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DIVIDEND POLICY, AGENCY COST AND BANK PERFORMANCE IN SUB-SAHARAN AFRICA

BY

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SUPERVISORS: PROFESSORS S.O. MIGIRO AND M. SIBANDA

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DECLARATION 1 – PLAGIARISM

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i) Dynamics of Lintner's Model in Nigerian Bank's Dividend Payment Process (Published by *SPOUDAI Journal of Economics and Business, 67*(4), 79-94).

ii) Operational Diversification and Financial Performance of Sub-Saharan Africa Commercial Banks: Static and Dynamic Approach (Published by *Actaoeconomica, University of Danubius. 13*(5), 84-106).

iii) Role of Agency Costs on Executive Compensation in South African Commercial Banks (Published by *Journal of Economics and Behavioural Studies (JEBS), 9*(3), 90-98).

iv) Dividend Payout, Retention Policy and Financial Performance in Sub-Sahara African Commercial Banks; Any Causal Relationship? (Published by *Studia Universitatis Babes-Bolyai Oeconomica, 63*(1), 37-62)

Accepted Articles for Publication

i) Examining Bank-Specific Determinants of the Dividend Payout Ratio of Sub-Saharan Africa Banks: The Panel GMM Approach. **Accepted by: Afro-Asian Journal of Accounting and Finance. Inderscience.**

Articles Under Review

i) Causal Relationship between Dividend Policies and Commercial Bank Performance: Evidence from 30 Sub-Saharan Africa Countries

ii) Income Diversification and the Financial Performance of Commercial Banks in Sub-Saharan Africa

Articles Under Development

i) An Overview of Sub-Saharan African Banking Sector

ii) Theoretical Review of dividend policy in SSA commercial banks

iii) Dividend Policy, Agency Cost, and Bank Performance in Selected Sub-Saharan African Countries: The Role of Market Risk

Papers Presented at Conferences

i) **Olarewaju, O.M.,** Migiro, S.O., & Sibanda, M. (2017), (August 31st –September 1st). Effect of Agency Costs on Executive Compensation in South African Commercial Banks. Paper presented at the 13th Biennial Conference of the Economic Society of South Africa, Rhodes University, Grahams-town, South Africa.

ii) **Olarewaju, O.M.,** Migiro, S.O., & Sibanda, M. (2017), (October 20th-21st). Determinants of Dividend Payout Ratio in Sub-Saharan Africa Banks: The Panel GMM approach. Paper presented at ISERD 83rd International Conference on Accounting and Finance, San Francisco, USA.

iii) **Olarewaju, O.M.,** Migiro, S.O., & Sibanda, M. (2017), (November 17th -18th). Operational Diversification and Financial Performance of Sub-Saharan Africa Commercial Banks: The Static and Dynamic Approach. Paper Presented at 6th IBSSH Conference, UAE, Dubai.

Seminars

i) Olarewaju, O.M, Migiro, S.O. & Sibanda, M (2017), (September 29th). Dividend Payout Ratio, Retention Ratio and Performance of Sub-Saharan Africa Banks, Any Causal Relationship? Paper presented at College of Law and Management Studies annual research day

DEDICATION

This thesis is dedicated to the good Lord that I serve, THE ALMIGHTY GOD, my Husband OLUSOLA OLAWALE and my children: OLUWADAMILARE EMMANUEL and OLUWADUNSIN ESTHER.

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ABSTRACT

This study explored the relationship between dividend policy, agency costs and bank performance among sub-Saharan African (SSA) commercial banks. More specifically, it examined the factors that determine the dividend payout ratio of commercial banks in this region; established the direction of causality between the dividend policy and financial performance of commercial banks in sub-Saharan Africa; determined the effects of operational diversification on these banks' financial performance and evaluated the relationship among dividend policy, agency costs, market risk and performance in SSA commercial banks. The study was motivated by the desire to assist banks to formulate a balanced dividend policy that will enable them to contribute to economic growth and thus ameliorate the poverty, underdevelopment and poor financial depth that characterise the region. Data were collected from 250 commercial banks from 30 SSA countries using BankScope for the period 2006 to 2015. The data were analysed using descriptive statistics and inferential statistics with different econometric techniques, namely, static regression via pooled, fixed and random estimations and dynamic regression analysis via Panel Generalised Method of Moments (GMM), Panel Vector Error Correction Model (P-VECM), the Panel Granger Causality test, Impulse response function and Variable decomposition. Using both Differenced and System GMM, the study found that the lagged dividend payout ratio, after tax income, size and leverage are the key determinants of the dividend payout ratio in SSA commercial banks. The analysis of the causal relationship between dividend policy (dividend payout and retention ratio) and bank performance revealed unidirectional causality between the retention ratio and Return on Assets as well as between Return on Equity and the dividend payout ratio. The study also found that none of the dimensions of operational diversification have a significant effect on financial performance in the static regression analysis, while the GMM analysis (dynamic analysis) showed that, past year performance (lagged Return on Average Assets), asset diversification, deposit diversification, loan diversification and income diversification have a significant effect on banks' financial performance (Return on Average Assets). In addition, a long-run relationship was identified between dividend policy, agency costs, and market risk and bank performance. The disequilibrium from the long run estimate will take about 39.5% annual speed of adjustment to return to a steady state. In terms of the two proxies of market risk, the interest rate risk has a negative effect, while the foreign exchange risk has a significant positive effect on variations in bank performance in sub-Saharan Africa. The evidence from the impulse response function and variable decomposition shows that all the variables in the series responded to shocks in performance (ROA) directly or indirectly during the investigated period, with dividend policy and agency costs the most significant. These findings imply that SSA banks should curtail payment of dividends as the current situation warrants re-investment of earnings to boost their assets and make a meaningful contribution to the region's economic growth. Among others, this study recommends policies to improve dividend policy formulation in such a way that the agency costs of debt and equity will be minimised, and all the banks' stakeholders' interests will be protected to promote the future growth of the sector. It contributes to the extant literature by examining dividend policy with a regional focus using data from 30 SSA countries and identifying the major bank-specific determinants of the dividend payout ratio that can serve as a uniform formula for dividend payments across the region. Furthermore, this is the first study to establish that only dividend retention policy can cause bank performance in this region. Finally, the study used the Herfindahl-Hirschmann Index to measure the diversification of four major dimensions of banking operations and is the first of its kind in the SSA region to evaluate the relationship between dividend policy, agency costs, and market risk and bank performance using long-run analysis.

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LIST OF ABBREVIATIONS

AIC	Akaike Information Criterion
AR	Arellano and Bond Test
AUR	Asset Utilisation Ratio
AFDB	African Development Bank
BOD	Board of Directors
BCEAO	Central Bank of West African States
BYOI	Bring your Own Infrastructure
CAR	Capital Adequacy Ratio
CIA	Central Intelligence Agency
CEMAC	Central Africa Economic and Monetary Community
DPOR	Dividend Payout Ratio
DRIPs	Dividend Re-Investment Plans
EAC	East Africa Community
ECOWAS	Economic community of West African States
FDI	Foreign Direct Investment
FEXR	Foreign Exchange Rate
FPE	Final Prediction Error
GDP	Gross Domestic Product
GMM	General Method of Moments
HQIC	Hannan Quinn Information Criterion
HHI	Herfindahl Hirschman Index
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
LICs	Low Income Countries
LIR	Lending Interest Rate

MFIs	Micro Finance Institutions
MICs	Middle Income Countries
NPLs	Non-performing loans
NBFIs	Non-Bank Financial Institutions
PAT	Profit After Tax
PBT	Profit Before Tax
P-VECM	Panel Vector Error Correction Model
ROA	Return on Asset
RERA	Retention Ratio
ROE	Return on Equity
SSA	Sub-Saharan Africa
SADC	South African Development Community
SBIC	Schwartz's Bayesian Information Criterion
VAR	Vector Autoregressive
WAEMU	West Africa Economic and Monetary Union

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

While maximising shareholders' wealth is the main corporate goal of non-social firms, how to achieve this is up to the individual firm. This goal is achieved through adequate consideration of other stakeholders' interests, short- and long-term financial planning and the implementation of various policies and strategies (Andriof, Waddock, Husted, & Rahman, 2017). A 2014 International Monetary Fund (IMF) summary noted that the ratio of bank assets to GDP is too low in most SSA countries except for South Africa and Mauritius. The summary and the Global Economy report list the ratio of bank assets to GDP as 44.1%, 18.91%, 18.25%, 14.85% and 12.05% in Kenya, Tanzania, Nigeria, Madagascar and Equatorial Guinea, respectively. This is due to the failure of SSA banks to use their earnings as a source of cheap equity that would enable them to operate at full growth potential, promote financial stability and contribute meaningfully to economic growth (Mlachila, Park, & Yabara, 2013a).

Statistics generated from TheGlobaleconomy.com and the IMF database show that, the two countries with the highest bank assets to GDP ratio were Rwanda (53.8%) and Namibia (50.81%), while the others were below 50%. Over the past two decades, the banking sector in SSA has undergone dramatic changes which have led to accelerated economic growth, with commercial banks making the largest contribution (Beck & Cull, 2013). According to Mlachila, Park, and Yabara (2013b), most countries in sub-Saharan Africa have an annual growth rate of 5.25%. While some commercial banks are well capitalized, which enabled them to survive the 2007-2009 global financial crisis, they are considered underdeveloped and are not in a position to sustain future growth prospects in the region (Mecagni, Marchettini, & Maino, 2015).

The financial system remains the engine of growth for SSA economies and is bank-based (Moyo, Nandwa, Council, Oduor, & Simpasa, 2014). The banking sector makes up more than 70% of this system and accounts for the biggest share of financial assets (Akande & Kwenda, 2017; Allen, Otchere, & Senbet, 2011; Enoch, Mathieu, Mecagni, & Kriljenko, 2015).

However, in comparison with other regions, SSA banks are immature, underdeveloped, highly concentrated and generally inefficient when it comes to financial intermediation, inhibiting their growth (Allen et al., 2011; Kablan, 2010; Mlachila, Dykes, et al., 2013). Hindrances to their development include a low asset base, weak creditors' rights mechanisms, and limited access to financial services, high poverty rates and the small size of national markets in most countries.

The low asset base and its consequences is one of the major constraints to economic growth in the region (Mlachila, Dykes, et al., 2013). Should this problem remain unresolved, it might resolve into instability, regressive performance, a lack of stakeholder confidence, inability to diversify, huge financing costs, and a poor contribution to economic growth. This stands the chance of threatening the banks' survival. Since the banking sector is the engine of growth for sub-Saharan Africa, such challenges could be an hinderance to the growth of the entire region. There is thus a need to examine what constitute bank assets and how they can be increased to contribute meaningfully to the economic growth of the SSA region. An optimal dividend policy is a tool that can be used by commercial banks to minimise the total agency costs of debt and equity (Murphy Jr, 1967; Shao, Kwok, & Guedhami, 2013). Jensen and Meckling (1976) identify two types of agency costs, the cost of debt arising from conflict between shareholders and debt holders and that of equity stemming from conflict between managers and shareholders. Both types of agency costs affect bank performance and should be minimised in formulating dividend policy (Shao et al., 2013).

A dividend policy that is capable of minimizing agency problem such that there is an increment in bank performance is crucial to achieve corporate goals (Ang, Cole, & Lin, 2000). The agency costs of both debt and equity that emanate from the separation of ownership must be adequately minimised (Shao et al., 2013). The two common dividend policies in the banking sector are the dividend payout policy (cash dividend) and dividend re-investment plans (DRIPs) otherwise known as a retention policy. While DRIPs are an important source of equity that constitutes a large proportion of bank assets, most SSA banks choose to pay out a larger percentage of their earnings. As assets represent the combination of equity and liability (deposits), if banks re-invest their profit, they will have a broader asset base because retained earnings create opportunities to explore viable investment opportunities, promoting financial stability and enabling the sector to make a meaningful contribution to the economy (Flamini, Schumacher, & McDonald, 2009). Moreover, in SSA economies that are characterised by weak creditors' rights, banks are expected to restrict dividend payments in order to explore viable investment opportunities to build reputational capital (goodwill) that will reduce their financing costs and increase their asset base (Ashraf & Zheng, 2015).

It remains unclear why SSA banks still pay dividends and what drives their dividend payout policy even though they are characterised by strong concentration, weak creditors' rights and a low asset base which are impediments to their operational diversification, sustainability and future growth. According to Nnadi, Wogboroma, and Kabel (2013), most African firms, including banks, pay annual cash dividends to their shareholders. As shown in the graph drawn from the dividend and performance data of the selected SSA commercial banks, they consistently pay dividends and the return on equity (ROE) and assets (ROA) which are measures of performance are decreasing. As at 2010, the averaged dividend payout ratio for the selected countries increased dramatically, while the ROA and ROE fell, but picked up in 2011 when the dividend payout ratio (DPOR) started decreasing.

Ongoing payment of dividends by SSA banks makes no provision to reduce future financing costs which will increase assets, and boost banks' performance and growth potential. This is because banks' earnings are important sources of equity that, if re-invested, lead to safe/healthy banking which promotes financial stability and consequently, enhances economic growth (Farsio, Geary, & Moser, 2004). Shao et al. (2013) posit that dividend policy is a crucial firm decision which leads to a conflict of interest between shareholders and creditors (depositors and debt-holders). While Lintner (1964) noted that optimal dividend policy enhances corporate growth, it also enables firms to manage the divergent interests of creditors and shareholders. Dividend payments reduce shareholders' fears of expropriation by managers (insiders), while aggravating creditors' concerns about expropriation by shareholders (Byrne & O'Connor, 2017). This is because a rational shareholder is more interested in the share price and dividend income than the riskiness of bank operations (Mehran, Morrison, & Shapiro, 2011).

Consequently, an optimal dividend policy requires a trade-off between creditors and shareholders' interests (Brockman & Unlu, 2009). Maximising shareholders' wealth should not be at the expense of other stakeholders' interests. In situations where creditors' rights are weak and there is a low level of assets, low dividends will be paid, while when creditors enjoy strong rights, dividends will be much higher as they will be involved in policy formulation (Byrne & O'Connor, 2012, 2017). Ongoing payment of dividends in the SSA banking system to satisfy shareholders at the expense of banks' creditors limits the region from achieving its full growth potential. It is not sound policy to maximise owners' wealth when creditors' interests are not protected. Ashraf and Zheng (2015) define bank creditors as depositors or debt-holders whose interests should be protected. In doing so, shareholders' interests and wealth are indirectly maximised because managers will take few risks. When creditors' rights are weak, managers are expected to reduce dividend payouts, and reinvest earnings in order to solidify their reputation capital (goodwill) and reduce future financing costs (Ashraf & Zheng, 2015; Byrne & O'Connor, 2017). The widely adopted payout policy of SSA banks does not consider future financing costs and building reputation capital that can increase bank assets. This will obviously limit their future performance and prevent them from achieving their full growth potential (European Investment Bank (EIB) report, 2013).

Although, dividend policy has been researched by scholars, the focus has been on the non-banking sector and specific regions have not been investigated. Dividend policy decisions are one of the top ten unresolved issues in corporate finance and have long been regarded as a puzzle with pieces that do not fit together (Black, 1976; Boţoc & Pirtea, 2014; B. Chang & Dutta, 2012; Hamid, Yaqub, & Awan, 2016; Imran, 2011; T. Patra, Poshakwale, & Ow-Yong, 2012). In general, banks use policies such as the capital adequacy ratio and deposit insurance to boost their performance and sustain growth. The lack of an optimal dividend policy that will increase banks' assets (as a cheap source of equity that is a major component of bank assets) and satisfy both shareholders and bank creditors (depositors and debt-holders) in SSA commercial banks motivated this research. The study thus empirically investigated the nexus between dividend policy, and agency costs and bank performance in SSA countries. This is not only timely but also adds to the body of knowledge required to promote economic growth in this region.

1.2 Problem Statement

While many studies have examined corporate dividend policy, it remains an unresolved issue (Ng'ang'a, 2014). More than four decades ago, Black (1976) posited that "the harder we look at the dividend picture, the more it seems like a puzzle with pieces that are unable to fit together". Although various models and theories have been developed to solve this problem, it remains one of the top ten puzzles in the corporate world (Al-Malkawi, Rafferty, & Pillai, 2010; Brealey & Myers, 2002). Divergent decisions in relation to dividends in SSA banks have rendered dividend policy ineffective and sub-optimal, to the detriment of value creation. Dividend policy should promote growth and minimise future financing costs. However, debate continues on whether banks should continue to pay out earnings or retain them for further investment opportunities. The consequences of ineffective and sub-optimal dividend policy will not only affect banks' stakeholders but economic growth across sub-Saharan Africa. According to Mecagni et al. (2015), the role of the banking sector in this region's financial system cannot be overemphasized as it remains at the forefront of its financial landscape.

Scholars have argued against banks' choice of dividend payouts in that they only reflect previous years' earnings and not current or future earnings generated by firms (Ling, Abdull Mutalip, Shahrin, & Othman, 2007a, 2007b; Miller & Modigliani, 1961; Ojeme, Mamidu, & Ojo, 2015; Omran & Pointon, 2004). Previous studies' failure to use a dividend model to determine a sharing formula is one of the gaps this study aimed to fill. The study proposes an optimal dividend sharing formula that considers capital adequacy ratio (a regulatory requirement). The aim is to ensure that SSA banks are solvent, and do not borrow to pay dividends or draw on their capital to meet demand for dividends. An optimal dividend policy would maximise banks' value and enhance their sustainability. However, this calls for consensus amongst all stakeholders and creditors (Panigrahi & Zainuddin, 2015a; Shao et al., 2013).

