DETERMINANTS OF CORPORATE GOVERNANCE IN FINANCIAL INSTITUTIONS

by

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DECLARATION

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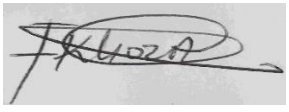
I declare that the work reported in this thesis titled "*Determinants of corporate governance in financial institutions*" is my own work. All consulted or quoted sources have been cited and acknowledged through complete references. This thesis has not, either in part or wholly, been submitted for degree or examination to any other university

Signature:  Date: 09 November 2022

DEDICATION

This thesis is dedicated to my parents: Mr Tepson Velaphi Khoza and Mrs Loyce Hlamalani Khoza, who profoundly shared their support, love, and encouragement throughout my pursuit of education. Attending my mom's graduation at a young age instilled the importance of education in me, and I am genuinely grateful for that opportunity. I hope this PhD achievement will fulfil the dreams they envisioned in me.

Sir Isaac Newton, the famous English scientist, once said, "If I have seen further, it is by standing on the shoulders of giants."

ABSTRACT

The study assessed the relationship between financial performance and corporate governance in selected financial institutions. Particularly, the study sought to examine the key determinant relationships, cointegrating relationships and causality between financial performance and corporate governance. The study employed panel data for the period 2007 to 2020 for 21 selected financial institutions, using South Africa as a unit of analysis. The joint effects of financial variables (risk appetite, financial stability, and financial performance) on corporate governance are scarcely studied. The current study contributed to the literature through the inclusion of financial variables to examine cointegrations and causal relationships between financial variables and corporate governance. The study used numerous econometric methodologies, including the Generalised Method of Moments (GMM), panel Autoregressive Distributed Lag (ARDL) and panel Error Correction Model (ECM), to address the research objectives. The study employed GMM to assess the key determinants of corporate governance proxies identified for the study. Panel ARDL and ECM models were employed to analyse the long-run, short-run, and causality relationships of the selected variables for this study.

Furthermore, the study employed Principal Component Analysis (PCA) to construct a composite index for corporate governance. To infer cointegrations and causality relationships between the financial variables and corporate governance, panel heterogenous estimation techniques such as Pooled Mean Group (PMG) and Dynamic Fixed Effects (DFE) were employed. PMG and DFE estimators were selected as the most suitable estimators. Using the p-value, the Hausman test was employed to determine the suitable estimator. Panel ARDL cointegration test results revealed a long-run association between financial performance, financial stability, risk appetite, and corporate governance. This study found bi-directional causality relationships in the long-run for the corporate governance index and the capital adequacy ratio, corporate governance index and financial stability.

Moreover, the study also found bi-directional causality relationships between the corporate governance index and financial stability in the short-run. However, no evidence of causal relationships was observed amongst most variables in the short-

run. The Error Correction Term (ECT) results are significant and negative, demonstrating dynamic stability between financial variables and the corporate governance index, therefore indicating a strong joint causality among the variables.

Keywords: causality, cointegration, corporate governance, financial dimensions, financial performance, financial stability, financial variables, risk appetite.

NKOMISO

Dyondzo yi kamberile vuxaka exikarhi ka matirhelo ya mali na vulawuri bya nhlangano eka mavandla ya swa timali lama hlawuriweke. Hi ku kongomisa, dyondzo yi lavile ku kambela vuxaka bya nkoka bya xihlawulekisi, vuxaka byo hlanganisa na xivangelo exikarhi ka matirhelo ya mali na vulawuri bya nhlangano. Dyondzo yi tirhisile datara ya phanele ya nkarhi wa 2007 ku fikela 2020 eka 21 wa mavandla ya swa timali lama hlawuriweke, yi tirhisa Afrika Dzonga tanihi yuniti ya nxopanxopo. Vuyelo bya nhlanganelo bya swilo swa timali leswi cincacincaka (mpimo wa khombo lowu nga amukeriwaka, ntshamiseko wa mali na matirhelo ya mali) eka vulawuri bya nhlangano a wu tali ku dyondziwa Dyondzo ya sweswi yi nghenisa xiave eka matsalwa hi ku katsa swilo leswi cincacincaka swa timali ku kambela mihlanganiso na swivangelo swa vuxaka exikarhi ka swilo leswi cincacincaka swa timali na vulawuri bya nhlangano. Dyondzo yi tirhisile maendlelo yo hlaya ya ikhonometiriki, ku katsa phanele ya GMM ARDL na phanele ya ECM, ku lulamisa swikongomelo swa ndzavisiso. Dyondzo yi tirhisile GMM ku kambela minchumu ya nkoka ya vayimeri va vulawuri bya nhlangano lava hlawuriweke eka dyondzo. Timodlele ta phanele ya ARDL na ECM ti tirhisiwile ku xopaxopa nkarhi woleha, nkarhi wokoma na vuxaka bya xivangelo bya swilo leswi cincacincaka leswi hlawuriweke swa dyondzo.

Ku yisa emahlweni, dyondzo yi tirhisile PCA ku aka xikombo lexi hlanganisiweke. Ku fikelela mihlanganiso na vuxaka bya xivangelo exikarhi ka swilo leswi cincacincaka swa timali na vulawuri bya nhlangano, tithekiniki ta nkumbetelo wo hambanahambana wa tiphanele to fana na PMG na DFE ti tirhisiwile.. Vapimanyeti va PMG na DFE va hlawuriwile tanihi vapimanyeti lava faneleke swinene. Hi ku tirhisa nkoka wa p,xikambelo xa Hausman xi tirhisiwile ku kumisisa mupimanyeti loyi a faneleke swinene.. Mivuyelo ya xikambelo xa ku hlanganisiwa ka Phanele ya ARDL yi humeserile erivaleni nhlangano wa nkarhi woleha exikarhi ka matirhelo ya mali, ntshamiseko wa mali, mpimo wa khombo lowu nga amukeriwaka na malawulelo ya nhlangano. Dyondzo leyi yi kumile swivangelo swa vuxaka bya matlhelo mambirhi eka nkarhi woleha eka xikombo xa vulawuri bya nhlangano, na mpimo wa ku ringanela ka mali, xikombo xa vulawuri bya nhlangano na ku tshamiseka ka swa timali.

Hixitalo, dyondzo yi tlhele yi kuma xivangelo xa vuxaka bya matlhelo mambirhi exikarhi ka xikombo xa vulawuri bya nhlangano na ntshamiseko wa mali eka nkarhi wokoma. Hambiswiritano, ku hava vumbhoni bya vuxaka bya swivangelo lebyi voniweke exikarhi ka swilo swotala leswi cincacincaka eka nkarhi wokoma. Mivuyelo ya ECT i ya nkoka naswona a yi khale, yi kombisa ntshamiseko lowu cincacincaka exikarhi ka swilo leswi cincacincaka swa mali na xikombo xa vulawuri bya nhlangano, hikwalaho wu kombisa xivangelo xo tiya xa nhlangano exikarhi ka swilo leswi cincacincaka.

Maritoyankoka: xivangelo, ku hlanganisiwa swin'we, vulawuri bya nhlangano, swiyenge swa timali, matirhelo ya mali, ntshamiseko wa mali, swilo leswi cincacincaka swa mali, mpimo wa khombo lowu nga amukeriwaka

ABSTRAK

Die studie het die verband tussen finansiële prestasie en korporatiewe bestuur in geselekteerde finansiële instellings beoordeel. Die studie het veral gepoog om die sleutelbepalende verwantskappe, koïntegrasieverwantskappe en kousaliteit tussen finansiële prestasie en korporatiewe bestuur te ondersoek. Die studie het paneeldata vir die tydperk 2007 tot 2020 vir 21 geselekteerde finansiële instellings gebruik, met Suid-Afrika as ontledingseenheid. Die gesamentlike uitwerking van finansiële veranderlikes (risiko-aptyt, finansiële stabiliteit en finansiële prestasie) op korporatiewe bestuur word selde bestudeer. Die huidige studie dra by tot die literatuur deur die insluiting van finansiële veranderlikes om koïntegrasie van kousale verwantskappe tussen finansiële veranderlikes en korporatiewe bestuur te ondersoek. Die studie het talle ekonometriese metodologieë gebruik, insluitend die veralgemeende metode van momente (GMM), paneel- outoregressiewe sloeringsbenadering (ARDL) en paneel-foutregstellingsmodel (ECM) om die navorsingsdoelwitte uiteen te sit. Die studie het GMM gebruik om die sleutelbepalers van gevolmagtigdes vir korporatiewe bestuur wat vir die studie geïdentifiseer is, te assesseer. Paneel-ARDL en ECM-modelle is gebruik om die langlopie-, kortlopie- en kousaliteitsverwantskappe van die geselekteerde veranderlikes vir hierdie studie te ontleed.

Verder het die studie hoofkomponentanalise gebruik om ’n saamgestelde indeks te konstrueer. Om koïntegrasies en kousaliteitsverwantskappe tussen die finansiële veranderlikes en korporatiewe bestuur af te lei, is paneelheterogene beramingstegnieke soos saamgevoegde gemiddelde groep (PMG) en dinamiese vaste-effek (DFE) gebruik. PMG- en DFE-beramers is ges lekteer as die mees geskikte beramers. Deur die p-waarde te gebruik, is die Hausman-toets gebruik om die geskikte beramer te bepaal. Paneel-ARDL-koïntegrasietoetsreultate het ’n langlopie-assosiasie tussen finansiële prestasie, finansiële stabiliteit, risiko-aptyt en korporatiewe bestuur aan die lig gebring. Hierdie studie het tweerigting-kousaliteitsverwantskappe in die lang lopie gevind vir die korporatiewe bestuursindeks en kapitaaltoereikendheidsverhouding, korporatiewe bestuursindeks en finansiële stabiliteit.

Die studie het boonop ook tweerigting-kousaliteitsverwantskappe tussen die korporatiewe bestuursindeks en finansiële stabiliteit op die kortlopie gevind. Geen bewyse van oorsaaklike verwantskappe is egter onder die meeste veranderlikes op die kort lopie waargeneem nie. Die resultate van die EKT is beduidend en negatief, wat dinamiese stabiliteit tussen finansiële veranderlikes en die korporatiewe bestuursindeks toon wat dus ’n sterk gesamentlike kousaliteit tussen die veranderlikes aandui.

Sleutelwoorde: kousaliteit, koïntegrasie, korporatiewe bestuur, finansiële dimensies, finansiële prestasie, finansiële stabiliteit, finansiële veranderlikes, risiko-aptyt.

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LIST OF ABBREVIATIONS

AIC	Akaike Information Criterion
AR(1)	First-order integration
AR(2)	Second-order integration
ARDL	Autoregressive distributed lag
BC	Board Composition
BCBS	Basel Committee on Banking Supervision
BD	Board Diversity
BIC	Bayesian information criterion
BIS	Bank for International Settlement
BR	Board Remuneration
BS	Board Size
CAR	Capital Adequacy Ratio
CEO	Chief Executive Officer
DEA	Data Envelopment Analysis
DFE	Dynamic fixed effect
ECM	Error Correction Model
ECT	Error correction term
ER	Efficiency Ratio
FE	Fixed Effect
FEM	Fixed Effect Model
FINPERF	Financial Performance
FINSTAB	Financial Stability
FS	Firm Size
FSCA	Financial Sector Conduct Authority
GP	Growth prospect
GMM	Generalised Method of Moments
GOVINDEX	Corporate Governance Index
GSE	Ghana Stock Exchange
INED	Independent Non-Executive Directors
IPS	Im, Pesaran and Shin

JSE	Johannesburg Stock Exchange
KPMG	Klynveld Peat Marwick Goerdeler
LEV	Leverage ratio
LLC	Levin, Lin and Chu
MG	Mean group
NED	Non-Executive Directors
NSE	Nairobi stock exchange
NYSE	New York Stock Exchange
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PCA	Principal component analysis
PMG	Pooled mean group
REM	Random Effects Model
ROA	Return on Asset
ROE	Return on Equity
USA	United States of America
VAR	Vector Autoregressive
VBS	Venda Building Society
VECM	Vector Error Correction Model
VIF	Variance inflation factors

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CHAPTER 1: INTRODUCTION

1.1 Background to the study

Over the last two decades, the 2007-2009 global financial crisis, environmental concerns, globalisation and corporate scandals have tremendously raised public awareness and attention to companies' corporate governance. The concept of corporate governance has emerged as a universal business quality concern and is crucial to the organisation's management and success (Mwanzia & Wong, 2011). It is a rapidly developing concept whose importance has been driven by the need to restore stakeholders' trust and confidence in the management of companies (Nadeem, Zongjun & Shoaib, 2013).

Corporate governance encompasses the leadership, stewardship, control, authority and direction exercised in the process of managing companies (Mwanzia & Wong, 2011). It is a management structure where executives are given authority to carry out tasks on behalf of stakeholders (Sven, Elin, Timurs, Penillar & Torbjorn, 2013).

From a broader perspective, the Organisation of Economic Co-operation and Development (OECD) (2015: 37) defined corporate governance as a set of relationships between a company's management, its board, shareholders, and other stakeholders. Hopt (2013) also recognised the prominence of the broader definition of corporate governance by economists that embrace stakeholder orientation. Shleifer and Vishny (1997) defined corporate governance as a mechanism that attempts to address the agency problem that may arise from management separation and finance and assuring stakeholders a return on their respective financial investment.

Corporate governance is the process through which a firm is managed and governed (Cadbury, 1992). Considering the above definitions, the study will focus on the board, transparency and disclosure, and risk appetite. Khanchel (2007) and John, Masi and Paci (2016) noted that transparency and disclosure should be considered for good corporate governance in banking institutions, as it was rendered an implication for prior studies. If good corporate governance systems are lacking in the institution to monitor the manager's activities, then the manager's interests will override those of investors, and therefore, the wealth maximisation objective will not be realised. Corporate

governance is a fast-evolving concept where its development has been backed and driven by the need to restore investors' confidence through the promotion of disclosure and transparency of information (OECD, 2015).

Effective corporate governance reduces the controlling rights, that shareholders and other fund providers confer on the institution's managers, increasing the probability of managers investing in positive investment projects (Shleifer & Vishny, 1997:740). Corporate governance has been one of the most discussed and debated topics by academics, policymakers, investors and researchers since the global financial crisis of 2007-2009 and other corporate scandals such as fraud, corruption and poor management within institutions (Mallin, 2010). According to Kirkpatrick (2009), while some have viewed corporate governance as a way to prevent corporate crises in businesses, others have blamed the global financial crisis of 2007–2009 on financial institutions' weak corporate governance, including improper board practices of directors.

Emmanouilides (2007) argues that scandals have eroded the confidence of the public, stakeholders and shareholders in corporate governance mechanisms. Globally, the banking sector has taken corrective steps in strengthening its governance practices to enhance accountability, financial reporting, transparency and corporate information disclosure. Transparent financial reporting is essential for decreasing or reducing information asymmetry and making management actions easier to track, preventing management from acting opportunistically (Tamimi & Sebastianelli, 2017).

According to Mahtab and Abdullah (2016), extensive research has been conducted on corporate governance, and comparisons were made between institutions with strong and weak corporate governance systems. Institutions with strong corporate governance systems tend to outperform those with weak corporate governance. Mahtab and Abdullah (2016) further noted that institutions with good corporate governance systems are better at allocating resources. Furthermore, the corporate governance and financial performance indicators of financial institutions are related, and corporate governance has been found to positively influence institutions' performance (Mahtab & Abdullah, 2016). However, there remains a question of what determines corporate governance in financial institutions.

Conformance to relevant corporate governance codes should improve corporate performance while lowering agency costs (Garanina & Kaikava, 2016: 351). Klapper and Love (2004), Durnev and Kim (2005), Giannetti and Simonov (2006), and Shank, Hill and Stang (2013) provided empirical evidence of effective corporate governance that is significantly associated with the growth opportunities of countries and companies and the benefits of stakeholders.

When there may be an imbalance between assets and liabilities, debt governance is the main concern from the standpoint of financial institutions' supervision (Hopt, 2013: 01). Despite the financial crises that occurred periodically, the connection between financial firms and their performance and the long-run stability of financial systems are not yet well understood. Corporate governance appears to be the driving force of the firm's performance and stability (Grace, Vincent & Evans, 2018: 01).

Internal corporate governance features are anticipated to increase firm performance in times of normal economic growth by properly overseeing directors and preserving their interests (Afrifa & Tauringana, 2015: 721). However, according to Van Essen, Engelen and Carney (2013), the validity of such claims in unusual economic times, such as financial crises, has been called into question. The literature on corporate governance and financial performance indicates that the connection between corporate governance and financial performance has mixed and inconclusive results during normal times and financial crisis (Aggarwal, 2013; Shank, Hill & Stang, 2013; Rani, Yadav & Jain, 2014; Grace *et al*., 2018). According to Shank *et al*. (2013), such findings could be attributed to differences in time periods, definitions, measurements, and variables associated with company complexity and size. Assuncao, De Luca and Vasconcelos (2015) made similar remarks when determining the complexity of the corporate governance of listed companies on the São Paulo Stock, Commodities, and Futures Exchange (BM&FBOVESPA).

The attention received by corporate governance is mainly due to the failures and scandals that have been encountered in various companies and have led some companies to retrench employees or completely shut down. The widespread failure of financial firms has been largely blamed on weak corporate governance mechanisms. The financial institutions have focused on strengthening the board structures and

compositions in recognising the role of directors and responsible fiduciaries. The board of directors must be stewards and guardians of the company, not only setting the strategic directions but also ensuring that the company abides by the laws and ethical standards while maintaining the effectiveness of corporate governance (James & Joseph, 2015).

Financial institutions may use complex financial instruments and participate in risky operations without adequate risk assessments because their primary goal is to increase rates of return (Zagorchev & Gao, 2015). When proper corporate governance is lacking, well-developed financial systems are vulnerable to flaws, systematic hazards, and wrongdoings, as demonstrated by the failure of financial institutions and financial sector malfeasance (Alexander, 2006; Zagorchev & Gao, 2015).

The corporate scandals and failures reported in the United States' financial industry include those of Lehman Brothers, Washington Mutual, Wachovia, IndyMac Bank and J.P Morgan (Zagorchev & Gao, 2015). Instances of wrongdoing and failures that have been most frequently reported in the South African financial sector include those of Regal Treasury Bank, African Bank Saambou, Leisurenet, Fidentia, Venda Building Society (VBS) Mutual Bank, and JCI, demonstrating the growing need for transparency and robustness in governing the financial firms. Furthermore, South Africa reported on the misconduct of management in advisory firms such as Deloitte, African Bank and Klynveld Peat Marwick Goerdeler (KPMG) scandals (Ruggunan & Spiller, 2018). The failures and misconduct in these firms across the globe have raised a considerable demand for a good corporate governance structure globally.

The motivation for selecting the financial industry for this study is that it plays an essential role in the economy by virtue of its ability to mobilise savings and be an agent of risk transfer (Tissot & Gadanecz, 2018). Financial institutions have an objective of financial and price stability, and improper corporate governance practices may result in systematic banking crises. Weaker institutional corporate governance may negatively affect the economic growth of a country (Financial Sector Conduct Authority, 2015). According to Sibindi (2015: 426), securing the financial sector would establish good corporate governance practices by strengthening existing regulations or internal controls.

International disasters in financial reporting have also included non-financial firms, including WorldCom Incorporated Inc in the United States of America (USA), Parmalat in Italy, the Maxwell saga in the United Kingdom (UK), Daewoo in Korea, and Macmed and Sentula in South Africa. According to Fisher and Sawczyn (2013), the scandals and failures in these companies were related to weak corporate governance. Almost all key developed and developing nations have attempted to ponder developing and implementing effective corporate governance standards (Macy & O'Hara, 2003).

According to the literature, financial institutions' corporate governance is different from that of non-financial institutions (Adams & Mehran, 2012; De Haan & Vlahu, 2012; Hameed, Tariq & Jadoon, 2013; Hopt, 2013; Abedin & Afrif, 2015; Belhaj & Mateus, 2016). Makina (2017) further observes that there is extensive literature on the corporate governance of non-financial firms but very little on financial institutions.

Financial institutions function as intermediaries between depositors, policyholders and borrowers. The core activities of financial institutions are facilitating various transactions, providing financing to enterprises, banks taking deposits and extending loans to households, and providing other services such as insurance, which makes their position integral to the economy (Financial Sector Conduct Authority, 2015). Their second core activity is offering liquidity to their customers according to preferences by ensuring the convenience of customers' access to funds (Starcevic, Subotic & Dalic, 2017: 42).

The scope of corporate governance in financial institutions extends beyond equity governance (shareholders). It includes various stakeholders such as insurance policyholders and debt holders (Hopt, 2013: 62). The corporate governance of financial firms differs considerably from general corporate governance since the scope of financial firms in corporate governance goes beyond shareholders. The Basel Committee on Banking Supervision (BCBS) (2006:4) defines a bank's corporate governance as approaches and methods that are used in the management of financial institutions through the directors and senior management in determining the alignment of objectives, operations of the bank and protecting the interest of the shareholders and stakeholders considering the existing laws and regulations.

The global financial crisis occurred because of poor corporate governance practices in financial and non-financial firms (Tshipa & Mokoaleli-Mokoteli, 2015b). The failures of banks and insurance companies in developed and developing countries came with huge financial costs (Brunnermeier, 2009). Therefore, the financial costs endured, highlighting that the world economy has receded due to the financial crisis. In 2009, South Africa was hit by a recession whereby the Gross Domestic Product was minus 1.8% as a result of the global financial crisis (Sibindi, 2015).

1.2 Problem statement

In any economy, financial institutions play a significant role. They allocate capital, mobilise funds, play a crucial role in the corporate governance of other firms and are agents of risk transfer (Tissot & Gadanecz, 2018). When such financial institutions are efficient, they stimulate the growth, affluence, and productivity of the entire economy. On the other hand, the banking sector crisis can destabilise the economy. The vulnerability to shocks and deficiency in corporate governance can damage the financial systems of financial institutions and pose systematic risks to the economy (Baihaj & Mateus, 2016). Therefore, these strong externalities on the economy make the corporate governance of financial institutions a fundamental issue. Because of the weakness and failures in financial institutions that contributed to the 2007 to 2009 global financial crisis, banking regulators and central banks have made efforts to stress the need for effective corporate governance practices in financial institutions (Basel Committee on Banking Supervision, 2006; Kirkpatrick, 2009).

Regulators became strict towards financial institutions due to the global financial crisis of 2007 to 2009 that caused huge economic problems worldwide, which led to the bankruptcy of some financial institutions and others to the brink of it. Several aspects of corporate governance were subject to hardened regulations after the 2007 to 2008 global financial crisis to benefit shareholders and stakeholders (Diaz, Garcia-Ramos & Diez, 2018). According to Lefort and Urzia (2008), the board of directors became the centre of attention when discussing internal governance principles. The board of directors provides strategic decisions and monitoring management of the organisation (Jensen, 1993). Therefore, the adherence of board members to good corporate

governance, especially the principles of transparency and disclosure of information, has drawn more attention from academics and policyholders (Kirkpatrick, 2009).

However, research has focused on the relationship between corporate governance and performance (Agyemang, Aboagye, Antwi & Frimpong, 2014; Gugong, Arugu & Dandago, 2014; Kelic, 2015; Balogobei, 2017) without examining the key determinants of corporate governance in financial institutions. This study is conducted to assess the impact of corporate governance in financial institutions, which is a crucial step in boosting confidence and attracting investments to financial institutions and the economy.

There are basic reasons for the growing interest in the corporate governance of financial institutions. When financial institutions fail to practice good corporate governance, it may cause insolvency for such institutions and may result in a lack of confidence within the country's financial system (Ahmed, Zannat & Ahmed, 2017). Corporate governance mechanisms significantly improve a firm's financial performance and financial stability. A well-governed financial institution will be more efficient in its functions than a poorly governed institution. As a unit of analysis of the universal research problem, South Africa is a global corporate governance pioneer, offers a relatively well-developed corporate governance framework and provides an environment suitable for corporate governance research (Addink, 2019; Solomon, 2020). The study aims to confirm the key determinants of corporate governance in financial institutions to contribute to the scholarly debates surrounding the factors influencing corporate governance, particularly in financial institutions of emerging market economies.

1.3 Research objectives

The topic and role of corporate governance in financial institutions in stabilising the economy has reached an important level of globalising financial markets, technological change, and deregulation (Brahimi, Dibra, Prodani, Halili & Diko, 2013). These positive factors, together with fraud, corruption, and poor management of financial institutions, resulted in multiple financial crises and brought the role of corporate governance in financial institutions to the forefront of the global economy.

Corporate governance has become one of the most important discussions in the world concerning financial institutions (Brahimi, Dibra, Prodani, Halili & Diko, 2013). Financial institutions worldwide started improving their structures of corporate governance. However, what determines corporate governance in financial institutions? since it differs from non-financial firms in terms of regulations and operations, remained unanswered.

As such, the objectives of this current study are to:

I. Identify the key determinants of corporate governance in selected financial institutions.
II. Assess the long-run (cointegrating) relationship between corporate governance and financial performance in selected financial institutions.
III. To examine the causal relationship between corporate governance and financial performance in selected financial institutions.

1.4 Research hypotheses

The purpose of this study is to investigate the determinants of corporate governance in financial institutions. Using South Africa as the unit of analysis, the study's research hypotheses are as follows:

I. There is no relationship between corporate governance and financial performance.
II. There is no long-run (cointegrating) relationship between corporate governance and financial performance.
III. There is no causal relationship between corporate governance and financial performance.

1.5 Contribution of the study

While corporate governance failure is viewed as one of the contributing factors to the global financial crisis of 2007-2009 (Tricker, 2015), very few empirical studies (Barucci & Falini, 2005; Ariff, Ibrahim & Othman, 2007; Boone, Field, Karpoff & Raheja, 2007) have been carried out to investigate the key determinants of corporate governance in

financial institutions. Generally, there has been a knee-jerk reaction to bringing corporate governance under regulation without fully studying its determinants in financial institutions. Against this background, the study intends to contribute to the body of knowledge concerning understanding the key determinants of corporate governance in financial institutions. Although using South African financial institutions as the unit of analysis, the results may not be peculiar to the country, and findings could have generalisability to other economies and non-financial sectors.

The study further contributes to methodology by developing a composite corporate governance index for financial institutions using principal components analysis (PCA). The model will view corporate governance in financial institutions as the dependent variable, unlike previous studies (Agyemang, Aboagye, Antwi & Frimpong, 2014; Tshipa & Mokoaleli-Mokoteli, 2015b; Balagobei, 2017), which used financial performance indicators as the dependent variables. There is no traceable scholar who has developed a composite index of corporate governance in financial institutions.

Furthermore, the study could benefit a variety of stakeholders. Policymakers can consolidate their strategies to improve corporate governance while taking into consideration the various components of corporate indexes. Policymakers are consequently encouraged to understand how financial variables might be used to improve corporate governance. A distorted conception and definition of corporate governance will result in policies that have little to no impact on the effectiveness of financial institutions. Adopting the concept of corporate governance is critical for development policy to have a major impact on actual sectors. Policymakers are urged to adopt a unified legal framework and governance recommendations to integrate solid corporate governance practices into the financial components of financial institutions to improve the oversight functions of the board.

Private sector training providers can provide training on corporate governance principles to managers and directors based on the identified determinants. Practitioners can comprehend and conclude the impact of financial factors on corporate governance processes. Principals and agents must ensure that resources and processes are used efficiently while adhering to corporate governance norms.

1.6 Study limitations

The research study is solely focused on the South African financial sector. For two reasons, South Africa was selected as the study's unit of analysis. Very few studies have examined the fundamental factors influencing corporate governance in financial institutions, using South Africa as the exclusive focus country. Second, South Africa is a developing country; hence, its level of sophistication and development of the financial sector is almost at par with developed countries, making it an interesting proposition to be used as a unit of analysis. For this study, the financial sector under investigation is limited to the banking and insurance companies in South Africa.

Moreover, the phrase ‘financial institutions’ bears reference to banking and insurance companies. The views of employees, management and other stakeholders will be excluded since the methodology is limited to quantitative in nature. As such, the findings may have limited generalisability to other economies and non-financial sectors.

1.7 Thesis outline

Chapter 1: Introduction, Background and Motivation

The chapter provided the background to the study, with emphasis on the relevance to the current study. The problem statement, research hypotheses, contributions of the study, and study limitations are outlined in the chapter.

Chapter 2: Literature Review

The chapter will review both the theoretical and empirical literature on corporate governance in financial institutions. First, it will begin by tracing the evolution of corporate governance theory. The prominent theories of corporate governance, such as model agency, stewardship and resource dependence theory, will be discussed. After that, it reviews the empirical studies on corporate governance in financial institutions. Furthermore, it explores the extent to which empirical literature attempts to link internal corporate governance in financial organisations.

Chapter 3: Corporate Governance of Financial Institutions in South Africa

The chapter will provide an overview of South African corporate governance practices. The chapter will first present external corporate governance and challenges facing regulatory systems. Afterwards, the internal corporate governance will be described.

Chapter 4: Research Methodology

The methodological research issues will be discussed in this chapter. The chapter begins by outlining the research framework and variable measurement. The data and sources, preliminary tests, and model specifications will be discussed in the chapter. The chapter highlights how the data will be collected and analysed, taking into consideration the reliability and validity. Furthermore, it will provide ethical considerations for the study.

Chapter 5: Presentation of Data, Analysis and Discussion of Empirical Results

In this chapter, the empirical results of the determinants of corporate governance in financial institutions are presented and discussed. The chapter discusses the econometric methodologies followed by the models designed for the study.

Chapter 6: Summary, Conclusions and Recommendations for Future Research

The chapter provides the concluding summary of the entire study, the main findings of the thesis drawn from the empirical literature review, and the study findings. The chapter concludes by identifying the contributions and recommendations of the study in filling the research gap. Furthermore, implications and suggestions for future research are provided in the chapter.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter presents and discusses the literature that relates to corporate governance. The chapter commences by providing the evolution of corporate governance theories and how these form a basis for institutions to strengthen their corporate governance systems. These theories include agency theory, evolutionary theory of economic change theory, stakeholders theory, transaction cost theory, resource dependence and stewardship theories. In addition, the chapter covers empirical research that has been done on factors that affect corporate governance in financial institutions. The literature review helps identify the research gaps and further provides information for further research. The theories that are pertinent to the current investigation are discussed in the following sections, building on this background and adhering to a context-specific approach.

2.2 Theories of corporate governance

Numerous theories explain or address corporate governance. The literature review discusses various theories to describe good and effective governance practices. It is, therefore, appropriate to discuss and highlight the theoretical literature behind corporate governance. For the purpose of the study, theoretical foundations will be discussed concerning corporate governance and the performance of financial firms.

According to Abdullah and Valentine (2009), the development of corporate governance theories began with the emergence of agency theory. Other theories, including the notions of stakeholder, transaction costs, resource dependence and stewardship theory, were later developed in the discipline (Lau, Lu & Liang, 2016; Tonurist & Karo, 2016). A multi-theory approach to research is advised because there is never one ideal theory that fully accounts for a phenomenon under study (Abdullah & Valentine, 2009; Hussain, Rigoni & Orij, 2018). A single-theory approach is further criticised by Walls, Berrone and Phan (2012), who claim that it is insufficient to properly explain study phenomena and account for hypothesised correlations.

According to Savitz and Weber (2006), financial institutions now need to prioritise and accomplish non-financial goals in addition to their financial performance. Stakeholders' requirements must be prioritised by those working as agents for financial institutions, which is consistent with stakeholder theory. Stewardship theory observers argue that for agents to put stakeholders' needs ahead of their own, they must act as stewards. The development of corporate governance and the interest other disciplines have shown in it have made it a multidisciplinary and adaptable field. The field is anticipated to continue posing various difficulties, given its expanding popularity and diversity.

Agency theory

Jensen and Meckling's (1976) agency theory describes the relationship between the institution's shareholders, managers, and external stakeholders in carrying out services on their behalf. This indicates that separation between the controlling functions by owners (principals) and managers (agents) could be a source of potential conflict of interest. The theory is known for its simplicity in breaking down the complex organisation into the participants of shareholders and managers. The theory is further concerned with aligning stakeholders' and managers' interests to reduce agency costs.

The relevance of agency theory was explored by Ross (1973), and a more detailed explanation was provided by Jensen & Meckling (1976). Agency theory is one of the corporate governance theories used in financial firms. The theory was previously proposed by Alchian & Demsetz (1972). Hagendorff, Collins and Keasey (2007) assert that the banking sector requires a separate agency analysis due to the uniqueness of the agency relationship originating from the manager's duty to safeguard investors' funds, including depositors. Consequently, corporate governance practices in financial institutions are expected to exhibit marked differences from practices in conventional corporations. The agency theory implies the nature of the firm by assuming optimal capital structure and perfect competition.

The manager and investor relationship should have a great positive impact, as investors may need management's expertise in increasing investment returns, and management may need investors' deposits (funds) for the operations of their institutions. Kiefer, Jones and Adama (2017) argue that the relationship between

managers and investors is symbiotic, where management provides and contributes human capital while shareholders provide financial capital to the institutions.

However, the relationship fails when managers enrich their interests to the detriment of investors (Kiefer *et al*., 2017). According to Jensen and Meckling (1976), the reason is the misalignment of managers' and shareholders' interests and actions. However, fiduciary duties have been imposed to combat institutions' conflicts of interest. According to Shleifer and Vishny (1997), to lessen the efforts that are dominated by the institution's CEO, the agency theory supports the need for board independence.

The theory-based agency studies focused largely on strategic decision-making, control over management behaviours and board structure (Hafsi & Turgut, 2013). However, agency theorists use the term corporate governance to closely analyse the role of managers in fulfilling their agreements with shareholders. According to Jensen and Meckling (1976), agency theorists of corporate governance fundamentally believe that managers have their self-interests and may not act in the best interests of shareholders unless appropriate internal corporate governance controls are placed to protect the shareholders' and investors' interests.

According to Shleifer and Vishny (1997) and Adegbite, Amaeshi and Amao (2012), the agency theory framework asserts that corporate governance attempts to monitor the mechanisms provided by shareholders in ensuring their wealth is maximised by reducing agency costs. However, in the absence of good corporate governance measures in institutions, management may benefit by pursuing their interests at the expense of the shareholders (Gartenberg & Pierce, 2017). According to Reibeiz (2015), monitoring mechanisms are regarded as internal corporate governance structures. The role of corporate governance is to ensure that human and capital resources are directed to achieve shareholders' objectives (Sternberg, 1998). Therefore, agency theorists consider corporate governance as a mechanism for reducing agency costs in an organisation.

According to Badu and Appiah (2017), agency theory recognises that information asymmetry between managers and shareholders resulting from separate control and ownership in institutions may distort the quality of the information that managers have to work in the best interest of shareholders. Therefore, the corporate board must serve

as a mechanism for controlling and monitoring activities in the institution. Agency theorists, therefore, advocate for more independent directors to perform effectively and reduce agency costs and information asymmetry (Badu & Appiah, 2017). Independent directors can reduce the agency costs and information asymmetry (Pijoh, Pratama, Pramono & Hapsari, 2022)

Despite the given role of agency theory in corporate governance, there is still a problem with the theory in that sometimes reality deviates from the proposed plan, and researchers have associated the bankruptcy and performance failure of institutions with the failure of corporate governance guidelines and agency problems. According to Mohammed and Muhammed (2017), shareholders may not be monitoring the institution but rather focusing on receiving dividends and share price improvements.

An institution may have multiple shareholders who acquired shares through fund managers and be regarded as artificial shareholders. Mohammed and Muhammed (2017) argue that in explaining the relationship between organisational performance and corporate governance using agency theory, there may be a possibility that researchers have focused less on stakeholders other than managers and shareholders or owners. Therefore, there is a tendency to ignore problems arising from creditors, employees, and investors.

Agency theory originates from the economic view of risk sharing between shareholders and managers; however, the parties may have different approaches to solving the problem (Jensen & Meckling, 1976). The shareholders' appetite for risk sharing is of great concern because shareholders have delegated certain responsibilities to the managers to achieve their expected goals. Therefore, managers are expected to reach the outcomes provided and specified by shareholders (Bendickson, Muldoon, Liguori & Davis, 2016). However, the agency problem lies in the concern for self-interest behaviours that may encourage managers to not act in the best interest of the shareholders (Fama, 1980).

According to Fama (1980), agency costs are provided and highlighted to both parties when the principal-agent relationship begins. However, when managers take action counter to the agreement, shareholders may perceive that managers have assumed more risk. Agency theory states that when managers have shares in the institution,

they are likely to embrace the actions desired by shareholders (Jensen, 1993). However, if there is perceived inequality, managers may serve their interests at the expense of shareholders. Therefore, information asymmetry may be created where shareholders cannot effectively monitor the managers' behaviours.

The greater the number of directors, the better the monitoring of the internal board members. The Basel Committee on Bank Supervision (2006) supports the strategic direction and independence of non-executive directors to help shape management and provide insights with their expertise. Nicholson and Kiel (2007) assert that there will be a reduction in agency costs and, consequently, high institutional productivity since managers will act in the best interest of the stakeholders.

Financial institutions such as banks and insurance firms operate in a well-regulated market, and the capital provided by investors is usually not more than 10% of capital, whereas the bondholder and depositors provide the rest. Ciancanelli and Gonzalez (2000) assert that the agency problem in financial institutions is more complex because of the asymmetry between owners and managers, including depositors, regulators, and institutions. Such asymmetric information in financial institutions makes the institutions very different from non-financial institutions, which view governance as only applicable to owners and managers.

Human beings are economic agents who seek the best for their personal interest; hence, managers can pursue interests that might conflict with the interest of the shareholders and other stakeholders. The expectations of principals from their agents in acting on their required interest could sometimes fall short when agents do not hold to the end of their bargain (Padilla, 2002). Smith (1976) indicated that agents promote the firm's productivity when their interests align with the firm's goals. In strengthening the relationship between management and owners, the shareholders (principal) will incur unavoidable agency costs by creating a monitoring board that will ensure management (agents) are maximising the stakeholders' interests (Jensen & Meckling, 1976).

Due to the dynamic and complex nature of a financial institution's operating environment, management and its control are complex, and the agency problem in financial institutions is due to expectations and multiple interests by the shareholders

(principal). Therefore, agency theory is relevant to financial institutions as they are led by executive management and represent the interests of shareholders (principals). In financial institutions, executive directors are usually agents. Wangechi (2019) asserts that researchers should consider the agency relationship's influence on the viability and sustainability of financial institutions.

According to Darayseh and Chazi (2018), financial institutions tend to disregard the principles of corporate governance independence. Therefore, financial institutions are plagued by agency problems due to the multiple interests and expectations of stakeholders. Despite its popularity as an approach to understanding conflicts of interest, agency theory is not without criticism. Behavioural theorists (Gore & Pepper, 2012; Martin, Wiseman & Gomez-Mejia, 2013) dispute the relevance of agency theory concerning the association between conflict and risk behaviour in the corporate governance context.

First, agency theory has limitations concerning how to handle an institution’s risky behaviours. The limited definition of risk used by agency theory ignores the relevance of risk-seeking behaviour, also known as risk tolerance behaviour, by assuming that principals are always risk-neutral and agents are always risk-averse. Second, the agency theory implies that the risk orientation of agents and principals will eventually stabilise.

Evolutionary theory of economic change

The evolutionary theory of economic change was stimulated by the seminal work by Nelson and Winter (1982), further discussed by Mirowski (1983). The theory utilises various theoretical tools to examine the wide range of organisational, technological, and institutional processes and their role in economic change (Nelson & Winter, 1982; Dopfer, 2005). According to the evolutionary theory of economic change, corporate governance will be established and monitored by allowing competition in financial firms to prevail (Stigler, 1958). When competition flourishes, firms will be propelled to minimise their costs and forced to adopt acceptable corporate governance standards that will allow them to attract investors.

The evolutionary theory views institutions as profit-motivated. However, their actions are not assumed to be profit-maximising (Nelson & Winter, 1982). The theory is driven by the most profitable firms' tendency to focus on sustainability and competition. According to Nelson and Winter (1982), evolutionary theory is closely related to behavioural theory, which views firms or institutions as having decision rules and certain capabilities that determine their institutional behaviours.

The theory supports the self-regulation of firms, institutions that are operating according to competitive rules. In non-financial firms, there is an assumption that there are no market failures. In the special case of financial firms, allowing evolutionary theory to guide the formation of corporate governance would simply increase systemic risks (Sundararajan & Balino, 1991). Sundararajan and Balino (1991) further noted that risks associated with financial institutions include the unexpected withdrawals of deposits, excessive volatility in foreign exchange markets, and securities holders' unexpected and continuous reversals of funds.

Stakeholder theory

Stakeholder theory is a popular corporate governance theory introduced by Freeman (1984). The main objective was to delineate an alternative form of strategic management as a prolonged response to rising globalisation, competitiveness and the growing complexity of organisation operations. It originated from the management discipline and developed to gradually include corporate accountability to the firm's stakeholders (Abdullah & Valentine, 2009; Fekadu, 2015). The theory postulates that managers are bound to have a network of relationships with shareholders and other stakeholders (Freeman, 1984; Kock, Santalo & Diestre, 2012). Freeman (1984) further stated that the theory postulates that managers make decisions while taking into account the interests of all stakeholders is necessary and forms part of conducting business.

Unlike agency theory, whereby managers are responsible for satisfying shareholders' interests, stakeholder theory maintains that managers are responsible for the interests of the shareholders and stakeholders (Fekadu, 2015). DeVilliers and Van Staden (2011) noted that reporting of information by managers is targeted at various stakeholders in the institution. According to the theory, the purpose of a financial

institution is to coordinate and serve the interests of the stakeholders. Stakeholders of financial institutions create a favourable external environment when considering corporate governance. Mutual resource dependence gives stakeholders a legitimate claim on the firm's allocation of resources (Kock, Santalo & Diestre, 2012). Within the stakeholder framework, the principal-agent relationship is extended to managers and stakeholders (Kock, Santalo & Diestre, 2012).

