltd	Technology
217	SEP	Sephaku Holdings Ltd	Industrials
218	SPO	Set Point Group Ltd	Industrials
219	SHP	Shoprite Holdings Ltd	Consumer Goods
220	SSW	Sibanye Stillwater Ltd	Basic Materials
221	SVB	Silverbridge Holdings Ltd	Technology
222	SIM	Simmer & Jack Mines Pty Ltd	Basic Materials
223	SOH	South Ocean Holdings Ltd	Industrials
224	SLO	Southern Electricity Co Ltd	Industrials
225	SOV	Sovereign Food Investments	Consumer Goods
226	SPA	Spanjaard Ltd	Basic Materials
227	SPP	Spar Group Limited/The	Consumer Goods
228	SPS	Spescom Ltd	Technology
229	SUR	Spur Corp Ltd	Consumer Services
230	SQE	Square One Solutions Group	Technology
231	SDO	Stadio Holdings Ltd	Consumer Services
232	SSK	Stefanutti Stocks Holdings	Industrials
233	SLL	Stella Vista Technologies	Industrials
234	SUI	Sun International Ltd	Consumer Services
235	SPG	Super Group Ltd	Industrials
236	TLM	Telemasters Holdings Ltd	Telecommunications
237	TKG	Telkom Sa Soc Ltd	Telecommunications
238	THA	Tharisa Plc	Basic Materials
239	TFG	The Foschini Group Ltd	Consumer Services
240	TBS	Tiger Brands Ltd	Consumer Goods
241	TON	Tongaat Hulett Ltd	Consumer Goods
242	TOR	Torre Industries Ltd	Industrials
243	TRT	Tourism Investment Corp Ltd	Consumer Services
244	TSX	Trans Hex Group Ltd	Basic Materials
245	TPC	Transpaco Ltd	Industrials
246	TRL	Trellidor Holdings Ltd	Industrials
247	TRE	Trencor Ltd	Industrials
248	TRU	Truworths International Ltd	Consumer Services
249	TSG	Tsogo Sun Gaming Ltd	Consumer Services
250	UBU	Ububele Holdings Ltd	Consumer Goods
251	UCS	Ucs Eye Investments Ltd	Technology
252	VLE	Value Group Ltd	Industrials
253	VMK	Verimark Holdings Ltd	Consumer Services
254	VOD	Vodacom Group Ltd	Telecommunications
255	VOX	Vox Telecom Ltd	Telecommunications
256	WEA	W G Wearne Ltd	Industrials
257	WSL	Wescoal Holdings Ltd	Oil and Gas
258	WEZ	Wesizwe Platinum Ltd	Basic Materials
259	WTL	William Tell Holding	Industrials
260	WBO	Wilson Bayly Holmes-Ovcon	Industrials
261	WNH	Winhold Ltd	Industrials
262	WGR	Witwatersrand Consolidated G	Basic Materials
263	WHL	Woolworths Holdings Ltd	Consumer Services
264	WKF	Workforce Holdings Ltd	Industrials
265	YYLBEE	Yeboyethu Ltd	Telecommunications

266	YRK	York Timber Holdings Ltd	Basic Materials
267	ZCI	ZCI Ltd	Basic Materials

Table A-2: Structure of Unbalanced Panel for Ownership Structure and Financial Performance Analysis.

Year	Number of companies	Percent	Cumulative
2004	122	3.76%	3.76%
2005	137	4.22%	7.98%
2006	152	4.68%	12.66%
2007	186	5.73%	18.39%
2008	208	6.41%	24.80%
2009	209	6.44%	31.24%
2010	220	6.78%	38.02%
2011	217	6.69%	44.70%
2012	208	6.41%	51.11%
2013	204	6.28%	57.39%
2014	197	6.07%	63.46%
2015	188	5.79%	69.25%
2016	175	5.39%	74.65%
2017	179	5.51%	80.16%
2018	169	5.21%	85.37%
2019	166	5.11%	90.48%
2020	160	4.93%	95.41%
2021	149	4.59%	100.00%
Total	**3246**	**100%**	

Table A-3: Number of Companies Selected from each Industry.