Agyei and Marfo-Yiadom (2011), Abiola (2014), Ehikioya (2015), and Abdella and Manual (2016) point to the correlation between dividend policy (mostly payout policies) and performance in both the banking and non-banking sectors despite the fact that it is not clear whether payouts or retention will minimise the agency problem and enhance performance. Granger (1969) observed that it is essential to test for causation as opposed to correlation or regression because correlation/regression does not necessarily imply causation. Causal analysis eliminates the effects of interaction between variables and shows the cause and effect relationship (A. E. Akinlo & Egbetunde, 2010). The paucity of this kind of research in SSA and on-going debate on dividend policy prompted the current study on the causal relationship between dividend policies (both retention and dividend payouts) and the financial performance of banks in SSA countries.

Furthermore, Mishra and Sahoo (2012) noted that managers diversify into various activities in the midst of market risk due to pressure to pay dividends to shareholders. This maximises profit but not does not add to banks' wealth (Abdella & Manual, 2016). Jensen and Meckling (1976) note, that, managers sometimes pursue diversification in order to reap personal benefits. However, this increases agency costs and hinders performance. The evidence shows that SSA banks are highly concentrated and lack diversification, impeding growth. The question of how diversification of banking operations impacts banks' performance requires urgent attention because a lack of diversification results in SSA banks having limited assets and thus not making a meaningful contribution to the region's economic growth (Beck & Cull, 2013).

Market risk is another problem militating against effective bank policies and growth in SSA. Also known as systematic risk, it refers to the effect of external macro-economic policies such as inflation, the exchange rate, interest rate etc., on banking activities. In the long-term, banks should aim to manage market risk (Brigham & Ehrhardt, 2013). While such risk cannot be eliminated through diversification, it can be hedged against. For this reason, this study also assesses the role of market risk in the relationship between dividend policy, agency costs and financial performance in the SSA banking sector.

In summary, given the importance of the banking sector in SSA and the fact that dividend policy plays a major role in determining a bank's success, there is need to identify an appropriate dividend policy that is able to solidify the bank asset base in the region. It is against this background that this study seeks to provide empirical evidence to answer the perennial question of which dividend policy would minimise the agency problem (conflicts of interest) and increase banks' assets/ value. To the best of the researcher's knowledge, this is the first study of its kind in the banking sector with a regional focus, specifically, SSA.

1.3 Aim and Objectives of the Study

This study aims to investigate the dividend policy puzzle and financial performance nexus in the SSA commercial banking sector taking cognisance of inevitable agency costs. To achieve this aim, its objectives are to:

a) Examine the factors that determine the dividend payout ratio of commercial banks in SSA.

b) Establish the existence and direction of causality between dividend policy and the financial performance of commercial banks in SSA.

c) Determine the effects of operational diversification on the financial performance of commercial banks in SSA.

d) Evaluate the nature of the relationship between dividend policy, agency costs, market risk and financial performance among SSA commercial banks.

1.4 Research Questions

a) What are the determinants of the dividend payout policy of commercial banks in SSA?

b) In what direction is the causal relationship between dividend policy and the financial performance of commercial banks in SSA, if any?

c) Is operational diversification having any effect on the financial performance of commercial banks in SSA?

d) How are dividend policy, agency costs, market risk and financial performance related among SSA commercial banks?

1.5 Significance of the Study

Several studies have examined the nexus between dividend policy and firm performance in different countries using the agency cost theoretical framework. This study, which focuses on banks in the SSA region, will benefit bank management and investors or shareholders, both existing and potential, as well as scholars in managerial accounting and finance, financial analysts and investment advisers. Its findings will inform prospective and existing investors as well as fund managers on the various factors to be considered before investing in banks especially where the investor's intention is to hold shares for a longer period in anticipation of reward (dividend income). Such knowledge will enable them to judiciously allocate their funds. Similarly, it will assist financial analysts and investment advisers to provide reliable services to their clients.

The empirical evidence emanating from this study will go a long way in resolving the so-called agency problem between agents (managers) and principals (owners) of banks in SSA countries which has limited this sector's prospects. The implications of its findings will influence shareholders' perceptions of whether retention/reinvestment or payouts determine banks' performance. In the same vein, the study will offer insight into the effects of operational diversification on the financial performance of commercial banks in SSA.

For instance, if operational diversification is found to drive the financial performance of SSA commercial banks, shareholders might be favourably disposed to a retention policy and vice versa. This is because operational diversification is possible if the internal source of financing is stable and this is only possible via retention of earned profits. All other things being equal, this would again have implications for the agency problem between the owners and management of banks in SSA countries. Finally, and most importantly, the study bridges the existing gap in the literature on dividend policy and financial performance in the SSA banking sector and thus provides a basis for future research on this subject.

1.6 Scope of the Study

Data on 450 well-regulated commercial banks with an adequate financial profile on the BankScope database were filtered and 250 banks from 30 countries were found to have the data required for the variables of interest in this study. The study covers the period 2006 to 2015. The base year of 2006 was selected as this is the year in which the revised capital framework for banks generally known as the 'Basel II' framework was adopted. This framework sets out the standard rules of the 1998 accord that had a significant influence on capitalisation, and supervisory and effective disclosure, which aim to improve banking practices to maximise owners' wealth by adopting effective policies, including dividend policy. The end year of 2015 renders the study current and up to date.

The countries examined are Angola, Benin, Botswana, Burkina Faso, Côte d'Ivoire, Cameroon, Ethiopia, Gabon, Ghana, Djibouti, Equatorial Guinea, Kenya, Lesotho, Liberia, Madagascar, Mali, Mauritania, Malawi, Mozambique, Namibia, Niger, Nigeria, Rwanda, Seychelles, Senegal, Swaziland, Togo, Tanzania, Uganda and Zambia. All these countries are impoverished, operate under unique economic conditions and banking characteristics and have responded slowly to global banking reforms. For instance, in SSA, apart from South Africa and Mauritius, only Kenya and Namibia have successfully implemented Basel II capital requirements while countries like Nigeria, Rwanda and Botswana have commenced implementation and others have not (Enoch et al., 2015; Mecagni et al., 2015). According to Allen et al. (2011), Beck and Cull (2013) and Akande and Kwenda (2017), with the exception of South Africa and Mauritius, SSA countries have fairly uniform banking policies and similar financial systems which are bank-based and most confront the same economic situations and challenges. Furthermore, the SSA banking system is unique in terms of its four main characteristics: a) Difficulties in reaping the benefits of economies of scale due to the small size of their economies, b) The majority of economic agents are located in the informal sector and lack adequate formal documentation to facilitate financial transactions, c) Volatility increases banks' operating cost and undermines risk management, d) Governance policy formulation and implementation problems.

Thus, South Africa and Mauritius were omitted from this study. Countries in the region whose economies have been ravaged by war and those for whom there is inconsistent and porous data are also excluded. According to Beck and Cull (2013), South Africa and Mauritius have fairly well-developed and well-established banking systems, while countries such as Central African Republic, and South Sudan and some north African countries have banking systems, but do not report on a regular basis. The 2013/2014 edition of the World Economic Forum Global Competitiveness Survey ranked the South African banking sector 3rd out of 148 countries and the Banking Association of South Africa classified the sector as very healthy in 2016.

1.7 Methodology

This descriptive correlation research falls under the positivist paradigm and adopts a deductive approach. This paradigm was chosen because this is a purely quantitative study. Using proportionate stratified simple random sampling techniques, data were collected on the financial profiles of 250 commercial banks for which up-to-date annual data were available in the BankScope database by Fitch/ IBCA Bureau Van Dijk covering the period 2006 to 2015. For objective one, the Lintner model formulated by Lintner (1956) was used based on the recommendations by scholars as the best model to describe dividend sharing formular. This model was estimated using both system and differenced Generalised Method of Moments (GMM). Objective two adopted the panel-Vector Error Correction Model (P-VECM) to run the block exogeneity Wald test, which shows the existence and direction of both long and short-run causality between dividend policies (payout and retention) and banks' financial performance (ROA and ROE consecutively). For objective three, the Structure Conduct and Performance (SCP) model was used to estimate the Herfindahl-Hirschman Index (HHI) in SSA banks in order to determine how operational diversification has affected their financial performance. Finally, objective four evaluated the relationship between dividend policy, agency costs and bank financial performance using market risk as an intervening variable employing panel-Vector Error Correction Model (P-VECM), the impulse response function and variable decomposition.

1.8 Limitations and Delimitations

Based on the availability of data on dividend policy, this study was confined to licensed banks in 30 SSA countries. A balanced panel was not possible as the required data were not available for all the sampled banks over the study period. All research suffers from limitations. This study's major limitation was its inability to incorporate all commercial banks in the 46 SSA countries (World Bank database) due to a lack of sufficient, reliable and complete data. All the banks with adequate data on the variables of interest from countries with similar economic and banking characteristics were included. However, these limitations and delimitations do not affect the veracity of the study's findings, as reliable alternatives were explored.

1.9 Structure of the Study

This study is presented in nine chapters. Chapter one introduces the research and Chapter two reviews the literature on the theoretical concepts relevant to this study. Chapter three captures the empirical and conceptual framework while Chapter four discusses the research methods, model specification and estimating techniques for each of the study's four objectives. Chapter five, six, seven and eight discusses the model estimation and presents the results of the data analysis and their implications. The final chapter presents a summary, conclusion and policy recommendations on dividend policy, agency costs and bank performance.

1.10 Chapter Summary

This chapter presented a background to the study, followed by the problem statement, and the justification for the study. The chapter identified that formulating and implementing optimal dividend policy can resolve the low bank asset to GDP ratio in SSA. It was also highlighted that optimal dividend policy can minimise the agency cost of debt and equity which is inevitable in banking sector. Moreover, the study highlighted the study's objectives, research questions and its significance and scope. The research methods interms of models and estimating techniques for achieving each of the specific objectives were also emphasized. While the study's limitations and delimitations were also briefly discussed, the chapter concluded with the structure of the study.

CHAPTER TWO

THEORETICAL REVIEW AND FRAMEWORK

2.0 Introduction

This chapter reviews relevant theories on dividend policy that support both payout and retention, diversification, risk and bank performance. The theories on dividend emphasise the dividend relevance and different views on dividend forms. The first section reviews relevant theories, the second presents the theoretical framework for each specific objective of the study and the final section presents a chapter summary.

2.1 Theoretical Review

Given that the dividend decision remains an unsolved puzzle, several theories have been proposed to highlight the relevance of dividends; their effect on firm performance; the impact of dividend policy on agency costs; and the effects of diversification and market risk on agency costs and firm performance.

2.1.1 The Dividend Signalling Theory

The origins of the dividend signalling theory can be traced to Lintner (1956), a change in the dividend paid always results in a change in companies' stock price. Ross' (1977) dividend signalling theory is based on the fact that there is information asymmetry between the owners and managers of firms. This theory assumes that the management team has more valuable information on the firm's assets than agents or owners who simply provide funds. Hence, managers use the dividend payout policy to signal the firm's financial status to investors. Miller and Rock (1985) extended this theory and concluded that if a dividend is a signal of a firm's performance, it should be large enough that only firms with real prospects can pay it and should not be a small ratio which is affordable by all firms. It should also not jeopardise future dividend payments and the firm's survival.

Information asymmetry, which has been the main cause of agency problems leading to agency costs in banking institutions, means that insiders (management) have access to information that enables them to forecast the bank's prospects. They use a dividend payout to provide information to outsiders (investors and the financial market); however, this is limited to the bank's short or long run strategies. The dividend payout policy is subjective, despite the fact that its signalling effect has some embedded costs that affect a firm's share price. Hussainey, Oscar Mgbame, and Chijoke-Mgbame (2011) and Adesina (2017) posit that the relationship between the share price and the dividend paid by firms is confirmation of the fact that a dividend has a signalling effect with respect to future expected earnings, although changes in dividend payments may be an ambiguous signal unless a growing firm can be distinguished from unhealthy firms.

2.1.2 Dividend Residual Theory

Dividend residual theory was propounded by Miller and Modigliani (1961). It posits that dividend policy is a trade-off between payment of a cash dividend and retained earnings. When the Board of Directors and management team make this decision, they must consider maximising shareholders' wealth and providing sufficient financing to enhance the bank's future growth. Residual dividend theory holds that firms should pay dividends after financing all available investment opportunities. Dividends should be paid from the bank's residual income in order to ensure a sufficiently liquid cash flow, as a prudent bank will not borrow to pay dividends. Thus, the theory suggests that dividend policy must be a residual decision.

Among commercial banks that adopt this practice, the dividend payout decision is treated as a passive and secondary decision to be considered after taking up viable and positive net present value (NPV) investment opportunities (Abu, 2012). Therefore, the payment of dividends for any financial year will be equal to the net income minus the bank's target equity ratio, multiplied by its planned total capital. It is assumed under this theory that since the bank gives priority to investment opportunities, its capital will be sufficient to run banking activities in a more viable manner to enhance cash flow and dividends can be paid without damaging the bank.

2.1.3 Tax Preference Theory

This theory was propounded by Graham (1951) and later supported by Litzenberger and Ramaswamy (1979). Taxation is a crucial legal factor that affects a firm's future profit and overall value. The theory concludes that since capital gains from Dividend Reinvestment Plans are taxed at a lower rate than cash dividends; a firm's value is fully maximised when a low payout ratio policy is adopted. The preferential tax system enjoyed by capital gains over cash dividends affects shareholders' choice of payout policy such that wealthy investors prefer companies to adopt a retention policy since earnings' growth prompts an increase in the share price. Although the tax rate on personal income and corporate income differs and dividend income is often personal income, dividend income-oriented shareholders suffer double taxation as corporate profit is subject to corporate income tax (CIT) before it is distributed to investors that pay personal income tax (PIT).

2.1.4 Agency Theory

According to Rozeff (1982), dividend payout policy mitigates the agency cost of external financing. Any firm with agency relationships faces the challenge of the agency problem due to the possibility of sub-optimality of goals between shareholders and managers who are supposed to act in the sole interests of the owner and render stewardship reports on time. The agency problem refers to a principal-agent problem where the principal is the shareholder and the agent is the manager whose main duty is to run the activities of the firm effectively and efficiently, in order to increase its value and maximise shareholders' returns. It emanates from the mis-alignment and divergence of the parties' interests because in such situations, managers no longer invest in viable or positive NPV projects that shareholders consider worthwhile.

The agency costs incurred in aligning these interests involve monitoring and bonding costs and residual losses. Jensen and Ruback (1983) state that the agency problem emanates from the fact that managers are more informed about worthwhile investments that will yield higher positive returns because they are involved in the daily activities of the firm. However, Ballwieser et al. (2012) show that managers whose activities are not properly monitored (agency monitoring costs) tend to pursue their personal interests at the expense of corporate goals by engaging in activities that increase their executive benefits. Brav, Graham, Harvey, and Michaely (2005) and A. D. Crane, Michenaud, and Weston (2016) argue that the dividend payout keeps the firm stable and viable in the financial market by maintaining high monitoring costs and thereby minimising the agency problem. This has long been supported by Ang et al. (2000) that in firms, agency cost is inevitable because of the nature of agency relationship they maintain. Also, the paper posits that the higher the agency cost incurred, better the performance of firms. The continuous payout and the consequential low performance of SSA banks is the main interest of this research. It is the quest to know if other dividend policy that has been described as a good source of equity can influence performance better.

According to Jensen and Meckling (1976), the dividend payout ratio reduces cash flows in the custody of managers, minimising the possibility of embezzlement or investing in zero or negative NPV projects; this invariably minimises the agency problem (costs) and maximises shareholders' wealth, which is the firm's ultimate goal. It has long been argued by Rozeff (1982) that dividend payouts are one means of minimising the agency costs that emmanates from agency problems. Firms raise funds from loans to stabilise in the capital market and the loan creditor acts as an agent that controls the firm's activities to avoid default of the loan terms and agreement. However, Easterbrook (1984) averred that investors accept increments in tax on dividends because they incur little or no monitoring costs in ensuring that the firm's value is fully maximised since the credit (loan) institution monitors its activities. This is an indicator that the firm will yield more income that will convey information about its future earnings.

2.1.5 Bird-in-the-Hand Theory

This theory was propounded by Lintner (1962) and extended by Gordon (1963). It argues that firms pay dividends because this reduces shareholders' uncertainty. The dividend they receive allows them to discount the firm's earnings at a minor rate and place increased value on its shares. Dividends that are paid promptly are a more reliable indicator of the future return on investment than re-investment plans (Gustav & Gairatjon, 2012). If a firm reduces or refuses to pay a dividend, the reverse will be the case.