A stakeholder in the institution is any individual or any group that may affect or is affected by the institution's achievements or failures (Freeman, 1984). According to Anderson and Baker (2010), the main stakeholder groups include investors, suppliers, creditors, employees, the local community, and the government. The theory put forward the growing recognition proposed by the boards of the need to take the wider interests of society into account (Dulewicz & Herbert, 2004). This implies that institutions have wider relationships with stakeholders, and one stakeholder's actions may influence or have implications for the other. Therefore, stakeholder theory takes into account the relationships together with the interests and outcomes of stakeholders.

Stakeholders play a vital role in corporate governance, and some of them, including creditors, customers, and employees, are considered important for the survival and operations of institutions. Because of the importance of stakeholders, the theory argues that the concerns and interests of stakeholders should receive attention in the process of controlling and directing institutions (Mohammed & Muhammed, 2017).

Since establishing the stakeholder theory, it has developed into the fundamental framework for numerous studies connected to corporate governance, a large portion of which deal with comprehending strategic management. Sceptics of the stakeholder theory contend that there is an issue with the theory's incapacity to comprehend the agreements made and potential concessions between the stakeholders (Mohammed & Muhammed, 2017).

Stakeholder theory recognises that institutions have larger stakeholders for which they are obliged and responsible and should have governance structures to address their unique and varied requirements (Sweeney & Coughla, 2008). However, the theory implies that corporate disclosure should focus on serving the interest of all

stakeholders rather than resolving the conflict between shareholders and management.

The existence of corporate companies (financial institutions in particular) and stakeholders are dependent on one another. Without the support of stakeholders, institutions may not exist and maintain stability in the end. In contrast, the stakeholders' livelihood depends on the services the institution provides to make a profit. According to the OECD (2015), organisations lacking appropriate governance practices are vulnerable to a financial collapse. Singh, Kumar and Uzma (2010) assert that this holds unfavourable financial implications for stakeholders. Consequently, how institutions conduct their services and activities will affect their stakeholders. Therefore, stakeholder theory is relevant to the corporate governance structure of financial institutions.

A proposal put forth by Brammer and Pavelin (2008) and Abdullah, Hassan and McClelland (2015) contend that corporate disclosure lessens the knowledge imbalance between stakeholders and institutions. Corporate disclosure helps institutions disseminate value-relevant information and provides opportunities to different stakeholders regarding the institution's future financial prospects. Freeman (1984) focused on the technical rather than the theoretical part of the concept. The presentation of identifiable actors provides a valuable strategic tool but does not provide the appropriate theoretical base to explain the organisation's behaviour or individual behaviours. Key (1999) contends that stakeholder theory fails to provide a sufficient explanation of the process, makes insufficient connections between external and internal variables, pays insufficient attention to the structure in which businesses operate as well as the levels of analysis within that system, and inappropriately evaluates the environment. Furthermore, the theory does not pay enough attention to the company's operations and inappropriately evaluates the environment (Mohammed & Muhammed, 2017).

Stakeholder theory provides the basis for categorising the structural and relationship framework of managers and stakeholders (Donaldson & Preston, 1995: 78). Himaj (2014) noted that the approach is relevant in financial institutions such as banks and insurance companies since they are multi-constituency firms due to many

stakeholders such as regulators, bondholders, depositors, policyholders, and other stakeholders. Additionally, the management of financial institutions should concentrate on rules, guidelines, and regulations since they provide a solid foundation for stakeholders to have a fair distribution of wealth.

Transaction cost theory

Coase (1937) established the transaction theory in trying to explain the firm's existence. Williamson (1985) further developed the theory and elaborated that firms' dependency leads to disadvantages due to opportunism, uncertainty, and transaction costs. The theory considers the theoretical framework in analysing the relationship between the service provider (financial institution) and the customers. The transaction cost, as the cost of monitoring, negotiating, and enforcing parties' exchanges to a transaction, measures the transaction efficiency (Bowen, DuCharme & Shores, 1995). The service provider and the customer depend on each other as transaction partners.

While institutions have to ensure that innovative resources can be established successfully, it requires additional effort and time to consider methods for obtaining innovative resources and establishing them (Hsieh, Huang & Lee, 2016). According to Williamson (1975), transaction cost theory can be employed to provide possible solutions to the problem. Coase (1937) states that the transaction cost between companies should not be zero. However, the theory suggests two transaction governance structures: hierarchy governance and market governance. According to Hsieh *et al.* (2016), when the cost of purchasing on the market is practically higher than that of producing, then the adoption of hierarchy governance should be applied, expanding the institution by internalising the transactions. Conversely, when the cost of purchasing on the market is less than the actual cost of producing something, adoption of market governance is needed, where the transaction may choose to obtain the required resources from the market.

Williamson (1975) states that formal authority controls resources. However, transaction costs influence the institution's selection of resource control methods. Transaction cost theory is applied to identify the environmental factors that prompt firms to engage in internal transactions to reduce transaction costs. Hsieh *et al*. (2016) state that traditional theory and microeconomics argue that operations and ideals of

market mechanisms and transactions are regarded as natural. However, expenditures and extra costs were unnecessary when the market was used to gain market-related information.

However, Coase (1937) argues that the complexity and uncertainty of the environment increase costs during the process of trading operations. Therefore, transaction costs should be highly considered in the market. Coase (1937) referred to transaction costs as fees or resources that must be expended when engaging or completing a certain transaction. The transactional cost theory assumes the following factors for the transaction cost; production atmosphere, complexity/uncertainty, information impactedness, opportunism, and bounded rationality. However, the transaction costs arise from contractual problems (Williamson, 1985). According to Hsieh *et al.* (2016), transaction cost theory was used to explore the existence of companies and how their boundaries are determined. However, the institution should choose the internal transaction deemed to reduce the transaction cost.

According to Coase (1937), the size of an institution is limited by the availability and existence of transactions, which can occur with fewer costs within the institution. Transaction costs increase when the institution grows. Thus, it might not be less costly when organising additional transactions within the institution (Pitelis & Pseiridis, 1999). Transaction cost theory brings together the service provider (financial institution) and the customer since it is a cost of monitoring, negotiating, and enforcing parties' exchange to the transaction that affects firm performance. It is manifested in the relationship between corporate governance and the performance of financial firms.

Resource dependence theory

Resource dependence theory describes the association between board characteristics and a company’s critical resources, including legitimacy and prestige (Nguyen, Locke & Reddy, 2015). Resource dependence theory arose from the work of Pfeffer (1972) and Pfeffer and Salancik (1978), inspired by Lawrence, Lorsch and Garrison (1967). Resource dependence theory focuses on managers' role as resource providers through effectiveness and efficiency in allocating resources to meet shareholders’ needs.

Boards enable firms to gain resources that establish resource dependency (Pfeffer, 1972). Resource dependence theory is used in assessing boards, focusing on board size and ownership structure as indicators showing the board's ability to provide critical resources (Pfeffer, 1972). Pfeffer (1972) added that the financial firm's ownership structure relates to the firm's environmental needs and greater interdependence, requiring a high ratio of external directors. According to Kor and Misangyi (2008), the resource-dependence approach in financial firms emphasises that external directors enhance the firm’s ability to protect itself against the external environment and increase the ability to raise funds.

Fama and Jensen (1983) reported that executive directors were typically opportunistic and took advantage of information asymmetry. Therefore, hiring independent directors avoids or minimises agency problems (Hillman & Dalziel, 2003). Pfeffer and Salancik (1978) introduced the other view of resource dependence theory. Ideally, boards should include an array of talents in terms of knowledge, expertise, reputation, and skills. This can be achieved by embracing diversity between characteristics, demographics, and social backgrounds. The characteristics of directors have been shown to influence behaviour and decision-making in prior studies (Forbes & Milliken, 1999; Bertrand & Schoar, 2003). A firm should not rely only on one factor when selecting or employing non-executive directors, which is independent, given the complexity of the roles of non-executive directors. Non-executive directors’ roles require personal qualities, experience, and specialist knowledge.

The resource dependence theory focuses on the board of directors' responsibility to provide ways to obtain the limited resources the institution could urgently need. Abid, Khan, Rafiq and Ahmed (2014) contend that the theory focuses on the director’s role in securing resources that are essential to the institution through the link to the external environment. Mwai, Kiplang’at and Gichoya (2014) concur that the provision of resources in the institution enhances the firm’s performance, survival, and organisational functioning. According to Abid *et al*. (2014), directors provide resources such as skills, information, and access to the market to the institution. A resource could be regarded as competitive if it is unique, imitable, and not easily sustainable, creating value for the firm (Barney, 1991).

According to Pfeffer and Salancik (1978) and Erakovic and Goel (2008), resource dependence theory asserts that institutions are dependent upon critical resources and such dependency influences the decisions of institutions. However, theorists have emphasised the director's role as a provider of resources such as advice (Abid *et al*., 2014). According to Stearns and Mizruchi (1993), outside board members provide access to valuable resources needed in the institution, therefore showing the importance of board independence.

Resource dependence allows for a greater understanding of how to establish specific corporate governance arrangements in terms of the actions of directors and structures. According to Pfeffer (1972), resource dependence theory can be used to analyse an institution's board of directors' behaviours. Daily and Schwenk (1996) observe that the requirements of resource dependence are critical in discussing the relationship between the board and management. Pfeffer (1972) argues that directors provide resources to the institution and reduce transaction costs in managing external relationships.

Abid *et al*. (2014) maintained that the board of directors' effectiveness directly impacts the institution's outcomes. According to Shropshire (2010), a board's capacity to perform its duties is influenced by its directors' links with other organisations. When a board member also serves on multiple boards of directors for different organisations, this is known as board interlocking. There are benefits associated with board interlocking, and such benefits could positively affect the financial performance of the institutions (Hung, 1998).

In obtaining the needs of shareholders, the company's resources should be in areas such as communication, technology, information, technical, finance and human (Daily, Dalton & Cannella, 2003). The company operates in an open economy; it should be protected from externalities for its survival (Hillman, Canella & Paetzold, 2000: 237). The resource dependence theory supports the board size comprising a larger number of external directors. With the huge pool of knowledgeable directors, the company is advantageous through the resources needed to enhance the firm's financial performance (Dalton, Daily, Johnson & Ellstrand, 1999: 674). The board acts as a link between significant shareholders and the company's external environment. According

to Nicholson and Kiel (2007), a stronger connection to the outside environment will improve access to resources. The action of the resource dependence theory in the current study is accrual to the board with diversity in background and expertise. The profitability of financial firms is directly associated with the availability and accessibility of resources.

Stewardship theory

The stewardship theory emerged from seminal work by theorists (Donaldson & Davis, 1991). The theory postulates that there is no vested conflict of interest between owners and managers and that the goal of governance in companies should be to identify the structures and mechanisms in facilitating effective coordination between the involved parties (Donaldson, 1990). The theory's underlying assumption is that managers' behaviour is aligned with principals' (owners') interests. The origin of the theory traces back to the human school of management (Hung, 1998), sociology and psychology (Muth & Donaldson, 1998), and organisation theory (Clarke, 1998). The theory assumes that stakeholders are stewards whose interests in the company are all aligned with the main goal. Management is impelled to communicate their decisions to their shareholders in maximising the institution's financial performance. According to Nicholson and Kiel (2007), stewardship theory indicates that executive managers are reliable and trustworthy individuals.

The uncertainties highlighted by agency theory led to the advancement of stewardship theory. The departure of stewardship theory from agency theory holds the viewpoint that institutional managers are less opportunistic, individualistic, and self-serving. The theory acknowledges that executive employees and managers of institutions are trustworthy and aim to achieve their personal goals by serving the interests of institutions (Contrafatto, 2014). The theory postulates that managers are motivated by the need to gain intrinsic satisfaction by accomplishing challenging tasks to their absolute best abilities (Okpara, 2011; Contrafatto, 2014). Their motivation surpasses monetary needs and focuses on recognition in the institution in achieving objectives.

Cam, Linda, Ranjan and Patricia (2008) state that the theory's proponents assert that stewards on an institution ensure that corporate governance structures are adhered to and seek to maximise the institutions' profitability using the available resources.

According to Choi, Chatfield and Chatfield (2017), the stewardship approach to corporate governance suggests that managers should a have similar interests to the institutions, and their reputation and careers should be aligned and linked with attaining the institution's objectives. Therefore, it supports the empowerment of governance mechanisms and corporate structures to allow directors and managers to make decisions that enhance corporate disclosure, transparency, and firm performance.

However, under stewardship theory, there is no conflict between managers and shareholders if appropriate structures are in place to allow coordination to be achieved (Contrafatto, 2014). The theory is based on the belief in the unification of command from the head of the institution. The Chief executive officer (CEO) duality role can benefit shareholders since it poses a greater result of strong command, control, and direction. However, agency theory does not advocate for CEO duality because of the concentration of power in a single person, which has consequences of lower returns on shareholders and increases agency costs (Mallin, 2010).

Better performance of a company is associated with the internal practices of corporate governance that grant power and autonomy to managers. According to Rebeiz (2015), with the ultimate business knowledge, managers should be granted such powers. The CEO and chairmanship should combine those powers (Donaldson & Davis, 1991). When authority and power are given to a particular individual, there will be no room for uncertainty about who has authority. A combined leadership of chairmanship and CEO can assist the company in attaining superior performance and its goals.

According to Contrafatto (2014), Hu and Alon (2014), and Keay (2017), stewardship theory is mainly based on a positive view of human attitude that asserts that people are not leaning toward opportunism and that managers pursue their shareholders' interests. The board of directors must act as stewards of the institutions as they are appointed and nominated in the institutions by the shareholders. Stewardship theory, contrary to agency theory, believes that the board of directors does not always act to attain their personal goals. They act responsibly, with integrity and independence, in achieving the shareholders' interests. According to Hu and Alon (2014), managers develop a strong sense of belonging to an institution and are highly motivated by the

rewards of recognition. Loyalty, collectivism, and paternalism are consistent with stewardship theory.

Stewardship theory suggests that agents of financial institutions act as stewards of the institution's stakeholder wealth because they have to work faithfully to safeguard the interests of stakeholders (Donaldson, 1990). According to Donaldson and Davis (1991), stewardship theory presents the management model in institutions where managers are presumed to be good stewards to act in the best interests of stakeholders. In financial institutions, managers are regarded as good stewards since they deal with stakeholders' funds; therefore, they have to act in the best interest of such stakeholders (Mweta & Mungai, 2018). Stewardship poses a strong relationship between an institution's success and managers and protects shareholders' wealth through performance. Therefore, the theory assumes that managers are trustworthy stewards who focus on improving institutions rather than their interests. The agents of the banking institutions are viewed as stewards whose interests are aligned with the objectives and interests of the banking institution.

2.3 Empirical literature

The failures of management and the board of directors are acknowledged as one of the major causes of institutions' collapse in the banking sector (Dibra, 2016). Hence, better knowledge and understanding of how the banking sector is governed will prevent poor corporate governance. The fine development of an effective corporate governance system should be the main concern to financial institutions and should constitute an essential strength for the sector to be competitive.

Financial institutions deserve special attention in day-to-day operations, considering the variety of complex risks that they face (Hull, 2018). Hull (2018) further noted that such risks include liquidity, credit, interest rates, loan concentration, exchange rates, settlements and internal operations, and systematic risks that relate to the failures of the institution's financial system. The literature on the corporate governance of financial institutions, banks and insurance firms, particularly, has been renewed by the recurrence of the global financial crisis of 2007 to 2009. Makina (2017) noted that since the last global financial crisis, policymakers and academics have acknowledged that

financial institutions have special corporate governance problems. Compared to non-financial institutions, they are unique and complex; they play a huge role in economic development and growth (Levine, 1997). Therefore, corporate governance is necessary for the effective functioning of institutions.

Financial institutions are affected by the following special effects. First, banks are uniquely opaque institutions that make agency problems and information asymmetry profoundly serious (Ahnert & Nelson, 2016). Information asymmetry and opaqueness provide strong incentives to internal members to pursue their interests at the expense of other stakeholders. According to Nam and Lum (2006) and Ahnert and Nelson (2016), the board of directors may be manipulated for any serious evaluation and shareholders not having sufficient and adequate information that will enable the participants in the decision-making of the institution. Banks may hide their loan quality and alter the risk compositions of their respective assets to continue offering their prospective clients loans they are experiencing difficulties paying (Makina, 2017). Being not transparent poses difficulty in assessing the institution’s ongoing performance.

Furthermore, financial institutions are subject to government regulations to safeguard the financial sector's stability (Aceves & Amato, 2017). Makina (2017) states that financial institutions are heavily regulated compared to other sectors due to their opacity of assets and activities. The interventions and regulations by the government allow external stakeholders to confront the government when the financial institution is in financial difficulty. Therefore, government intervention is crucial to regulating financial institutions (Aceves & Amato, 2017).

Moreover, deregulation, globalisation, and financial innovation render higher risk for financial institutions while weakening the corporate governance process (Nam & Lum, 2006). Furthermore (Nam and Lum, 2006), financial institutions are directly involved in dealing with new clients and complex financial instruments. According to the Basel Committee on Banking Supervision (2015), decision-making in financial institutions is delegated, and the consequences of such trends pose a high risk of taking any chances of poor decision-making.

Additionally, in the banking sector, the role of competition is not clear. Competition in the product's market poses a disciplinary behaviour on its managers. However, it may be a weakness in the corporate governance of financial institutions (Nam & Lum, 2006; Fu, Lin & Molyneux, 2014). Tougher competition may increase the institution's bankruptcy threat and, therefore, decrease the institution's value simultaneously. Competition may play a tremendous role as a disciplinary measure that forces managers of financial institutions with poor corporate governance to enhance their performance and reduce slack in competitive markets.

Ultimately, the banking sector plays a tremendous role in governing other corporate clients. The sector's corporate governance is crucial when it must serve this role. Banks provide financial services to their clients, and they keep their settlement accounts and review their creditworthiness (Jayaraman & Thakor, 2014). With the information collected, banks may intervene in the governance and management of their clients if their performance is progressively worsening. According to Furfine (2001), banks have been supervised and regulated to protect their clients from failures and the viability of financial systems.

The agency theory highlighted the importance of a board, which proposed the company's directors' monitoring and controlling of the strategic direction (Jensen & Mackling, 1976). When monitoring is implemented, the institution’s performance is increased, thus maximising the shareholder’s wealth (Fama & Jensen, 1983). Orazalin and Manhood (2018) found that a company with good corporate governance leads to improved financial performance at the institution. The corporate governance proxies selected for the current study are discussed below in detail.

Board size

The two major functions of the board of directors are advising and monitoring the company's management (Nguyen & Rahman, 2015). Market participants, regulators, and academics have been closely examining board size as a corporate governance mechanism in recent years. Due to the inconclusive empirical evidence, board size still receives more attention in research (Johl, Kaur & Cooper, 2015).

According to agency theory, a bloated board will not function effectively (Jensen, 1993). Coles, Daniel and Naveen (2008) argue that a large board size is appropriate for larger companies with complex operations, which may require more advice and monitoring. Therefore, it will require more directors than a small company. Small appropriate boards are more effective than large boards because they encourage personal focus, participation, and interaction (Firstenburg & Malkiel, 1994). However, Dalton, Daily, Johnson and Ellstrand (1999) argue that according to resource dependence theory, larger boards often lead to a better performance of the institution. Lipton and Lorsch (1992) and Jensen (1993) support the idea that a larger board can be dysfunctional, as a larger board is less effective due to increased agency problems.

Furthermore, a large board is slower in decision-making and less effective in monitoring management because of free-riding problems. Several empirical studies (Dogan & Yildiz, 2013; Orozco, Vargas & Galindo-Dorado, 2017; Sarkar & Sarkar, 2018) support the detrimental effects of board size on financial institutions. Khanchel (2019) supports that board size influences corporate information disclosures, firm value, profitability, and firm size.

The determinants of board size in financial institutions differ from one institution to another and are mainly influenced by firm size. Therefore, identifying the optimal board size is essential for financial institutions to provide effective corporate governance (Manini & Abdillahi, 2015). However, determining the optimal board size has been a controversial and ongoing debate in the corporate governance arena (Lawal, 2012).

Lipton and Lorsh (1992) proposed an ideal board size of between seven and nine members. The board size of a financial institution should be significant and relevant to its operations. The board should be selected in a way to maintain integrity, the ability of the members to attend the board meetings, and independence (Jensen, 1993). Jensen (1993) supports the opinion that an ideal board size should be between seven and eight members. However, board size in corporate governance was empirically tested, and mixed results were found (Akpan, 2015). A board size below seven is considered a small board, and a board above nine is considered large (Jensen, 1993).

The empirical literature shows mixed results on how board size is influenced in financial institutions. Ramos and Olalla (2014) showed the association between a

larger board and productivity as ineffective while sampling publicly traded non-financial firms, while Guest (2009) indicated that a board composed of a smaller number is more effective and increases the value of a firm. The determinants of an appropriate board size should be viewed from the point of resource dependency which suggests that the greater the reliance on the external environment, the larger the institution's board of directors (Pfeffer & Salancik, 1978). Preferences for board size may be based on the complexity, resource dependency and size of the institution.

Damagum and Chima (2013) and John, De Masi and Paci (2018) have postulated and empirically shown that complexity, resource dependence, and size of the institution are the response to investor's belief in the superiority of a small board's monitoring and controlling the management of the institution, thereby making them a value maximising board. According to corporate governance regulations, the size of a board should range from 5 to 16 members (Damagum & Chima, 2013).

The larger the board of directors is, the better it is for disclosures and performance because they have a large number of professionals with expertise and experience, which could assist in making better decisions for financial institutions (Kilic, Kuzey & Uyar, 2015; Haan & Vlahu, 2016; Jizi, 2017; Farag & Mallin, 2017; Tulung & Ramdani, 2018). In line with Samaha, Dahawy, Hussaney and Stapleton (2012) and Haan and Vlahu (2016), who affirmed that a large board leads to an increase in high disclosure quality and financial reporting expertise. Such a board will likely be transparent in disclosing information on its webpage and annual reports. Furthermore, a large board is likely to reduce the occurrence of information asymmetry, promoting disclosures and value creation.

Karkowska and Acedanski (2019) investigated how banks' structures and quality affect their risk incentives. The study used panel regression analysis for 40 countries and a cross-country sample of 239 commercial and publicly traded banks from 1997 to 2016. The study found a negative relationship between board size and bank stability. However, Thoha, Nugraha, Suryoka, Nadhifah and Rhosyida (2022) found insignificant results between board size and corporate financial stability. The study used 11 companies listed on the Jakarta Islamic index from 2016 to 2018, using multi-linear regression for data analysis. However, Nasrin (2022) found a significant and

negative impact between board size and financial stability by employing the Z-score to measure financial stability.

According to Adams and Mehran (2012), in large financial institutions, there are positive and statistically significant relationships between board size and performance. However, Jensen (1993), and Coles, Daniel and Naveen (2008) assert that when board size increases, it becomes less effective at monitoring and controlling management's decision-making. Their analysis advocates that this is because of the prolonged decision-making period among members. On the contrary, Belkhir (2009) found no statistical significance between board structures and performance using 260 financial institutions. Moreover, Erkens, Hung and Matos (2012) do not confirm that board sizes relate to bank risks and profitability. Erkens *et al*. (2012) examined the relationship between board size and bank risks proxied by using standard deviation on 296 financial institutions across 30 countries for the period 2007 to 2008. The results indicate that board size is not related to bank stability.

Soba, Eram and Ceylan (2016) investigated the relationship between corporate governance and the efficiency of Turkish banks. The study used a sample of 10 Turkish depository banks listed in Borsa Istanbul for the period 2005 to 2015. The results show that the free float rate and board independence have a negative and significant impact on the efficiency of banks. However, major shareholders, the board size, and the number of committees had a positive and significant relationship with the bank's efficiency.

Samson and Tarila (2014) investigated the impact of corporate governance on financial performance in Nigerian financial institutions. The study used the regression analysis model. The corporate governance measures used were board size and board composition, while ROE and ROA measured financial performance. The results showed a positive relationship between corporate governance and financial performance.

Adeabah, Gyeko-Dako and Andoh (2019) examined the determinants of bank efficiency in 21 financial institutions from 2009 to 2017 and found that board size improves an institution's efficiency. Shahid, Gul and Hasnain (2017) found that board size and composition have a significant and positive association with efficiency. The

study used 24 conventional and Islamic banks operating in Pakistan for the period 2012 to 2016 using data envelopment analysis (DEA) and pooled ordinary least squares (OLS) panel data methods.

According to Conyon and Peck (1998) and Guest (2008), large boards can increase monitoring capabilities. The advisory role of the board of directors is to provide additional information, expertise, and resources to the management, which is efficiently provided by independent directors (Fama & Jensen, 1983). Guest (2008) averred that the number of directors (internal and external) should be increased to provide greater information. Huang and Wang (2015), Aktan, Turen, Tvaronaviciene, Celik and Alsadeh (2018), and Alkurdi, Hussainey, Tahat and Aladwan (2019) found that board size and independent non-executive directors are positively related to firm leverage. The findings were confirmed by Yihun, Kolech and Tole (2019), who established a significant and positive relationship between board size and leverage of Ethiopian financial institutions from 2006 to 2015. However, Chen and Al-Najjar (2012) found an insignificant relationship between board structure and leverage.

Majeed, Jun, Muhammed, Mohsin and Rafiq (2020) investigated the effect of board size on the financial performance of financial institutions. The study sampled two counties (Pakistan and China) listed banking sectors from 2007 to 2018. The study used a panel regression model, and the results indicated that for Pakistani banks, board size was positively correlated with ROA and negatively correlated with ROE, however, these correlations were insignificant. The study also found that for Chinese banks, board size was positively correlated with ROA and ROE, and these correlations were significant at 10%. Sarpong-Danguah, Gyimah, Afriyie and Asiamah (2018) examined the effect of corporate governance on the financial performance of manufacturing firms in developing countries. The GLS panel regression model was used to analyse the data from 11 listed manufacturing firms in Ghana from 2009 to 2013. The empirical results showed no statistically significant relationships between board size and financial performance measures (ROA and ROE). In contrast with the results, Kafidipe, Uwalomwa, Dahunsi and Okeme (2021) found that board size had a positive relationship with ROE for banks in Nigeria.

Isik and Ince (2016) investigated the impact of board size and board composition on bank performance. The study used a sample of 30 Turkish commercial banks from 2008 to 2012. The ROA and operating ROA were used as bank performance measures. The panel fixed effects regression results found that board size was significant and positively affects banks' financial performance. Furthermore, Turkish commercial banks can improve their financial performance by increasing their institution’s board size.

Board size has been widely recognised as a crucial internal corporate governance mechanism and plays a tremendous role in an institution’s management (Isik and Ince, 2016). For this reason, an institution’s board size and its impact on performance are argued issues in corporate governance. Agency theory asserts that superior firm performance may be associated with small or smaller board size. Furthermore, agency theory contends that a small board's communication and coordination are more effective than those of a larger board. However, resource dependence theory advocates for larger board sizes. Resource dependence theory believes that larger boards have an advantage in reducing dependency on external resources because of greater opportunities linked to environmental linkages (Pfeffer & Salancik, 1978).

A larger board can make decision-making, communication, and coordination more inefficient than a smaller board (Lipton & Lorsch, 1992; Jensen, 1993). However, Yermack (1996) sampled 452 large United States (US) public corporations for the period 1984 to 1991 and reported an inverse relationship between board size and firm value. Therefore, causality runs from board size to valuation, and there is no evidence that institutions change their board size due to past performance.

The effective functioning of the board relies on the size of the board. Jensen (1993) emphasised the importance of board size in determining the efficiency and productivity of an institution. Prior studies (Pathan & Faff, 2013; Dogan & Yildiz, 2013) used the performance measures, return on assets (ROA) and return on equity (ROE) as dependent variables and board size as independent variables in banks. Mixed results were found among the scholars. However, the evidence of prior results indicated shortcomings when looking into board size. According to agency theory, board size is important in determining an institution's operations (Jensen, 1993).

Malik, Wan, Ahmed, Naseem and Rehman (2014) examined the relationship between board size and firm performance using the Pakistani-banking sector. Using 14 listed commercial banks from 2008 to 2012, a significantly positive relationship was found between board size and performance measured by ROA. Meanwhile, Pathan and Faff (2013) reported board size to be negatively related to bank performance. However, the results are contradictory to the literature.

Board size plays a vital role in the profitability of financial and non-financial institutions, and therefore, it serves as a determining factor of corporate governance in financial institutions. However, Harford, Mansi and Maxwell (2008) assert that a smaller board is efficient in the institution's decision-making. The board of directors can easily communicate with each other and play a vital role in improving the institution's corporate governance, taking into account the accountability and integrity of the board. However, a large board is better at monitoring and preventing management from achieving selfish interests and mismanagement, thus being responsible for increasing the value of the firm (Haan & Vlahu, 2016).

John, De Masi and Paci (2016) argue that the board size in financial institutions positively influences the increase in communication and co-ordinating problems and may reduce the ability of the board to control its management, leading to poor decisions. Ineffective communication and coordination lead to slow growth and increased profitability risk for the institution. The larger the banking institution is, the larger the number of directors. A large institution has a greater capacity to absorb and assume greater risk because of its members' ability to establish policies and networks of interest in protecting and conferring security to the institution (Hakenes & Schnabel, 2011; Falicio, Rodrigues, Grove & Greiner, 2018). A greater board size allows greater intellectual capital diversification, implying a positive association between board size and risk-taking (Saunders, Strock & Travios, 1990; Falicio *et al*., 2018).

Verma and Surya (2016) contend that the size of the board is a good proxy for the variety of advising and monitoring roles and that independent directors are more prevalent on larger boards. Furthermore, larger boards are more likely than smaller boards to assign duties to board committees. However, Haslindar and Fazilah (2011) and Haan and Vlahu (2016) argue that firms can improve their financial reporting,

disclosure, and profitability by having a small board size because it fosters cohesion in strategic decision-making. Therefore, board size is one of the key mechanisms influencing corporate governance practices adopted by banking institutions (Verma & Surya, 2016)

Agyemang, Aboagye, Antwi and Frimpong (2014) used a sample of eight banking companies listed on the Ghana Stock Exchange (GSE) for the period 2007 to 2012 and found no significant relationship between board size and performance measured by ROA and Tobin's Q of the institutions. The agency and stakeholder theory does not support the results that found a significant relationship between board size and performance (Tulung & Ramdani, 2018). However, Yasser, Entebang and Mansor (2011) recommend that board size be kept to a reasonable limit. The Johannesburg Stock Exchange (JSE) listing requirements require a minimum of four directors (Du Toit & Lekoloane, 2018). According to the South African company Act No.71 of 2008, a minimum of three directors are required for all public companies. Therefore, no maximum number of board sizes is in place.

Furthermore, the King Report (2009) on corporate governance (King III) does not specify the number of directors. However, it establishes a general principle that boards must consider their size to be effective. King III asserts that board size affects an institution's performance and allows its board to determine its actual size (King report III, 2009).

Focusing mainly on financial firms, Gafoor, Mariappan and Thyagarajan (2018) used a sample of 36 scheduled commercial Indian banks for the period 2001 to 2014, investigating the effect of board size and financial performance measured by ROA and ROE. Their study found a significant result when the size of the board is between 6 and 9 members, and this was endorsed by Nodeh, Anuar, Ramakrishnan and Raftnia (2016), who found board size as a determinant factor of corporate governance and positively influences the financial performance moderated by firm size. The study investigated the key determinants of board structures using a sample of 37 Malaysian banks and a regression model for analysis. Isik and Ince (2016) also found a significantly positive result when using 30 commercial banks from 2008 to 2012 in Turkey to investigate the impact of board size on the banking sector.

On the other hand, El-Masry, Abdelfattah and Elbahar (2016) found board size to be negatively associated with institutions' risk management. The study used a sample of 900 observations from banks in the Gulf countries over the period from 2003 to 2012. Khandelwal and Aljifri (2016) used a sample of 80 Islamic banks from 2009 to 2014 from the Gulf Cooperation Council countries. The results showed that board size has a positive effect on financial performance. This was supported by Kusuma and Zain (2017), who confirmed board size as a significant factor for corporate governance when using all listed Islamic banks in Indonesia from 2011 to 2015.

Tanna, Pasiouras and Nnadi (2011) found a positive result between board size and efficiency. The study examined 17 banking institutions in the UK for the period 2001 to 2006. DEA was used to measure the efficiency of banks. Salim supports the results of Salim, Arjomandi and Heinz (2016), who found that board size and committee meetings positively and significantly impacted efficiency. The study used Australian banks for the period 1999 to 2013, employing a two-stage double-bootstrap data envelopment analysis. Chineme and Nwadialo (2018) determined the effect of board size on the capital adequacy of money deposit banks in Nigeria using 22 banks from the Nigerian stock exchange for the period 2000 to 2016. The results show that board size contributes positively to the capital adequacy of money deposit banks. Therefore, capital adequacy is significantly influenced by the board size of the institutions. Florinita (2013), investigating the relationship between board size and debt ratio, and equity ratio, found that the size of the board is positively affected by the level of debt and equity ratio. The study sampled 50 financial institutions for the year 2010 in Romania.

However, Andries, Capraru, and Nistor (2018) studied the influence of corporate governance on efficiency using 139 commercial banks from 17 central and Eastern Europe from 2005 to 2012. Using a larger sample, the results revealed that good corporate governance practices significantly positively affect firm efficiency. Mustafa, Isil and Fatih (2016) also examined the relationship between board size and bank efficiency, using a smaller sample of 10 Turkish depository banks listed on the Borsa Istanbul Stock Exchange for the period 2005 to 2015. DEA was employed to determine the efficiency level, and regression panel analysis was used to determine whether

corporate governance affects bank efficiency. The results show that board size has a significant and positive relationship with bank efficiency.

Using a shorter period, Kusuma and Ayumardini (2016) investigated the relationship between board size and firm efficiency. However, using purposive sampling, the study sampled 11 Islamic banks from Indonesia for the period 2010 to 2014. Employing regression panel data in analysing the relationship, the results show that board size significantly affects firm efficiency. However, Khan, Ahmed, Liyas and Khan (2018) examined the effect of firm-level corporate governance on firm efficiency using DEA for the period 2008 to 2017. Using a sample of 136 non-financial firms listed on the Pakistan Stock Exchange, the study used total assets, total liabilities, and cost of goods sold as input variables, and sales, income before tax, and net income as output variables. The result also shows a positive effect of board size on firm efficiency. A better implementation of corporate governance practices helps institutions to enhance their efficiency. Better corporate governance helps institutions to use their resources in a better way to produce profitability for firms.

Fanta, Kemal and Waka (2013) examined corporate governance mechanisms and their impact on commercial banks. The study used nine Ethiopian commercial banks for the period 2005 to 2011. Board size had a statistically significant positive effect on the capital adequacy ratio. However, Kamau and Basweti (2013) examined the relationship between corporate governance and working capital management efficiency using 42 listed firms on the Nairobi securities exchange (NSE) from 2006 to 2012. Looking at annual sales, current assets, current liabilities, and size of working capital as data for working capital management efficiency, the study found that board size and working capital management efficiency have no statistically significant relationship.

Mersni and Othman (2016) examined whether corporate governance mechanisms affect the reporting of loan loss provisions by managers in Islamic banks in the Middle East Region. The study used balanced panel data from a sample of 20 Islamic banks in seven Middle Eastern countries from 2007 to 2011. The result found that discretionary loan loss provisions are negatively related to board size. This indicates that smaller board size is more efficient than larger boards, which could negatively

affect decision-making and lead to higher costs. However, the results are inconsistent with agency theory (Jensen, 1993).

Arora and Sharma (2016) sampled 1922 Indian companies from 2001 to 2010 to examine the relationship between board size and ROE. The study focused on the manufacturing sector and found a positive relationship between board size and ROE. Their findings show that greater board size is associated with a greater depth of intellectual knowledge, which improves a firm's decision-making and enhances firm performance. Similar results were found by Abdul-Qadir, Yaroson and Abdul (2015) when using non-financial firms listed on the Nigerian Stock Exchange (NSE) for the period 2009 to 2013. The positive results suggest that board size determines the profitability together with the financial stability of the firm. Using a sample of 400 non-financial firms in Libya, Atkins, Zakari and Elshahoubi (2018) concluded that a larger board size positively impacts the firm.

Foyeke, Odianonsen and Aanu (2015) used 137 financial and non-financial companies in Nigeria to determine the relationship between corporate governance disclosure and firm size. The study revealed a significant and positive relationship between corporate governance disclosure and firm size. Regulators should put measures in place for all companies to disclose their corporate governance information in the annual reports with the relevant information. The emphasis on having a large board size is to enhance monitoring, ensuring greater independence of the board and increasing firm performance (Johl *et al*., 2015).

Eyenubo (2013) examined the relationship between the bigger board and financial performance using firms listed on the Nigerian Stock Exchange from 2001 to 2010. The study found that a bigger board size negatively affects the financial performance of the firms. The results are consistent with Nakano and Nguyen (2013), who found a negative association between board size and firm performance using 1771 Japanese listed companies between 2003 and 2007. The study consisted of financial and non-financial firms focusing on firms with large boards, using ROA and ROE to measure performance. Guest (2009), using a much larger sample of 2746 UK-listed companies from 1981 to 2002, measured performance with ROA, Tobin's Q, and share return and reported a negative and statistically significant relationship between board size and

firm performance. The study had a mixture of financial and non-financial firms and found a strong negative impact on their profitability. The result of the inverse relationship supports the agency theory assertion that a smaller board is likely to outperform a larger board and be managed effectively (Jensen, 1993).

The studies investigating the effect of board size on institutions have examined companies based on three levels, financial firms, non-financial firms, and a mixture of financial and non-financial firms. Comparing the above empirical results shows mixed results for studies conducted on financial firms only. While the non-financial firms showed positive results, it is because of the nature of the companies and used different variables such as total assets and total liabilities, while others used annual sales, current assets, and current liabilities. A mixture of financial and non-financial firms shows a mixed results due to the measuring variables used.

Given the mixed results, board size should be a function of firm performance and hence should be set as a dependent variable. According to Guluma (2021), good corporate governance is significant for firms because it improves financial performance and attracts investors. Prior studies have shown that corporate governance compliance and performance may be linked to changes in the internal characteristics of financial institutions, indicating reverse causality (Demsetz & Villalong, 2001; Leone, Gallucci & Santulli, 2018). In attempting reverse causality in the current study, some governance variables should be a function of firm performance considering their importance in the corporate governance arena (Mehran, Morrison & Shapiro, 2011; Akbar, Poletti-Hughes, El-Faitouri & Shah, 2016). Jensen (1993) asserts the importance of board size; however, there is no visible, traceable evidence of running analysis on board size as a dependent variable in financial institutions. Therefore, the current study attempts to find the effect of reverse causality.

Board composition

Board composition is described as the distinction between executive directors and non-executive directors (Ibiam & Nwongo, 2017). Companies with non-executive directors are considered independent, operate in the best interest of the principals, have better control over the institutions' management, and positively influence performance (Hermalin and Weisbach, 1988; Borokhovich, Parrino & Trapani, 1996).

Board composition became a key area of interest because of its benefits associated with the availability of diversified (executive and non-executive) board members (Kilik, 2015). Agency theory asserts that external directors hold an advantage in monitoring management and maintaining their reputation, also as efficient and independent decision makers (Fama & Jensen, 1983). Therefore, an increase in the number of non-executive directors is expected to reduce the institution's agency problem.

Poor governance of financial institutions encourages excessive risk-taking by management and has contributed to some of the previous financial crises (Minton, Taillard & Williamson, 2014). Strivastav and Hagendorff (2015) assert that corporate boards oversee executives and advice on the decisions to maximise the institution's value and stability. According to Strivastav and Hagndroff (2015), board composition will reduce risk-taking behaviour and management in the banking sector. The independence of the board is a critical issue in the banking industry.

According to Vallascas, Mollah and Keasey (2017), independent directors are appointed in financial institutions to advice on risk choices. In accordance with agency theory, independent external directors have greater motivation to monitor the management than internal non-independent directors (Fama & Jensen, 1983). Independent directors have greater independence to carry out their duties due to their reputational effects on performance and career development (Fama & Jensen, 1983; Jiang, Wan & Zhao, 2016). Moreover, resource dependence theory contends that independent external directors contribute through knowledge, expertise, skills and educational background. The expertise can enhance decision-making within the company. Prior studies argue that too many independent directors may not be ideal, and they will not be able to gather related and valuable information like internal directors (Harris & Raviv, 2008).

According to agency theory, an effective board has the majority of independent of its members as independent directors (Jensen, 1993). In corporate governance, the board should consist of internal and external members (Edeti & Garg, 2020). External directors have no accountability for the company's daily operations but advice management on strategic decisions. Agency theory postulates that independent

directors facilitate the effectiveness of the board practices, as they provide objective judgement on the performance of management (Jensen, 1993).

Inim (2021) examined the impact of corporate governance on the efficiency of deposit money institutions in Nigeria using 8 selected banks for the period 2013 to 2019. Correlation and panel data regression models were used for analysis. DEA was also used to examine the efficiency of the banks. The results found that board composition and size had a significant and positive relationship with the efficiency of the banks.

Chat and Lee (2010) investigated the impact of board size and composition on the efficiency of Malaysian commercial banks from 2000 to 2009. The study employed DEA. The study found that independent directors positively influenced the efficiency of the institutions. The findings imply that board independence serves an effective monitoring function in overseeing and evaluating management's performance in the banking industry.

Almania (2017) investigated whether the independence of directors affects the leverage of listed firms in Saudi Arabia. The study sampled 122 non-financial firms employing panel data for the period 2012 to 2012. The presence of independent directors was found to have a significant negative link with capital structure in the study. Independent directors are important in persuading firm executives to aspire to low-leverage strategies. The results are inconsistent with Perera, Wadkj and Priyadarshani (2021), who found that independent directors positively and significantly affected the corporate financial leverage of institutions.