Industry name	Number of companies	Number of observations	Percentage of firms in industry (%)
Basic Materials	45	584	16.85%
Consumer Goods	31	359	11.61%
Consumer Services	48	641	17.98%
Health Care	9	93	3.37%
Industrials	88	1041	32.96%
Oil and Gas	5	58	1.87%
Technology	29	329	10.86%
Telecommunications	12	141	4.49%
	267	**3246**	**100%**

Table A-4: Industry Dummy Variables.

Variable	Explanation
Ind_1	A dummy variable equal to unity if a firm is in the Basic Materials industry and otherwise equal to zero.
Ind_2	A dummy variable equal to unity if a firm is in the Consumer Goods industry and otherwise equal to zero.
Ind_3	A dummy variable equal to unity if a firm is in the Consumer Services industry and otherwise equal to zero.
Ind_4	A dummy variable equal to unity if a firm is in the Health Care industry and otherwise equal to zero.
Ind_5	A dummy variable equal to unity if a firm is in the Industrials industry and otherwise equal to zero.
Ind_6	A dummy variable equal to unity if a firm is in the Oil and Gas industry and otherwise equal to zero.
Ind_7	A dummy variable equal to unity if a firm is in the Technology industry and otherwise equal to zero.
Ind_8	A dummy variable equal to unity if a firm is in the Telecommunications industry and otherwise equal to zero.

Table A-5: Year Dummy Variables.

Variable	Explanation
Year_{2004}	A dummy variable equal to unity if the year is 2004 and otherwise equal to zero.
Year_{2005}	A dummy variable equal to unity if the year is 2005 and otherwise equal to zero.
Year_{2006}	A dummy variable equal to unity if the year is 2006 and otherwise equal to zero.
Year_{2007}	A dummy variable equal to unity if the year is 2007 and otherwise equal to zero.
Year_{2008}	A dummy variable equal to unity if the year is 2008 and otherwise equal to zero.
Year_{2009}	A dummy variable equal to unity if the year is 2009 and otherwise equal to zero.
Year_{2010}	A dummy variable equal to unity if the year is 2010 and otherwise equal to zero.
Year_{2011}	A dummy variable equal to unity if the year is 2011 and otherwise equal to zero.
Year_{2012}	A dummy variable equal to unity if the year is 2012 and otherwise equal to zero.
Year_{2013}	A dummy variable equal to unity if the year is 2013 and otherwise equal to zero.
Year_{2014}	A dummy variable equal to unity if the year is 2014 and otherwise equal to zero.
Year_{2015}	A dummy variable equal to unity if the year is 2015 and otherwise equal to zero.
Year_{2016}	A dummy variable equal to unity if the year is 2016 and otherwise equal to zero.
Year_{2017}	A dummy variable equal to unity if the year is 2017 and otherwise equal to zero.
Year_{2018}	A dummy variable equal to unity if the year is 2018 and otherwise equal to zero.
Year_{2019}	A dummy variable equal to unity if the year is 2019 and otherwise equal to zero.
Year_{2020}	A dummy variable equal to unity if the year is 2020 and otherwise equal to zero.
Year_{2021}	A dummy variable equal to unity if the year is 2021 and otherwise equal to zero.

Appendix B

Table B-1: Unbalanced Panel for Construction of Corporate Governance Index and Subindices.