The theory further explains that a rational investor prefers to receive a dividend as a bird in the hand is worth two in the bush (Ouma, 2012). It supports a positive correlation between a dividend and the value of a firm, in that firms that pay dividends receive a higher rating from rating agencies than those that do not. This makes it easier to raise funds on the capital market because creditors (loan institutions) prefer disbursing funds to dividend-paying firms as this signals their ability to meet their financial obligations. Indeed, such firms are able to borrow at preferential rates. In financial terms, the 'bird in the hand' means that shareholders prefer to invest in shares in firms that pay current dividends rather than in those that retain profits and delay dividend payments due to the possibility of unexpected future occurrences that could jeopardise future dividend payments and capital gains (Kent Baker & Powell, 2012).

2.1.6 Life Cycle Theory of Dividend

The life cycle theory of the firm was propounded by Mueller (1972) and the life cycle theory of dividends was developed by Bulan and Subramanian (2009) and Thanatawee (2011). The major argument of this theory is that the stage a firm has reached in its life cycle determines its optimal dividend policy. The life cycle runs from inception to maturity with many circumstances arising along the way, including a declining growth rate, shrinking investment opportunities, and the decreased cost of raising capital externally. The optimal dividend policy involves a trade-off between the costs and benefits associated with raising capital for new projects taking life-cycle-related factors into account. Dividend policies change over the life cycle of a firm, and, surprisingly, as a firm matures, its ability to explore profitable investment opportunities is overtaken by its ability to generate cash.

According to Coulton and Ruddock (2011), a newly incorporated firm has diverse investment opportunities which it finances with internally generated funds due to the fact that it is difficult to access external finance. Such firms find it impossible to pay dividends. As the firm grows, it reaches maturity when investment opportunities vanish, growth and profitability levels remain stagnant, market risk is reduced to the minimum, and the firm has access to internally generated funds that it can invest profitably. At this stage, the firm disburses its earnings to investors, although the extent to which it does so depends on the congruence between managers and shareholders' goals and interests.

The life cycle theory of dividends posits that a firm should adopt a payout policy when its profitability and growth rate are expected to decline. This contrasts with the signalling hypothesis of dividends that argues that a firm's ability to payout is a signal to the financial market that its profitability and growth prospects have improved. A rich body of evidence supports the life cycle theory of dividends. For instance, Benartzi, Michaely, and Thaler (1997) noted that an improved growth rate leads to reduced dividends, while an increase in dividends is not followed by earnings growth. Grullon, Michaely, and Swaminathan (2002) find an inverse relationship between a firm's profitability and dividend payments, such that when a high dividend is paid, there is an increase in profitability and vice versa. Any firm that increases dividends should expect a future decline in profitability and vice versa. Only firms that have exhausted available investment opportunities should increase their dividends (Brown & Sum, 2010).

Hence, adopting a dividend payout policy indicates firm maturity rather than being a signal of their future profitability. Bulan, Subramanian, and Tanlu (2007) also find that firms that pay dividends experience a fall in systematic risk; therefore, companies only adopt a dividend payout policy after reaching maturity. Dividend initiators are firms that are fully grown and more profitable with greater cash reserves, but fewer investment opportunities. Bulan et al. (2007) also conclude that no significant increase in profitability or growth prospects is attached to dividend initiation. Similarly, DeAngelo, DeAngelo, and Stulz (2006) find that there is a significant positive correlation between dividend payment and the mix of internally generated and externally sourced capital in a firm's capital structure. Firms that generate capital internally tend to be dividend payers.

However, many banks have made it the norm to pay dividends as this policy is commonly adopted in this sector to indicate their performance and attract investors. This could be the reason for the underdevelopment of the SSA commercial banking sector, because a dividend decision has a great impact on other decisions. Newly incorporated firms that are in their growth stage should pay low or no dividends as they require internal funds (retained earnings) to finance investment and enhance their sustainability. The big-four banks that have reached maturity are expected to pay high dividends, based on their shareholders' expectations, because at this stage cash flow exceeds capital requirements and over-liquidity problems will result in willingness to distribute cash to reward shareholders. However, as noted earlier, the tendency is for all banks to pay a dividend to signal their future prospects. Hence, this study seeks to determine what factors the banking sector should consider in terms of setting the dividend payout ratio.

The relationship between a firm's life cycle and dividend policy is shown schematically below:

Stage of Growth ⇓		Dividend Policy ⇓
Introduction	⇒	Undecided
Growing	⇒	Higher retention policy
Maturity Stage	⇒	Increased payout policy
Declined Growth	⇒	Generous payout policy

From the picture above, it could be discovered that higher retention should be the optimal dividend policy in SSA banking sector. This is due to the fact that the sector is just growing and has not reached the maturity stage that can justify the present increased payout policy.

2.1.7 Walter's Theory of Dividend

This theory centres on the effect of the dividend decision on share value and firm value. Walter's theory posits that dividend policy and investment policy are inter-related and that the choice of dividend policy affects the firm's value. Hence, the value of high dividend-paying firms is always higher than that of low dividend-paying firms (H. K. Baker, Veit, & Powell, 2001; Fama & French, 2001). The theory also postulates that a firm's adoption of a retention policy would considerably increase owners' future returns but is associated with opportunity costs (the costs of the unpaid dividend).

If the cost of equity capital is greater than the rate of return $(k_e > r)$, the firm must choose a payout policy, but if it is less than the rate of return $(k_e < r)$, the firm should adopt a retention policy and reinvest the retained earnings in profitable and viable projects. Hence, in implementing dividend policy in firms, including the banking sector, efforts must be made to understand the relationship between the cost of equity capital (k_e) and the rate of return on investment (r).

2.1.8 Behavioural Theory of Dividend Policy

The basic assumption of this theory is that the target dividend and the previous year's dividend can be used to explain the change in the dividend when it is expressed as a proportion of current earnings. Lintner (1956) found that dividend polices vary across firms because managers change their dividend policy when unexpected changes occur in the firm's earning capacity. He thus concluded that a firm's bottom-line earnings are the main determinant of dividend policy changes. Litner's behavioural view of dividend policy avers that many firms refuse to cut dividends because this signals an expected permanent decline in their earnings which invariably discourages their investors from buying more shares. Hence, an increase in the dividend is proportionate to the lagged earnings of the firm such that the dividend payout is only expected to occur following evidence of relatively permanent and sustainable earnings. Moreover, regulatory controls affect the choice of dividend policy such that regulated firms reduce their payout when they operate in deregulated environments.

2.1.9 Clientele Theory of Dividend Policy

This theory traces the links between shareholders' dividend preferences and their characteristics (whether they are elderly, wealthy, institutions, less well-off, tax-exempt, etc.). According to Bhattacharya (1979), investors' payout preferences are the result of different institutional characteristics such as tax differentials, regulatory requirements and other behavioural influences. According to Shefrin and Thaler (1988), the personal life-cycle of investors determines their dividend preferences. A company with more elderly investors tends to choose a payout policy because dividend income pays for their daily living expenses. This theory has been widely used to explain institutional investors' dividend policy preferences. Allen, Bernardo, and Welch (2000) and Seida (2001) found that firms' dividend policy is affected by investors' tax status. Similarly, Hotchkiss and Lawrence (2007) found that dividend announcements by firms with institutional investors who prefer payouts enhance their returns. Managers consider shareholders' preferences when formulating dividend decisions.

The clientele theory of dividend policy has been challenged. For instance, Grinstein and Michaely (2005) found that institutional investors invest in dividend-paying firms but prefer low dividend-paying firms to high paying ones. Barclay, Holderness, and Sheehan (2009) found that corporate investors prefer a retention policy that will improve the firm's operating activities. Brav et al. (2005) aver that managers are sceptical about the existence of any relationship between investors and dividend policy as institutional investors appear to be indifferent when it comes to such decisions. Damodaran (2010) notes that it is logical for investors in low tax brackets to invest in firms that adopt a payout policy while those in high tax brackets invest in firms that adopt retention policy, which does not reward owners with dividend income but capital gains.

2.1.10 Catering and Investors Sentiment Theory of Dividend Policy

Catering theory avers that investors' demand for dividends varies over time and reflects their sentiment and time-bound risk preferences. For example, during a period of recession (a low-sentiment period), investors prefer to invest in dividend paying firms because they are considered safer while during economic booms (good times), they prefer to invest in companies that adopt a retention policy as they regard their stocks as more risky. The catering theory of dividend is based on the assumption that firms need to consider and accommodate dynamic predilections in making dividend decisions. Thus, firms that adopt retention rather than a payout policy must pay dividends when investor demand for dividend payments is high.

In contrast, firms that tend to opt for dividend payments should desist from doing so when investors prefer reinvestment of their rewards (returns on investment). Fama and French (2001) note that dividends can disappear over time in accordance with a fall in market dividend premiums. However, DeAngelo, DeAngelo, and Skinner (2009) found that dividends never disappear but are more concentrated among US firms, and while they found an increase in dividends over time, there is no concrete evidence that investor demand explains this trend. Von Eije and Megginson (2008) found that, while dividend payments by firms in the European Union (EU) declined towards the turn of the millennium there is no evidence to show that this is explained by the catering hypothesis. The catering theory is not new as several previous studies have shown that the policies adopted by firms respond to investor demand, including dividend policies (M. Baker, Ruback, & Wurgler, 2007; Ben-David, 2010; Ben-David & Roulstone, 2009; Dong, Hirshleifer, Richardson, & Teoh, 2006).

2.1.11 Managerial-Biases Theory of Dividend Policy

This theory is based on the concept of "optimism". It assumes that Chief Executive Officers (CEOs) of firms are over-confident (optimistic) about the firm's current and future cash flows which invariably affects their choice of dividend policy. According to Cordeiro (2009) and

Deshmukh, Goel, and Howe (2009), optimistic managers do not adopt a payout policy and if they do, they pays less dividends because they are over-confident about their firms' prospects and prefer to retain and reinvest cash in viable and positive NPV projects. Furthermore, market reaction to increased dividends announced by optimistic managers is less positive than when such an increase is announced by less optimistic Board.

However, Ben-David, Graham, and Harvey (2007) did not find that optimistic CEOs pay less dividends. Managers who are over-confidant about their firms' future also adopt policies aimed at enhancing growth including high leverage (financing) and investment policies. In light of the other factors that determine the choice of dividend policy, a payout policy might not be the first choice. If a firm pays high dividends because managers are optimistic, should the firm achieve less than expected earnings in the future, they will be forced to reduce or cut dividend payouts (Ben-David, 2010).

2.1.12 Firm Valuation Hypothesis (Theory) of Dividend Policy

According to Frankfurter and Wood Jr (1997), the main purpose of dividends is to maintain a balance between equity financing as debt financing because it gives investors tangible returns on their investment over time and provide a basis to calculate share values. The information exchanged between outsiders (owners and the market) and insiders (managers) may enhance the firm's value and maximise the owners' wealth. Steward states that reports on cash flows provided by managers to investors are the major basis for valuation due to the incomplete and inaccurate information that is usually available to shareholders (Panigrahi & Zainuddin, 2015b). Most investors use diverse ratio analyses such as the price earnings ratio, sales to assets ratio, and market to book ratio to determine if a particular firm is under- or over-valued. Thus, scholars have maintained that the dividend yield which is the ratio of the dividend per share to the firm's share price is an indicator of the firm's value and also a yardstick for valuation, although it is not always a true measure of its value (Damodaran, 2009).

The main proposition of the valuation yardstick hypothesis of dividend is that dividend policy helps investors in the valuation of their cash flows and provides a basis for comparison with other firms in the same industry. This hypothesis is based on two assumptions; first, firms initiate dividend payouts when they are undervalued by shareholders and do not pay dividends when they are highly- or over-valued. This assumption is empirically supported by Michaely, Thaler, and Womack (1995) study that found that dividend paying firms outperform the market as soon as they announce dividends while firms that do not pay dividends underperform.

The second assumption is that dividend patterns or changes are correlated across firms in the same industry. This means that if shareholders use a single ratio of dividend yield as a yardstick for firms' valuation within an industry and the firms desire high valuation, it is expected that a change in the payout ratio of one firm will cause changes in the payout ratios of others in the industry following the same direction. Empirical evidence to support this assumption has been provided by Firth (1996). While the valuation yardstick hypothesis does not hold at all times, numerous studies have supported it (Benartzi et al., 1997; Damodaran, 2009; Grullon, Michaely, Benartzi, & Thaler, 2005; Grullon et al., 2002). In summary, for dividend policy to be a useful tool for valuation, firms should adopt and smooth dividend payout policy because it provides information about firms' undervaluation even if it does not forecast changes in their operating performance (Boudoukh, Michaely, Richardson, & Roberts, 2007; Leary & Michaely, 2008).

2.1.13 Percent Payout Theory of Dividend

This theory was propounded by Rubner (1966). Its basic proposition is that shareholders prefer dividend income and hence firms should adopt payout policy amidst many other dividend policies. Managers are expected to convince investors that their expected return on investment will increase their current wealth. However, for managers to ensure their own job security and maintain a good reputation with shareholders, they should adopt a 100 percent payout policy. This is despite that fact that this may not be practicable if managers are pursuing maximisation of all owners' wealth. Careful evaluation will be required if the business model is faltering; if the company needs funding to undertake a specific project that will enhance its long term growth; and if the firm's growth is slowing down due to competition or other factors.

2.1.14 Percent Retention Theory of Dividend

This theory argues that, since investors fall into different categories such as income, age, tax bracket, etc, managers should adopt a 100 percent retention policy so as to avoid conflict between shareholders, minimise the burden of the high tax (double taxation) attracted by dividend income and reduce the transaction costs associated with a payout policy which have made the policy a luxury, and negative NPV transactions. Under this theory, firms should take up all viable investment opportunities as positive NPV transactions which will assist in achieving the ultimate corporate goal (maximisation of shareholders' wealth).

2.1.15 Pecking Order Theory

The pecking order theory postulates that firms prefer to use capital generated from retained earnings to finance their businesses (Myers & Majluf, 1984). Due to information asymmetries between managers and potential investors, firms' order of preference in terms of finance will be using retained earnings rather than debt (either short term or long term), short term debt instead of long term debt and any form of debt rather than equity (issue of new shares). Myers and Majluf (1984) argued that the problem of information asymmetry will be resolved if firms refuse to issue new security but utilise retained earnings to finance investment opportunities. This implies that the equity source of finance becomes more expensive as the asymmetric information between insiders (managers) and outsiders (owners) increases.

Hence, it is preferable for firms with high information asymmetry to issue debt so as to avoid selling underpriced securities. Based on this, care should be taken in the choice of policy on dividend payouts so that the source of financing or the mix of sources does not become a problem. Managers are privy to insider information that is not known to the market and they have more information on the most judicious distribution of the firm's earnings and the risk attached to such earnings than the owners (outsiders). Therefore, dividend policy that signals higher returns but jeopardises the firm's financing structure should not be accepted by the owners because managers tend to limit the use of equity in order to retain control of the firm (Abor & Biekpe, 2006).

2.1.16 Market Power Theory

Diversification is one of the strategies to address competition by enabling firms to increase their market power. Diversified firms accumulate market power and competiveness due to their stake in other markets. The market power theory has its origins in the work of Porter (1980) who used different strategies to distinguish a firm's position among its competitors. The theory posits that diversification enhances profitability because firms with market power can cross subsidise, i.e., use the gain derived from one market to support competitive pricing in other markets and can engage in mutual and reciprocal buying and selling that makes it difficult for potential competitors to enter the industry.

2.1.17 Resource Based View (RBV) Theory

This theory was formulated by Penrose (1959) and extended by Rubin (1973). It assumes that firms achieve sustainable competitive advantage through deliberate managerial effort. A firm with resource advantage can build barriers to ensure it enjoys a competitive advantage. The main postulation of this theory is that firms usually have productive resources that can be used to exploit opportunities and pave the way for growth.

According to Contractor, Kundu, and Hsu (2003), firms derive benefits by sharing tangible resources and technological know-how, vertical integration, coordinated strategies and pooling their negotiating power. This enhances their efficiency, promoting economies of scope and scale. Diversification enables firms to maximise the exploitation of their valuable resources and hence improve their financial performance. This theory thus advocates for diversification through building resources and entering new markets which promotes efficient cost-benefits analysis.

2.1.18 Modern Portfolio Theory

This theory was propounded by Markowitz (1952) and its legacy was established in the study of Fabozzi, Gupta, and Markowitz (2002). The theory focuses on rational investors' ability to assess and obtain an optimal trade-off between the risks and returns embedded in their investments so as to build a sound portfolio. It shows how a risk-averse shareholder can construct a portfolio and maximise the expected return given a certain level of market risk. The basis of this theory is that risk is an embedded part of returns in any firm. It shows that a sound portfolio will maximise returns with a given level of risk or minimise risk for a given amount of returns derivable from the combination of various assets. In terms of this theory, the impact of unsystematic risk emanating from external contingencies in each market is reduced through the allocation of assets across diverse markets. Thus, diversification reduces a firm's exposure to risk and it also enjoys higher debt and leverage capacity which create room for expansion and growth.

2.1.19 Agency Cost Theory of Diversification

The main postulation of this theory is that the separation of ownership and control in firms creates conflicts of interest which lead to agency costs in firms. Agency costs are made up of monitoring costs incurred by shareholders to ensure goal congruence, bonding costs incurred by managers to deter owners from taking action that does not gel with managers' vision and residual loss incurred by owners as the result of the gap between the wealth maximisation decisions they expect and those taken by agents (Jensen & Meckling, 1976). Due to the nature of agency relationships, managers deploy corporate assets to pursue their personal goals rather than the corporate goal of maximising owners' wealth.