Ibiam and Nwogo (2017) argues that the banking sector's stability does not rely on the institution's size. Furthermore, many non-executive directors (NEDs) promote rational decision-making and create shareholder value. However, Čihák and Hesse (2010) examined the impact of Islamic banks and conventional bank governance on financial stability. The Z-score was used to quantify financial stability in the study, which included a sample of 474 financial institutions from 19 countries from 1993 to 2004. The study found that large Islamic banks are less stable than large conventional banks. The study suggested that the institution’s size affects its financial stability.

Lassoued (2018), used Malaysian Islamic banking institutions to study the connection between corporate governance and financial stability. However, the investigation employed the Z-score to measure banking stability and sampled 16 financial institutions from 2005 to 2015. The study used the fixed effect, GLS random effect, and OLS methods. The study found that independent non-executive directors had a significant and positive effect on financial stability.

Dey and Sharma (2020), used ten financial institutions from 2013 to 2019 to examine the nexus between board composition and the financial performance of selected Indian public financial institutions. The study used correlation and regression models for analysis and applied the fixed effect generalised least squares model. The results found that financial performance (ROA and ROE) are negatively related to board size and board independence. However, they found a positive association between non-executive directors, board directors (women), and financial performance measures.

Atieno (2016) examined the relationship between commercial bank's performance and the composition of the board in Kenya for the period 2013 to 2015. A descriptive approach was adopted with 25 banks considered for the study. The study found that the independence of the board and bank performance had a significant and positive relationship for Kenyan commercial banks. Bank performance was measured by return on assets (ROA). A study by Merendino (2014) investigated the relationship between the board of directors and firm performance in Italian-listed companies. The board composition included executive, non-executive, and independent directors. The financial measures employed were return on equity (ROE) and Tobin's Q. The study found no relationship between board composition and financial performance.

Mweta and Mungai (2018) investigated the influence of board meeting attendance and the number of non-executive directors on the financial performance of financial institutions listed on the Nairobi Securities Exchange (NSE). The study sampled 11 financial institutions. The study adopted correlation analysis, descriptive and multi-regression analysis. The study found a significant negative relationship between the number of NED and ROA. Kutubi (2011) investigated the association between independent directors, board size, and profitability in private commercial banks in Bangladesh from 2005 to 2009. The study used ROE, ROA, and Tobin's Q as firm

performance measures. The study found a positive and statistically significant relationship between board size, independence of the board, and financial performance measures.

García-Meca, García-Sánchez and Martínez-Ferrero (2015) examined the impact of independent directors on bank performance. The study sampled 158 listed banks and found that performance measured by ROA was positively affected by the number of independent directors. This finding is consistent with the results of Handriani and Robiyanto (2019), who used 293 financial institutions listed on the Indonesian stock exchange. The results of the study showed a positive impact of independent directors on performance measured by ROA and ROE. Arora (2018) conducted a study on 207 bankrupted banks and found that independent directors were better at giving advice, searching for information, and accessing needed capital by the banks.

Adhiambo (2014) studied the relationship between board composition and financial performance in Kenya, which consist of financial institutions. The study used a cross-sectional research design with 43 financial institutions for the period 2009 to 2013. Regression analysis was performed where ROE and ROA were used as measures of financial performance. The study found that board composition and board remuneration positively affect financial performance. The results were supported by earlier findings by Kitui (2013), who undertook a study to establish the effect of board composition on the financial performance of NSE-listed companies. The study included financial and non-financial companies for the period 2008 to 2012. The board composition variables were age, gender, independent directors, and ethnic background. That study used the regression analysis method and found the variables are positively associated with financial performance, as measured by ROA and ROE. The findings concur with the stewardship theory that firms with independent directors show better financial performance; however, contradicts with Ongore, K'Obonyo, Ogudu and Bosire (2015), who found that independent directors have an insignificant effect on firm performance.

Cherotich and Obwogi (2018) studied how financial performance was influenced by board composition in NSE. The study adopted a quantitative and descriptive approach using the annual financial reports for the period 2010 to 2017. The study sampled 55

listed companies and found that the independence of the board and gender composition had a significant and positive effect on financial performance measured by ROA. Boussaada and Karmani (2015) found that the number of independent directors in financial institutions positively affect their ROE and ROA, the study sampled 38 banks during the period 2004 to 2011 in the Middle East and North Africa. The studies by Boussaada and Karmani (2015) and Cherotich and Obwogi (2018) support the agency and stewardship theories postulated by Fama and Jensen (1983).

Akinyomi and Olutoye (2015) found contradictory results when conducting a study on the composition of non-executive directors to executive directors and how this composition influence bank profitability. Their study used ROA and ROE as measures of profitability and found that profitability is not significantly affected by the composition of financial institution's boards. On the contrary, Filip, Vesna and Kiril (2014) found a strong negative effect of board independence on financial performance measured by ROE and ROA. The empirical studies by Filip *et al*. (2014), Akinyomi and Olutoye (2015), Ongore *et al*. (2015), and Mweta and Mungai (2018), indicate the gap in the literature and therefore advocate for the current study to be conducted.

Uyar, Wasiuzzamn, Kuzey and Karaman (2022) investigated whether independent directors ensure financial stability in the financial firms listed in the Thomson Reuters Eikon database for the period 2011 to 2018. The results found that board independence improves financial stability only in the investment banking sub-sector. However, it reduces financial stability in the banking sub-sector.

Kutubi (2011) studied the influence of corporate board size and board independence on bank performance in Bangladesh. The study found that the ROA and ROE of the banks depended on the board size and independence of directors of the institution. The results are supported by those of John and Ibenta (2016), who found that board composition and size positively affect the financial performance of financial institutions. Moreover, Surya (2016) found that the independence of the board, director remuneration, and board committees positively influenced firm performance measured by ROA and Tobin's Q. Shan (2019) focused on Australian listed companies for the period 2005 to 2015 to investigate whether bi-directional relationships among managerial ownership, board independence, and firm performance are related. The

study found managerial ownership and board independence positively affect firm performance when measured by ROA. However, Wahba (2015) sampled 40 Egyptian-listed companies from 2008 to 2010 to examine the relationship between independent directors and financial performance measured by ROA, using 334 firm-year observations. The study focused on non-financial companies and used the generalised least squares method and found that increasing independent directors negatively influenced financial performance. Vintila and Gherghina (2013) found similar results of independent directors influencing company performance negatively.

Ntim (2013) conducted a study on the relationship between the presence of independent non-executive directors and company performance using 169 samples of companies listed on the JSE for the period 2002 to 2007. The study used ROA and Tobin's Q as company performance proxies. The study found that non-executive directors' independence positively and significantly affects company performance. The study was supported by Lin and Chang (2014), who found the independence of the board of directors was positively and significantly correlated with ROA and ROE. The study used 236 Taiwanese-listed companies from 2011 to 2012.

Anginer, Demirgue-Kunt, Huizinga and Ma (2018) examined the boards' independence in financial institutions in the USA. They found that regulations introduced by the NASDAQ and New York Stock Exchange (NYSE) forced companies to have more independent directors. Earlier studies such as those of Minton, Taillard and Williamson (2010) and Fernandes and Fich (2016) found a significant relationship between board independence and firm performance measured by ROA and ROE. However, earlier empirical results by Erkens, Hung and Matos (2012) and Wang and Hsu (2013) presented different findings where independent directors are negatively related to the bank's performance measures.

Mixed results were reported when comparing the above studies. Moreover, the studies used different methodologies (cross-sectional method, regression analysis, and generalised least squares) and different variables (ROA, ROE, and Tobin's Q). Therefore, the current study intends to use reverse causality where board composition (independence of the board) becomes a function of financial performance and financial stability (Mehran *et al*., 2011; Akbar *et al*., 2016). Mehran *et al*. (2011) assert that there

is evidence of causality that better firm performance leads to efficient and effective corporate governance. Jensen (1993) contended the importance of an independent board. However, there is no visible, traceable evidence of running analysis on board independence as a dependent variable on financial institutions.

Board remuneration

Executive compensation has been a sensitive issue for decades; the global crisis has increased attention towards executive remuneration. Attention is also given to including executive compensation in corporate income tax returns; however, legislation should guide it. A board committee is important in improving corporate governance and assessing and monitoring the financial reports of the institution (McMullen, 1996). It is customary for the board to establish different committees since it is difficult for the entire board to deal with every single issue together. Establishing committees allows delegation of work by the board and maximises the benefits of their expertise. Each committee will have clear tasks and reporting obligations in the board meetings (John, Masi & Paci, 2016).

In financial institutions, the board of directors comprises the remunerations, nominations, and audit committees as the primary standing committees (John *et al*., 2016). However, varying with institutions, other committees such as risk management, governance, and executive committees could be formed to meet specific needs (Tricker, 2009). Board remuneration is identified as a determining factor that influences the corporate governance of financial institutions. The remuneration committee is established to set remunerations for executives and compensate the board for work done and ensure that they act in the interest of the stakeholders (Jensen & Meckling, 1976). As the board delegates the respective remuneration function to the established committee, it is able to reduce the conflicting matters between managers and shareholders (Jensen, 1993).

In the banking sector, the remuneration committee's responsibility is to deal with the benefits and compensations of the board and management. The board remuneration of financial institutions has long been a subject of discussion (Tricker, 2009; Verma and Surya, 2016). Mallin (2010) and Verma and Surya (2016) argued that remuneration committee formulation precludes the executive board from determining

their packages for compensation, however, includes the independent non-executive directors and should provide transparent procedures for executive remuneration. The remuneration committee's primary motive is to determine and review the amount and nature of all compensation for the board of directors. The committee helps the institution reduce the agency problem by designing and implementing packages for compensation of the executives which prevents excessive remuneration/compensation of executives (John *et al*., 2016; Khanchel, 2019).

According to Shao, Chen and Mao (2012), remuneration is a contract tied to an institution's performance. Therefore, Shao *et al*. (2012) found that remuneration agreements can tackle organisational issues among directors and investors. From the agency theory perspective, the link between directors' remuneration and firm performance provides an important incentive for the board of directors to tackle the agency problem. The appointment of external directors ensures the institution's objectivity in making internal directors' decisions. Thus, if directors perform their duties and responsibilities efficiently, internal and external governance mechanisms, such as compensation contracts, play a tremendous role in aligning the interests of principals and agents (Ruparelia & Njuguna, 2016).

Murphy (1986) examined the relationship between an institution's performance and executive remuneration. The study sampled large publicly held USA companies and found that executive remuneration is positive and statistically linked to the institution's performance, measured in terms of shareholder return and growth. Jensen and Murphy (1990) studied a large sample of US companies and assessed the relationship between shareholders' wealth and CEO wealth. The study found little evidence of a relationship between performance and compensation. Conyon and Leech (1994) investigated the agency theory prediction that director's compensation is positively related to organisational performance in large United Kingdom (UK) institutions. The results are supported by O'Neill and Iob (1999), who conducted a study on the determinants of remuneration for Australian organisations and found a positive link between performance and board remuneration, where share options were included.

Conyon (1997) examined the effect of executive compensation on performance by sampling 213 large UK financial institutions for the period 1988 to 1993 and found a

positive relationship between executive remuneration and performance because of corporate governance measures, especially when a remuneration committee was established. Consistent with stewardship theory, the compensation of directors has a significant relationship with a firm's performance (Keay, 2017). According to agency theory, a higher compensation of executives should lead to higher board productivity and better corporate performance (Jensen, 1993). Prior studies show that the remuneration of the board serves as a function of firm performance (Jensen & Murphy, 1990; Rankin, 2007; Aslam, Haron & Tahir, 2019).

Lee and Isa (2015) argue that firm performance is considered a corporate governance variable's function. However, it hinders the importance of corporate governance in financial institutions. Therefore, executive remuneration should serve as a function of firm performance (Love, 2011). Better financial performance of financial institutions will lead to better corporate governance practices. As the financial performance of any financial institution is important in increasing the value of the business, it should appear straightforward that identifying and analysing the determinants that influence financial performance is of tremendous relevance for corporate governance. According to Muller (2014), board compensation influences the financial performance of firms. Therefore, the current study is attempting a reverse causality where identified corporate governance variables are the function of firm performance and should be set as dependent variables, thereby implying that better financial performance may lead to better corporate governance of financial institutions (Mehran *et al*., 2011). Prior studies reflect the possibility of reverse causality, where internal firm characteristics may influence corporate governance practices in financial institutions (Love, 2011; Mehran *et al*., 2011; Andries, Balutel, Ihnatov & Ursu, 2020). However, it is unclear whether certain board characteristics concerning compensation would significantly influence the financial performance of banking institutions. Pucheta-Martínez and Gallego-Álvarez (2020) found board characteristics such as having a female director, board independence and board size are positively associated with firm performance. In contrast, Pucheta-Martínez *et al.* (2020) found board compensation is not associated with firm performance. The study used Tobin's q to measure firm performance.

Iskandrani, Yaseem and Al-Amarneh (2018) investigated the relationship between executive compensation and corporate performance in Jordan commercial banks. Used a sample of 13 Jordanian commercial banks listed on the Amman Stock Exchange during the period 2010 to 2016. The study found a significant relationship between executive compensation and a firm's performance measured by ROA. Furthermore, the study found a positive impact of firm size on firm performance. The study adopted the Ozkan (2011) approach with a regression model highlighting executive compensation as a dependent variable and firm performance as an independent variable.

Verma and Surya (2016) empirically examined the determinants of corporate governance practices in the financial institutions of Nepal using a sample of 31 A-class financial institutions from 2010 to 2014. The results revealed that board remuneration was a key mechanism that positively influenced the corporate governance practices adopted by the banking sector. Sheikh and Kareem (2015) found that board remuneration positively influenced the performance of five Islamic commercial banks operating in Pakistan from 2004 to 2014. The results of the study concurred with agency theory advocating for suitable board remuneration to ensure the productivity of institutions (Jensen, 1993).

Cornett, McNutt and Tehranian (2009) examined whether corporate governance mechanisms affect earnings and earnings at management at the largest publicly traded banks in the United States, for the period 1994 to 2002 using a sample of 100 largest bank holding companies. The earnings and earnings management variables included earnings before extraordinary items and after taxes, discretionary loan loss provision, and earnings of management. The results showed board remuneration to be positively related to the earnings and earnings of management. In contrast, Dong, Girardone and Kuo (2017) investigated the impact of board governance features on bank efficiency and risk-taking using 105 Chinese commercial banks for the period 2003 to 2011. The result shows that board remuneration positively impacts bank efficiency and risk-taking. According to Andries, Capraru and Nisotr (2018), implementing rigorous governance structures in financial institutions is associated with high costs for banks and lower levels of efficiency. A tight governance mechanism significantly increases technical efficiencies and an institution's costs.

Developments in corporate governance and its practice play a tremendous role in enhancing the global economy, and in financial institutions, it improves financial stability. Festus, Rufus and Olawele (2019) examined the effect of board remuneration on the financial stability of Nigerian financial institutions, adopting an ex-post facto research design. The study used 10 financial institutions listed under deposit money institutions in Nigeria for the period 2007 to 2016. The study revealed board remuneration has a positive effect on financial stability. In financial institutions, this means that corporate governance has a significant effect on financial stability. When corporate governance improves, financial stability also increases.

However, Sari and Tjoe (2017) examined the relationship between board remuneration and firm performance, the study used Indonesian state-owned enterprises in 2016, focusing on non-financial institutions and found the board remuneration system to be inadequate and had a negative impact on the performance of the board. The study used six in-depth, semi-structured interviews and a purposive sampling method. Razak (2014) examined the relationship between directors' remuneration, governance structures, and performance, using a sample of 150 companies listed on Bursa Malaysia for the period 2008 to 2013. The study used a panel regression model to examine the relationships and found a statistically positive significant relationship between directors' remuneration and firm performance measured by ROA and Tobin's Q. The results indicated a significant impact of board remuneration on firm performance.

The results were similar to the findings reached by Lee and Isa (2015) when examining the association between directors' remuneration and performance measured by ROA using 21 Malaysian banking sectors from 2003 to 2011. Using multivariate regression analysis, the study concluded that directors' remuneration has a positive association with financial performance. Furthermore, Lee and Isa (2015) found that board remuneration is positively related to company size and negatively related to the capital adequacy ratio. Moreover, directors' remuneration was negatively related to board size and positively related to the board of director's independence. The findings imply that board remuneration packages are a significant determinant of performance in financial institutions (Lee & Isa, 2015).

Appiah and Chizema (2015) examined whether the existence of a remuneration committee is related to corporate failure in the UK, using 98 failed and 269 non-failed UK-listed non-financial firms from 1994 to 2011. The study used pooled cross-sectional, fixed, and random effects to estimate whether corporate failures are associated with the remuneration committee. The study found that corporate failure is negatively associated with remuneration committee effectiveness. However, corporate failure is positively and significantly associated with remuneration committee independence.

Agyemang-Mintah (2016), used 63 financial institutions for the period 2000 to 2011 to investigate the association between the existence of remuneration committees and firm performance, and found the establishment of a remuneration committee to positively influence profitability and to be statistically significant with the institution's market value. Firm performance was measured by ROA, employing the ordinary least square and random effects regression estimations.

Zraiq and Fadzil (2018), used data on 228 industrial and service companies for the period 2015 and 2016 and found board remuneration is positively and significantly influenced by corporate financial performance. The study focused on non-financial firms and excluded financial firms since they differ in their capital structures, accounting practices, and operations. Similar results were also found in studies where financial institutions were sampled (Ruparelia and Njuguna, 2016; John *et al*., 2016). When examining the role of board characteristics using Australian credit unions from 2004 to 2012, Unda, Ahmed and Mather (2017) found board remuneration is positively associated with profitability and consistent with the primary objective of maximising shareholders' wealth.

Endraswati, Suhardjanto and Krismiaji (2014) used a sample of 18 financial institutions from 2006 to 2012 to examine the determinants of the executives in the Indonesian banking sector. The study found a negative impact of a number of meetings and gender on remuneration but found that the sizes of the institutions positively impact remuneration. Unda and Ranasinghe (2019), however, found that highly paid boards and voluntary boards are more likely to reduce insolvency risk. The findings are in line with those by Gneezy and Rustichini (2000), Adams and Ferreira (2008), and Unda

and Ranasinghe (2021), who concluded that individuals perform better when they are well remunerated. Unda and Ranasinghe (2021) assert that the board of directors may not be able to fulfil their monitoring and advising roles effectively without sufficient remuneration incentives. A significant positive effect of board remuneration on firm performance was found by Oziegbe and Cy (2021). This implies that directors should be well-remunerated to increase their commitment and hence the financial performance of their institutions.

Zakaria (2018) used the Kopmas 100 Index for the period 2013 to 2015 to analyse the impact of the existence of remuneration committees on company performance. The study focused on a mixture of financial and non-financial firms and found the existence of remuneration committees has a significant effect on the net profit margin of institutions. Nyambia and Hamdan (2018) investigated the effect of board size on directors' remunerations. The sample consisted of 173 bottom-listed companies from Bursa Malaysia in 2010. The study found a significant positive relationship between board size and executive remuneration. The study focused on non-financial institutions, excluding financial firms, since they have different requirements, regulations, and rules in their operations. The results support the agency and stakeholder theories.

Kirsten and du Toit (2018) investigated the relationship between the performance-based remuneration of executive directors and financial performance using 42 consumer goods and services industries listed on the JSE for the period 2006 to 2015. The results showed that while remuneration policies were in place for South African executive directors within these industry, the performance-based remuneration were affected by the company's share price. The directors' performance was influenced by the level of remuneration and bonuses received. The relationship between executive director remuneration and share performance may indicate that remuneration policies are based on share price and are thus directly related to the principle of maximising shareholder wealth. Afrifa and Adesina (2018) investigated the remuneration levels of UK-listed small and medium enterprises using 1014 non-financial firms in 2014. The results showed a positive effect of the director's remuneration on the firm performance of enterprises.

Razali, Yee, Hwang, Tak and Kadri (2018) investigated the directors' remuneration in the consumer products sector. The study used 40 Malaysian listed companies for the period 2012 to 2014 and found that directors' remuneration has a positive effect on the firm performance measured by ROA and ROE. The results suggested that high remuneration can help retain and motivate the board of directors to perform their duties and work harder in the best interest of the shareholders. The empirical results supported earlier findings by Razak (2014) examining directors' remuneration using 150 samples of Bursa Malaysian listed companies from 2008 to 2013. However, they excluded financial institutions and found a significant positive impact of directors' remuneration on firm performance.

Empirical studies on directors' remuneration have shown that it motivates directors who are compensated for their work and improves the performance of institutions. Motivation through bonuses improved the board's individual performance, influencing effective corporate governance. Comparing the above empirical literature results shows mixed results where samples were in a category of financial, non-financial, and a mix of financial and non-financial firms. Different findings were a result of the different variables and methodologies used.

Board diversity

Brickley, Lease and Smith (1988) defined board diversity as the inclusion of both genders within the institution's boards. Board diversity is not limited to gender but considers age, ethnicity, religion, culture, occupation, knowledge, industry experience, and independence (La Porta & Scheifer, 2015). The concept of board diversity in an institution reflects the structure of society with regard to ethnicity, gender, and professional background (Denis, 2011). For the board of directors to provide diverse viewpoints, they must have the correct diversification. However, for the study, board diversity referred to the gender of members.

Over the last two decades, research on board diversity has grown tremendously as companies were pressured to increase board diversity regarding gender and race equality globally. Previous studies have shown that a smaller number of women are part of the board, yet compared to men, they possess better managerial skills (Wachudi & Mboya, 2012; Kilic, 2015). Similar findings were made by Tshipa and

Mokoaleli-Mokoteli (2015a), who reported 13% female board representation in South African JSE-listed companies. Technical expertise should also be considered when considering diversity in board members.

According to agency theory, board diversity increases board independence and improves the monitoring of the board (Van der Walt & Ingley, 2003). Board diversity also brings new perspectives and business knowledge. Diversity of board members can increase the board's effectiveness, as women will be more trustworthy and stricter than their counterparts (Dang & Vo, 2012; Nedelchev, 2018). Parrault (2015) asserts that women in financial institutions bring in skills such as knowledge, prestige, skills, and connections to external resources. Diversity of the board and the participation of women is an important factor that affects both the operations and performance of the institution (Oladi, Gerivani & Nasibeth, 2013; Nedelchev, 2018). Fauzi and Locke (2012) and Nedechev (2018) argue that more female representations on the board of directors provide additional perspectives and skills that may not be possible with only male board members. Countries have made laws to encourage board diversity on listed companies (Adams, 2015). However, most institutions still report low percentages of women as part of their boards of directors (Kelic, 2015). Agency and resource dependence theories advocate the concept of gender diversity on the board of directors (Jensen, 1993; Wagna & Nzulwa, 2016).

Saerang, Tulung and Ogi (2018) examined the influence of executives' characteristics on bank performance using a sample of SulutGo bank officials. The study used the capital adequacy ratio, ROA, and ROE to measure performance. The results revealed a positive relationship between the capital adequacy ratio and female gender diversity. However, there was no relationship between female gender diversity and ROA, ROE, and total assets. The results imply that financial performance did not affect the female gender diversity of the SulutGo bank.

Obert, Suppiah, Desderio and Brighton (2015) examined the importance of board heterogeneity and the importance of women as part of the board to improve corporate governance and stakeholder value. Their results of the study showed that there were few women on the board, yet they are regarded as risk averse, objective, prepared for meetings diligently, protective of the institution, and have high integrity. Furthermore,

they criticised men for focusing on quantifiable issues and money and less on the human and social aspects of the business (Obert *et al*., 2015). Men are less socially oriented than their counterparts. Obert *et al*. (2015) noted that when corporations such as Tyco, WorldCom, Parmalat, and Enron dismally collapsed, the board was found to be male-dominated. Therefore, women improve corporate governance and stakeholder value,

Joecks, Pull and Vetter (2013) conducted a study on gender diversity in the boardroom and found evidence that a board that is more gender diverse will enhance firm performance. Abou-El-Sood (2018) investigated the association between board gender diversity and bank risk-taking behaviour using a sample of 82 banking institutions from 2002 to 2014 in the Gulf Cooperation Council countries. The study found that institutions tend to invest in less risky positions when there is a high number of female board members. Furthermore, female board members protected risky investments and invested less in risky assets in Islamic banks than in conventional banks.

Investing in less risky investments assures the institution's productivity and financial stability. Yaseen, Al-Amarneh and Iskandrani (2018) examined the impact of board diversity on a firm’s corporate social responsibility using a sample of 13 Jordanian commercial banking institutions listed on the Amman Stock Exchange during the period 2005 to 2014. The study found that board diversity positively influences the corporate social responsibility of institutions. However, Charles and Opemigo (2018), found that board gender diversity positively affects institutions' profitability when investigating the corporate governance diversity of quoted deposit money banks in Nigeria from 2011 to 2015. The study measured profitability using ROA.

Farag and Mallin (2017) found that female directors are not risk averse, but a critical mass representation of female board may reduce an institution’s vulnerability to a financial crisis. Female board members were found to have an impact on the operations of the financial institution, as they are more dependable and have a better understanding of consumer behaviour when compared to their male counterparts (Mohammad, Abdullatif & Zakzouk, 2018).

Cucari, De Falco, and Orlando (2018) examined the association between environmental, social, and governance (ESG) disclosures and board diversity. The empirical study used 54 Italian financial and non-financial companies, listed on the Milan Stock Exchange from 2011 to 2014. The results of the study indicated that the number of women on the board of directors were negatively correlated with environmental, social, and governance disclosure, while age was not significant with ESG disclosure. However, gender diversity played a significant role in environmental, social, and governance disclosures. These results, however, contrast with those of Green and Homroy (2018), who used a sample of EuroTop 100 firms for the period 2004 to 2015, focusing on both financial and non-financial firms, and found female board representation to positively affect firm performance. In the study, ROA was used to measure the firm performance of the study. Furthermore, it encouraged female representation on the board committees to enhance productivity.

Mixed results were found in previous literature on the role of female participation. Owen and Temesvary (2018), using 90 United States bank holding companies for the period 1999 to 2015, argue that the inconclusive results are because there is no linear, U-shape relationship between gender diversity and bank performance measures. Moreover, female participation on the board positively affects financial institutions' threshold level of gender diversity. Furthermore, the positive effect of gender diversity on firm performance is only observed in institutions with good corporate governance.

Abobakr and Elgiziry (2017) investigated the influence of board characteristics on bank risk-taking. The study used pooled ordinary least squares regression techniques on data drawn from a sample of 27 Egyptian banks from 2006 to 2011. The study used credit risk, insolvency risk, and liquidity to measure bank risk. The results showed boards composed of mostly females were negatively and significantly related to the institutions’ insolvency and liquidity risk. However, the board composed of mostly women was positively significant with credit risk. Therefore, the study's findings support the idea that the board’s characteristics determine bank risk-taking. Reddy and Jadhav (2019) assert that gender diversity, firm size, board size, and industry influence enhance the representation of female directors on the board.

Chan and Heang (2010) examined the effects of board composition and board size on cost and profit efficiency in Malaysian commercial banks for the period 2000 to 2009, employing DEA and Tobit regression to determine the effect of board composition and board size. The study found gender diversity has no significant effect on Malaysian commercial banks' cost and profit efficiency. The reason may be due to low female representation in corporate boardrooms. On the contrary, Tanna *et al*. (2011) found that board composition had a positive and significant impact on the efficiency of financial institutions. The study examined a sample of 17 banking institutions in the United Kingdom (UK) for the period 2001 to 2006. The study used DEA to estimate the measures of efficiency and panel data regression to investigate the impact of the board structure on the institution's efficiency.

Taljaard, Ward and Muller (2015) examined whether increased levels of diversity within boards are associated with improved financial performance. Their study used the share returns and directors' demographics on firms listed on the JSE for the period 2000 to 2013. The results of the study showed that gender diversity and younger board members are strongly positively associated with improved share price performance. However, the results showed that racial diversity was not associated with the performance of these institutions. Increased gender diversity in institutions bolsters independence and lessens the agency problem. According to Jensen (1993), rising diversity enlarges board external networks and allows the diverse stakeholders' needs.

Harris (2014) examined the relationship between corporate leverage and gender diversity on the USA companies' boards, focusing on 78 financial and non-financial firms with at least 25% women on their boards. The results of the study revealed a negative relationship between boards with more than 25% women as directors and corporate leverage. However, 25% of women on the board had a significant positive effect on the association between the age of the board, the board size, and corporate leverage, thus leading to a stronger negative relationship. A substantial board's gender diversity can influence institutions' performance and affect financial leverage.

Li and Chen (2018) investigated the relationship between board gender diversity, firm performance, and firm size. The study used panel data from non-financial firms in

China in the period 2007 to 2012. The results of the study showed a positive impact of board size on firm performance. Makelak (2021), using manufacturing companies listed on the Indonesian Stock Exchange from 2013 to 2018, found that female directors had no significant effect on profitability when using firm size as a control measure. The results were supported by the earlier findings by Unite, Sullivan and Ashi (2019), who found that a greater board diversity insignificantly affects either the short-term firm performance or long-term firm value. However, the results are inconsistent with the findings of Pervin and Rashid (2019), who examined the effect of board characteristics on the performance of listed banking institutions in Bangladesh. The study used 30 financial institutions listed on the Dhaka Stock Exchange for the period 2013 to 2017. The study found a negative and statistically significant relationship between female directorship and firm size.

Bernile, Bhagwat and Yonker (2018) examined the effects of board diversity on corporate policies and risk using non-financial firms of the ExecuComp and Risk Metrics databases in the period 1996 to 2014. Their sample consisted of 21572 firm-year observations and they found that greater board diversity leads to lower volatility and better institutional performance. Furthermore, they asserted that the lower risk levels are largely due to the diverse boards adopting less risky financial policies. Hoang, Abeysekera and Ma (2018) examined the effect of board diversity on the corporate social disclosure of non-finance Vietnamese listed firms from 2008 to 2010. The sample was obtained from 150 firms listed on the Ho Chi Minh Stock Exchange and Hanoi stock exchange. The study found a significant positive effect of board diversity on the corporate social disclosure of institutions. The results imply that board diversity influences the corporate social disclosures of non-financial institutions in Vietnamese listed firms.

Disclosure and transparency

According to Habibi and Shamsi (2015), disclosure and transparency involve the timely and proper disclosure of adequate information concerning corporate governance practices and institutions' operations and financial performances that should be provided to the firm's stakeholders. Disclosure and transparency in financial institutions mean that the institution should publish information such as directors'

reports, statements of financial position, statements of comprehensive income, and cash flow statements (Andrievjkaya & Semenova, 2016).

Disclosure and transparency is the access and channels where potential and existing stakeholders obtain valuable information about a particular institution (Omran and Abdelrazik, 2013; Andrievjkaya & Semenova, 2016). Stakeholders of an institution continuously require information because they are not directly involved in the day-to-day running of the institution. Verma and Surya (2016) described disclosure and transparency as key elements of corporate governance that may enable stakeholders to monitor and assess institutions' actions and operations. Solomon (2011) also asserts the importance of disclosure and transparency to external stakeholders of an organisation. Andrievjkaya and Semenova (2016) and Srairi (2019) articulate that stakeholders such as creditors, employees, investors, and others require reliable and quality information to make opinions and decisions about the institution.

The quality and quantity of information about a particular institution influence how stakeholders make strategic decisions and how it affects economic growth. Corporate disclosure and transparency are external control mechanisms to reduce agency conflict between shareholders (Waweru, 2014; Patelli & Prencipe, 2017). Primary role of disclosure and transparency is to reduce information asymmetry by requiring institutions to provide all information that affects investment choices and decisions (Meser, Veith & Zimmermann, 2015). When valuable and relevant information is omitted from the institution’s reports, it hinders users' decision-making (Verma & Surya, 2016). Shareholders, for example, may not have full information to decide whether to invest in a particular institution.

For listed companies, the disclosure and transparency of information is mainly through quarterly, interim and annual reports, prospectuses, and websites. The disclosure and transparency of an institution’s information has several advantages that include disclosure and transparency improvement in the institution’s image, increase in trust and investor confidence, and enhance stock liquidity (Coates, 2009; Egginton & McBrayer, 2019). Information disclosure and transparency are viewed as signals to capital markets, where they reduce information asymmetry, which ultimately reduces the firm’s cost of capital. It serves as a control system and is useful in the decision-

making process by stakeholders. It is in line with agency theory, in which disclosure and transparency reduces and resolves the agency conflict between managers and shareholders (Jensen and Meckling, 1976).

However, the disclosure and transparency of an institution's information may pose a disadvantage to the institution, which can outweigh the benefits. The disclosure of information requires collecting, processing, and disseminating information which is a direct cost to the institution. Corporate governance requires institutions to disclose financial and non-financial information (Du Plessis, Hargovan & Harris, 2018). The financial information relates to interim and annual financial statements. The effectiveness of corporate governance is highly fundamental in overseeing the disclosure, transparency, and reporting processes to assure investor confidence (Andrievjkaya & Semenova, 2016; Srairi, 2019).

According to Vera (2013) and Baraiba-Diez, O'driozola and Sunchez (2017), the requirements of financial reporting standards and corporate governance codes create a pleasant environment for stakeholders to have the appropriate information required to make conclusive decisions about institutions. The disclosure of non-financial information addresses with the governance structure where corporate information such as the company's vision, direction, employees, and corporate strategy is disclosed and transparent to stakeholders. Furthermore, disclosures also highlight involvement in community projects and social and environmental matters.

The disclosure and transparency of information in financial institutions have received much attention recently and have been identified as factors determining good corporate governance. Cunha and Rodrigues (2018) analysed the determinants of the level of corporate governance disclosure using listed non-financial Portuguese companies between 2005 and 2011. Corporate governance disclosure had a significant positive influence on the company's performance measured by ROA. Costello, Granja and Weber (2019) found that the regulatory oversight of the U.S banking industry plays an important role in enforcing disclosure and transparency.

Bose, Khan, Rashid and Islam (2018) examined the influence of regulatory guidance and other factors on green banking disclosure in Bangladeshi commercial banks from 2007 to 2014. The study included a sample of 205 banking firms. The study found that

board size and institutional ownership positively affect the level of green banking disclosure. Al-Maghozon, Hussainey and Aly (2016) empirically explored top management teams' corporate governance and demographic traits as determinants of voluntary risk disclosure practices in Soudi Arabian listed banks. The study used content analysis to measure the level of risk disclosure in Saudi Arabian listed banks for the period 2009 to 2013. The study Used a sample of 86 banks and found that external ownership, gender, size, board size, and profitability are primary determinants of voluntary disclosure practices in Saudi Arabian listed banks.

Banking institutions with high levels of transparency and disclosures have less volatile stocks. Stakeholder theory states that greater transparency and disclosure affirm the rational choice of investors and inversely affect bank risks. According to Jensen (1993) risk disclosures reduce information asymmetry and attract investors. However, disclosures are not transparent when there is a lack of useful information. Zheng, Sarker and Nahar (2017) investigated the relationship between bank disclosures and credit risk in developing countries, using time-series data from 32 commercial banks from 2010 to 2014 in Bangladesh. The study revealed that bank disclosures, non-sponsor ownership, and advances to total assets are inversely associated with bank risk. Furthermore, the capital adequacy ratio has a positive effect on bank disclosures.

Jizi (2015) examined the effect of CEO duality on the content of risk management disclosures in US national commercial banks for the years 2009 and 2010. The sample used included 193 banks with total assets ranging from 48 million to 2.2 billion dollars. The results showed that CEO duality positively impacts risk management disclosures. Jizi (2015) was supported by Foyeke *et al*. (2015), who evaluated the role of disclosure on financial performance and firm size of 137 Nigerian financial and non-financial firms. Their study used the weighted logistic regression method to analyse the relationship and ROA was used to measure financial performance of the study. The results of the study showed a significant positive relationship between financial performance and corporate governance disclosures. The results further revealed a significant positive relationship between firm size and corporate governance voluntary disclosure. Therefore, measures should be ensured for all companies to disclose their corporate governance information.

Akanfe, Michael and Bose (2017) examined the determinants of corporate social responsibility disclosures in Nigeria, using 15 banks quoted on the Nigerian stock exchange for 2015. The results showed that the firm size and ROE are positively related to corporate social responsibility disclosures. However, leverage exhibits a negative relationship with corporate social responsibility disclosures. Srairi (2019) examined the impact of corporate transparency in 29 Islamic banks operating in five Gulf Cooperation Council countries from 2013 to 2016. The results showed that an increase in transparency positively impacts the stability of banks. Verma and Surya (2016) reported disclosure as the key mechanism that directly influences the corporate governance practices adopted by the banking sector.

Andrievjkaya and Semenova (2016) provided evidence to improve the functioning of the banking system. They found that it is wisely necessary to disclose information about the institutions. They further noted that countries with high banking information transparency had lower banking concentration. However, an earlier study by Moataz and Hussainey's (2013) used 97 financial reports and accounts of Saudi Arabian listed companies from 2006 to 2007 and did not find a relationship between disclosure and firm size.

Ellili and Nobanee (2017) examined the degree of corporate governance disclosure using annual data of listed banks on the UAE financial markets from 2003 to 2013. The results of the study showed that a low degree of corporate risk disclosure affects the banking sector. The level of disclosure and transparency is positively related to the institutions' size. The disclosure and transparency of firms affected the quality of corporate governance in South Africa and Kenya (Waweru, 2014). Therefore, corporate governance should consider the implications and impact of disclosure and transparency in an organisation. Waweru (2014) noted that improving corporate governance practices could attract investors and increase economic growth.

Economic growth is likely to be affected by financial institutions' availability of information because investors could lose confidence in the financial sector, making share prices overvalued and resulting in lower international and domestic investments. Therefore, countries with low transparency and disclosure of information are likely to experience low economic growth considering the risk of investments. Disclosure and

transparency play a huge role in determining good and effective corporate governance in financial institutions.

Risk appetite

The causes of bank failures have recently been caused by taking too much risk than the institutions can manage (Luu, 2015). To reduce excessive risk-taking, regulators have increased their pregulation oversight on financial firms forcing them to adhere to minimum capital requirements and banking standards. However, implementing current regulations has often been followed by an increase in the capital adequacy ratio (CAR) in institutions (Luu, 2015). Nevertheless, the evidence is insufficient to judge whether the regulations of financial institutions led to this increase of CAR (Lee & Hwang, 2019).

Managers with relatively no shareholding interest in their banking institutions behave in a risk-averse manner rather than maximising their shareholders' wealth by engaging in more risk-taking activities (Jensen & Meckling, 1976). When faced with a trade-off between potential profits and income risk in the future, higher risk-taking institutions may have higher projected returns, but responsible managers may forgo part of those potential earnings to make the institutions' income more risk-free (Smith & Stulz, 1985).

According to Abou-El-Sood (2016), used a sample of 19 United States bank holding companies from 2002 to 2014. The results of the study found that more managerial ownership, concentrated shareholders, and fewer outside directors undertook less risky investments concerning loans, off-balance sheet assets, and total assets. The capital adequacy effect was overwhelming, pushing for riskier positions in the institutions. However, financial institutions with good and sound corporate governance pushed for less risky positions, even with larger capital ratios (Abou-El-Sood, 2016). Board of directors have contributed to the collapse of financial institutions by failing to assess the risk taken, evaluating the vulnerability of the institutions to economic shocks, and acting with prudence (Abou-El-Sood, 2016)

Financial institutions are generally prone to higher risk since they deal with operational, market and credit risks (Amos, Sharon & Anita, 2016). Financial institutions operate

under different government regulations and management. Gorton and Rosen (1995) analysed US banks on bank failures for the period 1984 to 1990 and discovered that an increase in managerial shareholding forced banking managers to make more risky loans and less safe loans. Anderson and Fraser (2000) found equivalent results and established a significant and positive relationship between the level of risk in banking institutions willing to take and managerial shareholding from 1987 to 1989.

Berger, Imbierowicz and Rauch (2014), investigating the role of corporate governance in bank default using a sample of 246 non-defaulted and 85 defaulted US banking institutions for the period 2007 to 2010, discovered that the moral hazard issue caused an increased managerial shareholding to encourage non-executive directors to take risks. However, it may lead to a bank default in the institutions. Jensen and Meckling's (1976) agency theory suggests that shareholding managers are willing to take more risk than non-shareholding managers, while stakeholders theory asserts that the degree and ability of a bank's owners in risk-taking is dependent on the firm's ownership structure. According to Shleifer and Vishny (1986), larger shareholders with significant voting rights possess greater incentives and influence over policy than those with lesser ownership.

Amos *et al.* (2016), using a sample of 27 public banks in India for 2015, examined how corporate governance mechanisms affect the credit risk exposure of banks. The results showed that corporate governance and financial ratios significantly and positively affect the institutions' confidence in maintaining the provision for unexpected losses. Financial institutions with good corporate governance mechanisms tend to value the risk involved in maintaining and lending an optimal level of provisions for loan losses, which may increase efficiency and profitability of the banking institutions (Amos *et al*. 2016).

Ahmed, Mohammed and Adisa (2014) investigated the relationship between loan loss provision and earnings management in Nigerian banks using a sample of 8 banks' annual reports from 2006 to 2011. Using a robust regression as a tool for data analysis, the results of the study indicated a positive relationship between provision for loan losses and earnings management in Nigerian deposit money banks.

Benlemlin and Bitar (2016) used a sample of 21,030 US firm-year observations representing 3,000 individual firms from 1998 to 2012. The study investigated the relationship between corporate social responsibility and investment efficiency. The relationship between corporate social responsibility and investment efficiency was positive and significant. The results of the study showed strong and robust evidence that high corporate social responsibility involvement decreases investment inefficiency and consequently increases investment efficiency.

2.4 Hypothesis development

This section establishes a connection between the methodology chapter and the literature review chapter. An intellectual assertion known as a hypothesis predicts the link between various variables (Kerlinger, 1956). This is supported by Creswell (2014) and Cooper, Schindler and Sharma (2018), who defined a study's hypothesis as a written statement outlining an anticipated link between variables. The objectives of the study presented in chapter one provide the reference point for the hypothesis development of the study. The study's main objective is to identify the key determinants of corporate governance in selected financial institutions.