Year	Number of companies	Percent	Cumulative
2004	118	3.72%	3.72%
2005	137	4.32%	8.05%
2006	150	4.73%	12.78%
2007	179	5.65%	18.43%
2008	203	6.41%	24.84%
2009	208	6.57%	31.41%
2010	217	6.85%	38.26%
2011	213	6.72%	44.98%
2012	205	6.47%	51.45%
2013	199	6.28%	57.73%
2014	190	6.00%	63.73%
2015	182	5.74%	69.48%
2016	170	5.37%	74.84%
2017	176	5.56%	80.40%
2018	165	5.21%	85.61%
2019	162	5.11%	90.72%
2020	151	4.77%	95.49%
2021	143	4.51%	100%
Number of observations	**3168**	**100%**	

Table B-2: Eigenvalues of Components in Index and Subindices.

Components	CGI	BCS	AC	RMI
1	**4.971**	**3.184**	**2.105**	**2.153**
2	**1.588**	**1.255**	0.962	0.918
3	**1.503**	**1.140**	0.696	0.750
4	**1.162**	**1.055**	0.237	0.178
5	**1.146**	**1.003**		
6	**1.097**	0.939		
7	**1.033**	0.857		
8	0.927	0.722		
9	0.857	0.592		
10	0.835	0.526		
11	0.742	0.472		
12	0.712	0.254		
13	0.685			
14	0.640			
15	0.573			
16	0.469			
17	0.400			
18	0.253			
19	0.236			
20	0.172			

Notes: This table reports the eigenvalues of 20 components in the main corporate governance index (CGI), 12 components in board characteristics and structure subindex (BCS), four components in accounting and auditing subindex (AA) and four components risk management and internal controls (RMI) subindex. Components in boldface are eigenvalues values that exceed 1.

Appendix C

Table C-1: Summary Statistics of Corporate Governance Measures 2004-2021.

Year	CGI	BCS	AA	RMI
2004	0.609	0.630	0.695	0.460
2005	0.619	0.643	0.693	0.471
2006	0.633	0.647	0.713	0.512
2007	0.628	0.635	0.736	0.496
2008	0.652	0.644	0.793	0.535
2009	0.681	0.667	0.850	0.555
2010	0.721	0.702	0.888	0.609
2011	0.773	0.731	0.930	0.745
2012	0.810	0.763	0.949	0.815
2013	0.827	0.775	0.966	0.844
2014	0.836	0.789	0.968	0.843
2015	0.847	0.804	0.974	0.849
2016	0.854	0.818	0.972	0.843
2017	0.863	0.830	0.967	0.859
2018	0.865	0.834	0.965	0.858
2019	0.885	0.861	0.975	0.878
2020	0.897	0.868	0.974	0.907
2021	0.898	0.872	0.967	0.906

Notes: Table C-1 displays the mean values for the corporate governance measures (CGI, BCS, AA and RMI) for the period 2004-2021.

ETHICAL CLEARANCE

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

11 Oct 2023

Miss Delane Deborah Naidu (214549400)
School Of Acc Economics&Fin
Westville

Dear Miss Delane Deborah Naidu,

Original application number: 00015251
Project title: The effect of ownership on firm performance, corporate governance and corporate social responsibility: Evidence from South Africa
Amended title: The impact of ownership structures on the financial performance and corporate governance of JSE-listed firms.

Exemption from Ethics Review

In response to your **amendment** application received on 5 Oct 2023 , your school has indicated that the amendment has been granted **EXEMPTION FROM ETHICS REVIEW.**

Any alteration/s to the exempted research protocol, e.g., Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through an amendment/modification prior to its implementation. The original exemption number must be cited.

For any changes that could result in potential risk, an ethics application including the proposed amendments must be submitted to the relevant UKZN Research Ethics Committee. The original exemption number must be cited.

In case you have further queries, please quote the above reference number.

PLEASE NOTE:
Research data should be securely stored in the discipline/department for a period of 5 years.

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

Yours sincerely,

[redacted]

Prof Josue Mbonigaba
Academic Leader Research
School Of Acc Economics&Fin

UKZN Research Ethics Office
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Website: http://research.ukzn.ac.za/Research-Ethics/