According to Jensen (1986), such divergence in interests is due to the risk preferences of agents and principals. While shareholders focus on market risk, managers are interested in unsystematic risk. The conflict of interest between owners and managers is more pronounced in firms with free cash flows because managers in such firms tend to invest the excess cash flow in investments that will maximise profit rather than wealth so as to satisfy their selfish desires. Diversification is one of the drivers of such managerial behaviour because managers tend to undertake low-benefit or value destroying diversification to increase the size of the business in order to reduce risk and promote their personal interests and positions (Jensen & Meckling, 1976). Thus, if diversification is not well-managed, it can result in negative repercussions.

2.2 Theoretical Framework for each Objective of the Study

2.2.1 Theoretical Framework for the Determinants of the Dividend Payout Ratio

The bird-in-the-hand theory is employed to examine the determinants of the dividend payout ratio because it explains dividend payouts as birds in the hands of shareholders with little or no uncertainty. Lintner's model is used to investigate the determinants of the dividend payout ratio because it still holds, represents the dividend setting process, has a good and best fit as far as panel data regression is concerned and offers a good explanation of dividend behaviour in organisations. The model is unique because it stabilises dividend policy by identifying an appropriate dividend payout ratio for firms, including those in the banking sector.

2.2.2 Theoretical Framework for the Causal Relationship between Dividend Policy and Bank Performance

The percent payout, percent retention and life cycle theories are used to establish the causality between dividend policy and bank performance. Payout and retention policy are critically examined to establish which causes bank performance, while the life cycle theory emphasises that the choice of dividend policy must be in tandem with the life stage of a firm if it is to enhance performance. The percent payout theory supports payment of dividends as a signal of improved performance while the percent retention theory supports retention of earnings in order to explore viable investment opportunities.

2.2.3 Theoretical Framework for Operational Diversification and Bank Performance

The RBV theory is employed to examine the effect of operational diversification on banks' performance. This theory is chosen because of its postulation that firms should use their available resources to promote competitive advantage and economies of scale and scope arising from synergy. Commercial banks have a range of operational resources that can be diversified, including assets, loans, deposits (their main liability) and income. If all these resources are efficiently utilised, there is a need to establish the impact on their financial performance.

2.2.4 Theoretical Framework for the Relationship between Dividend Policy, Agency Costs, Market Risk and Bank Performance

The modern portfolio theory (MPT) is used to evaluate the relationship between the key variables in this study using market risk as the intervening variable. Having established that market risk is unavoidable, MPT shows the risk-return trade-off in an entity. Hence, evaluating the relationship between the variables will show the inter-relationship among each of the variables and bank performance taken as the return.

2.3 Chapter Summary

This chapter reviewed the theories relevant to this research study and identified those employed to achieve each of its objectives. The bird-in-the-hand theory is employed for objective one, while the percent payout, percent retention and life cycle theories, RBV theory and the modern portfolio theory are used for objectives two, three and four, respectively. While the current chapter reviews the relevant theories, the next chapter presents the review of relevant concepts and prior research relating to the dividend policy and bank performance so as to show the knolwege gaps this study intends to fill.

CHAPTER THREE

REVIEW OF RELEVANT CONCEPTS AND PRIOR RESEARCH

3.0 Introduction

The first section of this chapter reviews the relevant concepts relating to the key variables in each of the study's objectives, while section two presents a review of the empirical literature and identifies knowledge gaps relating to each of these objectives. Section three summarises the literature review and section four presents the conceptual framework for each of the study's objectives to illustrate the linkages between their variables of interest. The chapter concludes with a summary.

3.1 Conceptual Review

3.1.1 Dividend Policy in Banks

Dividend policy is a parameter used by managers and the Board of Directors to make decisions on dividend issues. It needs to be well defined to address both the timing and the amount of the issuance which is part of the bank's cash out-flows. The shares of a bank that shows consistent returns and earnings growth are attractive to investors. There is a tendency for a bank that is growing rapidly to divert its cash to fund growth and pay less cash dividends to its shareholders. When it chooses to pay dividends, some growth-oriented investors assume that the bank is involved in indulgent activities and might dispose of their shares, while many others regard dividend income as their own portion of the bank's value.

The Board must always strive to satisfy all its investors, both growth-oriented and dividend income-oriented by making wise use of its cash to make acquisitions and settle liabilities. If it chooses to pay cash dividends, this should be well-planned to ensure consistency; otherwise, the bank could lose both categories of investors, thereby undermining it value. When a dividend payout is adopted, a wise bank will start by paying small dividends that can easily be paid from its current resources and cash flow but can later increase the dividend in such a way that its growth is not jeopardised. Conversely, a bank that pays large dividends that absorb all its income, even going to the extent of sourcing external funds, would endanger its survival.

Furthermore, before adopting a dividend payout policy, the Board of Directors should consider the negative implications of the bank's inability to continue dividend payments due to a shortage of cash. This could lead to dividend income-oriented shareholders disposing of their holdings and imbalanced demand and supply of the bank's shares, as investment-oriented shareholders would purchase more shares due to the fall in the share price. Hence, the Board of Directors should consider dividend policy as a strategic or long-term decision to reflect the availability of adequate cash flow and the required capital framework for the bank to operate, which serves as the basis for its liquidity.

3.1.2. Optimal Dividend Policy among Banks

The optimal dividend policy preferred by banks depends on whether decision-makers perceive that dividends will increase the value of the bank. According to I. M. Pandey (2001), the cash dividend payout ratio is the most common policy adopted by commercial banks. The major issues are thus how much should be paid, the source of the funds to be paid, how to ensure that capital requirements are not violated, whether the dividend should be paid directly to the shareholders or be repurchased and how frequently it should be paid. All these questions must be constantly answered by the Board due to the dynamic nature of payout policy which requires constant review to reflect the bank's financial situation. The dividend payout policy is not only important due to its effect on a bank's cash flow; it also has the tendency to impact on other financing and investing policies. The Board of Directors and management need to decide on the level of dividends, the amount of financial slack available in the bank, the probability of investment in real assets, debt insurance, working capital management, and merger and acquisition decisions as these significantly influence dividend policy.

According to Allen and Michaely (2003), the following factors should be considered in setting dividend payout policy. a) Taxes: does the cash dividend attract higher taxes than capital gains such that beneficiaries find it difficult to avoid this tax? It is better to minimise the payout ratio in cash and rather shift to stock dividends or dividend re-investment plans. b) Asymmetric information: if managers are convinced that the bank's dividend will signal the value of its shares to the market and prospective investors despite the associated costs, they should continue to pay out and if otherwise, they can resort to dividend options. c) Transaction costs: if a dividend payout will reduce shareholders' transaction costs and encourage them to retain their shares, managers should increase the payout and ensure that shareholders' wealth is optimally maximised in all their activities. d) Incomplete contracts: if managers are involved in incomplete or unviable investments, shareholders can use high cash dividend payouts to hold managers accountable for all investments and hence, minimise the agency problem that leads to agency costs.

3.1.3 The Concept of Dividend Payout Policy

According to I. Pandey (2003), a dividend payout refers to the portion of the net earnings generated by a company which the Board of Directors decides to distribute to the owners in proportion to their respective shareholdings. Gustav and Gairatjon (2012) noted that a dividend payout policy can be implemented in two ways, namely, a cash dividend or stock dividend that involves buying back outstanding stock. Determining the appropriate proportion of net earnings to distribute to shareholders, while maximising owners' wealth has been a major challenge. Shareholders face the constant dilemma of whether payouts or retention are the best way to ensure the future growth of firms (Henok, 2016).

However, dividend payouts have been widely used by banks to signal their viability and financial health to prospective investors. According to Nnadi et al. (2013), in the SSA banking sector, the Board of Directors has sole responsibility for formulating the dividend payout policy although there might be some exceptions to this rule. Commercial banks choose to pay dividends due to their signalling effect and the need to minimise the free cash flow that causes the agency problem as well as maintain the market price of their shares (Gill, Biger, & Tibrewala, 2010).

3.1.4 The Concept of Dividend Smoothing

Lintner (1956) posited that a firm's dividend will only increase if the payment ratio can be maintained as paying dividends, suggests that the firm will continue to grow in the future. Managers thus seek to ensure stable dividend policies by smoothing their dividend decisions relative to the level of earnings. Their dividend payment structure is expected to gradually increase and rarely fall due to the expectation of consistent returns. Studies by scholars such as Aivazian, Booth, and Cleary (2006); Lambrecht and Myers (2010) and Brav et al. (2005) in various economies confirm that it is difficult for managers to increase or reduce dividends in tandem with an increase or decrease in earnings, such that they prefer to issue equity or reduce investment in order to maintain a stable payout ratio.

A recent study by Leary and Michaely (2011) found that dividend smoothing has been a major preoccupation of managers for more than 50 years, resulting in failure to review dividend policy in response to changing environmental, institutional and economic situations. Furthermore, share repurchases and cash dividends are the most common dividend policy with the latter the most favoured. However, the dividend policy segment of corporate financial decision making remains an issue for debate, with no consensus reached since the Miller and Modigliani theorem of dividend irrelevancy (Sibanda, 2014a, 2014b). Asymmetric information in firms, including the banking sector has been identified as a perpetrator of dividend smoothing such that information directed at institutional investors may lead to improved monitoring of managers' activities and increased managers-shareholders conflict (Guttman, Kadan, & Kandel, 2007). Similarly, Allen et al. (2000) observe that, institutional ownership will increase when dividend smoothing is addressed in line with the agency theory of firms while, in contrast, institutional holdings will decrease when such smoothing is addressed from the information asymmetry perspective.

Why are managers not interested in changing their payout ratio when there are many determinants of the ratio they are supposed to pay based on firm-related characteristics? Managers find it difficult to change their payment ratio and smooth dividends over time so as to lower their revenue risk and withhold adverse news that negatively impacts executive benefits. Reluctance to adjust their dividend policy can thus be traced to managers' desire to safeguard their careers. A review of the dividend ratio or a cut does not directly indicate a future decrease in the firm's expected earnings, but points to large earning shocks which invariably impact future performance. Grullon et al. (2005) posit that it will take a long time for a firm that cuts dividends to reach a stable position i.e., there will be slow productivity reversals.

Managers also favour smoothing the payment ratio over time because announcement of a reduced payout ratio usually has a marginal effect on likely turnover. Firms that decrease their dividends are expected to experience a one-third increase in the rate of forced turnover compared to those in the same range of earnings that maintain or increase dividends. Thus, career concerns and personal benefits have been the main reason for managers smoothing dividends over time, rather than the goal of maximising owners' wealth. There has been an inverse correlation between dividends and earnings (Wu & Wang, 2000). In this respect, there is a need to identify the factors that determine the payment ratio in the banking sector that has chosen a dividend payout policy as its preferred method in the belief that it signals performance.

3.1.5 Agency Problems and Dividend Policy in the Corporate World

Dividend policy became the focus of attention following the work of Miller and Modigliani (1961) that posited that it has no effect on shareholders' wealth in a frictionless and perfect market, with investment policy held constant. This led to on-going debate on how firms select a suitable and implementable dividend policy. This puzzle is more complicated in SSA countries because there are no perfect market conditions as proposed by Miller and Modigliani (1961). Many scholars have contributed ideas to address this issue. The signalling approach, in terms of which the dividend policy is designed to signal a firm's future performance, is a popular notion that was initially empirically supported by scholars such as Bhattacharya (1979); Miller and Rock (1985); and Agyei and Marfo-Yiadom (2011). However, more recent research has yielded mixed results, with some scholars finding that dividend changes do not predict future earnings growth in firms (Benartzi et al., 1997; DeAngelo et al., 2006).

The agency approach has received little or no attention, especially in the banking sector. It proposes that dividend policy minimises the conflict of interest that leads to agency problems in a firm operating agency relationships. According to Kapoor (2009), agency conflict can occur in two ways, namely, debt-holder versus shareholders conflict, and managers versus shareholders conflict. In the latter relationship, *ceteris paribus*, managers are more interested in retention policy in order to protect their personal pecuniary benefits and other compensation. This will invariably result in them adopting a flexible approach that seeks to maximise assets and reduce the need to raise funds on the capital market to finance long term projects, all of which go against the desires of shareholders. Although shareholders desire managerial efficiency in viable and positive NPV investment decisions, they prefer their managers to fund such investment from the capital market with little cash in management's purse so as to avoid managers acting against owners' interests. Shareholders are of the opinion that the capital market plays the role of monitoring managers' activities, thus promoting discipline among managers.

The agency approach is unique in emphasising the two main points that formed the basis for Miller and Modigliani (1961) assumptions. The first is that dividend policy and investment policy are dependent and correlated such that the inefficiency of marginal investment can be reduced via the payout policy. The second assumption is that allocation of firms' earnings to shareholders as their reward cannot be neglected because it is assumed that managers (insiders) receive preferential treatment through embezzlement, transfer prices and asset diversion, even when investment policy is held constant. Hence, the agency view is believed to benefit shareholders in that they receive pro-rata income as dividends in contrast to a retention policy that can lead to expropriation of owners' wealth.

The question is: how certain can investors be about the earnings generated by managers? It is possible that earnings are generated by vague activities in which managers dabble to ensure that dividends are paid but do not promote the firm's future growth. This study thus compares payout (a bird in the hand) and retention (a bird in the bush), because it is possible for managers to engage in dividend re-investment plans aimed at ensuring that the bird that is assumed to be in the bush does not fly away by assuring investors of huge capital gains. Furthermore, investors have clientele effects; while some are dividend-income oriented, others are not in need of income, but are growth-oriented.

3.1.6 Corporate Dividend Policy and Earnings

According to. A. Patra (2008), dividend and retention policy are interesting and conflicting because dividend decisions are key financial decisions in corporate financial management. Management needs to decide on the portion of earnings to be distributed to investors as a reward and that to be re-invested in the firm to sustain future growth, thus satisfying the desires of the two categories of shareholders without restricting the firm's progress. Walter (1963) affirms that the choice of dividend policy always affects the value of the firm holding the assumptions that investment is financed via retained earnings; all earnings are either ploughed back or paid out; a firm's cost of capital and rate of return are constant; and finally, that a firm is a going concern. However, when dividend policy is treated as a financing decision, the payment of cash dividends is a passive residual.

Despite the fact that dividend policy guides decisions on whether to distribute or retain earnings, not all profit making organisations (including the banking sector) adhere strictly to the dividend policy guidelines (Nwude, 2003). Earnings management in firms is not only concerned with dividend policy. This is due to the fact that discretionary accruals do not always influence dividend policy significantly (Arif, Abrar, Khan, Kayani, & Ali Shah, 2011). Logically, a higher rate of retained earnings invariably results in low levels of income for distribution to investors. The ultimate purpose of a retention policy is to build reserves in order to service or terminate obligations as and when due, fund projects and signal the strength of the firm, as retained earnings cushion future challenges.

Thus, any dilution of a firm's retention policy, including in the banking sector, will reduce its market value which runs contrary to the objective of maximising owners' value. The dividend signalling hypothesis avers that dividend payments are used to signal that the firm's future cash flow will be higher than expected. However, Damodaran (2009) is of the view that this is not a reliable signal of the real value of the firm as managers embark on risky activities such as borrowing and issuing new shares to compensate for the amount paid out as dividends. Managers choose to consistently pay dividends without reviewing other policies because they dislike sending negative signal to outsiders (the market) about the future prospects of the firm, even if this is not a true picture of its net worth. Narrowing this down to the banking sector in the SSA region, the lack of financial deepening and development of this sector can be traced to ineffective financing decisions (dividend decisions) such that most commercial banks regard payout policy as a signalling policy instead of treating it as a residual policy that will prioritise DRIPs to justify the future growth of the sector.

Jensen and Meckling (1976) free cash flow hypothesis averred that agency problems are inevitable in a firm that operates agency relationships where ownership and control are separate. For, instance bank managers mismanage free funds by over-investing in negative or zero NPV projects due to the selfish desires, benefits and empire building. It is believed that this agency problem of sub-optimality of goals, over-investment and misappropriation could be minimised when managers pay dividends. In contrast, Grullon et al. (2002) maturity hypothesis argued that the life cycle of a firm rather than its free funds should be the basis for setting the dividend policy. This would mitigate the agency problem. It follows that, as a firm matures, its available investment opportunities are reduced with an attendant reduction in market risk (DeAngelo et al., 2006). Hence, when re-investment plans are well monitored by owners, the agency problem can be minimised.

3.1.7 Asymmetric Information and Dividend Policy

In the financial market, all stakeholders, including managers, shareholders, customers and other interested parties are privy to information, but managers (insiders) have superior or more current information about the current and future prospects of banking activities. Information on dividend initiation, dividend swings (changes) and dividend elimination is released at intervals in the financial media. The market price of banks' shares responds to such announcements. The chief financial officers of large US corporations accept that dividends can signal a firm's future prospects (Amihud & Li, 2006).

Generally, information about firms' prospects includes their current investments and prospective investment opportunities. Other information covers issues such as insider trading, capital expenditure and dividend policy. Empirical research on this issue has produced mixed results. Ghosh, Coyne, and Boldin (2004) found that there is an equilibrium long run relationship between dividends and earnings per share, while Shah, Yuan, and Zafar (2010) found no evidence that dividends predict prospective earnings. In the same vein, there is weak evidence that dividends transmit information about future earnings (Garrett & Priestley, 2000). Bessler and Nohel (2000) study on the banking industry pointed to an inverse abnormal return on the shares of non-announcing central banks compared to the larger regional banks when a dividend is paid.