Furthermore, the study seeks to assess the long-run (cointegrating) relationship between corporate governance and financial performance in selected financial institutions. Additionally, the study examines the causal relationship between corporate governance and financial performance in selected financial institutions. The study empirically tests the developed hypothesis derived from the objectives. For the study, corporate governance proxies are Board size, Board composition, Board remuneration, and Board diversity. Therefore, corporate governance refers to the corporate governance proxies in the hypotheses.

The need for corporate governance in financial institutions arises because of the separation between corporate control and ownership. According to Jensen (1993), agency theory explains the emergence and development of an institution’s governance in a way that the separation of control and ownership gives rise to agency problems. However, sound governance systems reduce the risk of expropriation of the institution’s assets. Therefore, the institution demands a system that ensures that

goals between principals and agents are aligned. In this way, the corporate governance concept evolves to reduce agency costs. According to Shrivastava and Addas (2014), it remains a fiduciary duty of directors to govern the institution in the best viable way.

Prior studies have found whether poor corporate governance negatively affects the financial performance of an institution (Pathan & Faff, 2013; Akinyomi & Olutoye, 2015; Abobakar & Elgiziry, 2017). On the other hand, studies like those of (Malik, Wan, Ahmed, Naseem & Rehmna, 2014; Cucari, De Falco & Orlando, 2018) reported that better corporate governance accelerates an institution's financial performance. However, few studies like those of Agyemang, Aboagye, Antwi & Frimpong, (2014) and Ongore *et al*. (2015) reported an insignificant relationship between corporate governance and financial performance. This study investigates the relationship between corporate governance and financial performance. Furthermore, we explore other mechanisms that mediate this relationship. Based on the arguments above and the empirical literature review results presented earlier, the first hypothesis of the study is stated as follows:

- Hypothesis 1: There is no relationship between corporate governance and financial performance.

Institutions are striving more for financial stability and profitability by incorporating economic, social, and environmental policies into the operations of businesses. According to Arora and Dharwadkar (2011), corporate governance plays a tremendous role in making effective decisions about proactive sustainable practices. Sound corporate governance is also associated with better financial performance and stability. Corporate governance components could strongly influence financial performance and stability. Fama and Jensen (1983) assert that a disciplined board with a majority of independent directors results in sustaining the institution.

Previous studies have investigated the possibility of endogeneity between corporate governance and financial performance (Conyon, 1997; Isik & Ince, 2016; Zraig & Fadzil, 2018). The studies show that corporate governance significantly and positively influences financial performance. However, Vintila and Gherghina (2013) and Wahba

(2015) reported a negative relationship between corporate governance and financial performance. Meanwhile, Utama and Musa (2011) and Ataunal and Aybars (2017) failed to find a causal relationship between corporate governance and bank performance. Based on the arguments above and the empirical literature review results presented earlier, the second hypothesis of the study is stated as follows:

- Hypothesis 2: There is no long-run (cointegrating) relationship between corporate governance and financial performance.

According to Rajan and Zingales (2014), who argued that it is insufficient for research to establish a correlation between the variables, effective policy studies should examine the causative links. The study seeks to examine the causal relationship between financial performance and corporate governance. Since the financial sector is viewed as the blueprint for the distribution of economic resources, the causal relationship between financial success and corporate governance is significant for policy development. The corporate governance of financial institutions conforms to future growth. Consequently, Levine (1997) contends that the financial industry predicts a country's economic development and growth. Furthermore, the country's economy adheres to the development of the financial industry, and the industry disseminates the growth perks to the economic system (Levine, 1997).

This study explores the causality of the relationship between financial performance and corporate governance. Available studies have examined the relationship between financial performance and corporate governance, and no traceable studies have examined the causality relationship. Therefore, this study's addition to the literature analyses the causal link. Based on the arguments above and empirical literature review results presented earlier, the third hypothesis of the study is stated as follows:

- Hypothesis 3: There is no causal relationship between corporate governance and financial performance.

2.5 Chapter summary

Due to volatile corporate financial markets, governance failures, and scandals, the public and private sectors must practice responsible governance. Financial institutions' oversight, cautious market regulations, executives' compensation, and successful boards of directors are examples of sound corporate governance processes. The question of whether the behaviours of agents are consistent with those of principals is still being discussed in the literature (Martin, Wiseman & Gomez-Mejia, 2013; Bellavitis, Kamuriwo & Hommel, 2017). The arguments in the literature show that stakeholders may have valid concerns (environmental and economic) about how businesses act to maximise profits. Therefore, transaction theory was considered relevant to the current investigation. According to Walls *et al*. (2012), organisations should take all necessary steps to prioritise stakeholders' interests first. This request is consistent with both stakeholder theory and stewardship theory. When institutions take these actions, they become responsible corporate citizens as companies, which is consistent with stewardship theory (Donaldson & Davis, 1991).

The shortcomings of agency theory can be addressed by incorporating governance and sustainability theories. Agency theory has been crucial in setting the groundwork for understanding the causes of agency issues. The stewardship and stakeholder theories are more compatible because both acknowledge stakeholders' requirements. Therefore, the phenomena within this field cannot all be explained by one theory.

The function of the board in a governance system to achieve sustainable performance was discussed. In this respect, boards should be held accountable for the institution's performance because they play a critical role in guiding the entity toward the targeted risk appetite, sustainable performance, and financial performance. The empirical literature reveals that some corporate governance variables such as board size (BS), board remuneration (BR), board composition (BC) and board diversity (BD) are studied as independent variables; meanwhile, they should serve as dependent variables. Henceforth the current study aims to contribute to the gap.

The empirical research connecting the theories and detailing the unresolved and frequently contradictory findings about the relationship between corporate governance characteristics and financial performance was also covered in this chapter. Earlier empirical studies show three streams of evidence: those that established a positive

relationship between a particular corporate governance variable and the independent variables, those who established a negative relationship between a particular corporate governance variable and the independent variables, and those that established a no-effect between a particular corporate governance variable and the independent variables. The study further developed the hypotheses for the study, which links the literature review and the study's methodology.

The next chapter discusses corporate governance from a South African perspective.

CHAPTER 3: CORPORATE GOVERNANCE OF FINANCIAL INSTITUTIONS IN SOUTH AFRICA

3.1 Introduction

The previous chapter presented the literature review related to the corporate governance of financial institutions. It provided the review of the corporate governance theories and the empirical findings of prior studies. The current chapter discusses the corporate governance codes and approaches of financial institutions in South Africa. The chapter starts by discussing the importance and benefits of corporate governance. This is followed by a discussion of corporate governance in South African financial institutions. The chapter also discusses legislations designed to strengthen and influence the governance of institutions.

According to Shawe, Colegrave and Overy (2019), there are two formal levels of the financial sector in South Africa: market and institutional levels. The market level comprises the money market, bond and stock markets, and foreign exchange markets, whereas the institutional level comprises non-banking and banking institutions. The current study considers the institutional level mainly as the insurance and banking sector.

3.2 The benefits of corporate governance in financial institutions

The economic and social costs associated with corporate failures are significant (Adedin & Afrif, 2015). These costs include the loss in public confidence, high job losses resulting in a high unemployment rate, and the ripple effect that on a single failure may have in a particular economy and industry. Sound corporate governance needs to be maintained to ensure efficiency and transparency in the management of financial institutions. Nonetheless, poor corporate governance has a negative impact on stakeholders as they are bound to lose as a result of managers' and directors' mismanagement (Jensen, 1993). Good corporate governance leads to better access to capital markets, promotes industry fairness, aids economic growth, and promotes accountability, fairness, and transparency.

Over recent years, there has been an increase in company collapses/failures because of corruption and fraud (South African Reserve Bank (SARB), 2017). The collapse of

institutions had a major effect on investors, stakeholders, prospective investors, and international and local communities. Kusi, Dzeha, Ofori-Sasu and Ansah-Addo (2018) states that good corporate governance is essential in financial institutions to mitigate negative practices on corporate governance. Moreover, Isukul and Chizea (2017) assert that good corporate governance reduces institutional fraud and possible failures. It promotes the honesty and integrity of the board and managers in overseeing the institution.

Ofoeda (2017) states that companies practising sound corporate governance increase the institution's wealth through financially sound procedures and regulations. Furthermore, institutions with good corporate governance practices gain value-added, and institutional investors pay more premiums for shares. Financial institutions with sound corporate governance attract more investors. Ofoeda (2017) highlighted that corporate governance practices could reshape an institution's management and ownership structures. It puts more pressure on directors and managers to be accountable, transparent, and efficient. Institutions with good corporate governance have tremendous advantages that includes access to financing, thus creating employment, institutional growth, larger investments and also reduced cost of capital.

3.3 Corporate governance in South African financial institutions

Corporate governance has played a tremendous role in the management of financial institutions in South Africa. In executing their roles and responsibilities, managers and directors must exercise their business judgement in good faith and in the best interest of creditors, investors, debt holders, employees, and society (Sparis, 2019). However, a conflict of interest often arises between stakeholders and managers. According to Cremers and Nair (2005) and Adams (2010), there is a heavy reliance on corporate governance structures and practices to reduce the conflict between principals and agents. Therefore, corporate governance transcends beyond establishing a reciprocal relationship between the manager and shareholders of the institution.

There have been numerous legislations in South Africa designed to strengthen and improve the corporate governance of financial institutions. This legislation includes the Companies Act (1973), Insider Trading Act (1993), Public Finance Management Act

(1999), and Securities Services Act (2004). South Africa initiated corporate governance codes and guidelines of practices with the King I Report (1994), the King II Report (2002), the King III Report (2009), and last, the King IV Report (2016). The King IV report (2016) emphasises the accountability of board disclosures. Isukul and Chizea (2017) despite the comprehensive legislation on corporate governance, South Africa has also been affected by major corporate governance failures and the collapse of institutions such as Regal Treasury Bank and Macmed.

The South African banking industry has a well-established regulatory framework. Which comprise of the Banking capital requirements in the Banking Act, 1990 (Bank Act), the National Treasury of South Africa enforce Legislation and exchange control regulation. The Financial Sector Regulatory Act (FSR Act, 2017) was signed into law and effectively implemented “The Twin Peaks” model of regulations in the financial sector.

According to Shawe *et al*. (2019) and FSCA (2015), effective governance measures need continue to strike an appropriate balance between the interest and rights of institutions and society. Basel committee on Banking Supervision has developed efficacious supervisory standards to ensure the robustness and efficiency of the banking systems. In South African implementation of Basel II and Basel 2.5, the regulations and Bank Act were amended to; clarify the responsibilities of banks, banking groups, and boards of directors of banks, increase the reporting responsibilities, provide comprehensive disclosure requirements for banks and banking groups, facilitate the options available to banks and banking groups in calculating minimum capital requirements for credit risk, market risk, and operational risk exposure, strengthen risk coverage of the capital framework, reduce risks from securitisation and off-balance sheet activities strengthen senior management oversight in banks and banking groups, and elaborate on the supervisory review process to, among other things, assess the capital adequacy and control environment of banks and banking groups.

Shareholders rely external and internal mechanisms to ensure returns on their investments. The external governance mechanisms in banks and insurance companies include legal systems and market takeovers; therefore, managerial

monitoring is enforced to mitigate agency problems (Ofoeda, 2017). Furthermore, external governance mechanisms include regulatory bodies, formulators, and policy implementers. According to Rebeiz (2015), external corporate governance is an influential control from the outside of the institution, market disciplinary forces, and legal systems. The registrar of companies, the Financial Sector Conduct Authority, the JSE, the registrar of banks, the South African Reserve Bank, and the minister of finance play a significant role in the control of South African financial institutions.

The corporate governance regulatory frameworks for financial firms are at their pinnacle under the Ministry of Finance. According to Shawe *et al*. (2019), the Ministry of Finance oversees the statutory regulation of all South African financial institutions. Bamber, Fakena, Llewellyn and Store (2001), and Shawe *et al*. (2019), the responsibilities of the finance ministry are to analyse and provide advice on public finances and fiscal policies, expenditure planning and priorities, and intergovernmental financial relations. The Ministry of Finance manages the annual budget processes and supports public fiscal management.

Good corporate governance creates and sustains above-average shareholder value, ensures that the behaviour of managers and directors is ethical and promotes a positive outcome for all stakeholders. According to the King IV's report (2016), for a financial institution to be fully committed to the highest standards of corporate governance, the board should be a focal point and custodian of that institution. The board charter under good corporate governance in financial institutions should provide the following pillars: the roles and responsibilities of the board, objectives, strategies, financial statements, code of ethics, risk appetite, policies, compliance with rules and regulations, and board committee mandates.

John *et al*. (2016) asserts that since the onset of the 2007 to 2009 global financial crisis, no other firms have been scrutinised such as insurance companies and banks. A financial crisis is often the outcome of a confluence of events, such as significant changes in credit volume and asset prices, severe disruptions in financial intermediation, particularly the supply of external financing, large-scale balance sheet problems, and the need for large-scale government support. While these events can be caused by a variety of circumstances, financial crises are frequently preceded by

asset and credit booms that then collapse (Claessens & Kose, 2013). Mehran and Mollineaux (2012) assert that for each financial instrument that becomes a weapon of mass financial destruction, there is an underlying failure of corporate governance among the managers and directors of the institution. However, corporate governance has the potential to identify the problems associated with the mismatch between principals and agents in a way that could lead an institution to undesired behaviours. The board of directors, regulators, and market actors are primary shapers of the financial institution's corporate governance structures.

In South African corporate law, the legal status of a financial institution as a publicly listed institution simply means that it is treated more like a non-financial institution (Isukul & Chizea, 2017). The uniqueness of financial institutions triggered by the 200t to 2009 global financial crisis as such demands different metrics for measuring their governance and different paradigms in evaluations (John *et al*., 2016). Financial institutions should be viewed from a different approach with soundness and safety against improvements and innovations to serve stakeholders and the public at large.

Various mechanisms govern South African financial institutions (King IV report, 2016). All institutions operate in the framework of social, taxes, and laws. Furthermore, financial institutions face strict supervision and regulations compared to non-financial institutions (Costello *et al*., 2019). Nedelchev (2018) states that any major decision made within the institution, whether growth, investment, financing mix, or mergers, is approved by internal governance, for instance, risk officers, board of directors, and external governance such as legislators, market participants, and regulators. However, the forces are not equal, and their interests may not always align because of personal outcomes toward financial institutions (Mehran & Mollineaux, 2012).

For a financial institution to be governed, an entity should possess the willingness and ability to do so. Levine (2011), states that while the agency problem may arise between managers and owners, there may also be a disconnect in the interest of regulators and society. Market failures play an essential role in determining the intensity and focus of board monitoring. Castello *et al*. (2019) believed that the current incentives and responsibilities of financial institutions' boards make them weak for corporate governance, considering the value maximisation of such firms.

Furthermore, market participants also face a large distortion that makes them less incentivised to enforce good corporate governance. However, this may be confirmed if good corporate governance is targeted at efficiency and stability rather than focusing on the profit maximisation of financial institutions. To support and promote the soundness and safety of financial institutions, South African bank regulators have looked towards the board of directors to play a significant role in guiding these institutions towards acceptable behaviour standards (King IV report, 2016; Kristen & Du Toit, 2018). Financial institutions' management is called upon to execute the daily activities and responsibilities of the institution; regulators have viewed the board as a source of independent oversight of managers' decision-making. The board reviews the strategic decisions, internal controls, and risk appetite of these institutions.

Corporate governance aims to solve the agency problems in institutions, therefore explicitly making management responsible for the institution's value maximisation. Mehran and Mollineaux (2012), assert that the institution's regulators expect the board of directors to monitor the progress of the management actively to address the weakness control highlighted by the regulators. Considering the role of financial institutions in the economy, idealistic expectations are expected over the board. However, the board only owes a fiduciary duty to the institution's owners.

The financial institution's board of directors has a duty to put the institution's interest first rather than personal interest. The Financial Sector Regulation Act (FSR) (2017) states that the powers and role of the board remain unknown in either normal or abnormal crises. Directors are expected to consider the interest of the institution when making decisions. However, the board may consider the interest of other stakeholders if the institution is in distress (Macey & O'Hara, 2003).

Shawe *et al*. (2019) argued that the oversight of boards receives close monitoring when financial institutions face financial difficulties, and the impact of financial dificulties may be imposed by the industry or the financial institution. The financial services conduct authority and National Treasury developed the legislation to strengthen the board committees considering loan failures. Therefore, the board is held accountable for the institution's performance.

The board size of banks in South Africa is larger than other industries (Tshipa and Mokoaleli-Mokoteli, 2015b). The benefits of a larger board in banks outweigh the coordination costs and increased communication costs (Guest, 2009). In practice, it is expected for financial institutions with larger boards to positively impact the institution. According to Mehran and Mollineaux (2012), the board of large financial institutions, are expected to understand the rapidity in which severe losses can emerge and the complexity of risks in innovative financial products. The board should understand the technological aspects that may enable financial institutions to serve new markets and develop new products.

The board of directors should oversee the increasing cross-border activities of their institution, bridging contact with customers electronically and counterparties worldwide while maintaining the regulatory regime and governance structures. Theoretically, the board mitigates or eliminates the agency problem. However, evidence suggests that the incentives that directors receive may regard them as imperfect monitors of managers in institutions (Mace, 1971). The effects of directors are considered on their reputation and will be linked to when serving on other boards.

According to Jensen (1993), directors are legally liable for failing to fulfil their fiduciary duties; however, it is enormously difficult to prove evidence of such negligence. It is rare for such negligence to have successful prosecutions under corporate law (Valukas, 2010). According to Showe *et al*. (2019), it is more difficult to evaluate whether directors have incentives and abilities to govern financial institutions. While directors continue to use value maximisation and stock prices as a benchmark against management, financial institutions may engage continuously in taking systematic risk activities.

Godwin (2018) described corporate governance in terms of the board of directors and explained how they face corporate governance through interactions with institutions within their competitive industry. According to Mehran and Mollineaux (2012), while market failures are present in financial markets, financial institutions' incentives and opportunities to exert discipline differ from non-financial firms. Debt and equity holders enforce market discipline in non-financial firms, as well as competitive pressures from market takeovers.

A weakened market is one of the major differences in corporate control in the banking industry. In a competitive industry such as the financial industry, underperforming institutions are subject to hostile takeovers and downgrades by stronger institutions. Mergers and acquisitions are also possible. Adams and Mehran (2003) argued that regulatory approvals discourage instant takeovers by delaying introductions allowing institutions at a target to successfully cover their defences.

Equity holders are some of the external governance players in financial institutions. Investors are primarily interested in their initial investment returns; therefore, monitoring such institutions is highly important (Godwin, 2018). Investors may even opt for institutions to take high-risk or high-return business strategies to boost their portfolio returns and avoid failures.

The board of directors' role is vital to any corporate governance structure. The board should present a balance of skills, experience, and independence to fully monitor an institution (Godwin, 2018). The board is entrusted with safeguarding the institution and investments and accurately reporting the financial standards to meet the required corporate governance measures. Therefore, shareholders are the original centre of attention concerning corporate governance.

King IV recommends that financial institutions have or comprise a majority of independent non-executive directors; and the directors' independence should be assessed yearly (Godwin, 2018). Independent directors not holding any service contracts with the institution maintain the board's independence. Furthermore, remuneration is not linked or tied to the institution's financial performance. All directors should have access to the institution’s services and advice. The King IV report (2016) and the SARB (2017) concur that independent directors bring a strong contingency of diversity of experience, standard of conduct, and resources to the financial institutions.

Firer and Meth (1986) and Jensen (1993) opined that board characteristics, such as personality, age, education, nationality, and gender, are vital in defining board diversity. Kusi *et al*. (2018) postulate that board diversity is essential to an institution’s management to ensure that all stakeholders are considered in decisions. According to the King IV report (2016), every institution should consider the board's demographics,

size, and diversity to make it effective and comply with corporate governance mechanisms.

Jensen (1993) and Godwin (2018) state that institutions need an acceptable and well-articulated division of responsibility to ensure authority and power balance. Therefore, no individual will have unfelted powers to make institutional decisions. It is therefore, essential and recommended to separate the CEO and chairperson positions and reduce the associated agency costs (Shawe *et al*. 2019). According to the FSCA (2015), a financial institution's CEO and chairperson should be separated. Supported by King IV, the governance report (2016), an institution may be able to reduce agency costs if both positions are separated.

According to the King IV report (2016), a board nominates and appoints a chairperson who will be an independent director. Therefore, it is not permissible for the CEO of a financial institution to fill the chairperson position. Donaldson and Davis (1991) found duality to enhance the institution’s returns. However, agency theory recommends separating both positions (Jensen, 1993). This is supported by the JSE listing requirements that state two separate individuals must occupy the position, the chairperson must be a non-executive member (Doni, Corvino & Martini, 2019). A chairperson may be elected annually; however, it is not a requirement for a CEO position. The election of a chairperson should be justified, and an independent appointment should be highlighted in the integrated reports of the institutions. FSCA (2015) and King IV report (2016) state that an outgoing CEO of a financial institution should not become the institution’s chairperson until three years have lapsed.

The essential board committees are nomination, audit, and remuneration committees. The King IV report (2016) recommended the availability of such committees in corporate governance. Depending on the institution, the governance, information technology, and risk committees are considered additional committees. The established committees aim to protect the shareholders’ interests and promote the board's effectiveness. The board should delegate some of the functions to other well-structured committees without hindering the main purpose of their responsibilities. Committees such as the risk committee should, however, have a majority of non-executive directors and qualify to be independent.

A financial institution's nominating committee assists in locating potential and qualified board candidates (King IV report, 2016). The committee conducts reference and background checks on certain personnel and assists in employing a suitable candidate. However, these requirements of a nomination committee have been recently adopted in South Africa (Godwin, 2018). The nomination committee requires at least three independent non-executive directors chaired by an independent person.

According to The King IV report (2016), institutions should fairly remunerate executives and directors responsibly. However, Kusi *et al*. (2018) and Shawe *et al*. (2019) postulate that there are no stated regulations abiding by fair compensation of the board. The King IV report (2016) further states that the remuneration board committee should assist in setting and administering remuneration policies, employment contracts, bonuses, and share-based benefits. However, the information should be disclosed in the integrated reports of the institution. Moreover, independent directors should be appointed to the remuneration committee.

According to international practices on corporate governance, the audit committee plays a vital role in financial institutions. The King IV report (2016) requires a suitable and independent skilled audit committee. According to the King IV report (2016), audit committees are set to give assurance and oversight of the institution’s integrity in disclosing their performance and financial statements. The reports accurately affect prospective investors' and stakeholders’ perceptions of the institution. However, the literature has showed the small effect of audit committees (Shawe *et al*., 2019).

According to the King IV report (2016), the board should ensure the independence and effectiveness of the committees such as remuneration committee, audit committee and nominating committee, and should meet frequently. The committee requires the appointment of non-executive independent board members since it forms an integral factor in the management of risk. The King IV report (2016) recommends that the audit committee comprise non-executive independent directors. However, according to Godwin (2018) and Kusi *et al*. (2018), the JSE requirements indicate at least two non-executive independent directors in both financial and non-financial institutions.

Focusing on disclosure and compliance with good corporate governance practices in South Africa, Lemma, Mlilo and Gwatidzo (2020) found that corporate governance practices and standards improved prior to the 2007 to 2009 global financial crisis from 2007 to 2009. Therefore, the findings have implications for regulators and policy implementers. However, strong measures are required to enforce good corporate governance in financial institutions (King IV report, 2016).

The regulation of South African financial institutions mirrors global best practices. According to the International Market Funds (IMF) (2014), the South African financial sector is larger and more advanced when compared to other developing countries. In addition, its assets amount to over 250% of the Gross Domestic Product, which exceeds the level of most emerging economies. The non-banking financial institutions hold approximately two-thirds of the total financial assets. The South African financial services sector is well developed, in line with developed economies; the regulatory measures are high standards constituting importance in the economy and internationally (FSCA, 2015). According to Botha and Makina (2011), South Africa coordinates regulation at the global level as a member of the Financial Stability Board and the Bank for International Settlement (BIS). Therefore, South African financial regulators enthusiastically embrace global best practices.

The intermediation role sets banking and insurance companies at an important level in the economy. The regulation of financial institutions ensures the financial soundness and safety of the sector (Kusi *et al*., 2018). The financial problems of a financial institution may lead to bankruptcy. Hart and Zingales (2011) and Godwin (2018) state that when a financial institution fails, it causes psychological contagion, and stakeholders have little faith in the financial industry, thus leading to financial strain in the economy. The financial institutions are interconnected in the economy; a failure of one institution can result in the distress of other financial institutions. Monetary authorities have implemented highly standardised regulation measures for the banking sector. Financial institutions have been anchored to creating an institution's safety net and the twin pillars of capital regulation.

The 2007 to 2009 global financial crisis increased the need for transparency in financial institutions. The transparency standards of institutions are one of the

requirements for good corporate governance (King IV report, 2016). Financial institutions must produce quarterly and annual reports with their regulators and make such information available to the public. Srairi (2019) states that reports should include detailed information on the statement of comprehensive income, statement of changes in equity, statement of cash flows, and statement of financial position.

Corporate governance standards require the full disclosure of information as compliance mechanism (King IV report, 2016). According to Mehran and Mollineaux (2012), disclosure of irrelevant information and already known content does not increase the institution's transparency. In corporate governance, the role of information affects the monitoring of managers (Baraibar-Diez *et al*., 2017). Market discipline is a robust mechanism governing financial institutions (Shawe *et al*., 2019). The institution's goal is financial stability, innovation, and value maximisation. Therefore, financial institutions are required to provide detailed information disclosures.

According to Jokipii and Milne (2008) and King IV's report (2016), other regulatory instruments of banking institutions have been adopted, including disclosure requirements, consumer protection, restrictions on asset holdings, and capital requirements. Hart and Zingales (2011), the banking capital regulation of institutions has been provided as a corollary to introducing deposit insurance. Insurance makes provision for debts a cheaper source of financing in financial institutions. Furthermore, creditors and depositors benefit from low-interest rates due to secured debt through insurance. Deposit insurance offsets the institution's risk-taking incentives (Allen, Carletti & Marquez, 2015).

The capital requirements in financial institutions serve as the sole defense against negative financial shocks. According to FSCA (2015), smaller financial institutions may face higher financial shocks and have low access to financial markets for support. It is crucial to have acceptable capital requirements. Financial institutions need to hold sufficient capital. The capital regulations rest on the following premises. It is the primary role to protect stakeholders from losses when a financial institution faces financial failures, and the incurred costs will not be borne by the shareholders or its financial claim holders (Kashyap, Rajan & Stein, 2008). Therefore, capital regulation

ensures that financial failures are avoided (Kusi *et al*., 2018). Incentive alignment increases the institution’s exposure to shareholders; therefore, capital regulation enhances the incentives to monitor managers and ensures taking minimal risks. Jensen (1993), a proper corporate governance framework enhances the monitoring of managers and the board of directors.

3.4 Chapter summary

In this chapter, the significance of corporate governance was addressed. Furthermore, the fundamental corporate governance of financial institutions in South Africa was discussed in detail. It was demonstrated that the corporate governance of financial institutions is of high importance to society and industry at large. It promotes the financial sector's financial stability. The regulation criteria provide a safety net in protecting society, and the capital requirements and deposit protection insurance were highlighted in the chapter.

Corporate governance has the potential to identify the mismatch that could lend an institution to financial troubles. Financial institutions with good corporate governance are recommended and are most desirable. An ideal financial institution focuses on innovation and the safety of financial measures in place. Corporate governance failures are tied to the mismanagement of the board and its managers. Therefore, information disclosures play a vital role in mitigating governance failures.

The following chapter outlines the methodological processes adopted by this study to address the research objectives.

CHAPTER 4: METHODOLOGY

4.1 Introduction

The previous chapter focused on the corporate governance of financial institutions in South Africa, mainly banks and insurance companies. In this chapter, the methodology applied in addressing the research objectives and hypothesis, as stated in chapter one, is presented. According to Cooper, Schindler and Sharma (2018), methodology refers to the study's general approach to carrying out the research problem. The chapter begins with the data sources and sample size. It is followed by the variable's definition and the measurement of variables. The proposed empirical models are then specified. The applicable econometric estimation techniques and diagnostic tests that will be used to test the hypotheses are then discussed. The last section focuses on summarising the chapter.

4.2 Empirical framework

The empirical framework that guided the study is discussed in this section. The empirical framework ponders the methodological considerations that have informed prior studies on corporate governance. It is vital to the current study in that it provided the basis for which proxies to adapt for the various corporate governance variables under consideration. The empirical framework informed the methodological choices that carried this study's efforts. To select the most appropriate research method, it is imperative to assess what methods have been used in similar studies in the past.

The behaviours of financial institutions have been examined using static and dynamic econometric models. Therefore, examine the methodologies used to select factors affecting corporate governance. It is sufficiently clear that the former category of research projects adopted static panel data models, while the latter used dynamic panel models. Studies on determinants of corporate governance have used panel data models in analysing their data. These studies are presented in Table 4.1.

Table 4.1: Selected studies on determinants of corporate governance.

Estimation method	Author
Fixed Effect (FE)	Carvalho, Dal'Bo and Sampaio (2020), Maswanto (2019)
Fixed Effect, Random Effect (RE), and Generalised Method of Moments (GMM)	Lin and Chang (2016)
Pooled Ordinary Least Squares (OLS)	Grassa, Chakroun and Hussainey (2018)
Fixed Effect and Ordinary Least Squares	Oliveira, Azevedo and Silva (2019)
Generalised Method of Moments	Orazalin (2019)

Source: Author's own composition

Static models have been previously employed in determining and analysing the relationship between corporate governance and its determinants. These models are the fixed effect model, random effects model, and pooled ordinary least squares model. Among the scholars, Maswanto (2019) and Carvalho, Dal'Bo and Sampaio (2020) employed the fixed effect estimation model.

However, scholars such as Grassia, Chakroun and Hussainey (2018) used pooled ordinary least squares. Nonetheless, Lin and Chang (2016) and Oliveira, Azevedo and Silva (2019) employed a combination of estimation methods and performed a final analysis based on the model with the best fit. With these studies as a point of reference, the researcher used a variety of estimation methodologies to assess the determinants that affect corporate governance in financial institutions. Consequently, the fixed effects (FE) and generalised method of moments are the primary estimation techniques used for the determinants. According to Baltagi (2008), and Gujarati (2021), the fixed effect model assumes that each unique specific effect is a fixed variable and allows for correlation with the explanatory variables. The generalised method of moments is more robust to the heteroscedasticity and autocorrelation problems (Roodman, 2012).

4.3 Data sources

Quantitative research, according to Bell, Bryman and Harley (2022), gathers information using a predetermined instrument to produce statistical data. According to Cooper, Schindler, and Sharma (2018), quantitative research strongly emphasises measuring and analysing the causal link between the variables under investigation.

There is no need to gather primary data because when secondary data is sufficient to provide answers to the problem and research hypothesis, there is no need to acquire primary data. The research population was comprised of JSE-listed and unlisted banks and insurance companies (see Appendix A). The population comprised of 14 banks and 27 insurance companies. All South African banks and insurance companies with complete data sets for the thirteen years from 2007 to 2020 are incorporated in the sampling frame.

The Bureau Van Dijk Orbis Bank focus database was used to source a list and data of banks; the Orbis database and the Financial Sector Conduct Authority (FSCA) were used to source an insurance list and insurance company data. Furthermore, data was obtained from the institution's annual integrated reports, which are downloaded from their websites. The Bureau Van Dijk Orbis Band focus and FSCA databases are South Africa's leading providers of data feed for banks and insurance companies (Busin & Modau, 2015). The banking sample comprised 11 banks out of a population of 19 banks in South Africa. The sample comprised 10 insurance companies out of 179 in South Africa. There were 291 cross-sectional observations for the financial institutions. The list of financial institutions is provided in Appendix A.

The following requirements had to be satisfied by the institutions to be part of the final sample:

- The banking institution had to be listed on the Bureau Van Dijk Orbis bank focus database, and the insurance company had to be listed on the Financial Sector Conduct Authority.
- The institution's annual reports for the period 2007 to 2020 should be available.

Institutions with more than one missing annual integrated report were excluded from the final sample.

4.4 Controlling for sampling bias

The current study is susceptible to sample selection criteria bias. According to Caughey, Berinsky, Chatfield, Hartman, Schickler and Sekhon (2020), sampling bias is the propensity for a sample to be systematically different from the population due to

sample selection techniques and how the available data is processed. A portion of the population could be purposefully excluded as a result of sample selection bias (Nardi, 2018). This study overcomes sampling bias by including small and large financial firms as part of the population. Furthermore, includes the JSE listed and unlisted financial firms, however, that are registered on the Bureau Van Dijk Orbis Band focus and FSCA. Earlier studies by Ntim (2013), Waweru (2014), Pamburai, Chamisa, Abdulla and Smith (2015), Tshipa and Mokoaleli-Mokoteli (2015b), and Muchemwa, Padia and Callaghan (2016) on corporate governance sampled the large listed companies and frequently omit smaller companies. However, Huse (2007) argues that institutional size affects the institution's leadership and board size.

4.5 Variable definition

Standard corporate governance regression analysis has been employed in extensive studies to analyse the relationship between corporate governance and its determinants. The expectations of the relationship were considered in developing this study's research objectives and hypothesis. The proxies employed for this study's dependent and independent variables are defined below. Corporate governance determinants include financial performance, financial stability, efficiency, and control variables. The data is extracted from the annual reports sourced from the company's official websites and Bureau Van Dijk Orbis Bank's focus database. The measurement of variables is carried out as follows in table 4.2.

Table 4.2: Summary of variables

Variables	Measurement	Expected sign of coefficients	Supporting studies
Board size (BS)	Total number of directors on the board.	Positive	Shukeri, Shin and Shaari (2012); Johl *et al*. (2015); Isik and Ince (2016); Atkins *et al*. (2018); Gafoor *et al*. (2018)
Board composition (BC)	Total number of independent non-executive directors to total non-executive directors. Number of non-executive directors/ total number of directors. Two proxies run board composition.	Positive Positive	Ramly, Chan, Mustapha and Sapiei (2015); Bhattrai (2017); Gafoor *et al*. (2018). Lassoued (2018); Khan, Armon and Eneizam (2019)
Board remuneration (BR)	Total amount of remunerations for board members	Positive	Verma and Surya (2016); Agyemang-Mintah (2016); John *et al*. (2016); Unda *et al*. (2017); Nyambia and Hamdan (2018); Unda and Ranasinghe (2019)
Board diversity (BD)	Percentage of female board members equals female board members to total board members	Negative	Taljaard *et al*. (2015); Owen and Temesyary (2018); Bernile *et al*. (2018)
Transparency and disclosure (TD)	• Disclosure of financial information. • General corporate governance disclosure. • Board of directors' reports and institution's information. • Age and qualification of directors • Compliance report. • Committees • Roles and duties of directors. • Accounting policies. • Remuneration of directors. • Risk management reports. • Auditors' reports indicators take a value of one if all the information above is disclosed, otherwise, zero.	Positive	Waweru (2014); Verma and Surya (2016); Baraiba-Diez *et al*. (2017); Srairi (2019).
Financial stability (FINSTAB)	The Z-score = (the mean of return on assets plus the ratio of total equity to total assets) ÷ the standard deviation of return on assets.	Negative	Shawe *et al*. (2019); Festus *et al*. (2019); Nasrin (2022)

Capital adequacy ratio (CAR)	Capitalisation ratio consisting of total equity to total assets.	Positive	Gambetta, Zorio-Grima and Garcia-Benau (2015); Gambetta, Benau and (2017)
Return on Asset (ROA)	Net income/Average total assets	Positive	Ross, Ross, Westerfield and Jordan (1998); Anarfor (2015); Farag and Malin (2017); Farag, Mallin and Ow-Yong (2018).
Return on Equity (ROE)	Net income/Average total equity	Positive	Shukeri, Shin and Shaari (2012); Lin and Chang (2014); Arora and Sharma (2016);
Efficiency ratio (ER)	Cost to income, proxies for management skills and bank operations complexity.	Positive	Gambetta *et al*. (2015); Gambetta *et al*. (2017).
Firm size (FS)	Natural logarithm of total assets.	Positive	Arora and Sharma (2016); Kusuma and Zain (2017); Gafoor *et al*. (2018); Sakar and Sarkar (2018).
Leverage ratio (LEV)	Book value leverage [1-(total equity ÷ total assets)]	Positive	Agyemang-Mintah (2016); John *et al*. (2016); Unda *et al*. (2017).
Growth (G)	(Current year total assets – Previous year total assets) ÷ Previous year's total assets = Growth rate	Positive	Farag and Mallin (2017); Yaseen *et al*. (2018).

Source: Author's own composition

4.5.1 Dependent variables

This study employed four dependent variables to evaluate the relationship between corporate governance and its determinants. The dependent variables employed are board size (BS), board composition (BC), board diversity (BD), and board remuneration (BR).

Board size is the total number of directors on the board (Johl *et al*., 2015). Studies by Jackling and Johl (2009), Adusei (2012), Adeabah *et al*. (2019), and Karkowska and Acedanski (2019) employed the board size proxy, in line with earlier studies by Anderson and Reeb (2003), Beiner, Drobetz, Schmid and Zimmermann (2004), and De Andres, Azofra and Lopez (2005), who employed board size to proxy corporate governance. However, the studies employed board size as a dependent variable. According to Jensen (1993), agency theory suggests that board size predicts the board's effectiveness and affects the organisation's operation. The positive effect of board size, as highlighted by agency theory, can impact an institution's profitability and performance (Tulug & Ramdani, 2018). Therefore, board size is a function of financial performance (Love, 2011; Mehran *et al*., 2011; Andries *et al*., 2020).

Board composition consists of executive and non-executive directors. The independent directors are known as external directors. They are non-executive directors who do not participate in the daily activities and management of the institutions (Bhattrai, 2017). Earlier studies by Sheikh and Wang (2012), Kajanathan (2012), Bulathsinhalage and Pathirawaam (2017), Sanchez and Martinez-Ferrero (2017), and Elsayed and Elbardan (2018) have employed independent non-executive directors as a dependent variable. Board composition plays a vital role in alleviating the agency theory issue and profitability improves the institutions (Jensen, 1993). In agency theory, contrary to stewardship, board composition affects an institution's corporate governance practices (Jensen, 1993; Verma & Surya, 2016).

The study defines board diversity as the inclusion of female members within the institution’s board structures (Brickley, Lease & Smith, 1988). Studies by Wang and Clift (2009), Daniel (2015), and Dankwano and Hassan (2018) have employed board diversity as a dependent variable and function of firm performance. Resource dependence and agency theories suggest that greater gender diversity may contribute to better board effectiveness, which improves financial performance (Jensen, 1993; Terjesen, Couto & Francisco, 2016). Terjesen *et al*. (2016) further noted that under resource dependence theory, gender diversity brings unique and valuable resources to the board and thus to the institution's governance which ultimately improves its effectiveness. The current study measures board diversity as a percentage of female board members which is calculated as equal to female board members over the total board members (Yaseen *et al*.*,* 2018).

Board remuneration is the payment or compensation received by board members for the services rendered (Yasser & Al Mamun, 2015). Therefore, board remuneration is the total amount of remuneration for board members received during the year. Studies by Andreas, Rapp and Wolff (2010), Yatim (2013), Scholtz and Engelbrecht (2015), and Merino, Manzaneque-Lizano and Sanchez-Araque (2019) employed board remuneration as a dependent variable. For the board's effectiveness, compensation ensures that the board operates in the interest of all stakeholders (Jensen & Meckling, 1976). Agency theory suggests that board remuneration contributes to the effectiveness of the board and corporate governance (Jensen, 1993; Terjesen, Couto & Francisco, 2016).

Given the improvements in the availability of data, corporate governance proxies have attracted increased attention in recent years (Ryan & Wiggins, 2004). The reason is that corporate governance proxies should depend on the firm-specific process (Barkema & Gomez-Mejia, 1998). The governance variables should therefore be a function of firm performance, implying that better financial performance will lead to better and more efficient corporate governance and vice versa. Justification for using board size, leadership structure, board diversity, and board remuneration as dependent variables is premised on other considerations. Some governance variables are a function of firm performance, and hence these became the variables of interest for the study.

4.5.2 Independent variables

The independent variables consist of the capital adequacy ratio (CAR), return on asset (ROA), return on equity (ROE), and efficiency ratio (ER). The variables are chosen based on the gap in the empirical studies when examining the determinants of corporate governance in financial institutions, which is in line with the theoretical expectations of the study.

To measure financial stability, the researcher employed the Z-score measure. Capital adequacy is the capitalisation ratio consisting of total equity to total assets. Gambetta *et al*. (2017) efficiency ratio is the cost to income, a proxy for management skills and operations complexity. It is calculated by dividing the institution's non-interest expenses by its net income (Gambetta. *et al*., 2017).

Return on assets (ROA) and return on equity (ROE) are measures of an institution's financial performance. ROA was defined as the return on average assets and return on average equity for the financial institution. According to Ross, Ross, Westerfield and Jordan (1998), ROA assesses how effectively and efficiently a firm runs its business and uses its resources (assets) to make profits. ROA is determined by dividing net income by the average total assets. A greater ROA denotes the management effectiveness and efficient utilisation of an institution's resources to maximise the value of the shareholders' investments. Anarfor (2015) and Farag and Mallin (2017) have employed the proxy to measure ROA. Due to its ability to ignore

the issue of institution size, ROA is a useful indicator of an organisation's financial performance. This facilitates comparisons among financial institutions (Lev & Sunder 1979).

Return on equity (ROE) is a metric that informs shareholders how much profits/losses are generated on the money they invested (Epps & Cereola, 2008). ROE is determined by dividing net income by the average total equity. It evaluates the management's effectiveness in using the company's equity to produce operating profits. Therefore, the higher ROE signals that a firm efficiently used its shareholder's equity to generate income. According to Rappaport (1986), ROA and ROE are the most often used financial performance indicators. This was supported by Ahsan (2012) and Cho, Chung and Young (2019), who assert the importance of ROA and ROE to measure an institution's financial performance. The benefit of using ROE as a metric for financial success is that it enables investors to assess how the organisation uses its equity compared to other forms of investment. In addition, the firm's debt is taken into account, which is regarded as a crucial component in financial institutions. An institution's efficiency ratio measures management skills and the complexity of its operations computed as the total costs to income.