3.1.8 Retention Policy and Firms' Growth

According to Thirumalaisamy (2013), dividend policy is a long term financial strategy to decide how to allocate a company's after tax earnings. It centres on the division of profit between reinvestment and disbursement to shareholders. Growth-oriented shareholders prefer capital gains to dividend income because of various tax advantages associated with retained earnings. Capital gains tax is lower and payment can be deferred, while tax on dividend income is considerably higher and must be paid immediately by the beneficiary.

Company tend to favour reinvestment when the personal income tax rate increases in order to reduce the tax burden on shareholders. A dividend policy that focuses solely on payout leads to the loss of opportunities for existing shareholders to reinvest their earnings for future growth and is associated with high agency costs (both bonding and monitoring costs). Droms and Walker (1994) empirical study found that, in the long run, growth-oriented investors benefit more from reinvested earnings than dividend income-oriented investors who receive and spend their dividend cash with little or nothing tangible to show for it. Ploughing profit back into the company leads to significant appreciation in a firm's value because the level of internal funds accumulated signals its future growth prospects.

Fully mature firms prefer to reward their shareholders with capital gains while those with few or no investment opportunities also limit their payout policy because they find it profitable to use their earnings to raise capital for viable investment opportunities. Conversely, higher dividends are paid by low-growth and stable firms because growth requires greater use of internally generated funds and less debt so as to avoid conflicts of interest between equity and debt holders (Thirumalaisamy, 2013). Thus, a bank that seeks to grow should stick to a retention policy in order to manage the moral hazards and risks associated with growth opportunities. Minimising such risks and problems requires using retained earnings and equity rather than debt financing.

3.1.9 Dividend Payout Policy as a Social Norm in the Corporate World

According to Chiang, Frankfurter, Kosedag, and Wood Jr (2006), investors' predilection for dividend income and firms' tendency to favour payout policies raises the question of whether this has become the norm in the corporate world, including the banking sector. The evidence shows that dividend payouts are an effective tool to mitigate information asymmetry that leads to agency problems (costs). Over the years, the extent to which firms adopt payout policies at the expense of other policies has elevated this practice to a custom that is hard to resist. This promoted scholars' interest in whether payout policy has become the norm, especially in the banking sector. Lintner (1956) interviews with managers of 28 firms revealed that, firstly, the benchmark payout ratio was relative to the existing dividend rate paid by the firm rather than being an independent rate; second, long term income is the prime driver of the dividend ratio;

and third, the respondents were of the view that managers have a fiduciary duty to shareholders to pay high dividends.

When a corporate policy (be it in relation to dividends, investment, or financing) becomes a social norm, this undermines the economic rationale for such a policy. Many firms that adopt payout policies do not consider the relevant theories of dividend and find it difficult to modify their policies due to investors' preference for payouts and fears of negative market reaction if they cut dividends or institute policy changes (Benartzi et al., 1997; Brav et al., 2005).

3.1.10 Dividend Policy and Corporate Social Responsibility

The effect of corporate social responsibility in firms' choice of dividend policy is discussed in light of the life cycle and agency theories. The life cycle theory posits that mature firms generate more cash than they can profitably invest because of few investment opportunities open to them at their peak; they thus pay dividends to avoid the agency costs of free cash flow. Such firms invest more in corporate social activities than newly established firms.

From the agency theory perspective, agency conflict is unavoidable since all insiders, not only managers, are interested in raising the firms' social responsibility profile. According to Barnea and Rubin (2010), insiders gain private benefits from social responsibility projects rendered by firms. Donations and related programmes enhance managers' reputation and provide them with other benefits at the expense of shareholders. When a firm does not have effective monitoring mechanisms and insiders lack a sense of ownership, they may induce the firm to increase its commitment to social responsibility projects such that the firm's value will not be fully maximised.

This could lead to over-investment and mismanagement of the free cash flow in environmental and social activities. However, when such projects are funded using external sources, it is assumed that over-investment will not occur due to the monitoring role played by debt holders. From this point of view, adopting a payout policy to reduce free cash flow that will discourage managers from over-investing in social responsibility projects is optimal.

3.1.11 Capital Adequacy as a Determinant of the Dividend Payout Ratio

Brogi (2010) averred that capital adequacy and bank dividend policy are related and that they form the main basis for prudent and sound management practices. Following the Basel III framework, restrictions on payment of dividends has been one of the sanctions applied to banks that fail to adhere to capital requirements in terms of their solvency and liquidity (Brunnermeier, Crockett, Goodhart, Persaud, & Shin, 2009; Caruana, 2010). This has been effective in enforcing the capital adequacy ratio because dividends are a signal of a bank's viability. The capital adequacy ratio is the ratio of banks' equity to total assets. They derive their earnings from their activities because they are adequately capitalised. Such earnings are the basis for their liquidity and cash flow which is used to pay dividends to their shareholders.

On the other hand, if the Board chooses DRIPs as a means of increasing the bank's value, this requires the bank to be adequately capitalised with sufficient liquidity to enhance the income derived from increments in its net assets. Furthermore, gains from the excess of ROI over the cost of capital and the bank's growth arising from franchise and goodwill created by investment in positive NPV projects creates further value for the owners. Therefore, both dividend payouts and value creation via dividend re-investment plans will maximise the owners' wealth in the long run if the bank is adequately capitalised. This is because, adequate capital serves as the underlying basis for wealth maximisation for shareholders in the banking sector.

3.1.12 Profitability as a Determinant of the Dividend Payout Ratio

Lintner (1956) defines dividend payout policy as the distribution of earnings generated by a company to shareholders following the payment ratio agreed upon by the Board of Directors. Miller and Modigliani (1961) argue that the value of a firm is determined by the earnings capacity of the assets utilised and its investment policy that determines the dividend payment ratio. The choice of dividend policy can alter the value of a firm; hence, firms with good profitability levels are characterised by high free cash flows which expose them to diverse investment opportunities. According to the pecking-order theory, internal financing takes priority over other sources of finance be it external equity or debt; thus, a company that generates more internal income is likely to pay higher dividends.

In terms of the postulations of the trade-off theory and the findings of Fama and French (2001) and Barclay et al. (2009), all companies seek to strike a balance between the costs and benefits attached to dividends. Firms with higher levels of profitability tend to demonstrate continuity in dividend payments because they enjoy free cash flows and incur lower costs than companies experiencing financial distress. Following the signalling theory and empirical evidence produced by Gunasekarage and Power (2002); Goergen, Renneboog, and Da Silva (2005) and Agyei and Marfo-Yiadom (2011), to name but a few, there is a direct relationship between dividends and income. The signalling theory posits that, a profitable company will consistently pay higher dividends in order to signal the company's future health and financial status and the fact that it is a going concern. This enhances existing investors' confidence in the company and attracts prospective investors. Therefore, irrespective of the dividend policy chosen by a company, it is expected that there will be a positive correlation between dividend and income.

3.1.13 Size as a Determinant of the Dividend Payout Ratio

Empirical investigations have shown a direct relationship between size and a firm's dividend decisions (Barclay et al., 2009; Denis & Osobov, 2008; Fama & French, 2001). A large firm has easier access to the market; can borrow at a reduced interest rate and is able to diversify its activities to enhance stable cash flows, which enable it to pay higher dividends than smaller firms. Since the earnings structure of larger firms is more stable, they tend to pay more of their earnings as dividends, without running into financial problems.

Conversely, smaller firms are characterised by unstable cash flow such that if they pay high dividends, this could result in illiquidity problems and they might be forced to source funds via external debt. The expected positive and significant relationship between size and dividend payouts is due to the benefits of economies of scale enjoyed by large firms which smaller firms lack. Despite the fact that larger firms have smaller issuing and transaction costs and a higher proportion of agency costs due to the divergence of interests, size is still expected to directly relate to both payout and retention policy.

3.1.14 Leverage as a Determinant of the Dividend Payout Policy

Leverage is one of the tools used by shareholders to monitoring managers' activities to reduce agency problems. Mixed results are reported in the literature on the effect of leverage (the debt structure) on dividend payment decisions. Following the postulations of signalling theory, a highly levered firm is expected to continuously pay dividends, although the terms and agreements of loans must be met as and when due. The fact that managers use payment of dividends as a signal of the firm's financial stability and future health can motivate them to work harder and invest funds wisely in positive NPV projects in order to meet their debt obligations and still earn tangible profit that maintains the payment of higher dividends.

In contrast, Nizar Al-Malkawi (2007); Faccio, Lang, and Young (2001) and Gugler and Yurtoglu (2003) found that leverage decreases a firm's ability to pay dividends. Their findings are in line with the agency cost theory (Jensen & Meckling, 1976) that states that leverage and dividends should be used to resolve conflicts of interest between managers and owners. Jensen (1986) concluded that, debt is an alternative to dividends to reduce agency costs. Hence, dividend payouts are inversely related to leverage.

For this study, it is expected that banks involved in huge debt should reduce their payout ratio because of the risk of repayment of the debts in due time. It is therefore expected that there will be an inverse relationship between leverage and payout ratio.

3.1.15 Growth Prospects as a Determinant of the Dividend Payout Ratio

According to the pecking order theory, companies with viable growth opportunities finance their investments with internal funds such that they pay low or no dividends, thereby avoiding external sources of financing which attract higher transaction costs. On the other hand, companies with few or no growth opportunities focus on dividend payments to minimise mismanagement of free or idle cash in the custody of managers; hence, they pay high dividends to motivate investors and send positive signals about the company. This is in line with Jensen (1986) and Nizar Al-Malkawi (2007) findings that dividends reduce agency costs caused by free cash flows.

3.1.16 Taxation as a determinant of the Dividend Payout Ratio

Tax is a compulsory obligation for any individual or corporate body that receives an income. The tax preference theory was formulated by Litzenberger and Ramaswamy (1979) and further developed by Bell and Jenkinson (2002). It states that dividend payouts attract higher tax compared to the tax advantage enjoyed by capital gains beneficiaries. Tax is expected to be inversely related to the dividend payout ratio as dividends suffer double taxation. This is due to the fact that, the earnings generated by a company attract corporate tax before being distributed, and investors pay personal income tax when they receive dividends.

In contrast, capital gains from DRIPs are only subject to capital gains tax when the project invested in is complete. This variable is used to determine if tax is really a significant factor in determining banks' dividend payout ratio. While Amidu and Abor (2006); Brav et al. (2005); and Barclay et al. (2009) found that taxation has no relationship with the dividend payout ratio, La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000) found that it is a significant determinant.

3.1.17 Dividend Policy and Bank Performance

Studies have shown that there is a feedback relationship between dividend policy and banks' performance. The SSA banking system is underdeveloped and is characterised by low levels of financial deepening. This creates a dilemma among shareholders as to which policy signals positive or negative performance by minimising the agency problem that perpetrates agency costs. There can be no doubt that the dividend decision goes a long way in predicting the achievement of a bank's overall goal because it indicates its level of productivity (Agyei & Marfo-Yiadom, 2011). The literature reveals inconclusive and divergent findings on the two commonly adopted dividend policies in the corporate world. While scholars like Allen and Michaely (2003); Karpavičius (2014) and David and Ginglinger (2016), to mention but a few, support the retention policy, regard the payout ratio as a luxury and zero NPV transaction. Ouma (2012); Lee and Lusk (2013) and Dada, Malomo, and Ojediran (2015) are of the view that the payout ratio signals a firm's performance and future growth.

According to Agbatogun and Adewumi (2017), the dividend policy remains one of the most controversial issues in financial economics and corporate finance. Studies have shown that dividend policy varies over time across firms. For instance, most firms that are experiencing financial difficulties adopt a retention policy and thus a lower payout ratio. However, investors show keen interest in the annual ROI which can be expressed in terms of capital gains and earnings. Therefore, the success of the two different two policies is affected by the quality of a firm's management team.

Dividend policy is crucial because of its impact on a firm's performance, share price, owners' satisfaction and its future. Since dividends are the firm's earnings that are disbursed to investors as ROI, the form they take must satisfy existing investors and attract prospective ones to invest in the company at a higher stock price. Empirical studies have shown that, of the four existing dividend policies, namely, retention, buy back shares, pay-off debts and payout policy, the cash dividend payout ratio is the most common one in the banking industry to signal a bank's health and viability to shareholders (Nnadi et al., 2013). The payout policy's tendency to reduce the agency problem (conflict of interests), such that the dividend is used as a mechanism to align managers and shareholders' interests, has been the main reason for this preference.

Banks commit to a dividend payout policy so as to restrict access to free cash flows that could be diverted to safeguard managers' personal benefits and promote selfish empire building or be used for inefficient or negative NPV investment that will not maximise the bank's overall value. However, scholars note that, payout policy is not the only policy that can mitigate the agency problem in that it is possible for managers to pay dividends to reduce free or idle cash flow in their custody, but lose out on valuable investment opportunities that will enhance the future growth of the firm. Weakly governed managers face pressure from dividend-oriented shareholders to pay dividends and are sanctioned if they refuse to do so (John & Knyazeva, 2006). The rationale is that the firm will incur less costs emanating from investment of internally generated funds in zero or negative NPV projects, regardless of the fact that the dividend might be paid from past reserves or fictitious profit from unstable investments which could cause greater harm than agency costs.

According to Damodaran (2009), the dividend payout ratio does not always accurately signal a bank's performance because some banks pay lower dividends than they could and use the remaining earnings to supplement their capital ratio, while others pay more than required but supplement their other ratios by issuing additional shares. In the case of the former, using the payout ratio to value the bank will undervalue its performance and the latter category will be over-valued. Panigrahi and Zainuddin (2015b) include an inappropriate dividend among the reasons why earnings are not a perfect measure of firms' value. They add that this remains a controversial theoretical and empirical issue. Hence, using the dividend policy as a signal of bank performance (value) requires constant review and monitoring, because dividend payment creates problems in valuing the performance of banks that have growth potential (Damodaran, 2009).

It is thus clear that, while there is consensus that dividend policy has a signalling effect on firms, there is no consensus on which of the two dominant policies employed by SSA commercial banks is most effective in indicating bank performance (Panigrahi and Zainuddin (2015b). Priya and Mohanasundari (2016) conclude that the "harder they try to peruse dividend policy decision in firms, the more it turns to a puzzle, scattered and difficult to fit together". This leads to on-going debate between dividend-oriented and growth-oriented shareholders.

3.1.18 The Concept of Diversification

There is no comprehensive definition of diversification as it has different meanings depending on the research context. In could refer to the methods adopted that reduce risk and enhance the achievement of organisational goals (Markowitz, 1952). It could also be defined as the extent of the services rendered, and products and markets in a corporate setting. In general terms, diversification means a larger spread of the number of business lines in a firm, whether or not they are related. A firm is diversified when two or more activities are run apart from the traditional activities in a location or more than one location.

Ebrahim and Hasan (2008) defined diversification in the banking sector as expansion into new products or financial services apart from the core traditional intermediary roles. Following the Glass-Steagall Banking Act of 1933, diversification refers to the expansion of banks' allowable and regular activities into non-traditional and unfamiliar activities (Baele, De Jonghe, & Vander Vennet, 2007; Christiansen & Pace, 1994). Hence, diversification in the commercial banking context refers to the disaggregation and conglomeration of the various elements that constitute banking operations such as assets, liabilities, income, deposits and loan structure.

Diversification among financial intermediaries has been a major research area in both developing and developed countries because banks' activities have gone beyond their traditional intermediary role between the surplus and deficit units of the economy. They have entered into different kinds of activities in the financial market and are rendering other financial services. The traditional portfolio theory posits that diversification is a means of reducing the risks inherent in investment by increase the firm's risk appetite. Further research is required on diversification in the banking sector to address the conflicting predictions of previous studies. While banks benefit from diversification in terms of economies of scale, it can intensify agency problems (costs) because managers (insiders) may expand the bank's financial activities in order to accrue private benefits.

Although operational diversification may ease information asymmetries and enhance the efficient allocation of resources via internal capital markets, banks may still be inefficient in designing managerial incentives contracts in a way that aligns outsiders and insiders' interests (Rotemberg & Saloner, 1994). Managers that pursue diversification for purposes of personal gain could hinder the bank's financial performance by incurring losses or reducing earnings. For diversification to fulfil expectations, all proposed activities must be adequate monitored.

In the case of commercial banks in many SSA countries, diversification has often resulted in crises and threats to their solvency and survival. Far from minimising the agency problem, it continues to recur such that banks continue to merge and re-merge. The question is whether this is due to the fact that the new activities are not well managed or that diversification has no significant effect on SSA banks' financial performance? It is impossible for commercial banks to reduce agency costs and maximise shareholders' wealth without spreading their tentacles through diversification to enjoy economies of scale. However, SSA banks continue to struggle for survival despite diversification of loans, deposits, assets and liabilities. It is clear that diversification exposes banks to new risks, and the management team might lack the expertise required to control these risks. Furthermore, diversification may lead to a conflict of interests between investors and the bank itself, with negative effects on financial performance (P. G. Berger & Ofek, 1996; Demsetz & Strahan, 1997).