4.5.3 Control variables

The current study employed the following control variables to reduce the omitted variables' biases (Ntim, 2013). These variables are Transparency and disclosure (TD), Firm size (FS), leverage ratio (LEV), and growth prospect (G). Leverage (LEV) is the ratio of total debt to the firm's assets. There is a direct relationship between leverage and the institution's assets. Earlier studies by John *et al*. (2016), Agyemang-Mintah (2016), and Unda *et al*. (2017) measured the impact of leverage, employing the leverage ratio on the factors affecting corporate governance. Therefore, the current study employs total liabilities to total assets to measure the leverage ratio.

Disclosure and transparency are the disclosure of adequate information concerning corporate governance practices (Arsov & Bucevska, 2017). The role of disclosure and transparency is to reduce information asymmetry (Meser *et al*., 2015). Therefore, reducing agency problems promotes good corporate governance and the

effectiveness of the institution and the board. It is in line with the agency, the evolutionary theory of economic change, and the stakeholder theory (Jensen, 1993).

To measure transparency and disclosure, the researcher considered the disclosure of financial information, general corporate governance disclosure, board of directors' reports and institution's information, age and qualification of directors, compliance report, available committees, roles and duties of directors, accounting policies, remuneration of directors, risk management reports, and auditor's report (Baraiba-Diaz *et al., 2017*; Srairi, 2019). All items related to corporate social responsibility take a value of one if the information is disclosed. Otherwise, it is zero. The dummy variables employed were intended to capture the firm-level corporate governance determinant's transparency and disclosure (Srairi, 2019).

The researcher used the natural logarithm of total assets to calculate the firm size (Ayuba, Bambal, Ibrahim & Sulaiman, 2019). Larger institutions are expected to have more assets compared to smaller ones. Earlier studies by Kusuma and Zain (2017), Gafoor *et al*. (2018), and Sakar and Sarkar (2018) employed the proxy of firm size on factors affecting corporate governance. To reflect the impact of business size, several studies have used the logarithm of net sales (Titman & Wessels, 1988; Barclay & Smith, 2005). As a result, the researcher was convinced to choose the total assets variables because they serve as good proxies for both banks and insurance companies.

Growth prospect (G) is proxied by the difference between the current and previous period total assets divided by the previous period total assets (Arora & Sharma, 2016: 430; Yasser & Al Mamun, 2015). The institution's annual rate of total asset growth is referred to as the growth variable. The higher the growth rate, the higher the institution's growth rate prospects.

To account for the dynamic nature of corporate governance, the study will additionally use the one-year-lagged corporate governance indicators as an explanatory variable (Wintoki, Linck & Netter, 2012). Using the lagged corporate governance measure as an explanatory variable lessens the potential dynamic panel bias (Afrifa & Tauringana, 2015). The variables are selected per earlier empirical studies looking at corporate governance and the theoretical predictions of the current study.

4.6 Panel data analysis

The researcher employed panel data econometric analysis to examine the South African determinants of corporate governance in South African financial institutions. Panel data combine time series and cross-section data (Baltagi, 2008). Numerous benefits accrue from employing panel data. These benefits include panel data, after controlling for individual heterogeneity, indicating that countries, individuals, or firms are heterogeneous (Biorn, 2016). Cross-sectional and time series studies, on the other hand, do not account for heterogeneity and may yield biased conclusions (Baltagi, 2008). Panel data provides more useful data, less collinearity among variables, greater degrees of freedom, and greater efficiency (Baltagi, 2008; Sul, 2019). Panel data are better suited to investigating the adjustment dynamics. Panel data can discover and quantify impacts that are not detectable in cross-sectional or time-series data (Hsiao, 2022). Biases caused by the aggregation of firms or individuals can be addressed or eliminated by the use of panel data (Baltagi, 2008). Panel data enable the development and testing of more complex behavioural models than cross-sectional or time-series data (Hsiao, 2014).

According to Baltagi (2008: 8-10), panel data have the constraint of being sensitive to design and collecting problems. These problems include issues with non-response, coverage, reference period, and interview frequency (Baltagi, 2008). Panel data is further limited to the distortion of measurement errors (Paterno, 1997; Hsiao, 2022). There may be measurement errors as an outcome of ambiguous questions, deliberate misrepresentation of responses, or memory errors (Hsiao, 2022). Furthermore, it is limited to selectivity problems (Baltagi, 2008; Hsiao, 2022). These include attrition, non-response, and self-selectivity. Moreover, panel data is limited to the short time-series dimension (Baltagi, 2008; Sul, 2019). Typical micro panels collect annual data for each individual over a short period. Panel data is limited to cross-sectional dependence (Paterno, 1997; Baltagi, 2008). Macro panels based on regions or countries with longer time series that fail to account for cross-country dependencies may produce misleading results (Hsiao, 2022).

Despite the limitations of the panel data discussed above, the advantages outweigh any potential drawbacks. The key benefit of using panel data in this study was that it

controlled the heterogeneity of the sample of banks and insurance companies, ensuring that the researcher's judgments were not skewed. Compared to cross-sectional or time-series investigations, panel data provides additional degrees of freedom and efficiency to the study. The researcher was able to evaluate the dynamic corporate governance model using panel data methodologies to determine the speed of adjustments toward the target corporate governance.

4.7 Unit root testing

The main challenge with time series data is the non-stationary of the selected data (Dickey & Fuller, 1981). Box, Jenkins, Reinsel and Ljung (2016), statistically, time series data must satisfy the property of time independence and be stationary. Time-series estimators' statistical characteristics depend heavily on whether the data are stationary or non-stationary (Hsiao, 2014). Therefore, it is crucial to establish the variables' integration order before employing cointegration techniques or approximation. The tests are run to verify that the data contain no higher-order integrations than the first-order integrations, despite the autoregressive distributed lags (ARDL) model not requiring them (Pesaran & Smith, 1995; Pesaran, 1997). The autoregressive distributed lags (ARDL) are of the premise that variables are I(1) or I(0). The order of variable integration is thus determined by the unit root test. According to Breitung and Pesaran (2008), if variables are integrated at higher orders, it could lead to fictitious regressions because the F-statistics cannot be accurately integrated.

Panel unit root testing was employed in the study based on time series unit root testing. Im, Pesaran and Shin (2003) indicate that individual time series unit root vary from panel unit root testing because unit roots acknowledge asymptotic behaviours of cross-sectional and time series dimensions. In contrast, individual time series unit root only consider the time dimensions. The time series must be non-stationary for cointegrating relationships to persist. Panel unit root tests are run as part of diagnostic testing to establish the time series stationarity. In panel data sets, individual unit root tests are insignificant and are aggravated by small samples (Baltagi, 2008; Hsiao, 2014). Therefore, it is impossible to run standard unit root tests for this investigation.

Consequently, several unit root tests are carried out, including first- and second-generation unit root tests. Such tests employed are Levin, Lin and Chu test (2002), with the LLC test, the Im, Pesaran and Shin (2003) IPS, Breitung tests, pp-Fisher chi-Square panel unit root tests, and ADF-Fisher Chi-Square. According to Baltagi (2008), the Fisher test can use different lag lengths compared to other unit root tests, although this test possesses a drawback in that lag lengths were determined through Monte Carlo simulation. Fisher's test lag is appropriate and adaptable to various unit roots (Maddala & Wu, 1999).

4.8 Econometric model specification

For this study, corporate governance proxies board size (BS), board composition (BC), board remuneration (BR), and board diversity (BD) are hypothesised to depend on financial performance, risk appetite and financial stability. This study employs preliminary descriptive statistics as well as correlation analysis. Corporate governance proxies are specified as a linear function to determine the relationship between corporate governance proxies and the study's independent variables. Equation 1 below delineates the functional form of the generalised method of moments (GMM) estimation technique.

$$GOV = f\ (TD, CA, ER, ROA, ROE, LEV, FS, and\ G) \qquad \text{Equation: 1}$$

where:

GOV= Corporate governance proxies are regressed individually (BS, BC, BR, BD)

TD= Transparency and disclosure

CAR= Capital adequacy ratio

ER= Efficiency ratio

ROA= Return on asset

ROE= Return on equity

LEV= Leverage

FS= Firm size

G= Growth prospect

Ordinary least squares (OLS) and GMM are proposed to identify the key determinants of corporate governance in financial institutions. Section 4.8.1 provides a detailed explanation of the methodology. To test the objective of assessing the long-run (cointegrating) relationships between corporate governance and financial performance in selected financial institutions, panel ARDL is employed. If cointegration is confirmed, the vector error correction model (VECM) is used to assess the short-run and long-run association between corporate governance and financial variables. The causal relationship between the variables is inferred from the results using the significance of the coefficients and the error correction term. Sections 4.8.2 and 4.8.3 include explanations of the approaches (ARDL and ECM).

Therefore, Equation 1 can be expressed as follows in panel data form:

$$\Delta Y_{it} = \beta_{1i}\Delta Y_{i,t-1} + \sum_i \lambda_{it}\Delta X_{it} + \mu_i + \Delta\varepsilon_{it} \qquad \text{Equation: 2}$$

where:

ΔY_{it} = the dependent variable of financial institution *i* for time *t*.

$\Delta Y_{it,\,t-1}$ = the lagged dependent variable of financial institution *i* for time *t*-1.

ΔX_{it} = the vector of explanatory variables.

μ_i = the time-invariant financial institution's specific effect.

ε_{it} = the random error term of institution *i* for time *t.*

The OLS approach presents a hurdle when estimating the model stated in equation 2. Additionally, when estimating equation 2 using static panel estimating techniques such as random effects, fixed effects, and pooled OLS models, has a probability of producing estimates that are biased (Gujarati, 2021). The lagged dependent variable has correlation problems with the error term, and the autocorrelation will produce

misleading results. The data generating process in equation 5.3 is autoregressive and it yields inconsistent estimates from the OLS.

The use of pooled OLS for the estimation of equation 2, is constrained by the assumption that all cross sections must have the same intercept and slope for each coefficient (Samargandi, Fidrmuc and Ghosh, 2015). According to the underlying assumption of common intercept and slope coefficients for all cross sections, this assumption implies that heterogeneity across individuals is disregarded by this estimation technique. Using the fixed effects to estimate equation 2, the endogeneity problem also constitutes a tremendous challenge. Endogeneity is described as the existence of a relationship between one or more independent variables and the error term. Some explanatory variables may be endogenous to the dependent variable, which could result in estimates that are skewed. Endogeneity testing in the panel model is challenging since the Hausman test estimates augmented regression, and one must distinguish probable endogenous variables and appropriate instruments measuring them.

If the endogenous variable structure is incorrectly specified, the provided instrument for the test becomes invalid, severely biases the testing procedure itself, and leads to invalid inferences. The use of a one-year lagged independent variable is suggested by Orazalin, Mahmood, and Lee (2016), this study uses a one-year lagged independent variable to overcome endogeneity and avoid its disadvantages.

One of the key tasks in empirical studies of corporate governance is handling the endogeneity problem of the independent variables. If endogeneity is not considered, casual inferences may be faulty and erroneous (Roberts & Whited, 2013). The appropriate empirical model for the corporate governance of financial institutions should be a dynamic model, where a lagged dependent variable is used as one of the independent variables (Wintoki, Linck & Netter, 2012). A dynamic model overcomes some of the limitations of cross-sectional estimation biases, such as misspecification of institution-specific effects, omitted variable errors, endogeneity problems, and the use of lagged dependent variables in the regression, which are common in panel data regressions. The current study adopted the dynamic model approach in investigating the determinants of corporate governance in financial institutions. In doing so, this

study responds to suggestions by Waweru (2014) and Arora and Sharma (2016) to use the dynamic panel model when dealing with corporate governance and financial studies.

There is a possibility of multicollinearity among the variables. Croissant and Millo (2019) proposed solutions for dealing with multicollinearity detected in variables. One could consider dropping a variable; however, this may result in a specification error or specification bias. Another alternative solution will be to combine time series and cross-sectional data. By increasing the study's number of observations, the pooled data boost the validity of the findings. A technique such as a factor analysis for principal component analysis may also be used. Finally, variables might be transformed to increase the number of observations, the first difference taken, or fresh data added. Differencing is heavily considered to reduce the series's skewness and prevent correlation issues that could occur while estimating the correlations between the variables.

However, the random effects assume strict exogeneity in that the model is considered to be time-invariant (Arellano, 2003). Therefore, the models do not consider the panel data aspect that distinguishes the short-run from the long-run relationships (Samardandi, Fudrmuc & Ghosh, 2015). If equation 2 is estimated using the random effects, fixed effects, and pooled OLS procedures, the issue of measurement errors, specification bias, and endogeneity persists. To overcome these challenges, the generalised method of moments (GMM) is more appropriate and discussed in section 4.8.2. Section 4.8.1 discuss the principal component analysis (PCA).

4.8.1 Principal component analysis

A principal component analysis (PCA) is a mathematical and statistical method for turning a set of possibly associated variables into linearly unrelated variables known as principal components (Lenka, 2015). According to the PCA procedure, the principal components should be equal to or less than one (Enache & Hussainey, 2020). We applied PCA to generate a composite index of corporate governance. It was necessary to employ the method since there is no consensus in the literature about the single most appropriate variable to measure corporate governance (Swedan & Ahmed,

2019). Based on the variables identified for the financial institutions, PCA was applied to develop a composite index of corporate governance.

The reason for using PCA is that using individual variables may not be sufficient to capture and adequately reflect the corporate governance status of financial institutions when used independently (Alam & Sattar, 2019; Festić, Črepinko & Bratina, 2020; Satheesh, Rohini & Sivaram, 2022). To implement PCA, the eigen values of the variance matrix must be computed. Several mutually independent principal components are used to summarise the variables of interest, where each principal becomes the weighted average of the underlying variables (Bro & Smilde, 2014; Tharwat, 2016). When PCA was used to construct a composite index, the weighted index values were determined by correlations between the individual corporate governance measures, namely, board size, non-executive directors, independent non-executive directors, board remuneration, board diversity, and transparency and disclosure. Therefore, the study used the PCA of combining the six corporate governance measures into a single index.

For each set of variables, the first principal component contains the maximum variance and is always a linear combination of unit-length variables. However, the variables are uncorrelated if more than one principal component is generated. After the first principal component is derived, all the subsequent principal components are orthogonal to the prior component and capture the different aspects of the data under consideration by maximising the variance among the unit-length linear combination (Johnson & Wichern, 1992; Huang, 2005). Accordingly, this study uses the first principal component measures of corporate governance in accordance with the purpose of the study and the literature.

This study employed PCA to establish an appropriate composite index for corporate governance in selected financial institutions using the following equation:

$$f_j = wj_1x_1 + wj_2x_2 + wj_3x_3 + \ldots + wj_px_p \qquad \text{Equation: 3}$$

where:

f_j = estimate of the jth factor

w_j = weight on factor score coefficient

x_j= variable of interest

p = number of variables.

4.8.2 Generalised method of moments (GMM)

To address the problems of specification errors and endogeneity associated with panel data, the GMM is adopted in *lieu* of OLS (Holtz-Eakin, Newey & Rosen, 1988; Arellano & Bover, 1995; Gujarati & Porter, 2009; Arellano & Bond, 1991).

Sources of persistence throughout the chosen time are agitating the dynamic panel data model. Individual effects indicate heterogeneity and autocorrelation since the regressors' lagged dependent variables are present. Therefore, the effects render estimation with generalised least squares or ordinary least squares inefficient and biased. However, several ways have been identified to mitigate the heterogeneity and autocorrelation problem. Anderson and Hsiao (1982) advocate differencing to eliminate individual effects. Additionally, the instrument will not be correlated with the error term if the differencing is not serially correlated. However, it is not an efficient estimate of the parameters in the model, even though it leads to its consistency.

Arellano and Bond (1991) propose a generalised method of moments procedure that is more efficient than the estimator by Anderson and Hsiao (1982). An additional instrument can be procured in a dynamic panel model if one utilises the orthogonality conditions that exist between lagged dependent variables and the disturbance term.

The model is estimated as specified below:

$$Y_{it} = \alpha Y_{it-1} + \beta X_{i\,t-1} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 4}$$

where:

Y = the adopted corporate governance proxies.

X = a matrix of explanatory variables (apart from lagged corporate governance variable).

The subscripts *i* and *t* represent the institution and the time period, respectively.

μ = an unobserved institution's specific effect.

The nature of $\varepsilon_{it} = u_i + u_{it}$.

ε = the error term.

Taking the first differences from equation 4, yields equation 5 which is expressed as follows:

$$\Delta Y_{it} = (\alpha\text{-}1)\ \Delta Y_{it\text{-}1} + \beta \Delta X_{i\ t\text{-}1} + \Delta \varepsilon_{it} \qquad \text{Equation: 5}$$

The difference GMM estimator has possible problems of omitted variable bias, individual-specific heteroskedasticity, and autocorrelation in the model. Since the error term is now a component of both variables, the dependent variable in equation 5 is correlated with the differenced error term.

The model maintained the correlation problem between the error term and lagged dependent variable since it is still based on the first differencing of the data (Seven & Coskun, 2016). Hence, the estimates are illogical. The dynamic panel data model is significant and suited for the study, which is supported by Batuo, Mlambo, and Asongu (2018) in addressing these issues. The selection of system GMM is recommended by Arellano and Bond (1991), Ogaki (1993), and Blundell and Bond (1998), where the system is validated by performing specification tests. Testing the reliability of the instruments is done using the Sargan and Hansen tests (Arellano & Bover, 1995). The model is specified as follows:

$$Y_{it} = \alpha Y_{it\text{-}1} + \beta X_{i\ t\text{-}1} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 6}$$

where:

Y_{it} = the dependent variable of institution *i* for time *t*.

$Y_{it\text{-}1}$ = the lagged dependent variable.

X= the vector of the explanatory variables.

μ_i = the time-invariant institution's specific effect

ε_{it} = the disturbance term.

To estimate equation 6 using panel data, the researcher used the Hausman test to determine whether the random effects or fixed effects model was appropriate for the study. The Hausman test was performed to decide between random effect and fixed effect models (Hausman & Taylor, 1981). When explanatory variables are used in the model, the random effect hypothesis assumes that differences between institutions are random and uncorrelated (Gunst & Mason, 2018). The supremacy of the random effects model (REM) is that it provides the estimates of all coefficients. However, the estimates are inconsistent when the fixed model is inappropriate. The fixed effect model (FEM) allows for correlation with explanatory variables while presuming that each unique specific effect is a fixed variable (Baltagi, 2008; Gujarati, 2021).

The general system GMM is therefore specified as follows:

$$\mathrm{GOVINDEX_{it}} = \alpha\mathrm{GOVINDEX_{it\text{-}1}} + \beta_1\mathrm{FINPERF_{it}} + \beta_2\mathrm{FINSTAB_{it}} + \sum_{n=1}^{i} \mathrm{bX_{i\,t}} + \mu_i + \varepsilon_{it}$$

Equation: 7

where:

$\mathrm{GOVINDEX_{it}}$ = the corporate governance proxies as captured in this study, namely board size (BS), board remuneration (BR), board diversity (BD), and board composition (BC) for institution *i* at time period *t.* GOVINDEX is a composite index constructed using the PCA.

$\mathrm{GOVINDEX_{it\text{-}1}}$ = the first lagged dependent variable for *it-1.*

X_{it} = the vector of explanatory variables.

$\mathrm{FINPERF_{it}}$ = financial performance proxies captured as return on assets (ROA) and return on equity (ROE).

$\mathrm{FINSTAB_{it}}$ = Financial stability

μ_i = the time-invariant institution's specific effects

ε_{it}.= the error term

The respective corporate governance proxies, namely, Board diversity (BD), Board remuneration (BR), Board composition (BC), and Board size (BS), will individually be tested using the equations below. The general system GMM model for each of these varianles is therefore specified as follows:

$$\mathrm{BD_{it}} = \alpha \mathrm{BD_{it\text{-}1}} + \beta_1 \mathrm{FINPERF_{it}} + \beta_2 \mathrm{FINSTAB_{it}} + \sum_{n=1}^{i} \mathrm{bX_{i\,t}} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 8}$$

$$\mathrm{BR_{it}} = \alpha \mathrm{BR_{it\text{-}1}} + \beta_1 \mathrm{FINPERF_{it}} + \beta_2 \mathrm{FINSTAB_{it}} + \sum_{n=1}^{i} \mathrm{bX_{i\,t}} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 9}$$

$$\mathrm{BC_{it}} = \alpha \mathrm{BC_{it\text{-}1}} + \beta_1 \mathrm{FINPERF_{it}} + \beta_2 \mathrm{FINSTAB_{it}} + \sum_{n=1}^{i} \mathrm{bX_{i\,t}} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 10}$$

$$\mathrm{BS_{it}} = \alpha \mathrm{BS_{it\text{-}1}} + \beta_1 \mathrm{FINPERF_{it}} + \beta_2 \mathrm{FINSTAB_{it}} + \sum_{n=1}^{i} \mathrm{bX_{i\,t}} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 11}$$

GMM models are relatively effortless to estimate if the cross-section dimension is greater than the time series dimension, and when the cross-section dimension is smaller than the time series dimension, it will most likely yield biased estimates (Roodman, 2012; Gujarati, 2021). Samargandi *et al*. (2015) found that when the slope coefficient of the lagged dependent variable is heterogeneous, the assumption of homogeneity can lead to inconsistent long-run estimates. The results are supported by earlier findings by (Pesaran & Smith, 1995; Pesaran, 1997).

Heteroskedasticity refers to the non-constant variances related to the error term in the model. This is an indication of significant variability in the model poses a problem. This study used the Chi-square test and the F-test. If the P-value is more than 0.05, then there is no heteroskedasticity. If the P-value is less than 0.05, then heteroskedasticity is present. However, the generalised least squares method is known to be robust to heteroskedasticity (Gujarati & Porter, 2009). Consequently, the panel autoregressive distributed lags discussed in the following section are performed for dynamic panel analysis to examine the association between corporate governance and financial performance.

4.8.3 Panel autoregressive distributed lags

The study seeks to assess the cointegrating relationship between the selected variables by applying ARDL bounds testing, the approach followed by Pesaran and Smith (1995) and Pesaran, Shin and Smith (2001). The estimation is appropriate in studies where the cross-sectional dimension is equal to 1, which implies a single time series study (Pesaran *et al*., 2001). However, when the time series dimension is greater than 1 and the cross-section dimension is greater than 1, then panel autoregressive distributed lag is a favourable method of estimations. Panel ARDL aims to determine the long-run cointegrating relationship between corporate governance and financial variables. According to Pesaran *et al*. (2001), the advantage of ARDL is that it considers both the short-run and long-run effects of variables in the specified model. Additionally, it may be used with smaller samples and predicts long-run relationships using the short-run parameters.

When using the ARDL bounds testing approach to estimate the F- statistic, vector autoregressive (VAR) is required to determine the optimal lag lengths. Bayesian information criterion (BIC) and Akaike information criterion (AIC) may be used. However, the lag length is selected utilising the smallest values of BIC and AIC. There is a prerequisite to establishing whether the mean group (MG) or pooled mean group (PMG) or dynamic fixed effect (DFE) can be utilised in panel ARDL estimation (Pesaran, Shin and Smith, 1999). The mean group is a relatively incompatible and inappropriate estimator when the cross-section or time series dimension is small (Pesaran *et al*., 1999). Furthermore, it is not possible to assume that the parameters will be homogeneous in the long-run. Therefore, Hausman tests are performed to examine the appropriate method between the pooled mean group, the mean group and the fixed dynamic effect (Hausman, 1978).

According to Pesaran *et al*. (1999), the difference between the MG and PMG methods is that mean group estimators require a separate equation for each cross-sectional dimension, and the model's parameters are averaged to create reliable estimators. The pooled mean group captures the institution’s heterogeneity in the short-run coefficients, error variances, and the speeds of adjustment to the long-run variables (Pesaran *et al*., 1999). The DFE presupposes that long-run coefficients are constant throughout the sample.

The unrestricted panel ARDL is specified below:

$$GOV_{it} = \varphi_0 + \sum_{k=1}^{p} \delta_{it} GOV_{i,\,t-1} + \sum_{i=0}^{q} \delta_{2t} X_{i,t-1} + \mu_i + \varepsilon_{it} \quad \text{Equation: 12}$$

where:

GOV is the dependent variable captured in this study as board size (BS), board remuneration (BR), board diversity (BD), and board composition (BC). The corporate governance (GOV) proxies are regressed individually. k is the selected financial institution, with lag lengths p and q, respectively. $X_{i,\,t-1}$ is the (k×1) vector of the explanatory variables for group i. μ_i is the fixed effect. ε_{it} is the error term.

The equations below are re-parameterised to the specifics of the current study.

$$GOV_{it} = \beta_0 + \beta_{1i} GOV_{i,t-1} + \beta_{2i} FINPERF_{i,t-1} + \beta_{4i} FINSTAB_{i,t-1} + \sum_{i=0}^{n} \delta \Delta GOV_{i,t-1} + \sum_{i=0}^{n} \delta_{2t} \Delta FINPERF_{i,t-1} + \sum_{i=0}^{n} \delta_{4t} \Delta FINSTAB_{i,t-1} + \varepsilon_{it} \quad \text{Equation: 13}$$

$$FINPERF_{it} = \beta_0 + \beta_{1i} FINPERF_{i,t-1} + \beta_{2i} GOV_{i,t-1} + \beta_{4i} FINSTAB_{i,t-1} + \sum_{i=0}^{n} \lambda_{1t} \Delta FINPERF_{i,t-1} + \sum_{i=0}^{n} \delta_{2t} \Delta GOV_{i,t-1} + \sum_{i=0}^{n} \delta_{4t} \Delta FINSTAB_{i,t-1} + \varepsilon_{it} \quad \text{Equation: 14}$$

$$FINSTAB_{it} = \beta_0 + \beta_{1i} FINSTAB_{i,t-1} + \beta_{2i} GOV_{i,t-1} + \beta_{4i} FINPERF_{i,t-1} + \sum_{i=0}^{n} \lambda_{1t} \Delta FINSTAB_{i,t-1} + \sum_{i=0}^{n} \lambda_{2t} \Delta GOV_{i,t-1} + \sum_{i=0}^{n} \lambda_{4t} \Delta FINPERF_{i,t-1} + \varepsilon_{it} \quad \text{Equation: 15}$$

where:

GOV is the corporate governance proxy, namely, board size (BS), board remuneration (BR), board diversity (BD) and board composition (BC) regressed individually. The proxies are regressed individually for corporate governance (GOV). FINPERF is the financial performance proxies, which are return on asset (ROA) and Return on Equity (ROE). β is the long-run coefficient of the independent variables. Financial stability is FINSTAB. The short-run coefficients are φ, δ, γ, λ, Θ. The Akaike information criterion is applied to select the lag order (p, q). *t-1* represents the long-run and short-run relationships tested with the differenced variable and the lagged variable of the ARDL. The error term with the *i* of the institution and time period *t* is ε_{it}.

4.8.4 Error correction model

Once the long-run relationship between corporate governance and financial performance has been established, the study uses the vector error correction model to determine the short-run effects (Apergis & Payne, 2010). Engle and Yoo (1987), Phillips (1991), and Hoffman and Rasche (1996) argue that the error correction model provides the advantages of incorporating cointegrations and capturing the short-run effect of variables being analysed. However, vector error correction is carried out using the ECM if there is no cointegration. Nevertheless, the error correction model is computed in panel ARDL. The ARDL framework's tri-variate ECM was used to investigate the causality relationship between each of the corporate governance proxies and the selected financial variables, namely, (financial stability, risk appetite, and financial performance). The Granger causality test was not performed in this study; instead, the ECM was used to assess the causality relationship between the variables of interest. This study inferred three types of causal relationships: short-run, long-run, and strong/joint causality. The coefficients' statistical significance determines the causality relationship between the variables, while the relevant error term's statistical significance demonstrates the strong/joint causal relationship of variables. The ARDL and ECM equations are presented individually for ease of reference and approach clarity, although in Stata, they are estimated using a single equation.

The generic error correction model is therefore specified below:

$$\Delta GOV_{i,t} = \alpha_{0,t} + \sum_{j=1}^{p} \beta_j \Delta GOV_{i,t-j} + \sum_{j=0}^{q} \phi_{i,j} \Delta X_{i,t-1} + \varphi_{1i} ECT_{i,\,t-1} + \omega_{it} \qquad \text{Equation: 16}$$

where:

Δ = the first difference operator.

GOV = each of the corporate governance proxies, board size (BS), board remuneration (BR), board diversity (BD), and board composition (BC) are regressed individually.

β, ϕ = the short-run coefficients.

X = the vector of the independent variable.

ECT = the error correction term.

φ = the speed of adjustments to the long-run equilibrium.

α = the constant.

(p, q) = the lagged length selected using the AIC.

ω = the error term, which assumes a normal distribution with constant variance and zero mean.

In the ECM equations, upon a shock in the short-run, the ECT coefficients describe the speed of adjustments of the system to the long-run equilibrium. Bildirici and Kayıkçı (2013) state that the ECT's coefficient should be statistically significant and negative to demonstrate how the variables converge to the equilibrium level.

The equations are specified as follows:

$$\Delta GOV_{it} = \alpha_0 + \sum_{k=1}^{q} \beta_{1i}\Delta GOV_{i,t-1} + \sum_{k=1}^{q} \beta_{2i}\Delta FINPERF_{i,t-1} + \sum_{k=1}^{q} \beta_{3i}\Delta FINSTAB_{i,t-1} + \phi_{1i}ECT_{i,t-1} + \varepsilon_{1t} \quad \text{Equation: 17}$$

$$\Delta FINPERF_{it} = \alpha_0 + \sum_{k=1}^{q} \beta_{1i}\Delta FINPERF_{i,t-1} + \sum_{k=1}^{q} \beta_{2i}\Delta GOV_{i,t-1} + \sum_{k=1}^{q} \beta_{3i}\Delta FINSTAB_{i,t-1} + \phi_{2i}ECT_{i,t-1} + \varepsilon_{2t} \quad \text{Equation: 18}$$

$$\Delta FINSTAB_{it} = \alpha_0 + \sum_{k=1}^{q} \beta_{1i}\Delta FINSTAB_{i,t-1} + \sum_{k=1}^{q} \beta_{2i}\Delta GOV_{i,t-1} + \sum_{k=1}^{q} \beta_{3i}\Delta FINPERF_{i,t-1} + \phi_{3i}ECT_{i,t-1} + \varepsilon_{3t} \quad \text{Equation: 19}$$

where:

GOV = the corporate governance proxies are board size (BS), board remuneration (BR), board diversity (BD), and board composition (BC). The proxies are regressed individually for GOV.

FINPERF = the financial performance proxies, which are return on asset (ROA) and return on equity (ROE).

FINSTAB = financial stability.

Φ, λ, φ, = the speeds of adjustment to the long-run equilibrium.

α = the constant.

β = coefficients in the short-run.

We used the GOVINDEX as a measure of the corporate governance index. Equations 20 to 22 are a system of equations for the vector error correlation between corporate governance measured by GOVINDEX (BS, BC, BC, BR, BD) and the financial variables (financial performance and financial stability). The equations are specified as follows:

$$\Delta \mathrm{GOVINDEX}_{it} = \alpha_0 + \sum_{k=1}^{q} \beta_{1i} \Delta \mathrm{GOVINDEX}_{i,t-1} + \sum_{k=1}^{q} \beta_{2i} \Delta \mathrm{FINPERF}_{i,t-1} + \sum_{k=1}^{q} \beta_{3i} \Delta \mathrm{FINSTAB}_{i,t-1} + \phi_{1i} \mathrm{ECT}_{i,\,t-1} + \varepsilon_{1t} \quad \text{Equation: 20}$$

$$\Delta \mathrm{FINPERF}_{it} = \alpha_0 + \sum_{k=1}^{q} \beta_{1i} \Delta \mathrm{FINPERF}_{i,t-1} + \sum_{k=1}^{q} \beta_{2i} \Delta \mathrm{GOVINDEX}_{i,t-1} + \sum_{k=1}^{q} \beta_{3i} \Delta \mathrm{FINSTAB}_{i,t-1} + \phi_{2i} \mathrm{ECT}_{i,\,t-1} + \varepsilon_{2t} \quad \text{Equation: 21}$$

$$\Delta \mathrm{FINSTAB}_{it} = \alpha_0 + \sum_{k=1}^{q} \beta_{1i} \Delta \mathrm{FINSTAB}_{i,t-1} + \sum_{k=1}^{q} \beta_{2i} \Delta \mathrm{GOVINDEX}_{i,t-1} + \sum_{k=1}^{q} \beta_{3i} \Delta \mathrm{FINPERF}_{i,t-1} + \phi_{3i} \mathrm{ECT}_{i,\,t-1} + \varepsilon_{3t} \quad \text{Equation: 22}$$

where:

GOVINDEX = represents the corporate governance proxies; board size (BS), board remuneration (BR), board diversity (BD) and board composition (BC). GOVINDEX is a PCA composite index from the four individual proxies.

FINPERF = the financial performance proxies, which are return on asset (ROA) and return on equity (ROE).

FINSTAB = financial stability.

φ, ϕ, λ = speeds of adjustment to the long-run equilibrium.

α = the constant.

β = coefficients in the short-run.

4.9 Chapter summary

The chapter explained the empirical framework that guided the study. Methodology and research design were also clarified in the chapter. It is primarily intended for econometric models to serve as the foundation for empirical research on the relationship between corporate governance proxies, financial performance, and financial stability. Estimation models are thoroughly explained to test the relationship between corporate governance and the selected regressors. The ordinary least squares method was initially selected to examine the relationship between corporate governance and financial performance. The approach, however, had a significant estimating bias in the panel data sets.

Therefore, the GMM method was considered. The Hausman test will be performed to determine if the model had random or fixed effects. Advanced econometric estimation techniques will be performed to determine the long-run relationship between corporate governance and financial performance. Such an estimation technique was panel ARDL. Tests such as PMG and MG will be used within the panel ARDL.

This study employed the ECM to ascertain the short-run relationships. However, it was employed only where there was cointegration after the ARDL estimation. The ARDL and ECM equations are presented individually for ease of reference and approach clarity, although in Stata, they are estimated using a single equation. The study also looked at the statistical significance of the short-run and long-run coefficients and the importance of the ECT in investigating the causal relationship between corporate governance and its determinants.

The following chapter provides the presentation of data, analysis, and discussion of empirical results.

CHAPTER 5: PRESENTATION OF DATA, ANALYSIS, AND DISCUSSION OF EMPIRICAL RESULTS

5.1 Introduction

The previous chapter presented the methodology followed in the study. This chapter presents the results of applying the research techniques discussed in the methodology chapter (Chapter 4). ARDL and GMM models were employed to empirically test the key determinants of corporate governance and the cointegrating relationships. Furthermore, this chapter reports and discusses the causal relationships between corporate governance and financial performance. Dynamic panel data models were used to perform statistical analysis therefore, the results discussed are for the dynamic panel model.

In chronological order as per the stated research objectives and hypotheses:

I. Identify the key determinants of corporate governance in selected financial institutions.
II. Assess the long-run (cointegrating) relationship between corporate governance and financial performance in selected financial institutions.
III. To examine the causal relationship between corporate governance and financial performance in selected financial institutions.

The following were the research hypotheses the study sought to address:

I. There is no relationship between corporate governance and financial performance.
II. There is no long-run (cointegrating) relationship between corporate governance and financial performance.
III. There is no causal relationship between corporate governance and financial performance.

This study employed system GMM to identify the key determinants of corporate governance and ARDL to assess the cointegrating relationship between corporate governance and financial performance. After that, we employed ECM to assess the short-run relationship between financial performance and corporate governance

variables. The study employed PMG and DFE approaches within the ARDL framework where short-run and long-run relationships were jointly estimated. The statistical significance of the short-run and long-run coefficients and the ECT were used to infer the causality relationship between chosen variables. This approach is suitable where long-run causality is inferred by the significance of the long-run coefficients, while the significance of the short-run coefficients infers short-run causality.

The rest of the chapter is organised as follows: section 5.2 presents the principal component analysis (PCA) results. Section 5.3 presents the data, descriptive, and correlation matrix. Section 5.4 presents the unit root tests. Section 5.5 presents the econometric model estimation results, discussions, and analysis. Section 5.6 presents the summary of the chapter.

5.2 Principal component analysis (PCA) results

For the sample of 21 financial institutions included in this study, the PCA technique was employed to create a single composite index of corporate governance. The composite index consisted of data covering the period from 2007 to 2020. We developed the corporate governance index for the selected financial institutions using the variables, namely, board size, independent non-executive directors, non-executive directors, board remuneration, board diversity, and transparency and disclosure. Table 5.1 provides the computed eigen values used to create the composite index using PCA.

Table 5.1: PCA for a composite index.

Eigen values: (Sum = 6, Average = 1)

Component	Eigen Value	Difference	Proportion	Cumulative Value	Cumulative Proportion
01	1.858412	0.633229	0.3097	1.858412	0.3097
02	1.225184	0.163204	0.2042	3.083596	0.5139
03	1.061980	0.062763	0.1770	4.145576	0.6909
04	0.999217	0.356932	0.1665	5.144793	0.8575
05	0.642285	0.429363	0.1070	5.787078	0.9645
06	0.212922	---	0.0355	6.000000	1.0000

Source: Author's own composition

A composite index was created as an independent variable to ascertain the association between financial performance and corporate governance in financial institutions. Furthermore, the index was constructed to reduce multicollinearity and parameterisation. Additionally, PCA was used to shrink the data to its smaller dimensions while still keeping the data's original content (Gries, 2009).

The eigen value of the first component is 1,858412, which accounts for 30.97% of the maximum variance. The second component has a value of 1.225184, accounting for 20.42% of the maximum variance. The third component has a value of 1.061980 and accounts for 17.70% of the maximum variance. The fourth component has a value of 0.999217, accounting for 16.65% of the maximum variance. The fifth component has a value of 0.643385, accounting for 10.70% of the maximum value. The last component has a value of 0.212922, accounting for 3.55% of the maximum variance. Therefore, the components have sufficient information, as reflected by their Eigen values above. Table 5.2 present the PCA eigen vectors.

Table 5.2: Principal component analysis: (Eigen Vectors)

Variable	PC 01	PC 02	PC 03	PC 04	PC 05	PC 06
BS	0.668034	-0.177008	-0.143301	-0.061849	-0.036940	0.704750
NED	0.662366	-0.200141	-0.150689	0.082177	0.006320	-0.701224
INED	0.236472	0.661019	0.284129	-0.071830	-0.647763	-0.040611
BR	-0.022959	0.155192	-0.229402	0.953907	-0.062341	0.094543
BD	0.206138	0.056765	0.826878	0.222168	0.469289	0.031087
TD	0.126737	0.681439	-0.373732	-0.158004	0.595718	-0.007615

Note: PC= principal component; BS= board size; NED= non-executive directors, INED= independent non-executive directors, BR= board remuneration, BD= board diversity, and TD= transparency and disclosure.

Source: Author’s own composition

Based on Table 5.2, the coefficients indicate the influence level of a variable on the other variables in the principal components. A positive component indicates a higher influential variable, and a negative component indicates the least influence on other variables. The maximum weight in principal component 01 is board size (BS), suggesting a stronger influence of this variable in these components. In principal component 02, Transparency and disclosure (TD) make the largest contribution, while Board diversity (BD) has the strongest influence in principal component 03. Principal component 04, board remuneration (BR), showed a stronger influence on other

variables, while board size (BS) had the strongest influence on principal component 06.

5.3 Data, descriptive statistics and correlation matrix

This section provides the data, descriptive statistics and correlation matrix results.

5.3.1 Data

The data used in this research were acquired from the financial institution's annual reports. The data used consisted of 21 financial institutions (banks and insurance companies). The names are outlined in Appendix A, and there were observations from 2007 to 2020.

5.3.2 Descriptive statistics

This section presents the statistical summary of the variables used in estimating the sample. Table 5.3 presents the descriptive statistics of the sample.

Table 5.3: Summary of descriptive statistics

Variables	Mean	Maximum	Minimum	Std. Dev.	Obs
GOVINDEX	0,0048	3,8398	-3,0215	1,3657	291
BD	16,6301	76,9000	0,0000	13,9889	291
BR	178 000 000	32 800 000 000	18 817 000	1 940 000 000	291
NED	9,5842	22,0000	3,0000	3,8105	291
INED	72,2787	100,0000	0,0000	22,9755	291
TD	0,7457	1,0000	0,0000	0,4362	291
BS	12,5086	25,0000	6,0000	4,2842	291
LEV	66,9364	99,4900	0,0000	32,8780	291
ROA	4,4525	69,9500	-18,8100	7,5174	291
ROE	16,0334	96,7400	-38,0600	13,9657	291
FINSTAB	16,8581	80,4755	-5,3882	11,8323	291
CAR	33,5740	172,8800	0,5100	33,8864	291
ER	49,6387	127,6300	-91,9900	30,2657	291
FS	23,3842	27,6100	19,4200	2,3638	291
G	17,4532	475,8500	-98,4100	49,5962	291

Note: Obs = number of observations, GOVINDEX= corporate governance index (composite index), BD= board diversity, BR= board remuneration, NED= non-executive directors, INED, independent non-executive directors, TD= transparency and disclosure, BS= board size, LEV= leverage ratio, ROA=

return on assets, ROE= return on equity, FINSTAB= financial stability, CAR= capital adequacy ratio, ER= efficiency ratio, FS= firm size, and G= growth prospects.

Source: Author's own composition

The data had 291 observations for variables with a full data set for 2007 to 2020. The study used 21 JSE listed and unlisted Sout African banks and insurance companies. The maximum of GOVINDEX, as illustrated in Table 5.3, is at 3.8398 and a minimum of -3.0215. The GOVINDEX in the study had a very low value of -3.021. The standard deviation was 1.3657. A low GOVINDEX implies that financial institutions did not have sound corporate governance in place.