Despite all the demerits of diversification, among other scholars, Landi and Venturelli (2001) and A. N. Berger, Hasan, and Zhou (2010) found that the banking sector tends to benefit from diversification in the form of stable and higher ROA; less unsystematic risk and improved efficiency. These benefits have not yet accrued to SSA commercial banks (Goetz, Laeven, & Levine, 2013). Since the global financial crisis of 2009, the commercial banking system in most countries in the region has been transformed either by mergers or absorption, increasing banks' size. South Africa is the only country with well-developed, profitable banking institutions (Mlachila, Park, et al., 2013b).

This study thus assesses SSA banks' assets, loans, deposits and income diversification, which I. M. Mulwa, Tarus, and Kosgei (2015) describe as the core dimensions of banks' operational diversification. The objective is to confirm if banks need to diversify across various activities or if they should focus and specialise on their main role of rendering intermediary services. The effect of diversification in minimising risk and maximising returns among SSA banks has not received sufficient attention in the banking literature. To the best of the researcher's knowledge, this study is the first of its kind in the region.

3.1.19 Diversification and Financial Performances in the Banking Sector

The capital market theory posits that there is a trade-off between returns and risks. The more an entity is willing to take up risk, the larger the returns. These risks are either market (un-diversifiable) or systematic risk (diversifiable risk). Thus, a well-diversified bank is expected to yield higher financial returns on its investments than banks with little or no diversification.

Under perfect capital market conditions, financial theory does not hold for a banking system. This led to the financial intermediation theory that emphasises the role of monitoring because of information asymmetries arising from agency relationships. Successful diversification calls for efficient monitoring because of the range of activities involved. Diamond (1984), posits that monitoring and its associated costs are constant across banks; hence, they should diversify their activities as widely as possible. This is despite the fact that previous studies point to a negative relationship between a bank's returns and diversification, because of the emphasis on specialisation (Winton, 1999).

Goddard, McKillop, and Wilson (2008) identify three motivations for diversification: the quest for market power, utilisation of resources to enjoy competitive advantage and minimising the agency problem. In terms of market power, diversified banks exhibit various anti-competitive characteristics. Resources refer to the core competencies; specific assets or distinctive capacities a bank possesses that can be exploited in its new activities. Finally, diversification can minimise empire building, and the pursuit of selfish interests and personal gain among managers, thus addressing the agency problem. This enables managers to focus on the ultimate goal of the bank, which is maximisation of owners' wealth.

3.1.20 Diversification and Agency Costs in the Banking Sector

Viewing diversification from the profit dimension, it is necessary to inquire if the benefits of diversification outweigh the costs. Diversification yields increased financial returns if the income generating capacity of the activities diversified into is enhanced (Baele et al., 2007). The complexity of managing diversified activities leads to higher agency costs because of the inherent conflict of interest between insiders (managers) and outsiders. As noted by Jensen and Meckling (1976), managers can pursue diversification to promote their personal interests even though this will reduce the firm's market value. Monitoring and supervision are thus required, with their attendant costs. It has proven difficult to establish whether potential gains from diversification exceed the associated costs. However, DeYoung and Roland (2001); Stiroh (2004b) and Stiroh and Rumble (2006) conclude that diversification is beneficial in spite of its tendency to increase agency costs (problems).

3.1.21 Managerial Entrenchment and Diversification Strategies

The concept of managerial entrenchment was developed by Shleifer and Vishny (1989). It describes empire building on the part of managers which invariably makes them irreplaceable or costly to replace. This trait can be detected in their choice of investment, contracts and their motive for diversification. Excessive growth in firms signals managerial entrenchment because managers have more incentive to invest to achieve wealth or fame. This tendency needs to be monitored because rent seeking on the part of managers creates costs for shareholders.

Managers' motive for diversification at times leads to poor financial performance even though underlying industry conditions might be the cause. If not well-monitored, diversification may fail to create value. Mechanisms to control managerial entrenchment include a knowledgeable Board of Directors that is able to evaluate the viability of new investment ideas or projects proposed by managers; rigorous selection procedures to appoint managers and remuneration packages and voting rights that will render mangers less inclined to pursue personal interests above those of owners.

3.1.22 Managerial Hubris and Diversification Strategies

This concept was developed by Roll (1986). It posits that managers diversify into many different activities with the intention of taking control of the firm. They achieve this by over valuing the firm to meet their target valuation. According to Gaughan (2005), pride leads managers to believe that their valuation is superior to that of the market. Generally, there are indicators of managerial hubris; viz, praise of the management team; excellent organisational performance, and managers' self-importance or overconfidence in the firm. All these indicators should be considered before institutionalising diversification because mangers' rise to power and prestige will not promote value creation which is the goal of diversification. Thus, proper corporate governance must be in place to ensure that the Chief Executive Officer (CEO) is not the chair of the Board of Directors.

3.1.23 Operational Diversification Strategy

Different administrative mechanisms respond to organisational change when new activities are embarked upon. Generally, firms pursue diversification to explore available investment opportunities by exploiting under-utilised resources within the firm and taking advantage of market imperfections to create new growth opportunities. The diversification strategy can be classified in terms of the degree of diversification (quantitative) and the type of diversification (qualitative). As noted by D. K. Datta, Rajagopalan, and Rasheed (1991), the degree of diversification refers to dispersion of a firm's assets across various markets while the type of diversification simply means diversity across different businesses which could also mean operational diversification even though it might be related or unrelated.

In the commercial banking sector, diversification offers opportunities to share capabilities, assets and other relevant financial resources. Therefore, operational diversification enables banks to enjoy more economies of scope because the core dimensions of diversification (assets, loans, income, deposits) are related. Liang and Rhoades (1991) found that banks diversify their loan portfolios subsequent to geographical diversification, while Saksonova and Solovjova (2011) averred that commercial banks can diversify not only their liability portfolio but also their deposits and investments. Another dimension is asset diversification which is measured as the sum of squares of net earning assets, non-earning assets, liquid assets and fixed assets to total assets. It is the distribution of a bank's assets across the various categories of assets such as lending (liquid) assets, non-lending (fixed) assets and so on (Doumpos, Gaganis, & Pasiouras, 2013; Elsas, Hackethal, & Holzhäuser, 2010).

3.1.24 Income Diversification and Financial Performance

The banking sector is a crucial sector that supports the execution of the commercial (socio-economic) activities of individuals, corporate institutions and even sovereign states. It primarily does so by acting as an intermediary between the surplus and deficit portion of an economy such that the gap is bridged. This has been the traditional role which enables banks to generate interest income since their major activity is loan disbursement. Loan activity has been classified as a major asset in banks that generates large interest and signals the financial performance of the bank. Recent financial liberalisation and advancements in information technology have broadened business and made banks highly competitive. The diversity of business activities calls for innovative financial banking services, prompting banks to consider non-traditional activities (fee-generating activities) to meet these demands and generate more non-interest income from fees, commissions and other services. According to Busch and Kick (2009), banks have two main streams of income, interest income and non-interest income.

Diversification within or across these streams enhances performance by mitigating insolvency risks (Sanya & Wolfe, 2011). Interest income is generated from loans and advances, while non-interest income is fee-generated income from various other financial services. Furthermore, loan-based activities are associated with high switching costs because they are relationship-based while fee-based activities are not relationship-based; this has made them a more volatile income source. However, non-interest income has gained traction in recent times, especially in the developed world, due to increased competition. DeYoung and Rice (2004b) estimate that more than 42.20% of total bank operating income in the US is made up of non-interest income. However, interest income is still the core source, with non-interest activities supporting, but not replacing the intermediation of interest income generating activities.

Since the SSA banking sector is also growing and becoming more competitive, it is important to establish the importance of this new fee-based income stream in terms of its effect on risk and bank returns. Most banks in SSA countries record higher non-interest income despite their greater operating leverage that leads to higher income volatility and decline. For instance, for banks in Botswana, Ghana, Kenya, Mauritius, Seychelles, Tanzania, Uganda and Zambia, the ratio of non-interest income to total income (non-interest margin) compared to the net interest income margin is 27.5% to 8.8%; 32.5% to 10.2%; 34.5% to 11.6%; 32.0% to 2.2%; 44.5% to 3.8%; 51.6% to 4.5%; 40.7% to 8.6%; and 48.6% to 6.8%, respectively. Despite increased competition, sophistication and a high proportion of non-interest income among commercial banks in most SSA counties, only a few empirical studies have focused on the effect of non-interest income on their financial performance and to the researcher's knowledge, none have investigated the effect of income diversification on the financial performance of SSA commercial banks. This study seeks to fill this gap.

3.1.25 Asset Diversification and Financial Performance

All the activities carried out by banks are achieved via efficient and effective use of their assets. Whether fixed or liquid, or earning or non-earning, a bank's assets must be properly allocated if diversification is to maximise owners' wealth. According to Doumpos et al. (2013), effective diversification minimises the adverse impact of financial crises and bankruptcy. Despite the fact that the SSA banking sector is well capitalised and has adequate assets, the sector remains under-developed (Mlachila, Park, et al., 2013b). It is therefore necessary to examine the effect of spreading assets to diverse activities on banks' financial performance, especially in the SSA region which has not been adequately researched.

3.1.26 Loan Diversification and Financial Performance

The traditional function of a bank is to disperse funds from the surplus unit as loans to the deficit unit such that there will be a balance between the two sectors and the economy will be sustained. Loans, which are a major proportion of banks' assets, are regarded as a solution to the problem of disparities between the surplus and deficit units which greatly affect the economy at large. Banks are the agents that bridge the gap between lender and borrower because it is much easier for them to gather information on borrowers' credit-worthiness. Finally, banks are able to minimise idiosyncratic risk (credit risk) by diversifying into multiple loan portfolios. All these factors minimise the default ratio that can adversely affect banks' financial performance.

According to Maubi and Jagongo (2014), loan diversification is crucial in the banking sector to minimise loan portfolio risk that can negatively impact financial performance. Loan activities have failed to increase overall performance because the banking sector is characterised by incompetent or poor lending and credit-testing which results in huge losses. Bank loans can be impaired or unimpaired and unimpaired ones can be performing or un-performing (sub-standard, doubtful and lost). For a loan to achieve its aim, the bank should decide at the outset if it is impaired or not, such that adequate provision is made for a cushion in times of default by the beneficiary (debtors).

3.1.27 Deposit Diversification and Financial Performance

The major role of the banking sector is to address the imbalance between agents with excess liquidity (depositors) and those short of liquidity (borrowers). This problem is inevitable because of information asymmetries and inherent gaps between liquidity suppliers and liquidity demanders. According to intermediation-based theories, commercial banks are in a position to address this problem because they pool funds in the form of deposits to provide liquidity to households and businesses that lack funds. Deposits are the major input banks use to carry out their traditional and non-traditional activities. While it is a proven fact that efficient and effective use of deposits will positively affect banks' financial performance, it is important to establish which stream of deposit affects financial performance positively or negatively.

3.1.28 Measures of Diversification Degree

According to Dautwiz (2009), different measures exist to weigh the spread of activities in diversified firms. The different indices are discussed below.

Hirschman-Herfindhal Index (HHI): This ranges from 0 to 1. It weighs the relative proportion of various dimensions of activities against overall turnover for such dimensions in the business unit W_i. The degree of concentration is measured using the value for the HHI. A value greater than 0.5 denotes high concentration of activities and one of less than 0.5 denotes better diversification. The closer the value is to 0, the higher the degree of diversification and an HHI of 0.5 denotes perfect or complete diversification. The formula is: $HHI = 1 - \sum_{i=1}^{n} W_i^2$, where $0 < HHI < 1$ and $W_i = \frac{X_i}{X}$.

Entropy Index: This is an index of diversification of economic activity because W_i is taken as a business unit's proportion of total turnover after the level of structural depth in the classification of activities has been predetermined. This index does not range from 0 to 1. The formula is $EI = \sum_{i=1}^{n} W_i * \ln \frac{1}{W_i}$.

Berry-Index: This is similar to the HHI. It also ranges from 0 to 1 but does not take into consideration various dimensions of activities in the business unit. The formula is: $BI = 1 - \sum_{i=1}^{n} W_i * W_i$.

Weighted Index: This diversification index applies the weighting factor on the individual business units W_i in order to assess the relative importance of the unit in the entity. This index has been criticised for its arbitrary choice of the weighting factor Y. The formula is: $WI = \sum_{i=1}^{n} W_i * Y_i$.

Ogive index: This is mainly used to measure country diversification. The lower bound of the Ogive index is 0 while the upper bound is $\frac{W-1}{W}$. When an Ogive index equals 0, this denotes perfect diversity and a higher uneven distribution of economic activity leads to a higher value.

The formula is $OI = \sum_{i=1}^{n} \frac{W_i - 1/n}{1/n}$ where, $W_i =$ the sectoral share of the economic activity and $n =$ number of sectors in an economy.

Given that many scholars have found that the HHI is suitable for measuring the degree of diversification in the financial sector (Behr, Kamp, Memmel, & Pfingsten, 2007; J. M. Mulwa & Kosgei, 2016), this index is used in this study to measure SSA commercial banks' diversification.

3.2 Review of the Empirical Literature

3.2.1 Empirical Evidence on Determinants of the Dividend Payout Ratio

While empirical studies have been conducted to examine the determinants of the dividend payout ratio in non-financial institutions in developing and developed countries, few have been undertaken on financial institutions in SSA, especially the banking sector. This sub-section provides a summary of the findings of the few existing empirical studies on the determinants of the dividend payout ratio. Nuhu, Musah, and Senyo (2014) used the ordinary least square (OLS) method to examine 30 listed Ghanaian companies over the period 2000 to 2009. The results showed that profitability, the square of profitability, leverage and audit type are the main determinants of Ghanaian firms' dividend payout ratio. However, the study did not use a formal model and the emphasis on firms' profitability neglects the past year's dividend. Dividends are not paid from the current year's earnings but the past year. This calls for further research on this issue.

Agyemang Badu (2013) study on financial institutions in Ghana for the period 2005 to 2009 used fixed effect and random effect estimations and found that the age of the firm, collateral and liquidity are the major determinants of the dividend payout ratio. Using OLS, Amidu and Abor (2006) examined 22 Ghanaian firms for the period 1998 to 2003. They found that taxation is positive but insignificant in the determination of the dividend payout ratio. This direct relationship could be due to the fact that higher tax is paid on a higher level of income. When income is high, the payout ratio is expected to be high for firms that adopt a payout policy.

This issue requires further investigation as other studies concluded that the relationship between taxation and the dividend payout ratio is significant

Kajola, Desu, and Agbanike (2015) investigated the determinants of the dividend payout ratio among 25 non-financial listed firms in Nigeria over the period 1997 to 2011. The fixed and random effect estimate showed that profitability, changes in the dividend payout, size and leverage were significant in determining dividend policy decisions among the sampled firms. Evidence from Nigerian banks using Multiple Regression Analysis and Pearson correlation for the period 2004-2013, showed that liquidity and profitability are the most critical determinants of the dividend payout ratio (Yusuf & Muhammed, 2014). This study failed to adopt a dividend model and neglected regulatory factors. During the period under study, Nigerian banks were forced to implement the Basel II accord. However, the capital adequacy ratio was not examined; the current study aimed to fill this gap.

Lily, Venkatesh, and Sukserm (2010) and Komrattanapanya and Suntraruk (2013) examined listed firms in Thailand for the period 2006 to 2010 using OLS and Tobit regression, respectively. Both studies both found that leverage has a negative effect on the dividend payout ratio. In terms of using the dividend payout ratio to minimise agency costs, it was found that owners prefer managers to borrow to pay dividends as they are of the view that the debt burden will streamline their activities to generate more income and thus pay more dividends. The inverse relationship between the leverage ratio and the dividend payout ratio requires further investigation as it is expected to boost income.

Using partial least squares structural equations modelling (PLS-SEM) on 120 listed companies in Dubai from 2011 to 2013, Kumar and Waheed (2014) found that income growth reduces dividend payouts and that liquidity was an important determinant of the dividend decision. This finding is in line with the life cycle theory of dividend which posits that a higher level of income reduces the payout ratio but increases the retention ratio of firms. Evidence from US banks for 2006 and for the period 1998 to 2000 gathered by Casey, Theis, and Dutta (2009) and Dickens, Casey, and Newman (2002), respectively, showed that capital adequacy ratios (capital to asset ratio; Tier 1 capital ratio) positively and significantly affect the dividend payout ratio. This is due to the fact that US banks have adopted the Basel I, II, III capital requirements of banks. In the SSA banking sector, six countries have implemented the Basel I accord. Hence, there is a need to investigate the effect of this factor on banks' dividend payout ratio and determine the specific effect of its non-implementation on SSA banks' dividend policy.

Similarly, Bushra and Mirza (2015) used OLS and the Fixed Effect Model (FEM) and found that profitability and growth in sales have positive effects on dividend yield while firm size, the ownership concentration ratio and market-to-book ratio have negative but highly significant effects. Return on equity, current earnings and firms' growth activities were found to be positively correlated to the dividend payout ratio and business risk and size were the major determinants of the dividend payout ratio in Kenyan listed firms (Musiega, Alala, Douglas, Christopher, & Robert, 2013). Since Kenya is among the SSA countries examined in this study, it is pertinent to determine how these factors affect the whole region. The study did not consider previous year's earnings because no specific dividend model was used. Since the proportion of earnings to be paid as dividends is determined from the previous year's earnings, this calls for further investigation.