Board diversity (BD) was measured by the percentage of women in the institution's board. The average for BD was 16.63 percent, with a standard deviation of 1.3657. This figure is unfavourably low, considering the move towards gender equality on the board that has gained momentum in recent years. From the South African context, board representation by women was tabled in 2013 in parliament to have a target of 50%. However, the bill failed in its implementation. BD had a maximum of 76.90 percent representation and a minimum of 0 percent. The maximum value indicates an institution with a high percentage of female members on the board. However, the results also indicate some institutions with zero representation of the female gender.

The remuneration of the board members had an average of R178 million. The amount represents the average among the selected financial institutions. The amount indicates that most board members were highly compensated in their institutions. The table indicates that the maximum value is R32.8 billion for financial institutions. High board remuneration implies that financial institutions compensate their board members exceptionally well compared to other institutions.

Non-executive directors (NED) are individuals employed by an institution's board of directors. However, they are external to the executive employees. The mean for non-executive directors was 9.5842, with a standard deviation of 3.8105. The results indicated a minimum of three NED and a maximum of 22 NED. The maximum number implies that some institutions had more NED than others. The average of financial institutions indicated a high representation of NED on their boards. The results are

supported by the literature and the King IV report that institutions should have non-executive directors (Pfeffer, 1972; Jensen, 1993).

The independent non-executive directors (INED) were 72.2787 percent, with a standard deviation of 22.9755. The descriptive results showed a high representation of INED in the institutions. The selected financial institutions have a minimum of 0.000 and a maximum of 100 percent. The 100 percent indicates the highest percentage of independence amongst the board. However, 0 percent indicated institutions without independent board members. The minimum is not consistent with the resource dependence and agency theories (Jensen, 1993; Hillman & Dalziel, 2003; Badu & Appiah, 2017). King IV report (2016) recommends most independent non-executive directors in firms.

The mean for Transparency and disclosure is 0.7457, with a standard deviation of 0.4362. The descriptive statistics indicated a maximum of 1.0000 and a minimum of 0.0000. The minimum indicated that the institution did not disclose all the required information. Therefore, it was not transparent to external stakeholders. The maximum value indicates that the financial institution disclosed all the required information. Corporate disclosure reduces information asymmetry between stakeholders and institutions (Abdullah *et al*., 2015).

The mean for Board size was 12.5086, with a standard deviation of 4.2842. According to Jensen (1993), a board size above nine is considered large, and a board size below seven is considered small. The average of 12.5086 is favourably high, considering the maximum and minimum values, the maximum value was 25 board members, and the minimum was six board members. The average complied with the resource dependence theory suggestions (Pfeffer, 1972). As expected, the financial institutions had more board members because they had more board committees than any other industry.

The leverage ratio is a financial instrument employed to assess an institution's ability to meet its financial obligations as they become due (Okoye, 2019). Therefore, it is considered optimal for financial institutions to have a higher leverage ratio because it signifies that the institution has higher capital. The descriptive statistics indicated an average of 66.9364 among the institutions, with a maximum of 99.4900 and 0.0000,

respectively. The standard deviation was 32.8780. The high leverage ratio implies that financial institutions had more capital reserves and were better positioned to withstand financial crises.

Return on assets (ROA) measures an institution's financial performance. It measures the effectiveness and efficiency of an institution's operations and utilisation of its assets to generate profits (Ross *et al*. 1998). The mean for ROA was 4.4525, with a standard deviation of 7.5174. A high ROA means that an institution is more efficient and productive in generating profits. According to Muhammad, Suluki and Nugraheni (2020), an ROA increase indicates that banks manage their financing to gain profit efficiently. The institutions had a maximum ROA of 69.9500, with a minimum ROA of -8.8100. A low ROA indicates that an institution is not efficient and productive in using its assets to generate profits (Zimon, Appolloni, Tarighi, SHahmohammadi & Daneshpou, 2021).

According to Pointer and Khoi (2019), return on equity (ROE) is a crucial indicator of a financial institution's performance. It is the percentage of net income to shareholders equity. A high percentage of ROE indicates that an institution effectively uses the shareholder's equity to generate profits (Sukmawardini & Ardiansari, 2018). According to the descriptive statistics presented in Table 5.3, the average ROE was 16.0334, with a standard deviation of 13.9657. The institutions had a minimum value of -38.0600 and a maximum value of 96.7400. A financial institution that incurred a loss will have a negative ROE. The minimum value indicates the institutions that had a loss on their financial statements.

Financial stability measures the financial soundness of the institution. According to Akhter and Daily (2009), stability in financial institutions is typically an unanticipated consequence of increased intermediation. The study measures financial stability with the Z-score. The mean of financial stability of the sampled companies was 16.8581, with a standard deviation of 11.8323. Financial stability had a maximum of 80.4755, with a minimum of -5.3882. A high value of financial stability indicates the stability of financial institutions, and it represents a low risk of financial insolvency (Hersugondo, Anjani & Pamungkas, 2021). The financial sector can deploy resources effectively and absorb shocks to the economy because of its stability (World Bank, 2016).

The capital adequacy ratio (CAR) was measured as a capitalisation ratio consisting of total equity to total assets. It is shown as a proportion of the risk-weighted credit exposures of the institution. It is a measure of how much capital an institution has. A financial institution should have enough capital reserves to handle unforeseen losses (Chineme and Nwadialo 2018). The descriptive results showed that institutions have an average CAR of 3.5740 with a standard deviation of 33.8864. The maximum value of (CAR) is very high, at 172.8800 and the minimum CAR is 0.5100. A high capital adequacy ratio is outstanding because the institution will be in a better position to handle unexpected losses (Gambetta *et al*., 2017).

The descriptive statistics of the efficiency ratio (ER) indicated a mean of 49.6387, with a standard deviation was 30.2657. The maximum ER of the institutions was 127.6300, and -91.9900 was the minimum (ER). If the efficiency increases, the institution's expenses are increasing or experience a revenue/net income decrease.

Firm size (FS) is crucial in ensuring the financial sector's stability. Therefore, the profitability and stability of financial institutions are crucial. Financial institutions play a pivotal role in allocating economic resources by assisting in channelling funds from depositors and investors in an economy (Ongore & Kusa, 2013). Financial institutions are, therefore, required to maintain strict financial ratio requirements. The average FS of the institutions was 23.3842. FS, as measured by the natural logarithm of total assets, has a maximum value of 27.6100 and a minimum value of 19.4200, with a standard deviation of 2.3638. The descriptive statistics showed that most institutions had a large firm size.

Growth rate prospects (G) are measured by the institution's annual growth rate of its total assets. The average growth prospect was 17.4532, which is relatively high, with a standard deviation of 49.5962. The descriptive statistics indicated a maximum of 475.85 percent with a minimum of -98.41 percent. The maximum number implied that an institution grew considerably high (quadrupled). However, the minimum or negative percentage (G) indicates a decrease/shrinkage of the institution. The institution did not experience growth prospects.

5.3.2 Correlation matrix

In this section, the results of the correlation statistics are presented and discussed accordingly. Table 5.4 presents the summary of the correlation results.

Table 5.4: Correlation matrix

	GOVINDEX	BD	BR	NED	INED	TD	BS	LEV	ROA	ROE	STAB	CA	ER	FS	G
GOVINDEX	1.000000														
BD	0.282144***	1.000000													
BR	-0.031700	-0.005439	1.000000												
NED	0.902727***	0.124746*	0.034138	1.000000											
INED	0.316648***	0.171534**	0.002850	0.075433	1.000000										
TD	0.175999**	-0.091934	0.041144	0.041969	0.261505***	1.000000									
BS	0.910830***	0.103020	-0.071249	0.777019***	0.114718	0.063908	1.000000								
LEV	0.216465**	-0.211047**	0.055080	0.350808***	-0.078935	-0.178292**	0.221455***	1.000000							
ROA	-0.056658	0.243330***	-0.027082	-0.182864**	0.008529	0.087439	-0.028832	-0.558020***	1.000000						
ROE	-0.071720	0.168550**	0.014101	-0.101368	-0.103021	0.016552	-0.063254	-0.154166**	0.605223***	1.000000					
FINSTAB	0.066937	-0.168843**	-0.084810	0.086997	0.033988	0.111028	0.065603	0.059712	-0.122218*	-0.163973**	1.000000				
CA	-0.224251***	0.202416***	-0.054727	-0.357999***	0.094581	0.181791**	-0.233764***	-0.967689***	0.532440***	0.132339*	-0.048927	1.000000			
ER	-0.059156	-0.228722***	-0.043674	0.061936	-0.154962**	-0.234227***	-0.014419	0.514434***	-0.378691***	-0.249308***	0.225860***	-0.494394***	1.000000		
FS	0.486139***	0.167668**	0.090707	0.454008***	0.245262***	-0.063346	0.418053***	0.506906***	-0.302410***	-0.228406***	0.122265*	-0.509563***	0.218922***	1.000000	
G	-0.036102	-0.078618	-0.015286	-0.047547	0.012568	0.063091	-0.019422	-0.035495	0.112412	0.053223	0.026122	0.036990	0.077584	0.112613	1.000000

(*), (**) and (***) indicate the 0.05, 0.01 and 0.001 significance levels, respectively.

Source: Owner's own composition

Board diversity (BD) positively correlated with GOVINDEX, and the result was statistically significant (0.282144) at 0.001. There was a strong association between BD and GOVINDEX. Non-executive directors (NED) variable was positively correlated with GOVINDEX. The evidence of the results indicated a high degree of correlation (0.902727) at 0.01. NED was also positively correlated with BD (0.124746) at 0.05.

Independent non-executive directors (INED) positively correlated with GOVINDEX (0.316648) and was statistically significant at 0.001. The evidence indicated a high association between the variables. INED was also positively correlated with BD (0.171534) at 0.01 significance. Transparency and disclosure (TD) positively correlated with GOVINDEX (0.175999) at 0.01, and a positive statistical significance was further established between TD and INED (0.261505) at 0.001.

The leverage ratio (LEV) was positively correlated with GOVINDEX, NED, and BS. The evidence from Table 5.4 indicates that GOVINDEX was correlated with LEV (0.216465) at 0.01 statistical significance, LEV and NED (0.350808) at 0.001 statistical significance, and LEV and BS (0.221455) at 0.001 statistical significance. The correlation between BD (-0.211047) and TD (-0.178292) was negative, evidenced by 0.01 statistical significance.

Return on assets (ROA) positively correlated with BD (0.243330) at 0.001 statistical significance. The correlations with NED (-0.182864) and LEV (-0.558020) were negative, evidenced by 0.01 and 0.001 statistical significance. Return on equity (ROE) positively correlated with BD (0.168550) and ROA (0.605223), at 0.01 and 0.001 statistical significance, respectively. The correlation between ROE and LEV was negative (-0.154166), evidenced by 0.01 statistical significance.

Financial stability (FINSTAB) negatively correlated with BD (-0.168843), ROA (-0.122218) and ROE (-0.163973). The variables were statistically significant at 0.01, 0.05, and 0.01, respectively. The capital adequacy ratio (CAR) was negatively correlated with GOVINDEX (-0.224251), NED (-0.357999), BS (-0.233764) and LEV (-0.967689). The results are evidenced by 0.001 statistical significance. However, CAR positively correlated with BD (0.202416), TD (0.181791), ROA (0.532440), and ROE (0.132339). The level of statistical significance of the variables was 0.05, 0.01, and 0.01.

The efficiency ratio (ER) was positively correlated with LEV (0.514434) and FINSTAB (0.225860). The coefficients were statistically significant at 0.001. The correlations between ER and BD (-0.228722), INED (-0.154962), TD (-0.234227), ROA (-0.378691), ROE (-0.249308), CA (-0.494394) were negative, and (BD, TD, ROA, ROE, CAR) were statistically significant at 0.001, while the correlation between ER and INED was statistically significant at 0.01.

Firm size (FS) positively correlated with GOVINDEX (0.486139), BD (0.167668), NED (0.454008), INED (0.245262), BS (0.418053), LEV (0.506906), FINSTAB (0.122265) and ER (0.218922). The level of statistical significance for GOVINDEX was 0.001. BS was 0.001, LEV was 0.001, FINSTAB was 0.05, and ER was 0.001. The correlation between FS and (ROA, ROE, and CAR) was negative and statistically significant at 0.001.

This study evaluates the variance inflation factors (VIFs) in addition to the correlation matrix to determine the degree of multicollinearity between each dependent variable and the independent variables. VIF scores were computed based on Allegrini and Greco's (2013) approach. Based on Chatterjee and Hadi's (2012) and Gujurati and Porter's (2009) guidelines, a score of 10 or more could indicate multicollinearity and cause problems in interpreting the results. The results in table 5.4 demonstrate that multicollinearity does not constitute a problem since all VIF values are significantly below the cut-off value of 10. Interestingly, BS and GOVINDEX have the highest correlation at 0.910830.

5.4 Unit root tests

Stationarity tests were applied to determine the order of integration of the variables for the purpose of regression analysis and cointegration analysis. The unit roots were used as a robustness measure to remove variables with a higher order of integration from the regression analysis, even though ARDL mostly cannot necessitate that variables are of the same integration order. The unit root selected depends on the strength of the test, as well as its significance level (Granger & Porter, 2009). The test's power can be used to describe the likelihood of dismissing a false null hypothesis. The study employed the following tests to determine the stationarity: the

Levin, Lin and Chu (LLC), Augmented Dickey-Fuller ADF-Fisher Chi-square, Im, Pesaran and Shin (IPS), and the Phillips-Perron PP-Fisher Chi-square. The alternative hypothesis that the panel does not contain a unit root is always accepted when the p-value is significant, rejecting the null hypothesis. The results of the LLC, ADF-Fisher Chi-square, IPS, and PP-Fisher Chi-square estimation techniques are presented in Table 5.5.

Table 5.5: Unit root tests

Variable	Individual effects	Individual effects, individual linear trends	None	Decision
Panel Unit Root Test using the LLC				
BD	350.252	366.032	-16.7479***	I(1)
BR	5.63153	7.53884	-11.8460***	I(1)
BS	-6.27251***	-4.61812***	-14.5591***	I(1)
INED	-2.05851*	-0.75946	-10.9957***	I(1)
NED	-6.40187***	-5.25326***	-14.6509***	I(1)
TD	-2.07934*	-3.65845***	-3.64086***	I(1)
FINSTAB	9.00096	7.02405	-14.3282***	I(1)
ROE	-12.6388***	-10.2274***	-18.5433***	I(1)
ROA	-2.24308**	1.16300	-14.5624***	I(1)
LEV	29.6923	34.9862	-11.8704***	I(1)
GOVINDEX	-8.52650***	-6.88067***	-15.0602***	I(1)
G	-4.62005***	-1.32074	-17.6375***	I(1)
FS	17.2169	16.6494	-7.00278***	I(1)
ER	-8.01250***	-7.71020***	-13.6462***	I(1)
CAR	-151.877***	-98.9562***	-155.605***	I(1)
Panel Unit Root Tests using IPS				
BD	-6.13390***	-4.08287***	-	I(1)
BR	-5.85990***	-3.71359***	-	I(1)

BS	-7.52902***	-4.88846***	-	I(1)
INED	-4.51318***	-1.72336*	-	I(1)
NED	-6.68488***	-3.95299***	-	I(1)
TD	-1.57106	-0.86707	-	I(1)
FINSTAB	-7.96881***	-5.85355***	-	I(1)
ROE	-9.53109***	-5.91768***	-	I(1)
ROA	-7.13337***	-4.23283***	-	I(1)
LEV	-4.18551***	-0.95582	-	I(1)
GOVINDEX	-7.21804***	-4.39384***	-	I(1)
G	-8.06480***	-4.73090***	-	I(1)
FS	-5.79213***	-4.97658***	-	I(1)
ER	-6.10491***	-3.98614***	-	I(1)
CAR	-29.7135	-18.0470***	-	I(1)

Panel Unit Root Testing using ADF – Fisher Chi-square

BD	101.711***	78.2546***	168.482***	I(1)
BR	110.102***	82.8669***	181.857***	I(1)
BS	131.057***	97.6413***	210.789***	I(1)
INED	89.7986***	59.9863***	155.190***	I(1)
NED	118.274***	82.5696***	205.607***	I(1)
TD	6.12068*	13.0011	11.7862**	I(1)
FINSTAB	131.909***	95.7898***	202.216***	I(1)
ROE	76.7206***	64.9057***	159.703***	I(1)
ROA	130.165***	96.2169***	229.287***	I(1)
LEV	84.9769***	50.6240	162.791***	I(1)
GOVINDEX	128.762***	91.9680***	205.479***	I(1)
G	146.047***	99.2992***	254.801***	I(1)
FS	107.739***	97.4556***	134.176***	I(1)
ER	117.665***	94.5710***	203.314***	I(1)
CAR	99.1064***	66.2363**	172.886***	I(1)

Panel unit root testing using PP - Fisher Chi-square

BD	230.775***	216.030***	280.386***	I(1)
BR	245.003***	239.193***	283.401***	I(1)
BS	255.603***	252.534***	316.856***	I(1)
INED	248.566***	220.048***	313218***	I(1)
NED	262.427***	233.602***	330.850***	I(1)
TD	112.8592**	36.4325***	19.2071***	I(1)
FINSTAB	238.538***	194.692***	297.169***	I(1)
ROE	271.060***	227.055***	342.782***	I(1)
ROA	265.935***	237.303***	328.545***	I(1)
LEV	218.179***	187.205	285.469***	I(1)
GOVINDEX	270.934***	261.267***	335.458***	I(1)
G	314.633***	294.936***	392.820***	I(1)
FS	238.704***	221.512***	265.431***	I(1)
ER	236.813***	239.697***	285.908***	I(1)
CAR	222.120***	192.468***	289.794***	I(1)

PP-F= Phillips Peron-Fisher Chi-Square; ADF- F= Augmented Dickey Fuller-Fisher Chi-Square; stat= statistics; prob= probability; *** 0.001; ** 0.01; * 0.05 significance levels. All tests show the initial difference (except indicated otherwise.) All test probabilities are based on the assumption of asymptotic normality, with the exception of Fisher tests, which are estimated by asymptotic Chi-square distributions. BD= board diversity, BR= board remuneration, BS= board size, INED= independent non-executive directors, NED= non-executive directors, TD= transparency and disclosure, FINSTB= financial stability, ROE= return on equity, ROA= Return on assets, LEV= leverage, GOVINDEX= corporate governance index, G= growth prospects, FS= firm size, ER= efficiency ratio and CA= capital adequacy.

Source: Author's own computation using Stata

The LLC was a common root test that was regarded as suitable for panel data, while the IPS, ADF, and PP were each individual root tests. According to the unit root test employed, the series under consideration were either I(1) or I(2). The estimation model may produce spurious results if variables are not considered in the first difference. However, the tests have rejected the null hypothesis. According to table 5.4, the unit root test applied to the variables under analysis is primarily of first-order

integration. The variables were stationary at the first difference I(1) and statistically significant at 0.001.

5.5 Econometric model estimation results, analysis and discussion

The study investigated the relationship between corporate governance and financial performance using dynamic panel data estimation model. To establish the relationship between corporate governance and financial performance, a panel system GMM was used. For this study, several equations were developed utilising various corporate governance proxies, including board size, board composition, board remuneration, and board diversity. To ascertain the short-run and long-run relationships between financial performance and corporate governance, panel ARDL is used. Sections 5.5.1 and 5.5.2 discussed the individual techniques and results.

5.5.1 System generalised method of moments (GMM)

The selected variables' endogeneity issue was best handled by the GMM as a favourable estimate technique (Roodman, 2012). GMM is the preferred system because it is additionally more resistant to autocorrelation and heteroskedasticity issues. According to Hansen (1983), in the absence of a heteroskedastic structure in the regression equation, the GMM approach produces an asymptotically unbiased estimation of the t-statistic. The GMM addressed these problems. Therefore, it was preferred to determine the key determinants of corporate governance in selected financial institutions.

The Hausman test determined that the fixed effect model is more acceptable while the random effect model is not appropriate. Therefore, the null hypothesis was rejected. As already discussed in the methodology chapter, the dynamic GMM model was estimated as follows:

$$Y_{it} = \alpha Y_{it-1} + \beta X_{i\,t-1} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 1}$$

The one-step and two-step system GMMs were both employed. However, only the two-step system GMM is described because it is more efficient and resilient than the one-step system GMM model (Blundell & Bond, 1998). According to the Hausman

tests, the random effects were rejected, indicating that fixed effects exist, and as a result, the system GMM model assumes that the panel has fixed effects. Therefore, the system GMM is the core technique for the study.

This study used numerous corporate governance proxies, which include the corporate governance index (GOVINDEX), board diversity, board composition, board remuneration, and board size. Dynamic panel estimations were carried out for all the corporate governance proxies. To ensure the reliability of the econometric model, the Sargan and Hansen statistics were used to diagnose the validity of the instruments (Sargan, 1958; Hansen, 1982). All models' validity could not be rejected when the Hansen statistics were applied. This is essential because it confirms that there is a (type ii) error estimate. The correlation performed by Arellano and Bond (1991) confirms the consistency of the model using the results of the first-order AR(1) and second-order AR(2). AR(1) and AR(2) results are reported in Tables 5.4 to 5.9. Therefore, it is anticipated that the models will be capable of having first-order AR(1) serial correlation. According to Roodman (2012), the second-order AR(2) insinuates that independent variables of the study are not correlated with future errors.

Roodman (2012) states that the number of groups should be more than the number of instruments. Consequently, a benchmark of 21 financial institutions was utilised to determine the number of instruments. Moreover, the lagged values of the independent variables were used as instruments in the GMM setup. To the researcher’s knowledge, there is no literature that offers recommendations for the cut-off values for the number of instruments that should be employed in GMM estimation. According to Ruud (2000), bias may occasionally be observed even in examples with few instruments. To ensure reliable results in response to changes in the set of instruments used to study the relationship between financial variables and corporate governance, several experiments with the GMM system were carried out using various estimation parameters.

We estimated the most effective model to determine the key determinants affecting corporate governance in the selected financial institutions. The fixed effects dynamic GMM model was used to specify the corporate governance index (GOVINDEX) as follows:

$$\mathrm{GOVINDEX_{it}} = \alpha\mathrm{GOVINDEX_{it\text{-}1}} + \beta_1\mathrm{FINPERF_{it}} + \beta_2\mathrm{FINSTAB_{it}} + \sum_{n=1}^{i}\beta X_{i\,t} + \mu_i + \varepsilon_{it}$$

Equation: 2

Table 5.6 presents the determinants of corporate governance in selected financial institutions. The validity of the instruments is also presented in the table. GOVINDEX tested against the independent variables of the selected financial institutions.

Table 5.6: Determinants of corporate governance in selected financial institutions

Variables	2-Step System GMM GOVINDEX	2-Step system GMM GOVINDEX
L.GOVINDEX	0.686***	0.580***
	(0.0399)	(0.0939)
FINSTAB	-0.0234**	-0.0901***
	(0.00655)	(0.00502)
ER	0.0105*	0.00298***
	(0.00441)	(0.000425)
CAR	1.902**	2.080***
	(0.658)	(0.134)
FS	0.0874*	-0.0785
	(0.0413)	(0.135)
LEV	1.906**	2.081***
	(0.660)	(0.134)
ROA	0.0501**	
	(0.0135)	
ROE		-0.00366
		(0.00321)
N	249	249
Number of instruments	17	20
Groups	21	21
AR(1)	-3.37	-3.09
AR(2)	1.74	1.79
Sargan test	11.79	36.46
Hansen test	9.62	16.63

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. Standard errors are in parentheses. L.GOVINDEX= lagged corporate governance index, FINSTAB= financial stability, ER= efficiency ratio, CAR= capital adequacy ratio, FS= firm size, LEV= leverage ratio, ROA= return on assets, and ROE= return on equity

This study expected corporate governance to be positively related to financial performance. Compatible with the expected results and prior empirical studies, the lagged corporate governance index is positively correlated with the corporate governance index at 0.001 statistical significance. Abobakr (2017), using a generalised least square model, found that the corporate governance index positively affected financial performance. Our findings are also supported by Arora and Bodhanwala (2018) and Benvenuto, Avram, Avram and Viola (2021), who found a significant positive relationship between the corporate governance index and firm performance matrix.

However, the results are inconsistent with Love and Rachinsky (2015), who sampled the Russian banking sector and found a negative result between corporate governance and its lagged variable. This is also inconsistent with the findings of Zagorchev and Gao (2015), who used the US banking sector and found a negative result between the corporate governance index and its lagged variable. The results of the current study imply that the corporate governance index is persistent with its lagged variable over time. If the financial institution has sound governance, it will not be disturbed. The positive result indicates that the corporate governance index has a long-lasting effect on the performance and profitability of the institution.

The study expected financial stability to be positively related to corporate governance, implying that a financially stable institution can assess and manage financial risks. Festus *et al*. (2019) found a significant positive result between corporate governance and financial stability. In contrast to the anticipated positive results between financial stability and the corporate governance index, there is a significant negative correlation between financial stability and the corporate governance index. The results are consistent with the findings of Gaganis, Lozano-Vivas, Papadimitri and Pasiouras (2020). However, the results are inconsistent with those of Mathew, Ibrahim and Archbold (2018), who found a significant and negative relationship between the corporate governance index and financial stability.

Iramani, Mongid and Muazaroh (2018), Adegboye, Ojeka and Adegboye (2020), and Agyapong (2020) found that financial stability has a positive impact on bank performance, indicating an indirect contribution of good corporate governance ratings. Moreover, financial stability can mediate financial institutions' governance and performance. This study found significant and negative results between financial stability and the corporate governance index. The results imply that financial stability for financial institutions negatively influences the index of corporate governance. An increase in financial stability will decrease the corporate governance index of the selected financial institutions. Furthermore, the results mean that the corporate governance index could be ineffective when financial stability increases.

The ability of the financial institutions to be efficient to the industry, thus providing financial services, is best captured by total cost to income. The study expected that the efficiency ratio is positively related to corporate governance. According to Jerab (2011), an institution's efficiency affects the internal corporate governance mechanisms. The resource dependence theory advocates for an institution's efficiency in meeting its shareholder's needs (Pfeffer, 1972).

In the present investigation, the efficiency ratio and corporate governance index were found to have a positive and statistically significant relationship. However, the significance is at 0.05 when the financial performance measure is the return on assets and 0.001 when the financial performance measure is the return on equity, as indicated in the table. The results are consistent with those of Salim *et al*. (2016), Zeineb and Mensi (2018), and Thaker, Charles, Pant and Gherman (2022). The results of the current study could mean that an increase in the efficiency ratio improves the effectiveness of the corporate governance index of the selected financial institutions. Implementing a rigorous corporate governance structure correlates with a higher efficiency level in financial institutions. Furthermore, the effective use of an institution's assets could play a major role in the corporate governance index. From the perspective of stakeholder theory, a sound and effective corporate governance structure are more beneficial to an institution's sustainability and profitability.

The capital adequacy ratio of the institutions is best captured by the capitalisation ratio consisting of total equity to total assets. The study expected a positive relationship

between the capital adequacy ratio and the corporate governance index of financial institutions. It is vital for a financial institution to maintain positive and high capital adequacy (Chineme & Nwadialo 2018). The results of the investigation found a positive and statistically significant relationship between the capital adequacy ratio and the corporate governance index. The result is consistent with those of Pratiwi (2016), Purba and Djamaluddin (2020), and Benvenuto, Avram, Avram and Viola (2021), who found a positive and significant relationship between the capital adequacy ratio and corporate governance. The results of this study imply that a percentage increase in the capital adequacy ratio for financial institutions will also increase the corporate governance index of the selected financial institutions.

Furthermore, institutions will absorb a more reasonable amount of loss and maintain their sustainability. Therefore, institutions will have more capital reserves and avoid the risk of solvency. However, the current results are inconsistent with the findings of Retno (2014), who found that the capital adequacy ratio did not affect corporate governance.

The firm size of the institution is best captured by the natural logarithm of total assets. There was a positive and significant relationship between firm size and corporate governance index when financial performance was measured by return on assets. The result is consistent with those of Widiyanti, Saputri, Ghasarma and Sriyani (2018), and Benvenuto, Avram, Avram and Viola (2021), who found a positive and statistically significant relationship between firm size and the corporate governance index of financial institutions. The results mean that a larger firm size enhances corporate governance practices. A larger firm size could mean more board representation which is supported by the agency theory (Fama & Jensen, 1983); therefore, increasing non-executive directors will reduce agency problems and improve corporate governance. However, the results of the current investigation found a negative and insignificant relationship when financial performance was measured by return on equity.

The leverage ratio of financial institutions is captured by total debt to the firm’s total assets. The study found a positive and statistically significant relationship between the leverage ratio and the corporate governance index. The results show the persistence of the leverage ratio on the corporate governance index, taking into account both

financial performance measures (return on assets and return on equity). The results imply that a percentage increase in the leverage ratio will increase the corporate governance index of the selected financial institutions. The positive results indicate the long-lasting effect of the leverage ratio on the corporate governance index. It is safer for financial institutions to have a higher leverage ratio. Generally, institutions use their own capital to make investments or loans or sell off their most risky or levered assets (Ross *et al*., 1998). The results of the study are consistent with the positive and statistically significant relationship found by Yaseen and Al-Amarneh (2015) and Uddin, Khan and Hosen (2019). However, the findings are inconsistent with the negative results of Zhou, Li and Chen (2021).

Return on assets is captured by net income to average total assets. The study expected a positive relationship between return on assets and the corporate governance index, implying that an increase in return on assets indicates an efficient and effective use of the institution's assets. The study found a positive and statistically significant result between return on assets and the corporate governance index. However, positive results were found based on the financial performance measure (return on assets) used in the corporate governance index. The corporate governance index with return on equity was insignificant. The results of the current study imply that a percentage increase in financial performance, namely return on assets, may increase the corporate governance index of the selected financial institutions. Therefore, the corporate governance index rendered effective for financial institutions. The results are consistent with the findings of Isik and Ince (2016), Dong *et al*. (2017), and Singh, Rai, Ojha, Gyawali and Gupta (2018), who found a positive and significant relationship. However, this is inconsistent with the results of Pratiwi (2016), who found a negative and significant result between return on assets and corporate governance.

Return on equity is captured by net income to average total equity. The study expected a positive relationship between return on equity and the corporate governance index. However, found a negative and insignificant relationship between return on equity and the corporate governance index. These results are inconsistent with those of Singh *et al*. (2018), who found a positive and significant relationship between return on equity and corporate governance.

The dynamic panel model estimated for board diversity (BD) was therefore parameterised as follows:

$$BD_{it} = \alpha BD_{it-1} + \beta_1 FINPERF_{it} + \beta_2 FINSTAB_{it} + \sum_{n=1}^{i} \beta X_{it} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 3}$$

Table 5.7 presents the determinants of board diversity in selected financial institutions. The table indicates the relationship and statistical significance between board diversity and the independent variables.

Table 5.7: Determinants of board diversity in selected financial institutions

Variables	2-Step System GMM BD	2-Step System GMM BD
L.BD	0.0125	0.0307
	(0.0181)	(0.0297)
FINSTAB	-0.736***	-1.068***
	(0.0867)	(0.0849)
ER	-0.0389***	-0.0683***
	(0.00321)	(0.00448)
CAR	0.000646***	0.000445***
	(0.0000223)	(0.0000402)
FS	-1.384***	-2.820***
	(0.218)	(0.370)
LEV	-0.0687***	-0.0617***
	(0.00383)	(0.00375)
ROA	-0.0266**	
	(0.00794)	
ROE		-0.0315***
		(0.00584)
N	249	249
Groups	21	21
Instruments	14	15
AR(1)	-2.37	-2.50
AR(2)	-0.64	-0.65
Sargan test	0.08	0.02
Hansen test	9.34	10.57

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. Standard errors in parentheses. L.BD= lagged board diversity, FINSTAB= financial stability, ER= efficiency ratio, CAR= capital adequacy ratio, FS= firm size, LEV= leverage ratio, ROA= return on assets, and ROE= return on equity.

Board diversity is measured by the percentage of women on the board. Board diversity has a positive and insignificant relationship with its lagged variable. The financial stability of financial institutions is pivotal as it has economic and social consequences. The financial stability measured by the Z-score has a negative correlation with board diversity and the relationship is statistically significant. The results of the current study imply that the financial stability of financial institutions has a negative influence on the board diversity of the selected financial institutions. A percentage increase in financial stability decreases the board diversity of the selected financial institutions. According to Akhter and Daly (2009), financial instability/stability has negative/positive ramifications. This result is inconsistent with the positive empirical results of Charles *et al*. (2018). However, the results could be ascribed to a lower representation of females on the board of financial institutions. Therefore, they do not have sufficient bargaining power. The results are important for shareholders, given the increasing emphasis on the institution's financial stability. In addition, the results are inconsistent with the findings of Nyumutsu (2019), who found that gender composition had a positive effect on bank stability.

The relationship between the efficiency ratio and board diversity is negative and statistically significant at 0.001. The results imply that the efficiency ratio available of financial institutions negatively influences the board diversity of these financial institutions. A percentage increase in the efficiency ratio decreases the board diversity of the selected financial institutions. From the results of the current investigation, it is evident that the institution's ability to generate income had a negative impact on the representation of females on the board of directors. These results are inconsistent with those of Shabbir, Xin and Hafeez (2020) and Thaker *et al*. (2022), who found a positive relationship between the number of females on the board of directors and the efficiency ratio. According to Jerab (2011), the efficiency ratio influences internal corporate governance mechanisms. Such a mechanism includes the percentage of women on the board of directors, and the results on tale 5.7 indicate that board diversity was negatively influenced. Financial institutions must deliver financial services effectively, and it is anticipated that this effect will favourably influence corporate governance (Jensen & Meckling, 1976).

Financial institutions should be better equipped to handle unforeseen losses and supply financial services in an effective manner (Gambetta *et al*., 2017). The capital adequacy ratio of financial institutions eases risk diversification (Bettin & Zazzaro, 2012). The capital adequacy ratio was found to be positively associated with board diversity and statistically significant at 0.001. The result is consistent with those of Saerang *et al*. (2018), who found a positive relationship between women's representation on the board and the capital adequacy ratio. The results mean that the capital adequacy ratio that is available for financial institutions has a positive influence on board diversity. The results imply that a percentage increase in capital adequacy increases the board diversity of the selected financial institutions. Agency theory suggests that board diversity improves board independence, brings new perspectives, and improves monitoring (Jensen, 1983). Agency theory argues that board diversity has an advantage in participating efficiently in the decision-making process, which also leads to better performance (Fama & Jensen, 1983).

The relationship between firm size and board diversity is negative. However, the relationship is statistically significant at 0.001. The results mean that firm size for financial institutions negatively influences the board diversity of the selected financial institutions. A percentage increase in firm size will result in a decrease in board diversity. However, the results are in contrast with those of Reddy and Jadhay (2019), who found a positive relationship between firm size and board diversity. The results of the current study are consistent with those of Pervin and Rashid (2019), who found that firm size and board diversity have a negative and statistically significant association. The results imply that firm size negatively influences the representation of female directors on the board.

A percentage change in the leverage ratio is negatively associated with board diversity. However, the relationship between the leverage ratio and board diversity is statistically significant. The results imply that the leverage ratio of financial institutions negatively influences the board diversity of the selected financial institutions. Furthermore, a percentage increase in the leverage ratio will significantly have a negative influence on the percentage of board diversity of the selected financial institutions. The results are consistent with those findings of Harris (2014), who found a negative and statistically significant relationship between the leverage ratio and

gender diversity. Notably, board gender diversity influences the institution's outcomes and financial choices. The code of corporate governance and regulations advocates for gender diversity on boards to influence decision-making (Fama & Jensen, 1983).

A board of directors with more gender diversity tends to enhance financial performance (Joecks *et al*., 2013). Financial institutions invest in less risky positions when the board has more female representation. The return on assets is a measure of financial performance. The results indicate a negative and statistically significant relationship between return on assets and board diversity. However, the significance of the variables was because of the financial performance measure used (return on assets). The results mean that return on assets has a negative influence on the board diversity of financial institutions. Furthermore, a percentage increase in return on assets will decrease the board diversity of the selected financial institutions. This is in contrast with the results of Charles *et al*. (2018) and Green and Fomroy (2018), who found a positive relationship between gender diversity and profitability measured by return on assets.

Return on equity measures the financial performance of the institutions. The agency and resource dependence theories advocates for gender diversity on boards to enhance financial performance and decision-making (Jensen, 1993; Wagna and Nzulwa, 2016). According to Nedelchv (2018), the representation and participation of women on a board is one important factor affecting performance and operation. The results in Table 5.6 indicate that the relationship between return on equity and board diversity is negative and statistically significant. The results are in contrast with those of Joecks *et al*. (2013) and Ogunsanwo (2019), who found a positive impact of gender diversity and performance measured by return on equity. However, the significance is because of the financial performance measure, namely, the return on equity employed. When the financial performance measure (return on assets) was employed, the relationship between return on assets and board diversity was insignificant.

The dynamic panel model estimated for board remuneration (BR) was, therefore, parameterised as follows:

$$\mathrm{BR_{it}} = \alpha \mathrm{BR_{it\text{-}1}} + \beta_1 \mathrm{FINPERF_{it}} + \beta_2 \mathrm{FINSTAB_{it}} + \sum_{n=1}^{i} \beta \mathrm{X_{it}} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 4}$$

Table 5.8 presents the key determinants of board remuneration in selected financial institutions. The table represents the relationship and statistical significance of board remuneration and independent variables.

Table 5.8: Determinants of board remuneration in selected financial institutions.

Variables	2-Step System GMM BR	2-Step System GMM BR
L.BR	0.0343*	0.446***
	(0.0158)	(0.0127)
FINSTAB	14368308.7***	-20241642.7***
	(1571956.7)	(2144614.2)
ER	-1761372.4***	-95884.0
	(206952.4)	(56288.3)
CAR	-22124.8***	-17327.3***
	(1363.2)	(455.6)
FS	-34896523.9***	-62486904.0***
	(6261743.7)	(5832898.0)
LEV	1945151.3***	958522.7***
	(86622.2)	(25539.1)
ROA	-1831825.9***	
	(372520.0)	
ROE		3590692.3***
		(53426.0)
N	249	249
Groups	21	21
Instruments	14	14
AR(1)	-1.03	-1.01
AR(2)	1.09	1.01
Sargan test	0.03	0.03
Hansen test	7.64	12.61

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. Standard errors in parentheses. L.BR= lagged board remuneration, FINSTAB= financial stability, ER= efficiency ratio, CAR= capital adequacy ratio, FS= firm size, LEV= leverage ratio, ROA= return on assets, and ROE= return on equity.

From the stance of the agency theory, the link between firm performance and directors' remuneration provides an important incentive where the board can tackle agency problems (Jensen, 1993). Therefore, remuneration ties the board of directors to the institution's performance (Shao *et al*., 2012). The relationship between board remuneration and its lagged variable is positive and statistically significant. The result

implies that the lagged board remuneration is persistent with the board remuneration variable over time. It will not be disturbed if the institutions have sound corporate governance in place. Therefore, lagged board remuneration has a long-lasting effect on board remuneration.

A financial institution's capacity to offer financial services depends on its financial soundness. The relationship between financial stability and board remuneration is positive and statistically significant at 0.001 when the return on assets is used as a financial performance measure. The results mean that the financial stability measured positively influences the board remuneration of the selected financial institutions. Moreover, the results imply that a percentage change/increase in financial stability will statistically influence/increase the board remuneration of the selected financial institutions. Therefore, financial stability plays an effective and efficient role in board remuneration.

Furthermore, the study found a negative and statistically significant result when the return on equity was used as a financial performance measure. The results imply that a percentage increase in financial stability will decrease the board remuneration of the selected financial institutions. The results indicate inconclusive results taking into account both financial performance measures. The positive result is consistent with those of Festus *et al*. (2019) and Nasrin (2022), who found a positive relationship between financial stability and board remuneration. Therefore, the negative results indicate inconclusive/mixed results between the relationships.

The relationship between the efficiency ratio and corporate governance proxied by board remuneration is negative and statistically significant. However, the relationship is statistically significant when a financial performance measure (return on assets) is employed. The results of the study imply that the efficiency ratio of financial institutions negatively influences the board remuneration of the selected financial institutions. Moreover, a percentage increase in the efficiency ratio will decrease the board remuneration of the selected financial institutions. Therefore, the efficiency ratio plays a negative role and affects the board's remuneration. The results are inconsistent with those of Dong *et al*. (2017) and Festus *et al*. (2019), who found a positive relationship between board remuneration and efficiency ratio. Moreover, agency theory argues that

board remuneration increases the monitoring of management and helps to participate efficiently in the decision-making process. This leads to better performance and decision-making (Fama & Jensen, 1983).

The study found a negative relationship between the capital adequacy ratio and board remuneration. The relationship is statistically significant at 0.001. The results suggest that the capital adequacy ratio available for financial institutions negatively influences the board remuneration of the selected financial institutions. Moreover, a percentage increase in the capital adequacy ratio will decrease the board remuneration of the selected financial institutions. However, financial institutions should prevent taking excessive risks and becoming insolvent. Therefore, ensuring the stability of the country's financial systems. The result is consistent with that of Lee and Isa (2015), who found a negative relationship between board remuneration and the capital adequacy ratio.

A statistically significant negative association exists between firm size and board remuneration. The relationship indicates an inverse relationship where both variables move in different directions. Therefore, there is a negative relationship. A statistically significant association exists between firm size and board remuneration of the selected financial institutions. An increase in the firm size of the institutions will negatively/decrease the board remuneration of the selected financial institutions. The reason may be the institution will require more board members who will have to be remunerated. However, the result of the current study is inconsistent with those of Eichholtz *et al*. (2008), Endraswati *et al*. (2014), and Lee and Isa (2016), where the results revealed a statistically significant and positive relationship between board remuneration and firm size.