Yimam (2016) used FEM and REM to examine Ethiopian banks and found that, the past year's dividend, growth and bank size have a positive and statistically significant effect on dividend payouts. Leverage and profitability were found to be negative and statistically significant in determining the dividend payout ratio of Ethiopian private commercial banks. The higher a bank's profitability the higher its capacity to pay out if a dividend payout policy is adopted. This inverse relationship between profitability and the dividend payout ratio among Ethiopian banks requires further investigation. Similarly, using OLS estimation, Muhammed (2012) found that profitability and liquidity positively and significantly affect the dividend payout ratio. It is evident that there are conflicting findings, even for the same country. It is for this reason that the current study focuses on a wider geographical scope to determine the determinants of the dividend payout ratio.

3.2.2 Empirical Evidence on Dividend Policy and Financial Performance

Few studies have empirically examined the relationship between dividend policy and performance in the banking sector. Hamid et al. (2016) recent study investigated Pakistan banks' dividend policy. The results of the FEM showed that tax and financial slack (retained earnings) had no significant effect on bank performance. It is pertinent to examine if retained earnings impact performance despite its insignificant effect. Waseem, Saleh, Shukairi, and Mahmood (2011) examined dividend policy and performance stability among 17 listed commercial banks in Jordan for the period 2000-2006 using pooled EGLS (cross-sectional random effect). The result showed that the cash dividend policy is unstable in Jordanian banks and hence has a negative effect on their performance.

Agyei and Marfo-Yiadom (2011) examined 16 Ghanaian commercial banks for the period 1999 to 2003. Using the fixed and random effect model estimation, they found that, dividend paying banks enhanced their performance. This requires further enquiry because the study was silent on banks that retain earnings to enhance growth. There is a need to weigh both policies to determine which tends to promote bank performance. Evidence from Bangladesh for the period 2008 to 2010 using regression analysis showed that variations in dividend policy did not explain variations in the returns on shares among the listed commercial banks (Zaman, 2011).

The review of the literature shows that, the majority of studies focused on non-banking sectors. Ouma (2012) examined Kenyan listed firms for the period 2002 to 2010 using regression analysis. The study found a strong and positive relationship between dividend payouts and firm performance. However, it did not consider other dividend policies. Ajanthan (2013) analysed the effect of dividend payouts on the performance of hotels and restaurants in Sri Lanka using multiple regression estimation. The study found a strong and positive relationship between dividend payouts and firm performance. Priya and Nimalathasan (2013) employed regression analysis to investigate hotels and restaurants in the same country for the period 2008 to 2012. The study found a significant positive relationship between dividend policy and firm performance. However, it did not specify the kind of dividend policy that influenced performance. Evidence from Nigerian manufacturing firms presented by U. Uwuigbe, Jafaru, and Ajayi (2012) and Ehikioya (2015) showed that dividend payouts significantly and positively impacts firm performance. However, both studies neglect retention policy and this requires further clarification as payout is not the only dividend policy. There are always some shareholders that prefer to retain profit to grow the firm and avoid external borrowing to finance viable investment projects. Furthermore, firms with financial constraints pay significantly lower dividends than those that are financially buoyant (Obembe, Imafidon, & Adegboye, 2014).

In contrast, a study conducted by Amidu (2007) among manufacturing firms in Ghana covering the period1994 to 2004, and Onanjiri and Korankye (2014b) research in the same sector covering 2004 to 2011, revealed that dividend payouts have an inverse but significant effect on financial performance. Ling et al. (2007a) examined dividend policy among public listed firms in Malaysia. The study found that dividend payments correlate with past earnings but there was little or no correlation with current earnings and negative correlation with future earnings. Zhou and Ruland (2006) found evidence of a strong positive relationship between the payout ratio and future earnings growth in Malaysian firms, Al-Twaijry and Powers (2007) used regression analysis to examine Malaysian firms and found that there is no statistically significant association between the payout ratio and the volatility of past, current and future earnings. All these studies used the dividend payout ratio as a proxy for dividend policy, calling for other dividend policies to be considered. When dividend payouts do not correlate with changes in future earning, this denotes that there is no assurance of the policy increasing expected earnings which is the firm's objective.

Anil and Kapoor (2008) reported an insignificant but positive relationship between the dividend payout and profitability of IT firms in India between 2000 and 2006. In contrast, Omran and Pointon (2004) study among 94 Egyptian firms found that retention policy is more important than dividend payout policy in firms with actively traded shares. Lie (2005) research on this subject among firms in the US for the period 1980 to 1997 employed multinomial logistic regression and found that an increase in payout levels provides firms with positive information about corresponding income and that, such firms experienced low operating income volatility in previous years. It is evident that previous studies have produced mixed results on the nature of the relationship between dividend policy and bank performance. The negative relationship and insignificance of dividend payouts might be a signal for firms to adopt a different dividend policy.

Evidence on the causality between dividend policy and performance has been scanty. Only three studies were identified on this subject matter and none on the African continent. Mougoué and Rao (2003) investigated earnings and dividends among U S firms from 1981 to 1991 using cointegration and the Granger causality test from the error correction model. The study showed that there is uni-directional causality from dividends to earnings. However, it used dividend payments as a proxy for dividend policy and this is not the only dividend policy. Farsio et al. (2004) study in the US covered the period 1988 to 2002 and employed regression analysis and the Granger causality test. It concluded that there is a negative relationship between earnings growth and dividend payouts in firms that adopt payout policy at the expense of re-investment in growth opportunities.

Distributed earnings have also not been found to be predictive of firms' future earnings. Instead, they reflect past performance that does not show the real growth of firms. Finally, a study of 137 United Kingdom manufacturing and service firms for the period 1970 to 2003 using the Granger causality test from the Vector Auto Regressive (VAR) framework showed that there is a bi-directional relationship between the signalling and smoothing hypotheses (Goddard, McMillan, & Wilson, 2006).

These studies failed to weigh the two commonly adopted policies and test for causality to show which is responsible for performance. Furthermore, none examined the causality between dividend policies and bank performance and none were conducted in Africa or SSA.

3.2.3 Empirical Evidence on Operational Diversification and Financial Performance

Few studies have empirically examined the relationship between operational diversification and financial performance, even though many have been conducted on income diversification which is just one dimension of operational diversification. The only study identified on operational diversification of banks was conducted by Mishra and Sahoo (2012) using 59 banks for the period 1996 to 2008. Using FEM and REM, it found that banks with greater levels of operational diversification experience larger fluctuations in financial performance due to poor decisions as to which areas to focus on and the optimum degree of diversification. As is evident in India's banking sector, if not properly monitored, diversification can have an adverse effect on performance.

Demsetz and Strahan (1997) analysed 150 publicly traded bank holding companies (BHCs) for the period 1980 to 1993. Using the factor analysis model, the study found that improved diversification does not reduce risk. The risk-reducing potential of diversification for large companies is offset by their larger loan portfolios and lower capital ratios. The study also showed that diversification may encourage BHCs to pursue riskier lending and operate with greater leverage which serves as an important motive for consolidation. Similarly, Behr et al. (2007) investigated the effect of specialisation and diversification on German banks between 1993 and 2003 using OLS. The study found that specialised banks generate higher returns than diversified banks, and have lower levels of non-performing loans and relative loan loss ratios. Furthermore, the standard deviations of non-performing and loan loss ratios are lower in diversified banks. The study thus suggests that banks should not diversify; this requires further investigation as other studies have shown that diversification boosts firm performance.

For example, Armstrong and Fic (2014) used OLS to investigate diversification among banks in 31 OECD countries for the period 1998 to 2012. The study found that, diversification adds value in small banks but reduces it in the largest banks. Lepetit, Patry, and Rous (2004) employed the GARCH Model to analyse 13 European banks from 1991 to 2001 and found a positive and significant market reaction to geographical specialisation and cross-product diversification. Turkmen and Yigit (2012) analysed diversification and the performance of 40 Turkish banks from 2007 to 2011. The findings revealed that ROA and ROE, which are measures of performance, are explained by diversification. Finally, a study that focused on Nigerian banks from 1998 to 2007 concluded that diversification has a strong impact on banks' profitability (Ugwuanyi & Ugwu, 2012).

The conflicting findings on the effects of diversification on performance could be due to the agency problem that emanates from the divergence in interests between managers and shareholders. Furthermore, it is essential to identify the most appropriate approach to diversification as over- or under-diversification can adversely affect a firm's performance. Goddard et al. (2008) examination of US credit unions from 1993 to 2004 found that large and small credit unions' responses to diversification differ and concluded that they should not institutionalise similar diversification strategies. J. M. Mulwa and Kosgei (2016) survey of

Kenyan banks found that commercial bank diversification is best explained by disaggregating the various elements that constitute their operations, such as income, assets and liabilities.

Previous empirical studies have produced mixed findings on income diversification and bank performance. Banks have two main streams of income, namely, interest income and non-interest (fee) income. While some studies have found interest income to be significant, others found that non-interest income was more important. An investigation into 472 US commercial banks covering the period 1988 to 1995 found that diversification of banking revenue from interest-based activities to fee-based activities leads to higher revenue volatility and total leverage (DeYoung & Roland, 2001). Stiroh (2004a) study on US banks from 1984 to 2000 concluded that decreased volatility of net operating income is caused by the volatility of net-interest income; therefore, higher non-interest income is associated with lower risk adjusted profit and higher risk. Similarly, DeYoung and Rice (2004b) examined US commercial banks for the period 1989 to 2001 using correlation and regression. They found that well managed banks have little involvement in non-interest activities. Furthermore, on average, a marginal increase in non-interest income leads to poorer risk-return trade-offs.

Evidence from 978 banks in emerging and developing countries for the period 2000 to 2007 showed that competition and diversification of revenue into interest and non-interest activities increases stability. It was also found that revenue diversification gives rise to competition which affects insolvency risks in emerging market (Amidu & Wolfe, 2013). Sanya and Wolfe (2011) examined 226 banks across 11 emerging economies using system generalised methods of moments (SYS-GMM). The study found that diversification across both interest and non-interest income generating activities enhances profitability by decreasing insolvency risk.

A study conducted by Sissy (2015) on 329 banks across 29 African countries for the period 2002 to 2013 found that cross border banking increases revenue diversification due to competition. This suggests that, geographical and revenue diversification improves banks' performance and the stability of such performance. Kiweu (2014) examined income diversification in Kenyan banks between 2000 and 2010. The study showed that there is a positive correlation between net interest and non-interest income. The implication is that the benefits of income diversification do not offset the risks attached to fee-based income. In similar manner, Teimet, Ochieng, and Away (2011) employed correlation and multiple regression analysis to examine income diversification among 44 commercial banks in Kenya for the period 2005 to 2009. The findings point to positive correlation between the two sources of income and suggest that diversification has a positive effect on Kenyan banks' financial performance.

Amediku (2012) examined three Ghanaian banks for the period 2006 to 2010 using correlation and pooled regression. The results showed that non-interest income which is one of the dimensions of income diversification had significant and positive impacts on the performance of the sampled banks. In contrast, Senyo, Olivia, and Musah (2015) research on income diversification in Ghana for the period 2002 to 2011 using OLS found that interest income makes the highest contribution to banks' profits in Ghana and that non-interest (fee) income only plays a positive role when there are short falls in interest revenue. The only empirical evidence on loan diversification emanated from a study conducted by Simpasa and Pla (2016b) on banks in Zambia for the period 2005 to 2014. The study found that concentrating lending in a few sectors reduces monitoring costs and risk, and hence boosts bank performance. This suggests that loan (spread) diversification has adverse effects on bank performance. The mixed findings on the effects of diversification were the reason for extending the geographical scope of the current study in order to establish if conclusions can be drawn that cover all the countries under investigation.

3.2.4 Empirical Evidence on Market Risk and Banks' Performance

Generally, everybody in modern society is familiar with the concept of risk because life itself is a risk. Traditionally, risk means the consequences that could occur when the future is uncertain. Damodaran (2012) described risk using Chinese symbols as a mix of threats and opportunities. There are two perspectives on risk; firstly, it can be regarded as any occurrence that strays from the results or returns predicted by an investor. Secondly, risk can be expressed as the probability of a decrease in the income expected from an investment (Gilb, 2002). The concept of risk is of great importance in any financial system, especially with regard to commercial banks that serve as intermediaries between the surplus and deficit units due to unstable economic situations and fluctuating environmental factors.

Like other variables, risk has a significant effect on firms' returns and profit. A firm that successfully manages risk can overcome other economic or environmental challenges. According to the portfolio theory, Nimalathasan and Pratheepkanth (2012) there are two types of risk, systematic and non-systematic. A firm can control non-systematic risk such as credit risk, operational risk and liquidity risk through diversification, while systematic risk, also known as market risk, refers to the risk of changes in asset valuation due to uncontrollable factors known as outliers and cannot be controlled by the organisation.

The relationship between risk and returns has long been a central focus of financial researchers that have concluded that investors are "risk-averse" and utility-maximisers (Collier & Agyei-Ampomah, 2006). They are always willing to diversify, and to maximise utility, but market risk prevents diversification. Due to the nature of market risk, managers, investors, and scholars have investigated different ways to understand and manage it in order to sustain returns. Brigham and Ehrhardt (2013) concluded that a firm's major long term goal is to deal with market or systematic risk.

Hence, managers of firms should ensure that market risk is well managed. In a banking context, market risk refers to the risk of losses in the bank's trading book caused by fluctuations in interest rates and foreign-exchange rates; unstable equity prices and credit spreads; dwindling commodity prices and similar factors outside the context of their system (Mehta, Neukirchen, Pfetsch, & Poppensieker, 2012). However, as noted by Santomero (1997), two market risks are of major concern to banks, the interest rate risk and the foreign exchange risk, both of which have a significant impact on their performance. For instance, if banks fail to manage interest rate risk, their net interest margin will fall. Likewise, if the foreign exchange risk is not well managed, a bank will need to revalue its assets because currency fluctuations negatively influence its balance sheet.

Due to the peculiarity of market risk, several scholars have examined risk in the context of commercial banks (Kargi (2011); Musyoki and Kadubo (2012); Fredrick (2013); Li and Zou (2014). However, these studies focused on bank-specific (unsystematic) risks such as liquidity and credit risk. To address this lacuna, this study inquires into the relationship between dividend policy, agency costs and profitability taking cognizance of market risk as it is inevitable in commercial banks' activities. Scholars such as Feldman and Schmidt (2000); Eriotis (2011); Nimalathasan and Pratheepkanth (2012); S. Acharya, Dupatti, and Locke (2015) and Ekinci (2016) examined the variables independently. The current study brings them together in the context of SSA banks. To the best of the researcher's knowledge, no other study has undertaken such an investigation in the SSA banking sector.

3.3 Summary of the Literature Review and Knowledge Gaps

Table 1: Knowledge Gaps Identified

After an extensive review of the existing literatures relating to this study, the Table below shows the outcome of the prior research on each specific objectives of the study, identify the gap in literature this study intends to fill and discusses the various contribution to existing knowledge this study intends to give.

Research Objectives	**Previous Research**	**Knowledge Gaps and Contribution of this Study**
Examine the determinants of the dividend payout ratio of SSA banks	The literature review shows that there is on-going debate as to whether to pay out or retain. While more studies support a payout policy, no consistent payout ratio formula is set. To the researcher's knowledge, no study has been conducted on this subject with a regional focus using a formal dividend model. All the studies on the determinants of the dividend payout ratio have been conducted in a single economy. This study seeks to address this gap.	Having reviewed the existing literature, this study is unique in its examination of the determinants of the dividend payout ratio in the SSA region in order to establish if there is a common formula for dividend payments. As noted by Panigrahi and Zainuddin (2015a), for a dividend policy to be optimal, it has to be consistent. The well-known Lintner model is tested using combined data from selected countries in the region.
Establish the direction of causality between dividend	Previous studies produced mixed findings on which dividend policy (payout or retention) should be adopted to	It has been established that there is a feedback relationship between dividend policy and performance.

policy and the financial performance of SSA banks	maximise wealth rather than profit. However, the majority concluded that banks should pay out. There are various theories on the choice of dividend policy and empirical findings have shown that not all firms that pay out positively signal their future performance. Studies have shown that, irrespective of the dividend policy adopted by banks, it will have a significant effect on bank performance. However, the most appropriate policy that will improve performance has not yet been identified because correlation does not mean causality.	However, what form this policy should take is a gap that this study seeks to fill. This study weighs the two common dividend policies in the banking sector and establishes the causal relationship between each and bank performance in the SSA region. Since the focus of this objective is to test causality, the block exogeneity Wald test and pairwise Granger causality were conducted. This is different from the tests of feedback relationship used in previous research.
Determine the effect of operational diversification on the financial performance of SSA banks	Studies have shown that, in a bid to satisfy dividend-income oriented shareholders who regard dividend income as a signal managers diversify into vague negative NPV activities that generate profit, but do not create value that positively impacts on banks' growth. This calls for an empirical investigation of how operational diversification has affected bank performance in SSA. The review of the literature on bank diversification showed that few studies have been conducted on African and SSA banks. Most focused on developed countries and on income	This study is unique in that it addresses operational diversification in the SSA banking sector context. It investigates all four dimensions of banking operations using the Herfindahl-Hirschman Index. In contrast, previous studies have focused on the effect of income diversification.

	diversification. The few studies in SSA countries also focused on income diversification which is just one dimension of operational diversification. The state of the banking sector in the SSA region, despite high concentration levels calls for further empirical investigation	
Evaluate the relationship between dividend policy, agency costs; market risk and bank performance among SSA commercial banks.	Previous studies focused on the individual relationship between these variables and performance. Examples include agency cost and performance (Ang et al., 2000; Singh & Davidson III, 2003), dividend policy and performance (Hamid et al., 2016; Ouma, 2012), and market risk and performance (Ekinci, 2016; Feldman & Schmidt, 2000). No known study has brought all these variables together to evaluate how they relate to one another.	Since all the reviewed studies established that a feedback relationship exists between these variables on an individual level, this study brings them together and evaluates how they relate to bank performance in the SSA. Irrespective of the policies adopted by banks, market risk is inevitable, and effective management of this risk is a major long-term goal of any firm.