The leverage ratio has a positive and significant relationship with the board remuneration of financial institutions. The effect of the leverage ratio is highly significant at 0.001, implying that it plays a pivotal role in board remuneration. The results indicate that the leverage ratio is positively related to board remuneration and implies a percentage increase in the selected financial institutions' leverage ratio, increasing the institutions' board remuneration. The result of the current study is consistent with those of Khan and Wasim (2016) and Majid, Mediaty and Possumah

(2019), who found a positive and significant relationship between board remuneration and the leverage ratio. Integrating resource dependence theory into our analysis, the results show that board remuneration plays a significant role in moderating the leverage ratio.

The study found a negative and significant relationship between return on assets and board remuneration. However, the relationship is statistically significant when the return on assets is used as a financial performance measure. The relationship is highly significant at 0.001 significance level. The result means that a percentage increase in the financial performance measure, namely, return on assets, significantly affects/decreases the board remuneration of the selected financial institutions. However, the results of this study are inconsistent with those of Conyon, 1997, Sheikh and Kareem (2015), and Iskandrani *et al*. (2018), who found a positive relationship between board remuneration and return on assets. The findings of the current study indicate that return on assets has a negative effect on board remuneration. However, agency theory asserts that financial performance improves/enhances board remuneration (Jensen, 1993).

The current study found the relationship between return on equity and board remuneration to be positive and statistically significant. However, board remuneration was significant when the financial performance measure, namely return on equity, was employed and insignificant when the return on assets was employed, as depicted in Table 5.7. The positive results are consistent with those of Jerab (2011) and Muller (2014), who assert that financial performance influences institutions' corporate governance. Conyon and Leech (1994), Rankin (2007), and Lee and Isa (2015) found similar positive results between board remuneration and return on equity. The results of the current study imply that a percentage increase in return on equity significantly increases the board remuneration of the selected financial institutions.

The dynamic panel model estimated for board composition (BC) is proxied by two variables, independent non-executive directors (INED) and non-executive directors (NED). BC was, therefore, parameterised as follows:

$$\mathrm{BC_{it}} = \alpha \mathrm{BC_{it\text{-}1}} + \beta_1 \mathrm{FINPERF_{it}} + \beta_2 \mathrm{FINSTAB_{it}} + \sum_{n=1}^{i} \beta \mathrm{X_{i\,t}} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 5}$$

Since board composition is proxied by two variables, the first variable, Independent non-executive directors (INED), will be discussed first, followed by the non-executive directors (NED). Table 5.9 summarises the relationship between INED and its independent variables.

Table 5.9: Determinants of independent non-executive directors (INED) in selected financial institutions

Variables	2-Step System GMM INED	2-Step System GMM INED
L.INED	-0.525***	-0.405***
	(0.00373)	(0.00401)
FINSTAB	-1.990***	6.097***
	(0.154)	(0.408)
ER	0.188***	0.0876***
	(0.00253)	(0.00219)
CAR	0.00134***	0.00151***
	(0.0000539)	(0.0000717)
FS	2.131**	10.94***
	(0.733)	(1.196)
LEV	-0.210***	-0.0692***
	(0.00402)	(0.00427)
ROA	0.850***	
	(0.0132)	
ROE		-0.0254
		(0.0242)
N	249	249
Groups	21	21
Instruments	14	14
AR(1)	-0.91	-1.84
AR(2)	-1.33	-1.18
Sargan test	1.22	0.87
Hansen test	7.20	8.27

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. Standard errors in parentheses. L.INED= lagged independent non-executive directors, FINSTAB= financial stability, ER= efficiency ratio, CAR= capital adequacy ratio, FS= firm size, LEV= leverage ratio, ROA= return on assets, and ROE= return on equity.

Independent non-executive directors are proxied by the percentage of independent non-executive directors in the selected financial institutions. The percentage of

independent non-executive directors has a negative and significant relationship with its lagged variable. The results show that independent non-executive directors were not persistent over time. Agency theory argues that independent non-executive directors have a great advantage in controlling and monitoring, which significantly helps them to efficiently participate in decision-making. Fama and Jensen (1993) assert that it leads to better decisions and performance. However, the results of the current study do not validate agency and stakeholder theory (Donaldson & Preston, 1995).

Financial stability is crucial in financial institutions as it has social and economic implications if the institution fails. Financial stability and the percentage of independent non-executive directors have a statistically significant relationship. However, when financial performance is measured by return on assets, the result is negative, and when financial performance is measured by return on equity, the result is positive. Agency conflicts can be minimised and controlled by increasing the number of independent non-executive directors. The presence of independent non-executive directors is expected to be effective in monitoring as they are independent and are interested in protecting their reputation. (Fama, 1980). Independent non-executive directors advocate for less risky projects that will avoid losses. The negative results are consistent with those of Brick and Chidambaran (2008), Pathan (2009), and Uyar *et al*. (2022). However, the positive results are consistent with those of Lassoued (2018), who found that financial stability had a significant and positive relationship with the independent non-executive directors of financial institutions.

The relationship between the efficiency ratio and the percentage of independent non-executive directors is positive and significant. The results are in line with those of Chan and Lee (2010), Tanna *et al*. (2011), Inim (2021), and Thaker *et al*. (2022), who found that independent non-executive directors were positively related to the efficiency ratio. The results of this study imply that a percentage increase in the efficiency ratio will increase the independent non-executive directors of the selected financial institutions. Furthermore, the results implied that independent non-executive directors monitored management to bring positive shareholder values and provide unbiased business judgement. Therefore, the efficiency ratio positively influenced the independent non-executive directors of the selected financial institutions. However, the results are

inconsistent with Soba, Erem and Ceylan (2016), who found a negative and significant relationship between the efficiency ratio and independent non-executive directors.

The association between the percentage of independent non-executive directors and the capital adequacy ratio was found to be positive and, more importantly, significant at 0.001 level. The results show a strong positive relationship between the independent non-executive directors and the capital adequacy ratio, implying that a percentage increase in the capital adequacy ratio will increase the independent non-executive directors of the selected financial institutions. The current study's findings are consistent with those of Abobakr (2017) and Arora and Bodhanwala (2018).

The percentage of independent non-executive directors positively and significantly affects firm size. The results of the study imply that an increase in firm size will increase the independent non-executive directors of the selected financial institutions. Therefore, firm size positively influences the percentage of independent non-executive directors. However, the positive relationship between firm size and the percentage of independent non-executive directors could be that independent non-executive directors improve the monitoring of management decisions, increasing the institutions' value. Furthermore, empowering independent non-executive directors enhances firm value. According to Strivastav and Hagendorff (2015), an institution’s value is enhanced when independent directors monitor the executive’s decisions. The results are consistent with those of Perdana and Raharja (2014), Mehrotra *et al*. (2018), and Handoyo and Putri (2019), who found that the firm size and independent non-executive directors were positively and significantly correlated. However, this finding is inconsistent with that of Suyanti, Rahmawati and Aryani (2010), who found no effect between the independence of non-executive directors and firm size.

Independent non-executive directors have a strong negative and significant relationship with the leverage ratio. The financial institution’s leverage ratio indicates the financial position regarding debt and total assets. The results mean that a percentage increase in the leverage ratio decreases the independent non-executive directors’ measure of the selected financial institutions. However, more compliance with the independent non-executive directors is not enough when they fail to exercise their duties effectively. The results are inconsistent with those of Almania (2017) and

Perera *et al*. (2021), who found positive and significant results between the leverage ratio and independent non-executive directors.

The percentage of independent non-executive directors has a positive and significant relationship with the return on assets. The results imply that a percentage increase in return on assets will significantly increase the percentage number of independent non-executive directors. According to the stewardship theory, the board's independence positively impacts financial performance (Jensen, 1993). The results of the current study are consistent with those of Adhiambo (2014), García-Meca *et al*. (2015), Bousaada and Karmani (2015), Atieno (2016), and Bezawada (2020), who found a positive and significant relationship between independent non-executive directors and return on assets. However, these results are inconsistent with Ongore *et al*. (2015), Somen and Avijit (2017), and Panditharathna and Kawshala (2017), who found insignificant results between independent non-executive directors and return on assets. The relationship between return on equity and independent non-executive directors for this study was negative and insignificant.

Non-executive directors (NED) are the second measure of board composition (BC) of the selected financial institutions. Table 5.10 provides the results of the relationship between NED and its independent variables.

Table 5.10: The determinants of non-executive directors (NED) in selected financial institutions

Variables	2-Step System GMM NED	2-Step System GMM NED
L.NED	0.0973***	0.0351***
	(0.00945)	(0.00847)
FINSTAB	0.287***	0.281***
	(0.0212)	(0.0196)
ER	0.00155***	0.000234
	(0.000223)	(0.000222)
CAR	-0.0000698***	-0.0000733***
	(0.00000451)	(0.00000456)
FS	0.576***	0.575***
	(0.0649)	(0.0698)
LEV	0.0108***	0.0103***
	(0.000258)	(0.000244)
ROA	-0.00589**	
	(0.00172)	
ROE		-0.00785***
		(0.00130)
N	249	249
Groups	21	21
Instruments	14	15
AR(1)	-2.16	-2.11
AR(2)	-0.05	-0.09
Sargan test	1.44	1.41
Hansen test	7.56	7.14

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. Standard errors it parentheses. L.NED= lagged non-executive directors, FINSTAB= financial stability, ER= efficiency ratio, CAR= capital adequacy ratio, FS= firm size, LEV= leverage ratio, ROA= return on assets, and ROE= return on equity.

Non-executive directors are measured by the percentage of non-executive directors on the board. Non-executive directors performed very well in this category. The relationship between non-executive directors and its lagged variable was positive and statistically significant. The lagged non-executive directors variable showed that the non-executive directors' measure under investigation was persistent over time.

Financial stability and non-executive directors had a positive and statistically significant relationship. The results are consistent with those of Lassoued (2018), who found that the variables of financial stability and non-executive directors showed a positive relationship and were persistent over time. The results confirmed that financial stability positively affects non-executive directors. The results are also in line with the relationship between financial stability and independent non-executive directors of the current study. The result of the current study implies that a percentage increase in financial stability will eventually increase the non-executive directors' measure of the selected financial institutions. A developed board structure plays a significant and effective role in monitoring management decisions.

The efficiency ratio and non-executive directors have a positive and significant relationship when the financial performance employed is the return on assets. The results were statistically insignificant when the financial measure employed was return on equity. The positive results are consistent with those of Chan and Lee (2010), Inim (2021), and Thaker *et al*. (2022). The results imply that a percentage increase in the efficiency ratio increases the non-executive directors of the selected financial institutions. Furthermore, non-executive directors made significant decisions and monitored the institution's management.

Moreover, the institutions efficiently analysed their ability to effectively employ their resources. Therefore, non-executive directors were positively affected. However, the results are inconsistent with that of Soba *et al*. (2016), who found a negative and statistically significant relationship between the efficiency ratio and non-executive directors.

The relationship between the capital adequacy ratio and non-executive directors was statistically significant and negative. The capital adequacy ratio ensures that financial institutions should comply with the requirements for statutory capital and be able to absorb a reasonable amount of loss. However, it had a negative association with the non-executive directors' measure. The results mean that the capital adequacy ratio available for financial institutions negatively influences the non-executive directors of the selected financial institutions. A percentage increase in the capital adequacy ratio decreases the non-executive directors. The results of the current study are

inconsistent with those of Arora and Bodhanwala (2018), who found a positive and significant relationship between the capital adequacy ratio and non-executive directors.

Non-executive directors have a positive and significant relationship with firm size. The positive results are consistent with those of Mehrotra, Malhotra and Pant (2018) and Handoyo and Putri (2019). The results imply that the firm size positively influences non-executive directors of the selected financial institutions. Therefore, an increase in firm size will positively influence non-executive directors. The results confirm that firm size positively affects the percentage of non-executive directors. However, Suyanti *et al*. (2010) found no effect between firm size and non-executive directors. This study found a strong positive and significant relationship between the leverage ratio and non-executive directors. The results are consistent with those of Pendana and Raharja (2014) and Perera *et al*. (2021). However, sound corporate governance measures improve financial performance and leverage ratio. The results mean that the leverage ratio available for selected financial institutions positively influences non-executive directors. A percentage increase in the leverage ratio will increase the non-executive directors of the institutions.

The study found a negative and significant relationship between return on assets and non-executive directors. The results mean that an increase in return on assets will decrease the non-executive directors of selected financial institutions. The results are consistent with those of Mweta and Mungai (2018), who found a negative and significant relationship between return on assets and non-executive directors. However, this finding is inconsistent with those of Kitui (2013), García-Meca *et al*. (2015), Boussaada and Karmani (2015), and Bezawada (2020), who found positive and significant results between return on assets and non-executive directors. Ongore *et al*. (2015) and Somen and Avijit (2017) found no significant relationship between return on assets and non-executive directors.

Non-executive directors and return on equity had a negative and significant relationship. The results imply that an increase in financial measures, namely return on equity, will decrease the non-executive directors of the selected financial institutions. The results are consistent with Filip *et al*. (2014) and Almoneef and

Samontaray (2019), who found a negative association between return on equity and non-executive directors. However, the results are inconsistent with those of Surya (2016) and Arif (2019), who found a positive association between return on equity and non-executive directors. Moreover, Somen and Avijit (2017) and Panditharathna and Kawshala (2017) found no significant relationship between return on equity and non-executive directors.

Monitoring and controlling strategic decisions by management relies solely on the board of directors' independence and the board's size (Jensen & Meckling, 1976). Equation 6 and Table 5.11 provide a summary of the relationship between board size (BS) and its independent variables. BS is measured by the number of members on the board of directors.

The dynamic panel model estimated for board size (BS) was, therefore, parameterised as follows:

$$\mathrm{BS_{it}} = \alpha \mathrm{BS_{it\text{-}1}} + \beta_1 \mathrm{FINPERF_{it}} + \beta_2 \mathrm{FINSTAB_{it}} + \sum_{n=1}^{i} \beta \mathrm{X_{i\,t}} + \mu_i + \varepsilon_{it} \qquad \text{Equation: 6}$$

Table 5.11: Determinants of board size (BS) in selected financial institutions

Variables	2-Step System GMM BS	2-Step System GMM BS
L.BS	-0.341***	-0.337***
	(0.00262)	(0.00348)
FINSTAB	-0.359***	-0.555***
	(0.0165)	(0.0159)
ER	-0.0827***	-0.0809***
	(0.000913)	(0.000893)
CAR	0.000419***	0.000433***
	(0.00000423)	(0.00000373)
FS	-0.369***	-0.599***
	(0.0899)	(0.0912)
LEV	0.00669***	0.00579***
	(0.000506)	(0.000495)
ROA	-0.0813***	
	(0.00150)	
ROE		-0.0533***
		(0.00157)
N	249	249
Groups	21	21
Instruments	14	15
AR(1)	-2.69	-2.34
AR(2)	-0.96	-1.06
Sargan test	7.37	4.98
Hansen test	7.34	7.59

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. Standard errors in parentheses. L.BS= lagged board size, FINSTAB= financial stability, ER= efficiency ratio, CAR= capital adequacy ratio, FS= firm size, LEV, leverage ratio, ROA= return on assets, and ROE= return on equity.

The effectiveness of institutions relies primarily upon the board of directors. Board size and its lagged variable have a negative and significant relationship. The result means that an increase in lagged board size will significantly decrease the board size, which indicates that past board size has a significant but negative impact on the current board size of the selected financial institutions.

The relationship between financial stability and board size was negative and statistically significant, meaning that an increase in financial stability will significantly decrease/influence the board size of the selected financial institutions. The financial stability of financial institutions negatively influences board size. The results are consistent with those of Adams and Mehran (2012) and Karkowska and Acedanski (2019), who found a negative relationship between financial stability and board size. However, Agyapong (2020) found a strong positive relationship between financial stability and board size, while Belkhir (2009), Erken *et al*. (2012), and Thoha *et al*. (2022) found an insignificant relationship between board size and financial stability.

The efficiency ratio and board size relationship are negative and significant, which implies that a percentage increase in the efficiency ratio will decrease the board size of the selected financial institutions. Therefore, the efficiency ratio negatively influenced the board size of the selected financial institutions. The result is consistent with those of Shabbir, Xin and Hafeez (2020), who found a negative relationship between efficiency ratio and board size. However, this finding is inconsistent with Soba *et al*. (2016), Salim *et al*. (2016), Shahid *et al*. (2017), Adeabah *et al*. (2019), Inim (2021), and Thaker *et al*. (2021), who found a significant and positive relationship between efficiency ratio and board size. Their results indicate that board size improves the efficiency of financial institutions and is supported by agency theory (Jensen, 1993).

The board size and capital adequacy ratio relationship was positive and statistically significant. The result means that a percentage increase in the capital adequacy ratio will significantly increase the board size of the selected financial institution. The results are consistent with those of Fanta *et al*. (2013), El-Masry, Adbelfattah and Elbahar (2016), and Chineme and Nwadialo (2018), who found a significant relationship between capital the adequacy ratio and board size.

The association between firm size and board size was negative and statistically significant, which means that an increase in firm size will decrease the board size of financial institutions. However, these results are inconsistent with the findings of Chin, Ganesan, Pitchay, Haron and Hendayani (2019). Moreover, the study results are inconsistent with agency theory, where an increase in company size will require a

larger board size to monitor and influence decision-making by management (Jensen & Meckling, 1976; Fama & Jensen, 1983; Jensen, 1993). However, the results could be the emoluments of directors affecting the firm size and the board's effectiveness, as suggested by Jensen (1993) and Coles *et al*. (2008).

The relationship between the leverage ratio and board size was positive and statistically significant. The result implies that an increase in the leverage ratio significantly increases/influences the board size of the selected financial institutions. Guest (2008) argued that the number of directors on the board should be increased to enhance management monitoring and provision of important information. The results of the study are consistent with those of Conyon and Peck (1998), Guest (2008), Huang and Wang (2015), Uddin *et al*. (2019), and Lekhak (2022), who found a positive and statistically significant results between leverage ratio and board size. However, this finding is inconsistent with those of Chen and Al-Najjar (2012), who found insignificant results between leverage ratio and board size.

The return on assets and board size have a negative and statistically significant relationship. The results mean that the financial performance measure (return on assets) had a negative impact on board size. Moreover, it implies that a percentage increase in the return on assets of the selected financial institutions decreases the corporate governance measure (board size). The result is consistent with the findings of Eyenubo (2013), Nakano and Nguyen (2013), and Singh *et al*. (2018), who documented a negative relationship between return on assets and board size. However, the results of the study are inconsistent with those of Malik *et al*. (2014), Isik and Ince (2016), Majeed *et al*. (2020), and Bezawada (2020), who documented a positive relationship between return on assets and board size. However, Agyemang *et al*. (2014) and Sarpong-Danguah *et al*. (2018) found an insignificant relationship between return on assets and board size.

The relationship between return on equity and board size has a negative and statistically significant relationship, which means that an increase in the financial performance measure (return on equity) will have a negative impact (decrease) on the corporate governance measure (board size). The results are consistent with those of Majeed *et al*. (2020), who found a negative and statistically significant relationship

between return on equity and board size. However, Almoneef and Samontaray (2019), Gafoor *et al*. (2018), Ogunsanwo (2019), and Kafidipe *et al*. (2021) found a positive and statistical relationship between return on equity and board size. Panditharathna and Kawshala (2017) and Sarpong-Danguah *et al*. (2018) reported an insignificant relationship between return on equity and board size.

5.5.2 Cointegration and error correction term

The purpose of this section is to present the analysis of the two objectives of the study, which are to assess the long-run (cointegrating) relationship between corporate governance and financial performance in selected financial institutions, and to examine whether there is a causal relationship between corporate governance and financial performance in selected financial institutions. Cointegration can be determined when variables are in equilibrium over the long-run (Awe, 2012; Nkoro & Uko, 2016). Vector error correlation (VEC) was performed between the corporate governance index and financial variables, risk appetite is represented by CAR, financial stability is represented by FINSTAB, and financial performance is represented by ROA and ROE.

Examining the cointegration relationship, the PMG and DFE estimators in the panel ARDL procedure were the preferred methods. The ARDL technique has the dominance of not requiring variables to have the same integration order. The variables should never have higher-order integrations than the first-order I(1). The ECT is drawn from panel ARDL estimation to examine the short-run characteristics of the relationships. The significance or insignificance level of the long-run, short-run, and ECT coefficients of the panel ARDL expound causality results between the corporate governance index and its determinants. According to Attiaoui, Toumi, Ammourie and Gargouri (2017), panel ARDL, which can distinguish between short-run and long-run relationships, is categorised as an error-correction model.

5.5.2.1 Pooled mean group (PMG), mean group (MG) and dynamic fixed effects (DFE)

For panel ARDL, it was necessary to determine the most appropriate and suitable estimator between MG, PMG, and DFE. In selecting the most suitable estimator for

the ARDL model, the Hausman tests were performed, and the P-values of the tests were statistically significant, thereby selecting PMG and DFE appropriately mixed. The study assumed that PMG and DFE are the most appropriate estimators to analyse the panel data. The PMG assumes that all the groups that make up the sample have similar long-run coefficients, and DFE assumes that long-run coefficients are constant throughout the sample.

PMG and DFE are preferred estimation techniques. Therefore, discussions of the results are mainly from both estimators depending on the tables. The panel ARDL was employed in this study to assess the cointegration between the variables, as previously discussed in chapter 4 (Methodology). Panel ARDL allows us to analyse the short-run and long-run dynamics of variables, and therefore, panel ARDL is preferable. The results obtained from PMG, MG, and DFE are presented in sections 5.5.2.2 and 5.5.2.3. However, the selection will discuss the results from PMG and DFE depending on the more efficient estimator.

5.5.2.2 Panel cointegration and the error correction model: Financial performance (ROA)

The section provides a discussion of the results of cointegration and the vector error correction between corporate governance proxies and the financial variables (financial stability, financial performance, and risk appetite). As explained in section 5.5.2.1, the Hausman test was used to verify the coefficients for long-run homogeneity. Tables 5.12 to 5.19 present the results of the ECT and the short-run and long-run coefficients. However, only the long-run and ECT will be discussed in this section. The short-run will be discussed in section 5.5.3. The current section will be discussed in relation to financial performance (ROA). Section 5.5.2.3 will be discussed in relation to financial performance (ROE).

Table 5.12: Summary of the cointegrating results and the ECT: GOVINDEX

Variables	PMG D.GOVINDEX	MG D.GOVINDEX	DFE D.GOVINDEX
Long-run			
FINSTAB	-0.0219***	0.226	0.00377
	(-5.21)	(0.48)	(0.21)
ROA	0.00178	0.628	0.00964
	(0.39)	(1.17)	(0.64)
CAR	-0.00536*	0.793	-0.00598
	(-2.32)	(1.72)	(-0.89)
ECT	-0.665***	-0.839***	-0.464***
	(-8.07)	(-9.19)	(-8.65)
Short-run			
D.FINTSAB	-0.0248	-0.0572	-0.00718
	(-0.48)	(-0.35)	(-0.99)
D.ROA	-0.00675	-0.0485	-0.00229
	(-0.07)	(-0.34)	(-0.43)
D.CAR	-0.0169	-0.322	-0.00519*
	(-0.34)	(-1.42)	(-1.99)
_cons	0.350**	-0.577	0.0245
	(2.90)	(-0.74)	(0.23)
N	273	273	273
Hausman Test (MG & MPG)	3.72	3.72	-
Hausman Test (DFE & MPG)	0.23	-	0.23

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. Standard errors in parentheses. GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROA (financial performance) and CAR (Rrsk appetite). D. represents the difference operator.

As shown in Table 5.12, financial stability and the corporate governance index have a cointegrating relationship. However, the cointegrating relationship is negative and at a 0.001 significance level. In the long-run, an increase in financial stability reduces the corporate governance index of the selected financial institutions. Theoretically, financial stability is expected to enhance corporate governance, as financial institutions can promote the development of sound and well-managed institutions (Lassoued, 2018). Strivastav and Hangendorff (2015) argue that corporate governance should provide oversight to management to maximise the institution's

financial stability. The same results were observed between the capital adequacy ratio and the corporate governance index. When the capital adequacy ratio is increased, the corporate governance index experiences a reduction in the long-run, and the result is significant at a 0.005 significance level. The results show that an increase in the capital adequacy ratio, in the long-run, widens the corporate governance index gap.

ECT is significant and negative under the more efficient estimator (PMG). There is a cointegrating relationship among the variables under analysis, namely, corporate governance index, financial stability, return on assets, and capital adequacy ratio, but more so, -0.665 represents the speed of adjustment. Therefore, the speed of adjustments to equilibrium will be 66.5 percent per year.

Table 5.13: Summary of the cointegrating results and the ECT: FINSTAB

Variables	PMG D.FINSTAB	MG D.FINSTAB	DFE D.FINSTAB
Long-run			
GOVINDEX	0.0668	0.490	1.659
	(1.08)	(0.20)	(1.86)
ROA	0.256***	4.240*	-0.0214
	(13.35)	(2.00)	(-0.21)
CAR	0.244***	1.285	0.268***
	(131.69)	(1.93)	(7.33)
ECT	-0.450***	-1.177***	-0.688***
	(-4.71)	(-6.76)	(-9.64)
Short-run			
D.GOVINDEX	-3.405	-2.262*	-1.707**
	(-1.36)	(-2.04)	(-2.67)
D.ROA	3.307*	-0.615	0.0959
	(2.55)	(-0.68)	(1.77)
D.CAR	-0.0773	-2.159	-0.0141
	(-0.24)	(-1.24)	(-0.53)
_cons	4.639**	4.885	5.275***
	(2.77)	(1.70)	(5.02)

N	273	273	273
Hausman Test (MG & MPG)	0.99	0.99	-
Hausman Test (DFE & MPG)	49.60***	-	49.60***
Hausman Test (MG & DFE)	-	0.26	0.26

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROA (financial performance) and CAR (risk appetite). D. represents the difference operator.

DFE is more efficient for financial stability. Therefore, the results discussed are based on the DFE estimator. The results from Table 5.13 show a cointegrating relationship between the capital adequacy ratio and financial stability. The relationship is positive and statistically significant. However, in the long-run, an increase in the capital adequacy ratio will increase the financial stability of the financial institutions. Therefore, contributes to a well-functioning and efficient financial system sector. The World Bank (2016) and Nguyen (2021) assert that an increase in corporate governance will also increase the financial stability of financial institutions.

There is a cointegrating relationship among the variables under analysis: financial stability, corporate governance index, return on assets and capital adequacy ratio. The cointegrating relationship in ECT is negative and significant. The model is in disequilibrium. Therefore, the speed of adjustment is 68.8 percent per year.

Table 5.14 provides a summary of the cointegrating relationship and the ECT. PMG is more efficient. Therefore, it is the preferred estimator, and the results are based on PMG.

Table 5.14: Summary of the cointegrating results and the ECT: CAR.

Variables	PMG D.CAR	MG D.CAR	DFE D.CAR
Long-run			
GOVINDEX	-0.0557	-3.228	-1.161
	(-0.56)	(-1.66)	(-0.57)
FINSTAB	0.230***	3.581**	1.266***
	(14.95)	(3.05)	(5.85)
ROA	0.670***	-0.255	0.894***
	(7.49)	(-0.47)	(4.10)

ECT	-0.157*	-0.793*	-0.683***
	(-2.61)	(-2.56)	(-12.25)
Short-run			
D.ROA	-0.851*	0.254	-0.321**
	(-2.25)	(0.58)	(-2.70)
D.GOVINDEX	-2.806	-2.085	-3.273*
	(-1.62)	(-1.23)	(-2.30)
D.FINSTAB	2.205	-1.033	-0.0280
	(1.67)	(-1.08)	(-0.17)
_cons	14.45*	5.676	5.684*
	(2.52)	(0.97)	(2.35)
N	273	273	273
Hausman Test (MG & MPG)	3.13	3.13	-
Hausman Test (DFE & MPG)	6.08	-	6.08

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROA (financial performance) and CAR (risk appetite). D. represents the difference operator.

Table 5.14 shows a cointegrating relationship between financial stability and the capital adequacy ratio. The long-run relationship is positive and significant at a 0.001 significance level. The higher the financial stability is, the higher the capital adequacy ratio. The results are in line with the findings of Nguyen (2021) in Vietnamese financial institutions, where the relationship between the capital adequacy ratio and financial stability was positive and significant. When the study measured the relationship between the return on assets and the capital adequacy ratio, the results showed a cointegrating relationship. The long-run relationship between the return on assets and the capital adequacy ratio is positive and significant. The higher the return on assets, the higher the capital adequacy ratio for financial institutions. The capital adequacy ratio measures the financial institution's ability to meet its financial obligations by comparing its capital with its assets. The results of the current study are consistent with those of Shabani, Morina and Misiri (2019) and Benvenuto *et al*. (2021), who found a positive and significant relationship between return on assets and the capital adequacy ratio.

Under the preferred PMG estimator, the ECT is negative and significant. Therefore, there is a cointegrating relationship among the variables (capital adequacy ratio, ROA, corporate governance index, financial stability, and return on assets) under analysis, but more so, -0.157 represents the speed of adjustments. The speed of adjustments to equilibrium will be 15.7 percent per year.

Table 5.15 provides a summary of the cointegrating relationship and the ECT. The PMG estimator is more efficient. Therefore, it is the preferred estimator. The discussion in this section is based on PMG.

Table 5.15: Summary of the cointegrating results and ECT: ROA

	PMG	MG	DFE
Variables	D.ROA	D.ROA	D.ROA
Long-run			
GOVINDEX	-0.00871	-5.099	-1.599
	(-0.28)	(-1.63)	(-1.80)
FINSTAB	0.0190***	2.895**	0.0569
	(3.42)	(2.99)	(0.47)
CAR	0.0823***	-0.597***	0.102*
	(15.02)	(-4.22)	(2.31)
ECT	-0.483***	-0.959***	-0.831***
	(-4.75)	(-13.15)	(-12.99)
Short-run			
D.GOVINDEX	0.617	1.309	1.649*
	(1.32)	(1.41)	(2.15)
D.FINSTAB	2.495**	0.344	0.0679
	(2.60)	(1.11)	(0.77)
D.CAR	-0.108	0.259***	-0.000803
	(-1.32)	(3.84)	(-0.03)
_cons	0.554*	-2.176	-0.0142
	(2.03)	(-1.35)	(-0.01)
N	273	273	273
Hausman Test (MG & MPG)	0.81 6.35	0.81 -	- 6.35
Hausman Test (DFE & MPG)	-	0.56	0.56

Hausman Test (DFE & MPG)	

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROA (financial performance) and CAR (risk appetite). D. represents the difference operator.

The results from Table 5.15 show a cointegrating relationship between financial stability and return on assets. However, the cointegrating relationship is positive and significant. A percentage increase in the financial stability of the financial institutions increases the financial performance (return on assets). This finding is consistent with Tan and Anchor (2016), who found a significant and positive relationship between financial stability and return on assets.

There is a cointegrating relationship between the capital adequacy ratio and return on assets. The relationship is positive and significant. An increase in the capital adequacy ratio of the financial institutions increases the return on assets of the selected institutions. The result is consistent with those of Shabani *et al*. (2019) and Benvenuto *et al*. (2021), who found positive and significant results. The ECT of the variables under analysis is negative and significant. Therefore, there is a cointegrating relationship among the variables under analysis: return on assets, corporate governance index, financial stability, and capital adequacy ratio. The speed of adjustment to equilibrium will be 48.3 percent per year.

5.5.2.3 Panel cointegration and the error correction model: Financial performance (ROE)

The section will be discussed in relation to the financial performance measure (return on equity). Table 5.16 summarises the cointegrating relationship between the variables under analysis and the ECT. DFE is more efficient; therefore, it is the preferred estimator.

Table 5.16: Summary of the cointegrating results and the ECT: GOVINDEX

Variables	PMG D.GOVINDEX	MG D.GOVINDEX	DFE D.GOVINDEX
Long-run			
FINSTAB	-0.0191***	0.288	0.00315
	(-5.16)	(0.68)	(0.18)
ROE	-0.000184	-0.0237	-0.00290
	(-0.08)	(-0.96)	(-0.38)
CAR	-0.00521*	0.511	-0.00427
	(-2.56)	(1.43)	(-0.67)
ECT	-0.669***	-0.842***	-0.474***
	(-8.25)	(-9.35)	(-8.85)
Short-run			
D.FINSTAB	0.0229	-0.0668	-0.00724
	(0.70)	(-0.42)	(-1.00)
D.ROE	-0.00812	-0.00645	0.00107
	(-1.08)	(-0.67)	(0.36)
D.CAR	-0.0246	-0.190	-0.00529*
	(-0.69)	(-1.18)	(-2.04)
_cons	0.323**	-0.139	0.0468
	(2.72)	(-0.21)	(0.38)
N	273	273	273
Hausman Test (MG & MPG)	4.54	4.54	-
	38.85***	-	38.85***
Hausman Test (DFE & MPG)	-	0.25	0.25
Hausman Test (MG & DFE)			

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROE (financial performance) and CAR (risk appetite). D. represents the difference operator.

There are no cointegrating relationships between financial stability and the corporate governance index, return on equity and the corporate governance index, capital adequacy ratio and the corporate governance index. The cointegrating relationship between financial stability and the corporate governance index is positive but statistically insignificant in the long-run. However, a cointegrating relationship among the variables, namely, corporate governance index, financial stability, return on equity,

and capital adequacy ratio under analysis exists. The model is in disequilibrium, and the speed of adjustment to equilibrium will be 47.4 percent per year.

Table 5.17 summarises the cointegrating relationship between the variables under analysis and the ECT. DFE is the efficient and preferred estimator.

Table 5.17: Summary of the cointegrating results and ECT: FINSTAB

	PMG D.FINSTAB	MG D.FINSTAB	DFE D.FINSTAB
Long-run			
GOVINDEX	0.494**	-2.051	1.400
	(2.82)	(-0.60)	(1.59)
ROE	0.197***	0.0609	-0.0714
	(11.73)	(0.29)	(-1.33)
CAR	0.269***	1.474	0.265***
	(312.01)	(1.94)	(7.99)
ECT	-0.462***	-1.142***	-0.704***
	(-5.50)	(-14.63)	(-9.82)
Short-run			
D.GOVINDEX	-3.852	-3.204	-1.589*
	(-1.16)	(-1.71)	(-2.48)
D.ROE	0.0383	0.00127	0.0450
	(0.86)	(0.02)	(1.49)
D.CAR	-0.0322	-2.095	-0.00946
	(-0.12)	(-1.62)	(-0.35)
_cons	3.262*	6.151	6.213***
	(2.09)	(1.34)	(5.14)
N	273	273	273
Hausman Test (MG & MPG)	1.63	1.63	-
Hausman Test (DFE & MPG)	40.00***	-	40.00***
Hausman Test (MG & DFE)	-	1.23	1.23

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROE (financial performance) and CAR (risk appetite). D. represents the difference operator.

There is a cointegrating relationship between the capital adequacy ratio and the financial stability of financial institutions. The long-run relationship is positive and significant at a 0.001 significance level. The results are consistent with those of Nguyen (2021), who found a positive and significant relationship between the capital adequacy ratio and financial stability. The result implies that an increase in the capital adequacy ratio will increase the financial stability of the financial institutions. The ECT is negative but highly significant at 0.001. Therefore, there is a cointegrating relationship among the variables, namely, financial stability, corporate governance index, return on equity, and capital adequacy ratio under analysis, with -0.704 representing the speed of adjustment. Therefore, the speed of adjustments to equilibrium will be 70.4 percent per year.

Table 5.18 provides a summary of the cointegrating relationship and the ECT. PMG is more efficient and a preferred estimator.

Table 5.18: Summary of the cointegrating results and ECT: CAR.

Variables	PMG D.CAR	MG D.CAR	DFE D.CAR
Long-run			
GOVINDEX	0.663	-2.785	-1.574
	(0.92)	(-1.43)	(-0.72)
FINSTAB	0.736***	3.337**	1.482***
	(6.01)	(2.93)	(6.63)
ROE	0.508***	0.0278	0.331*
	(7.04)	(0.17)	(2.51)
ECT	-0.310*	-1.739**	-0.648***
	(-2.20)	(-2.72)	(-11.59)
Short-run			
D.ROE	-0.184*	-0.0378	-0.156*
	(-2.17)	(-0.48)	(-2.31)
D.GOVINDEX	-2.733	-1.879*	-2.849*
	(-1.62)	(-2.01)	(-1.97)
D.FINSTAB	1.974	-0.746	-0.0655
	(1.69)	(-1.00)	(-0.39)
_cons	9.189	7.443	2.134
	(1.67)	(1.18)	(0.75)

N	273	273	273
Hausman Test (MG & MPG)	3.27	3.27	-
Hausman Test (DFE & MPG)	3.13	-	3.13
Hausman Test (MG & DFE)	-	55.75***	55.75***

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROE (financial performance) and CAR (risk appetite). D. represents the difference operator.

Table 5.18 shows a cointegrating relationship between financial stability and the capital adequacy ratio. The long-run relationship is positive and significant at 0.001. In the long-run, an increase in financial stability will increase the capital adequacy ratio of financial institutions. This finding is consistent with the results of Nguyen (2021) and Benvenuto *et al*. (2021), who found a significant and positive relationship between financial stability and the capital adequacy ratio.

The relationship between return on equity and the capital adequacy ratio is also significant and positive. Therefore, there is a cointegrating relationship between these variables. The higher the return on equity, the higher the capital adequacy ratio of the selected financial institutions. The results are consistent with those of Shabani *et al*. (2019), who found a positive and significant relationship between return on equity and the capital adequacy ratio. Financial institutions use the capital adequacy ratio to assess the sufficiency of their capital holdings in light of their exposures. The ECT is negative and significant. Therefore, there is a cointegrating relationship among the variables, namely, capital adequacy ratio, corporate governance index, financial stability, and return on equity under analysis, but more so, -0.310 represents the speed of adjustments. Therefore, the speed of adjustments to equilibrium will be 31 percent per year.

Table 5.19 provides the summary of the cointegrating relationship between the variables under analysis and the ECT. PMG is more efficient and a preferred estimator.

Table 5.19: Summary of the cointegrating results and ECT: ROE.

Variable	PMG D.ROE	MG D.ROE	DFE D.ROE
Long-run			
GOVINDEX	-0.138	62.65	-2.759
	(-0.21)	(0.93)	(-1.61)
FINSTAB	0.128	6.283	0.000331
	(1.14)	(1.40)	(0.00)
CAR	-0.0433	-4.543	0.00410
	(-1.40)	(-1.15)	(0.05)
ECT	-0.577***	-0.969***	-0.783***
	(-6.37)	(-11.76)	(-12.19)
Short-run			
D.GOVINDEX	2.579	6.133*	2.013
	(1.44)	(2.03)	(1.45)
D.FINSTAB	6.196*	-2.267	-0.0248
	(2.18)	(-0.98)	(-0.15)
D.CAR	1.283	6.872	0.0505
	(0.57)	(1.55)	(0.87)
_cons	7.903***	7.122	12.18***
	(5.84)	(1.24)	(4.62)
N	273	273	273
Hausman Test (MG & MPG)	0.73 0.60	0.73 -	- 0.60
Hausman Test (DFE & MPG)	-	4.17	4.17
Hausman Test (MG & DFE)			

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROE (financial performance) and CAR (risk appetite). D. represents the difference operator.

The long-run relationship between the corporate governance index and return on equity is insignificant. Furthermore, the relationship between financial stability and return on equity is also insignificant. Moreover, the relationship between the capital adequacy ratio and return on equity is insignificant. Under the preferred PMG estimator, the ECT is negative and statistically significant at 0.001. Therefore, there is a cointegrating relationship among the variables: return on equity, corporate

governance index, financial stability, and capital adequacy ratio under analysis. The speed of adjustment to equilibrium will be 57.7 percent per year.

As a result of the entire test where the corporate governance index was the dependent variable, the ECT measuring the speed of adjustments for long-run equilibrium is significant and negative. ECT must be significant and negative to correct the short-run divergence to its long-run equilibrium (Gujarati & Porter, 2009). In this study, none of the ECTs were positive, indicating that the time series diverged from its equilibrium. The results of the current study satisfied the PMG and DFE conditions of the long-run relationships. The negative and significant coefficients of ECT were less than -2 (Loayza & Ranciere, 2006).

Using corporate governance proxies as dependent variables, the study discussed the cointegration relationships. Therefore, the current study reported cointegrating relationships between the chosen independent variables. This analysis allows the study to investigate some relationships that have not yet been thoroughly examined empirically. The causal relationship between the financial variables and the corporate governance index (GOVINDEX) is discussed in section 5.5.3.

5.5.3 Panel causality tests

The tri-variate ECM within panel ARDL was employed to examine the causality relationship between each of the corporate governance proxies and financial variables. However, examining the causality between variables of interest employed ECM instead of the Grange causality test. The causality relationships that the study inferred fall into three categories: short-run, long-run, and joint causality (ECT). There is a scant literature reference on the causal relationship between financial variables and corporate governance. Therefore, the statistical significance of the coefficients is used to determine the causality between the variables, whereas the ECT indicates the joint causality between the variables under analysis.

All variables adopted to examine the causality relationship were employed as dependent variables in the tri-variate analysis. Section 5.5.2 discussed the cointegration relationship, where the study found cointegrating relationships among the chosen variables. This project continued and conducted a vector error correction

model after discovering the cointegrating relationships between the chosen independent variables and corporate governance index to ascertain the short-run association and inferred causal relationships between the variables using the results.

Table 5.20 provides a summary of the results. Table 5.21 further elaborates the results indicating the causality relationships. The results are discussed in relation to financial performance measure (ROA).

Table 5.20: Summary of the panel error correction model (ECM)

Dependent variable	**Source of Causation (independent variables)**								
	Long-run coefficients				Short-run coefficients				ECT
	CAR	GOVINDEX	FINSTAB	ROA	∆CAR	∆GOVINDEX	∆FINSTAB	∆ROA	
∆CAR		-0.0557 (-0.56)	0.230*** (14.95)	0.670*** (7.49)		-2.806 (-1.62)	2.205 (1.67)	-0.851* (-2.25)	-0.157* (-2.61)
∆GOVINDEX	-0.00536* (-2.32)		-0.0219*** (-5.21)	0.00178 (0.39)	-0.0169 (-0.34)		-0.0248 (-0.48)	-0.00675 (-0.07)	-0.665*** (-8.07)
∆FINSTAB	0.268*** (7.33)	1.659 (1.86)		-0.0214 (-0.21)	-0.0141 (-0.53)	-1.707*** (-2.67)		0.0959 (1.77)	-0.688*** (-9.69)
∆ROA	0.0823*** (15.02)	-0.00871 (-0.28)	0.0190*** (3.42)		-0.108 (-1.32)	0.617 (1.32)	2.495** (2.60)		-0.483*** (-4.75)

GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROA (financial performance) and CAR (risk appetite). Error Correction Term (ECT).

Source: Owner's own composition.

The causality links presented in Table 5.20 are summarised and elaborated in table 5.21. The causality links presented in the short-run, long-run, and ECT coefficients are statistically significant, indicating joint causality. The causal analysis in this study is distinctive in that it allowed us to evaluate not only the relationship between the corporate governance index and financial variables but also the link among the other financial variables (dimensions) employed in the study. Literature on the causal relationship of financial variables (financial stability, risk appetite, and financial performance) on corporate governance is very scant.

Table 5.21: Panel ECM. Summary of the causality results

Dependent variable	Source of Causation (independent variables)								
	Long-run coefficients				Short-run coefficients				ECT
	CAR	GOVINDEX	FINSTAB	ROA	∆CAR	∆GOVINDEX	∆FINSTAB	∆ROA	
∆CAR		No causality (-0.56)	Causality (14.95)	Causality (7.49)		No causality (-1.62)	No causality (1.67)	Causality (-2.25)	Causality (-2.61)
∆GOVINDEX	Causality (-2.32)		Causality (-5.21)	No causality (0.39)	No causality (-0.34)		No causality (-0.48)	No causality (-0.07)	Causality (-8.07)
∆FINSTAB	Causality (7.33)	No causality (1.86)		No causality (-0.21)	No causality (-0.53)	Causality (-2.67)		No causality (1.77)	Causality (-9.69)
∆ROA	Causality (15.02)	No causality (-0.28)	Causality (3.42)		No causality (-1.32)	No causality (1.32)	Causality (2.60)		Causality (-4.75)

GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROA (financial performance) and CAR (risk appetite). Error Correction Term (ECT).

Source: Owner's own composition.

This study found a uni-directional causality relationship between the capital adequacy ratio and financial stability in the long-run. The causality link is in one direction, where the capital adequacy ratio causes financial stability. The higher the capital adequacy ratio of the financial institutions, the higher the financial stability. Furthermore, there is a uni-directional causality relationship between the capital adequacy ratio and return on assets in the long-run. The causality relationship is in one direction where the capital adequacy ratio causes return on assets. In the short-run, there is a bi-directional causality relationship between the capital adequacy ratio and return on assets. Where capital adequacy ratio causes return on assets, and vice versa. The higher the capital adequacy ratio is, the lower the return on assets of the financial institution, and vice versa. However, there is no causal relationship between the capital adequacy ratio and the corporate governance index in the long-run.

Furthermore, the result indicates no causal association between the capital adequacy ratio and the corporate governance index in the short-run. Moreover, there is no causal relationship between the capital adequacy ratio and financial stability in the short-run. The study further investigated the causal relationships in conjunction with the other financial factors and discovered that the variables under investigation have common (jointly) causes.

This study also found a bi-directional causality relationship between the corporate governance index and capital adequacy ratio in the long-run. The higher the corporate governance index is, the lower the capital adequacy ratio, and vice versa. Furthermore, there is a bi-directional causality relationship between the corporate governance index and financial stability in the long-run. The causality relationship is in both directions, where the corporate governance index causes financial stability and vice versa. The higher the corporate governance is, the lower the financial stability of the selected financial institutions. The results are consistent with those of Urgessa and Ababa (2021), who found a bi-directional causality relationship between corporate governance and financial stability. This study found no causal relationship between the corporate governance index and return on assets in the long-run.

Furthermore, the study found no causal relationship between the corporate governance index and capital adequacy ratio in the short-run, no causal relationship between the corporate governance index and financial stability in the short-run, and no causal relationship between the corporate governance index and return on assets in the short-run. These results are consistent with those of Utama and Musa (2011) and Ataunal and Aybars (2017), who did not find a causal relationship between corporate governance and financial performance. The study further investigated the causal relationships in conjunction with the other financial factors and discovered that the variables under investigation, namely, corporate governance index, risk appetite, financial stability, and financial performance, have a joint causality relationship.

Financial institutions' stability is essential for the financial sector and the economy to operate effectively. The study found uni-directional causality between financial stability and the capital adequacy ratio in the long-run. The causality relationship is in one direction, where financial stability causes the capital adequacy ratio. The higher the financial stability is, the higher the capital adequacy ratio of the financial institutions. However, there is no causal relationship between financial stability and the corporate governance index in the long-run.

Furthermore, there is no causal relationship between financial stability and return on assets in the long-run, as the coefficients are insignificant. The study found a bi-directional causal link between financial stability and the corporate governance index

in the short-run. The higher the financial stability is, the lower the corporate governance index, and vice versa. The results are inconsistent with those of Adusei (2011) and Yuniarti, Chandrarin and Subiyantoro (2018), who found a uni-directional causality relationship between corporate governance and banking stability. However, there is no causal relationship between financial stability and the capital adequacy ratio in the short-run. Furthermore, there is no causal relationship between financial stability and return on assets in the short-run. The study tested the causality link jointly with other variables under analysis, namely, the capital adequacy ratio, corporate governance index, financial stability, and return on assets, and found joint causes between the variables.

Our study found a uni-directional causality relationship between the return on assets and the capital adequacy ratio in the long-run. The higher the return on assets, the higher the capital adequacy ratio, where the return on assets causes the capital adequacy ratio. This result is consistent with the findings of Shungu, Ngirande and Ndlovu (2014) and Alley, Adebayo and Oligbo (2016), who found a uni-directional relationship between return on assets and the capital adequacy ratio. Instability in the banking sector (financial institutions) is caused by unsustainable financial services intermediation (Beck & Feyen, 2013). No causality relationship was established between return on assets and the corporate governance index in the long-run. The result of the current study is inconsistent with those of Adusei (2014) and Yuniarti *et al*. (2018), who found a bi-directional causality relationship between return on assets and corporate governance. This study found a uni-directional causality relationship between return on assets and financial stability in the long-run. The higher the return on assets, the higher the financial stability, where the return on assets causes financial stability.

The study found no causal relationship between return on assets and the capital adequacy ratio in the short-run. Furthermore, we found no causal relationship between return on assets and the corporate governance index in the short-run because the coefficient is insignificant. However, there is a uni-directional causality relationship between return on assets and financial stability in the short-run. The lower the return on assets, the lower the financial stability. Therefore, the return on assets causes financial stability of the selected financial institutions. This study found a joint causality

relationship between the variables: capital adequacy ratio, corporate governance index, financial stability, and return on assets.

Table 5.22 provides a summary of the results. Table 5.23 further elaborates the results indicating the causality relationships. The results are discussed in relation to financial performance measure, namely, return on equity.

Table 5.22: Summary of the panel error correction model (ECM)

Dependent variable	**Source of Causation (independent variables)**								
	Long-run coefficients				Short-run coefficients				ECT
	CAR	GOVINDEX	FINSTAB	ROE	∆CAR	∆GOVINDEX	∆FINSTAB	∆ROE	
∆CAR		0.663 (0.92)	0.736*** (6.04)	0.508*** (7.04)		-2.733 (-2.733)	1.974 (1.69)	-0.184* (-2.17)	-0.310* (-2.20)
∆GOVINDEX	-0.00427 (-2.32)		0.00315 (0.18)	-0.00290 (-0.38)	-0.00529 (-2.04)		-0.00724 (-1.00)	-0.00107 (0.36)	-0.474*** (-8.85)
∆FINSTAB	0.265*** (7.99)	1.400 (1.59)		-0.0714 (-1.33)	-0.00946 (-0.35)	-1.589* (-2.48)		0.450 (1.49)	-0.704*** (-9.82)
∆ROE	-0.0433 (-1.40)	-0.138 (-0.21)	0.128 (1.14)		1.283 (0.57)	2.579 (1.44)	6.196 (2.18)		-0.477*** (-6.37)

GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROE (financial performance) and CAR (risk appetite). Error Correction Term (ECT).

Source: Owner's composition.

The causality links presented in Table 5.22 are summarised and elaborated in table 5.23. The causality links are presented in the short and long-run, and the ECT coefficients are statistically significant, indicating joint causality.

Table 5.23: Panel ECM. Summary of the causality results

Dependent variable	**Source of Causation (independent variables)**								
	Long-run coefficients				Short-run coefficients				ECT
	CAR	GOVINDEX	FINSTAB	ROE	∆CAR	∆GOVINDEX	∆FINSTAB	∆ROE	
∆CAR		No causality (0.92)	Causality (6.01)	Causality (7.04)		No causality (-2.733)	No causality (1.69)	Causality (-2.17)	Causality (-2.20)
∆GOVINDEX	No causality (-0.67)		No causality (0.18)	No causality (-0.38)	No causality (-2.04)		No causality (-1.00)	No causality (0.36)	Causality (-8.85)
∆FINSTAB	Causality (7.99)	No causality (1.59)		No causality (-1.33)	No causality (-0.35)	Causality (-2.48)		No causality (1.49)	Causality (-9.82)
∆ROE	No causality (-1.40)	No causality (-0.21)	No causality 1.14)		No causality (0.57)	No causality (1.44)	No causality (2.18)		Causality (-6.37)

GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROE (financial performance) and CAR (risk appetite). Error Correction Term (ECT).

Source: Owner's composition.

The study found no causality relationship between the capital adequacy ratio and the corporate governance index in the long-run because the coefficients are insignificant. However, the study found uni-directional causality between the capital adequacy ratio and financial stability in the long-run. The result implies that the capital adequacy ratio causes financial stability. Therefore, the higher the capital adequacy ratio is, the higher the financial stability. According to Yuniarti *et al*. (2018), through financial institutions' risks, good corporate governance mechanisms influence banking/financial stability.

Moreover, the study found a uni-directional causality link between the capital adequacy ratio and return on equity in the long-run. The result implies that a percentage increase in the capital adequacy ratio will increase the return on equity. Therefore, the capital adequacy ratio causes return on equity.

However, no short-run causality was found between the capital adequacy ratio and the corporate governance index. Furthermore, no causality relationship was found between the capital adequacy ratio and financial stability in the short-run. The results with no causality relationship are because of the insignificance of the coefficients. However, there is a bi-directional causality relationship between the capital adequacy ratio and return on equity in the short-run. The higher the capital adequacy ratio, the

lower the return on equity of financial institutions in the short-run. The result implies that the causality relationship is in both directions, where the capital adequacy ratio causes return on equity and return on equity causes the capital adequacy ratio and vice versa. The study found a joint causality relationship between the variables: capital adequacy ratio, corporate governance index, financial stability, and return on equity.

Effective corporate governance improves economic efficiency and growth and enhances stakeholder/investor confidence, which is essential for the proper functioning of the corporation (Shleifer & Vishny, 1997). However, no causality relationships exist between the corporate governance index and capital adequacy ratio in the long-run because the coefficient is insignificant. Furthermore, there is no causal relationship between the corporate governance index and financial stability in the long-run because the coefficient is insignificant. The results are inconsistent with those of Adusei (2011) and Yuniarti *et al*. (2018), who found a uni-directional relationship between corporate governance and financial stability. There is no causal relationship between the corporate governance index and return on equity in the long-run because the coefficient is insignificant. The relationship between the corporate governance index and capital adequacy ratio is insignificant in the short-run.

Furthermore, the causality relationship between the corporate governance index and financial stability is insignificant. Moreover, there is no causal relationship between the short-run corporate governance index and return on equity because the coefficient is insignificant. The study found a joint causality relationship between the joint variables: capital adequacy ratio, corporate governance index, financial stability, and return on equity.

The study found a uni-directional causality link between financial stability and the capital adequacy ratio in the long-run. The results imply that financial stability causes a capital adequacy ratio. The causal relationship is in one direction, where an increase in financial stability causes an increase in the capital adequacy ratio. Raouf and Ahmed (2022) assert that the effectiveness of risk governance structures contributes to aspects of financial institutions' financial stability, such as their distance from solvency and liquidity. It could then be inferred that the financial stability of financial institutions is associated with the level and strength of the key risk management

mechanisms. This study found no causal relationship between financial stability and the corporate governance index in the long-run because the coefficient is insignificant.

Furthermore, the study found no causal relationship between financial stability and return on equity in the long-run because the coefficient is insignificant. However, this study found a bi-directional relationship between financial stability and corporate governance in the short-run. The results imply that the causality relationship is in both directions, where financial stability causes corporate governance and vice versa. An increase in financial stability will decrease the corporate governance index of financial institutions. There is no causal relationship established between financial stability and the capital adequacy ratio in the short-run because the coefficient is insignificant.

Furthermore, there is no causal relationship between financial stability and return on assets because the coefficient is insignificant. The study found a joint causal relationship between financial stability and the following variables: capital adequacy ratio, corporate governance index, financial stability, and return on equity. Beck and Feyen (2013) state that the financial sector's performance depends on its financial stability.

The study found no causal relationship between return on equity and the capital adequacy ratio in the long-run because the coefficient is insignificant. Furthermore, there is no causal relationship between return on equity and the corporate governance index in the long-run because the coefficient is insignificant. Moreover, there is no causal relationship between return on equity and financial stability in the long-run. The study found no causal relationship between return on equity and the capital adequacy ratio in the short-run because the coefficient is insignificant. Furthermore, there is no causal relationship between return on equity and the corporate governance index in the short-run because the coefficient is insignificant. Moreover, there is no causal relationship between return on equity and financial stability in the short-run because the coefficient is insignificant. However, there is a joint causality relationship between the variables namely, capital adequacy ratio, corporate governance index, financial stability, and return on equity.

For all the estimates, the coefficients of the error correction term are significant, indicating that the variables in the panel are jointly causally related. The empirical

literature has mainly examined the association between corporate governance and financial performance, and this study contributes to the dearth ofempirical literature by examining causality relationships between financial variables and the corporate governance index.

5.6 Chapter summary

The study’s objectives were addressed using a variety of econometric methodologies. To investigate the nature of the data, the study used descriptive statistics and correlation analysis. Hausman and unit root tests were performed before performing the econometric models. To ascertain the association between corporate governance proxies and the study's chosen variables, GMM models were used. A Hausman test was performed to decide whether FE or RE should be employed in the GMM estimate. Therefore, the Hausman results suggested the fixed effects as the most appropriate for the tests. After that, the findings revealed that there was no consensus regarding the association between corporate governance and the factors used as independent variables for the study.

ARDL was employed to examine the cointegrating relationship between the financial variables and corporate governance proxies after determining the relationship between the variables. There is no requirement to perform the unit root tests in panel ARDL; however, the variables should not exceed the first-order integration. When using ARDL, the study determined the appropriate and suitable estimator between MG, PMG, and DFE. When Hausman's test was used, the PMG and DFE were the most suitable estimators for cointegration and causality analyses between the study's variables.

While the variables were integrated, the short-run link between the study's variables was tested using panel ECM. The study discovered that the financial variables and the corporate governance index tended to have mostly long-run (cointegrating) relationships. However, the short-run relationships are mostly insignificant. The significance of coefficients, namely, short-run, long-run, and ECT, was used to infer the causation relationship between the variables under consideration using the panel ARDL test results.

The next chapter concludes the study by summarising the main findings, drawing conclusions and proposing recommendations.

CHAPTER 6: SUMMARY OF KEY FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

6.1 Introduction

There are six chapters in this thesis. The context for the study was covered in the first chapter, and the literature in the area of study was reviewed in the second chapter, which presented theoretical and empirical reviews of the literature. Chapter 3 discussed the corporate governance of financial institutions in South Africa and chapter 4 discusses the research design and methodology. The results and discussion of the study are presented in chapter 5. The study concludes in this chapter with a summary of the results, a discussion of the study's contributions, and recommendations for further investigations.

Financial institutions appear to have more importance than other industries in corporate governance because they are a key source of financial intermediaries for all economies, especially those in developing nations (Soud & Aypek, 2020). Poor corporate governance can make the market lose faith in a financial institution's capacity to effectively manage its liabilities, assets, and deposits, which could lead to a liquidity crisis, which could then trigger an economic crisis in a nation and pose a significant systemic risk to society (Cebenoyan & Strahan, 2004). For 21 selected financial institutions, the study investigated the key determinants, cointegrations, and causality relationship between corporate governance and the selected variables of interest. The study examined annual data from 2007 to 2020. In Chapter 4, the results are presented in detail. The study employed the GMM method for analysis.

The rest of the chapter is organised as follows: section 6.2 summarises the study's objectives. Section 6.3 provides a summary of the results and concludes the study. Section 6.4 discusses the contributions to the current study. Section 6.5 provides implications and recommendations for future research.

6.2 Summary of the study’s research objectives

The study's primary objective was to investigate the relationship between financial performance and corporate governance utilising a panel of selected financial

institutions. Aiming to achieve this, the study examined the relationship between the determinants of corporate governance for this study and the selected independent variables. Furthermore, the study examined the cointegration between corporate governance and its determinants. The study investigated the short-run relationships after confirming the existence of cointegration. The study further examined the causal relationship between corporate governance and financial variables.

6.3 Summary of the results

Section 6.3.1 presents the key determinants of corporate governance in financial institutions. Section 6.3.2 presents the cointegration relationship between corporate governance and selected firm-specific variables. Section 6.3.3 presents the causality relationship between corporate governance and selected firm-specific variables.

6.3.1 Key determinants of corporate governance in selected financial institutions

Based on the deterministic relationship between independent variables and corporate governance proxies, the relationship depended on the corporate governance proxy used. The corporate governance index and board diversity were found to be significant and negatively associated with financial stability. Furthermore, the study found that financial stability decreases the corporate governance index and board diversity. Contrary to the recent arguments in the literature that claim women are more risk-averse, protective of institutions, and have high integrity (Obert *et al*., 2015), there is a negative correlation between board diversity and financial stability. Meanwhile, the relationship between board remuneration and financial stability were positive and significantly correlated as a result of when financial performance was measured by return on assets, and the association was negative and significant when financial performance was measured by return on equity. The association between the independent non-executive directors and financial stability was highly significant however, it was negative when the financial performance measure was returned on assets and positive when the return on equity was employed. However, non-executive directors were positively and significantly associated with financial stability.

The corporate governance index, board diversity, independent non-executive directors, and board size were positive and significantly associated with the capital adequacy ratio. However, the association of non-executive directors and board remuneration with the capital adequacy ratio was negative and highly significant. Board diversity, board remuneration, non-executive directors, and board size were negatively and significantly associated with return on assets, while the corporate governance index and independent non-executive directors were positively and significantly associated with return on assets. Board diversity, board remuneration, non-executive directors, and board size were negatively and significantly associated with return on equity, while the percentage of independent non-executive directors was positively and significantly associated with return on equity. However, the association between the corporate governance index and independent non-executive directors, and the return on equity were negative and insignificant. Agency theory asserts that corporate governance aims to ensure that management maximises shareholders' wealth by minimising agency costs and enhancing the institution's performance (Bonazzi & Islam, 2007:7; Adegbite *et al*., 2012:389).

However, agency theorists assert that a higher percentage of independent non-executive directors' results is efficient for board oversight (Nicholson & Kiel, 2007). They contend that if the board's oversight responsibilities were efficiently carried out, the likelihood that management would engage in self-serving behaviour would be reduced. This viewpoint aligns with resource dependence theorists, who contend that non-executive directors act as a conduit for the essential resources firms need.

The hypotheses of the study were addressed. Therefore, we conclude that overall financial variables in the selected financial institutions had mixed results. Financial stability in the selected financial institutions had a positive and highly significant effect on corporate governance measures namely, board remuneration, independent non-executive directors, and non-executive directors, thereby confirming the significant role of financial stability as sought to be established by the study. Furthermore, the capital adequacy ratio had a positive and significant effect on the corporate governance index, board diversity, independent non-executive directors, and board size of the selected financial institutions, thereby confirming the pivotal role of capital adequacy ratio as aimed to be established by this study. Moreover, the return on

assets had a positive and significant effect on the corporate governance index and independent non-executive directors, meanwhile, the return on equity had a positive and significant effect on independent non-executive directors to the selected financial institutions, thereby confirming the pivotal role of return on assets and return on equity as sought to be established by this study.

Table 6.1 summarises key determinants of corporate governance in selected financial institutions, in line with this study's research objective.

Table 6.1: Summary of the determinants and their effects

Dependent variable	Independent variable	Coefficient, effect and significance (ROA)	Coefficient, effect and significance (ROE)
GOVINDEX	FINSTAB	-0.0234**	-0.0901***
	ER	0.0105*	0.00298***
	CAR	1.902**	2.080***
	FS	0.0874*	-0.0785
	LEV	1.906**	2.081***
	ROA	0.0501**	
BD	FINSTAB	-0.736***	-1.068***
	ER	-0.0389***	-0.0683***
	CAR	0.000646***	0.000445***
	FS	-1.384***	-2.820***
	LEV	-0.0687***	-0.0617***
	ROA	-0.0266**	
	ROE		-0.0315***
BR	FINSTAB	14368308.7***	-20241642.7***
	ER	-1761372.4***	
	CAR	-22124.8***	-17327.3***
	FS	-34896523.9***	-62486904.0***
	LEV	1945151.3***	958522.7***
	ROA	-1831825.9***	
	ROE		3590692.3***
INED	FINSTAB	-1.990***	6.097***
	ER	0.188***	0.0876***
	CAR	0.00134***	0.00151***
	FS	2.131**	10.94***
	LEV	-0.210***	-0.0692***
	ROA	0.850***	
NED	FINSTAB	0.287***	0.281***
	ER	0.00155***	0.000234
	CAR	-0.0000698***	-0.0000733***
	FS	0.576***	0.575***
	LEV	0.0108***	0.0103***
	ROA	-0.00589**	
	ROE		-0.00785***
BS	FINSTAB	-0.359***	-0.555***
	ER	-0.0827***	-0.0809***
	CAR	0.000419***	0.000433***
	FS	-0.369***	-0.599***
	LEV	0.00669***	0.00579***

	ROA	-0.0813***	
	ROE		-0.0533***

*** $p < 0.001$,** $p < 0.01$,* $p < 0.05$. GOVINDEX (corporate governance proxies: BS, NED, INED, BR, BD, and TD), FINSTAB (financial stability), ROA and ROE (financial performance) and CAR (risk appetite).

Source: Owner's composition

6.3.2 Cointegrating relationship between corporate governance and firm-specific variables in selected financial institutions

We were keen to examine the nature of the relationships between corporate governance and financial variables using panel data after identifying the key determinants of corporate governance and financial performance in selected financial institutions. We examined the presence of cointegrating and causality relationships between the corporate governance index and financial variables using the autoregressive distributed lags bounds testing approach. The autoregressive distributed lags addressed the second and third objectives of the study on the cointegration relationships between corporate governance and the financial variables of interest. Using the pooled mean group and dynamic fixed effect, the results of the study suggest that how corporate governance is measured is significant, as the corporate governance proxies are associated with the financial variables differently. A vector error correction model was used to assess short-run relationships between the variables (Gujarati & Porter, 2009). The study's cointegration analysis revealed a long-run equilibrium relationship between financial variables and the corporate governance index. According to the analysis, most variables show stronger long-run relationships with corporate governance proxies than in the short-run.

The study found the following results when the financial performance measure, namely, return on assets, was employed in the autoregressive distributed lags model. The study indicated a cointegrating relationship between financial stability and the corporate governance index. Furthermore, we found a cointegrating relationship between the capital adequacy ratio and the corporate governance index. However, the relationship between return on assets and the corporate governance index was insignificant. This study found a cointegrating relationship between the capital

adequacy ratio and financial stability. However, the corporate governance index and financial stability are insignificant.

Furthermore, the cointegration between return on assets and financial stability was insignificant. The study found a cointegrating relationship between financial stability and the capital adequacy ratio. Furthermore, we found a cointegrating relationship between the return on assets and the capital adequacy ratio. However, the cointegrating relationship between the corporate governance index and the capital adequacy ratio was insignificant. This study found no cointegrating relationship between the corporate governance index and return on assets. However, we found a cointegrating relationship between financial stability and return on assets. Furthermore, we found a cointegrating relationship between the capital adequacy ratio and return on assets.

The study found the following results when the financial performance measure, namely, return on equity, was employed in the autoregressive distributed lags model. The relationship between financial stability and the corporate governance index was insignificant. Furthermore, the return on equity and the corporate governance index were insignificant. Moreover, the cointegration between capital adequacy ratio and the corporate governance index was insignificant. This study found a cointegrating relationship between the capital adequacy ratio and financial stability. However, there was no cointegrating relationship between the corporate governance index and financial stability.

Furthermore, there is no cointegrating relationship found between return on equity and financial stability. This study found a cointegrating relationship between financial stability and the capital adequacy ratio. Furthermore, a cointegrating relationship between return on equity and capital adequacy ratio was found. However, the relationship between the corporate governance index and the capital adequacy ratio is insignificant. This study found no integrating relationship between the corporate governance index and return on equity. Furthermore, there is no integrating relationship between financial stability and return on equity. Additionally, there is no cointegrating relationship between the capital adequacy ratio and return on equity.

The error correction term is significant and negative under the more efficient estimators namely, pooled mean group and dynamic fixed effect. Therefore, in all the variables, there is a cointegrating relationship among the variables under analysis, but more so, the coefficients represent the speed of adjustments towards equilibrium. This study found that introducing other financial variables, namely, risk appetite, financial stability, and financial performance in other cases, changes the relationship and magnitude in the corporate governance proxies. The analysis can illustrate how risk appetite, financial stability, and financial performance affect corporate governance.

Therefore, when financial stability was regressed as the dependent variable, we concluded that financial stability in the selected financial institutions had cointegrating relationships with the corporate governance index, capital adequacy ratio, and return on assets when the financial performance measure was used as return on assets. Furthermore, financial stability had a cointegrating relationship with the capital adequacy ratio when the financial performance measure was used as return on equity. When the capital adequacy ratio was regressed as the dependent variable employing return on assets as a measure of financial performance, we found cointegrating relationships between the capital adequacy ratio and corporate governance index, between capital adequacy ratio and financial stability, and between capital adequacy ratio and return on assets. However, capital adequacy had a cointegrating relationship with financial stability when the financial performance measure was return on equity. When the return on assets was regressed as the dependent variable, we found a cointegrating relationship between the return on assets and the capital adequacy ratio. When the return on equity was regressed as the dependent variable, we found a cointegrating relationship between the return on equity and capital adequacy ratio. The presence of a cointegration relationship means that there is a long-term equilibrium between the variables.

6.3.3 Causality relationship between corporate governance and selected firm-specific variables in selected financial institutions

The existence of cointegration relationships does not imply causality among the variables. Therefore, a further examination of the long-run relationships was needed to determine their causality. The Hausman test was used to verify the coefficients for

long-run homogeneity, where cointegration relationships were found to exist. The evidence confirmed the uni-directional causality relationship between the capital adequacy ratio and financial stability in the long-run. Furthermore, a uni-directional causal relationship between the capital adequacy ratio and return on assets in the long-run. This study found a bi-directional relationship between the capital adequacy ratio and return on assets in the short-run. However, the causality association between the capital adequacy ratio and the corporate governance index is insignificant in the long-run. Furthermore, the relationship between the capital adequacy ratio and the corporate governance index is insignificant in the short-run. Moreover, the capital adequacy ratio and financial stability are insignificant in the short-run.

This study found a bi-directional causality relationship between the corporate governance index and the capital adequacy ratio in the long-run. Furthermore, a bi-directional causal relationship was found between the corporate governance index and financial stability in the long-run. However, the causal relationship between corporate governance and return on assets was insignificant. Furthermore, the study found insignificant results between the corporate governance index and the capital adequacy ratio in the short-run. Moreover, the relationship between the corporate governance index and financial stability was insignificant in the short-run. There was no causal relationship between the corporate governance index and return on assets in the short-run.

This study found a uni-directional causal relationship between financial stability and the capital adequacy ratio in the long-run. However, there is no causal relationship between financial stability and the corporate governance index in the long-run. Furthermore, there is no causal relationship between financial stability and return on assets in the long-run. This study found a bi-directional causality relationship between financial stability and the corporate governance index in the short-run. However, the causal relationship between financial stability and the capital adequacy ratio was insignificant in the short-run. Furthermore, the causal relationship between financial stability and return on assets was insignificant in the short-run.

This study found a uni-directional causal relationship between return on assets and the capital adequacy ratio in the long-run. Furthermore, we found a uni-directional

causal relationship between return on assets and financial stability in the long-run. However, we found no causal relationship between return on assets and the corporate governance index in the long-run. This study found a uni-directional causal relationship between return on assets and financial stability in the short-run. However, the causal relationship between the return on assets and the capital adequacy ratio is insignificant in the short-run. Furthermore, the relationship between return on assets and the corporate governance index is insignificant in the short-run.

This study found no causal relationship between the capital adequacy ratio and corporate governance in the long-run when the financial performance measure, namely, return on equity, is employed. However, this study found a uni-directional causal relationship between the capital adequacy ratio and financial stability in the long-run. Furthermore, there is a uni-directional causal relationship between the capital adequacy ratio and return on equity in the long-run. This study found no causal relationship between the capital adequacy ratio and the corporate governance index in the short-run. Furthermore, there is no causal association between the capital adequacy ratio and financial stability in the short-run. However, there is a bi-directional causal relationship between the capital adequacy ratio and return on equity in the short-run.

This study found no causal relationships between the corporate governance index and the capital adequacy ratio in the long-run, the corporate governance index and financial stability in the long-run, and the corporate governance index and return on equity in the long-run. Moreover, this study found no causal relationships between the corporate governance index and the capital adequacy ratio in the short-run, the corporate governance index and financial stability in the short-run, and the corporate governance index and return on equity in the short-run. This study found a uni-directional causal relationship between financial stability and the capital adequacy ratio. However, there was no causal relationship between financial stability and the corporate governance index in the long-run. Furthermore, no causal relationship between financial stability and return on equity in the long-run. This study found a uni-directional causal relationship between financial stability and the corporate governance index in the short-run. However, there was no causal relationship between

financial stability and the capital adequacy ratio in the short-run. Moreover, there is no causal relationship between financial stability and return on equity in the short-run.

This study found no causal relationships between return on equity and the capital adequacy ratio, in the long-run, return on equity and the corporate governance index in the long-run, and return on equity and financial stability in the long-run. Furthermore, there is no causal relationship between the return on equity and the capital adequacy ratio in the short-run, the return on equity and the corporate governance index in the short-run, and the return on equity and financial stability in the short-run. For all the estimates, the coefficients of the error correction term were significant, indicating a joint causality relationship in the panel.

Therefore, we concluded that there is a uni-directional causal relationship between capital adequacy ratio and financial stability, a uni-directional causal relationship between capital adequacy ratio and return on assets, and a uni-directional causal relationship between capital adequacy ratio and return on equity in the long-run. Furthermore, there is a uni-directional causal relationship between financial stability and capital adequacy ratio. Moreover, there is a uni-directional relationship between return on assets and capital adequacy ratio, and a uni-directional relationship between return on assets and financial stability in the long-run. However, in the short-run, there is a uni-directional causal relationship between return on assets and financial stability, and financial stability and corporate governance index.

There is a bi-directional causal relationship between the corporate governance index and capital adequacy ratio, and a bi-directional causal relationship between the corporate governance index and financial stability in the long-run. however, there is a bi-directional relationship between the capital adequacy ratio and return on assets in the short-run. Furthermore, there is a bi-directional causal relationship between financial stability and the corporate governance index in the short-run. Moreover, there is a bi-directional relationship between the capital adequacy ratio and return on equity in the short-run.

Table 6.2 summarises the causality relationship between the corporate governance index and selected firm-specific variables in selected financial institutions, in line with this study’s research objective.

Table 6.2: Summary of the causality test results

Dependent variable (x)	Independent variable (Y)	Direction of causality	
		Long-run	Short-run
Financial performance measure employed (ROA)			
CAR	FINSTAB	→	
CAR	ROA	→	
CAR	ROA		→
GOVINDEX	CAR	↔	
GOVINDEX	FINSTAB	↔	
FINSTAB	CAR	→	
FINSTAB	GOVINDEX		↔
ROA	CAR	→	
ROA	FINSTAB	→	
ROA	FINSTAB		→
Financial performance measure employed (ROE)			
CAR	FINSTAB	→	
CAR	ROE	→	
CAR	ROE		↔
FINSTAB	CAR	→	
FINSTAB	GOVINDEX		↔

CAR= capital adequacy ratio, FINSTAB= financial stability, ROA= return on assets, ROE= return on equity, and GOVINDEX= corporate governance index. The single-headed arrows indicate a uni-directional causality relationship and the double-headed arrows indicate a bi-directional causal relationship.

Source: Owner's composition

6.4 Contribution of the study

The study contributes in several ways to the body of knowledge. Prior studies have focused on the relationship between corporate governance and financial performance in financial institutions (Shungu *et al*., 2014; Yuniarti *et al*., 2018; Urgessa & Ababa, 2021). The current study investigated the key determinants of corporate governance in financial institutions, attempting to reverse causality where corporate governance is the function of financial performance. There may be a reverse causal relationship whereby corporate governance frameworks are influenced by financial performance. The study followed the suggestion of prior studies indicating a possibility of reverse causality in the results due to their changes in internal firm characteristics, which may be accountable for corporate governance compliance (Utama & Musa, 2011; Akbar *et*

al., 2016). According to Haan and Vlahu (2015), there are no conclusive results between corporate mechanisms and the financial performance of financial institutions. From the commonly employed independent variables, the study further employed risk appetite and financial stability, which are not extensively discussed in financial dimension settings of financial institutions.

The study used contemporary data and econometric techniques such as the panel autoregressive distributed lags that have not been comprehensively employed in prior studies on the relationship between financial performance and corporate governance. Therefore, there are continual improvements in data availability for measuring financial performance and corporate governance. Furthermore, we developed and applied the corporate governance index to our study by employing principal component analysis. Since corporate governance has different dimensions, the study used a variety of corporate governance proxies to ensure that observations and analysis were rigorous and robust. The corporate governance index comprises variables, namely, board diversity, remuneration, composition, and size, utilised throughout the study.

In contrast to earlier studies, where the index was established utilising the arithmetic average, the composite index was created using principal component analysis, which creates a multidimensional weighted index. The study is consistent with Ellul and Yerramillin (2013), Zagorchev and Gao (2015), and Andries, Capraru and Nistor (2018), who used a self-structured framework that is based on one or few sets of fundamental corporate governance dimensions to create the composite index. However, in contrast with studies using a third-party developed corporate governance index, Peni and Vähämaa (2012) employed the corporate governance index developed by Brown and Caylor (2006).

We employed the principal component analysis method to develop a composite index to proxy corporate governance instead of only using the individual corporate governance proxies, namely, board diversity, board remuneration, board composition, and board size. Therefore, the corporate governance index of the current study was necessary to capture and reflect the corporate governance differences in the sample of selected financial institutions. Moreover, incorporating the corporate governance index into the study further emphasised its importance in financial institutions. The

corporate governance index had a statistically significant and negative relationship with financial stability. However, the relationship between the corporate governance index and the efficiency ratio was statistically insignificant.

Furthermore, the relationship between the corporate governance index and the capital adequacy ratio was insignificant. Moreover, there were no relationships between the corporate governance index and firm size, no relationship between the corporate governance index and the leverage ratio, and no relationship between the corporate governance index and return on equity. This study examined the financial aspects of risk appetite, financial stability, and financial performance to determine the short-run and long-run equilibrium correlations between the financial variables and the corporate governance index.

The study contributed by analysing the relationships between financial variables and corporate governance by investigating the key determinants, cointegrating, and causality relationships. To the best researcher's knowledge, no traceable study was found that carried out such a comprehensive analysis employing different methodological approaches, particularly focusing on financial institutions within an emerging market such as South Africa. Furthermore, the causality analysis employed in the study capacitated us to examine the causality relationship between financial variables individually. Moreover, the analysis employing corporate governance proxies contributes to the literature on how the corporate governance index is measured and affects how it correlates to the key determinants applied to the study. This enabled us to examine the susceptibility of the results to the method used to measure corporate governance.

Academics, policymakers, and practitioners may find the results more beneficial. Consequently, policymakers may integrate their approaches to enhancing corporate governance while considering the various components of corporate governance metrics. Policymakers are therefore urged to note how good corporate governance is enhanced using financial variables. A flawed conception and definition of corporate governance will lead to distorted policies, which will have little to no impact on the effectiveness of the corporate governance of financial institutions. For development policy to have a significant impact on the actual sectors, adopting the concept of

corporate governance is crucial. To improve the oversight functions of the board, policymakers are urged to adopt a unified legal framework and governance suggestions to integrate sound corporate governance practices into the financial dimensions of financial institutions.

Practitioners can therefore understand and conclude the significance of financial dimensions on corporate governance practices. Financial institutions with good financial performance, financial stability, and risk appetite enhance good corporate governance practices. Therefore, principals and agents must ensure resources and systems are effectively utilised while adhering to corporate governance principles (King IV report, 2016). Due to the complexity of what constitutes corporate governance, key determinants of corporate governance in financial institutions are not well understood by decision-makers. The study employed multiple corporate governance measures, which indicated that different corporate governance proxies provide different results.

6.5 Limitations and recommendations for future research

The study was limited to South African financial institutions registered under Bureau Van Dijk Orbis Bank and Financial sector conduct authority, with data for the period 2007 to 2020. Consequently, a small cohort of financial institutions was not included in the study because it was challenging to obtain financial statements to extract the required data. Most of the financial institutions excluded were missing data for more than a one-year period. The study employed secondary data, and if the data sources had systematic errors, this would have an effect on the findings. However, the study examined publicly reputable sources.

The study was limited to only five corporate governance measures, namely, board diversity, board remuneration, board composition, transparency and disclosure, and board size. However, the association between under-examined corporate governance and financial performance needs further extensive exploration to comprehend the association in financial institutions. Such corporate governance measures include board performance, board committees, qualifications, educational backgrounds, and board tenure. Furthermore, future studies may expand the model to incorporate audit

committee-based metrics to understand the financial performance of financial institutions.

The studies may focus on pillars of good corporate governance practices. Integrating quantitative and hermeneutic approaches could reduce methodological artifacts and help establish a direct connection between financial performance and corporate governance in financial institutions (Rebeiz, 2015). The results of the current study showed that financial variables improve corporate governance proxies, which is important for internal corporate governance and investment decision-making. However, in this study's examination of the determinants of board remuneration in the selected financial institutions, there was a negative relationship between board remuneration and financial stability when the financial performance measure is the return on equity, but a positive relationship between board remuneration and financial stability when financial performance measure is the return on assets. Therefore, a study examining why return on equity exhibits low and different explanatory power compared to return on assets could contribute to the extant literature on financial institutions. Furthermore, future research could therefore be carried out to examine the determinants of corporate governance employing external factors such as country-specific legislations and banking regulations. Also includes internal factors such as non-performing loans which could affect corporate governance systems. Moreover, this study only focused on South African banks and insurance companies, future research could also extend the analysis to be a panel study covering other developing countries.

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APPENDICES

Appendix A

List of Financial institutions

Insurance firms	Banks
African Reinsurance Corporation	ABSA Bank Limited
Clientele Limited	Standard Bank of South Africa Limited
Discovery Life Limited	Albaraka Bank Limited
Export Credit Insurance Corporation of South	Bidvest Bank Limited
Federated Employers Mutual Assurance Company	First Rand Bank Limited
Liberty Holdings Limited	Nedbank Limited
Old Mutual Life Assurance Company Limited Africa Limited	Grindrod Bank Limited
Professional Provident Society Limited	Habib Overseas Bank Limited
PSG consultant	HBZ Bank Limited
Sasria Limited	Investec Bank Limited
	Mercantile Bank Limited

Appendix B

Ethical clearance

UNISA

UNISA DEPARTMENT OF FINANCE, RISK MANAGEMENT AND BANKING ETHICS REVIEW COMMITTEE

Date: 09 DECEMBER 2019

ERC Ref #2019/CEMS/FRMB/022
Name : Mr F Khoza
Student #:
Staff #: 90219384

Dear Mr F Khoza

Decision: Ethics Approval from 09 December 2019 to 31 January 2025

Researcher(s): Name Mr F Khoza
E-mail address eknozaf@unisa.ac.za, telephone 012 429 6752

Supervisor (s): Name Prof D Makina
E-mail address maklnd@unisa.ac.za, telephone 012 433 4832

Working title of research:

Determinants of corporate governance in financial institutions

Qualification: DCOM

Thank you for the application for research ethics clearance by the Unisa DFRB Ethics Review Committee for the above mentioned research. Ethics approval is granted for the period 09 December 2019 to 31 January 2025

*The Negligible **risk application** was **reviewed** by the DFRB Ethics Review Committee on 09 December 2019 in compliance with the Unisa Policy on Research Ethics and the Standard Operating Procedure on Research Ethics Risk Assessment*

Appendix C

Language editor's report

TransKaroo
COMMUNICATIONS

8 November 2022
Pretoria, South Africa

To whom it may concern,

I hereby confirm that I undertook the language editing for:

DETERMINANTS OF CORPORATE GOVERNANCE IN FINANCIAL INSTITUTIONS

by Floyd Khoza

Cillié Swart BA (Harvard) MBA (Kuehne)
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pjcswart@transkaroo.net

Appendix D

Turnitin report

turnitin

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	Floyd Khoza
Assignment title:	Revision 2
Submission title:	Complete thesis
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