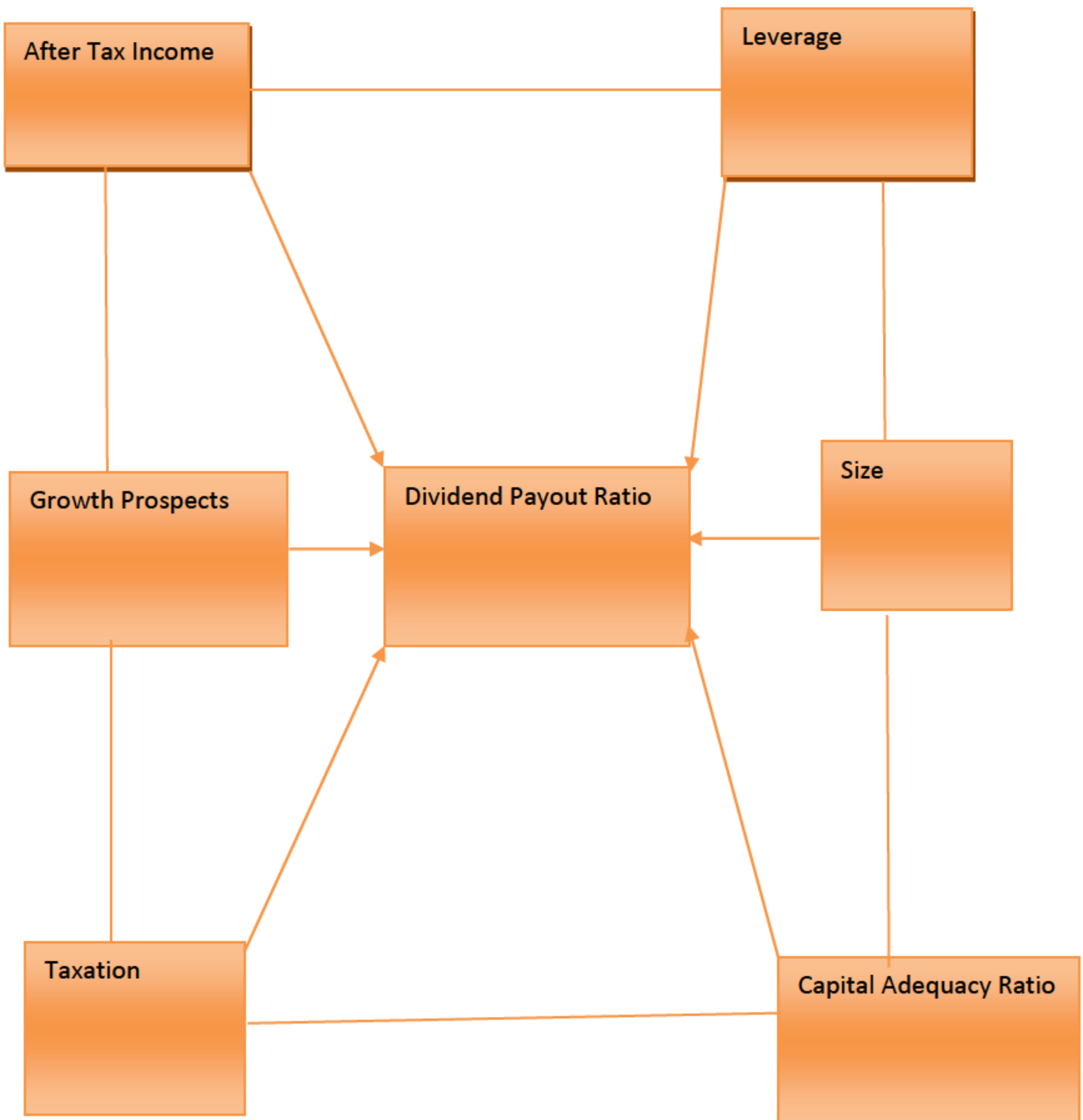
Source: Author's Compilation (2017)

3.4 Conceptual Framework

3.4.1 Determinants of the Dividend Payout Ratio

The figure below shows the shows the link between the various bank-specific determinants of dividend payout ratio. All the variables are chosen based on the Lintner Model and other control variables. The control variables are selected based on previous research on dividend payout ratio across various economies. It was found that this model has not been used to determine a dividend payment formular for the region. This might be the reason for the continuous argument on dividend payout formular which this study finds necessary to examine.

Figure 1: Conceptual Framework on Determinants of the Dividend Payout Ratio



Source: Author's design (2017)

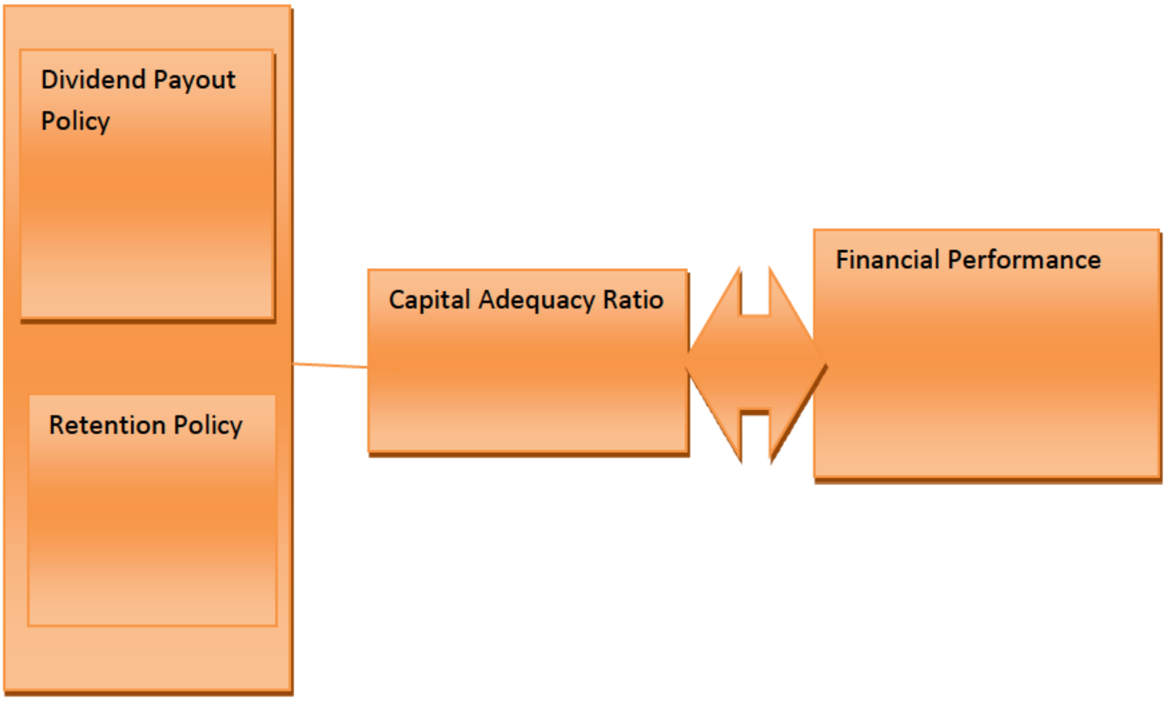
Figure 1 shows the various bank-specific factors that affect the dividend payout ratio following Lintner's model. It illustrates that the preceding year's profit after tax is one such factor. Dividends are usually paid after the bank's annual general meeting from the previous year's profit after deducting company tax. The bank's growth prospects in terms of total assets are also considered. Expected growth will affect the dividend payout ratio and retention ratio, since what is not paid is assumed to be retained. The taxation ratio is considered as higher taxation is a signal of higher income generated. Dividends can only be paid after tax has been deducted from the year-end profit. Leverage is a crucial determinant of the dividend payout ratio because dividend-oriented shareholders prefer managers to increase the debt level and set a high performance target that results in higher dividends. These shareholders believe that high debt capacity will enhance performance because managers will strive to meet the terms and conditions of the debt.

The debt holder serves as a monitoring tool to ensure that managers' activities are geared towards non-default, hence maximising shareholders' wealth. Size is also expected to determine the dividend payout ratio in banks. It is logical that small banks will tend to increase their payout ratio to serve as a signal to attract potential investors, while large banks with a huge capital base could explore other dividend policies or reduce the payout ratio if a payout policy is adopted. Finally, capital adequacy which was not considered in previous studies is examined in this study. This is a measure of banks' capital such that depositors are protected; it promotes stable and efficient financial systems the world over. The capital adequacy ratio is aimed at ensuring that banks are able to absorb reasonable losses; it is hence part of policy formulation in the banking sector.

3.4.2 Dividend Policy and Financial Performance

Having established that there is a correlation between dividend policy and bank performance by prior research, the figure below depicts the causality between the two examined dividend policies and bank performance using capital adequacy ratio as a control variable to avoid bi-variate analysis. This is to establish the exact policy that will cause bank performance as aginst the mere correlation which has been established by prior studies.

Figure 2: Conceptual Framework on Causality between Dividend Policy and Financial Performance



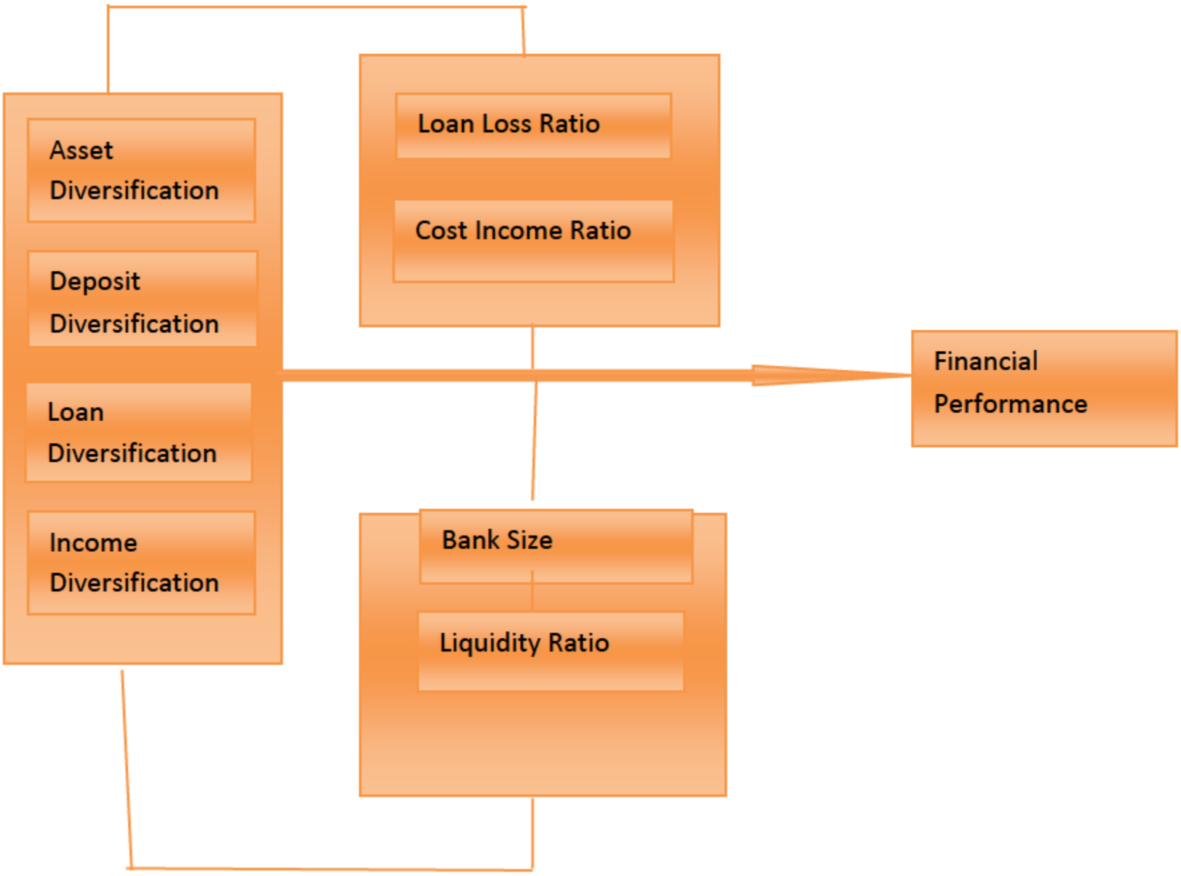
Source: Author's design (2017)

Figure 2 depicts the cause and effect relationship of dividend policy and banks' financial performance. Hamid et al. (2016) note, that, dividend payout and dividend retention are the two most common dividend policies in the banking sector. However, dividend payout is the most popular as it is considered as a signal of bank performance. Retention policy, which relates to the capital gain generated from investment in viable opportunities, has not been adopted by many SSA banks. Studies on causality have used the dividend payout ratio as a proxy for dividend policy, neglecting the retention ratio aspect of such policy. Payout and retention policies are two sides of a coin. This study seeks to address this gap by considering these two policies in a multi-variate causality model. The capital adequacy ratio is included as a control variable in order to avoid simultaneity bias. The choice of the capital adequacy ratio amongst other banking ratios is premised on the fact that it is used to protect depositors and promote the stability and efficiency of financial systems around the world. A bank that declares a dividend must satisfy minimum capital adequacy requirements. The double-pointed arrow shows the causality between financial performance and dividend policy which can either be uni- or bi-directional.

3.4.3 Operational Diversification and Financial Performance

The figure below depicts the effect of the four dimensions of operational diversification and other control variables on the financial performance of banks. This is to establish if operational diversification has been of a positive or negative impact on bank performance in SSA.

Figure 3: Conceptual Framework on the Effect of Operational Diversification on Financial Performance



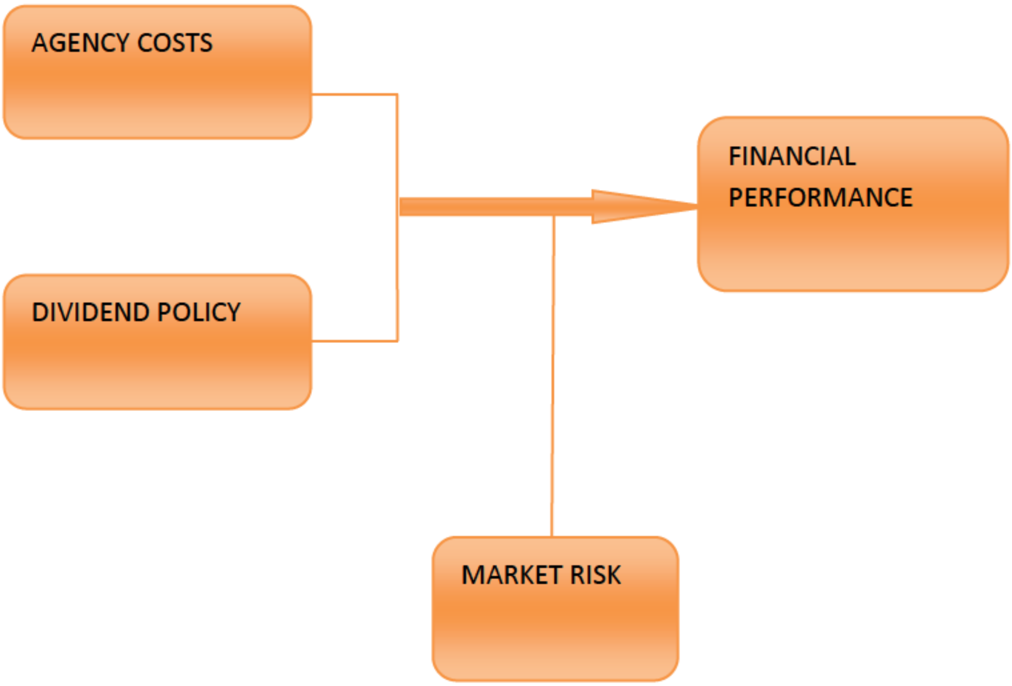
Source: Author's design (2017)

Figure 3 depicts the nexus of operational diversification and SSA banks' financial performance. While previous studies found that diversification had a negative effect on performance, J. M. Mulwa and Kosgei (2016) investigation of Kenyan banks concluded that, commercial bank diversification will increase financial performance, if such diversification is explained by disaggregating the various elements that constitute their operations, such as income, assets, loans and deposits. Based on this, the HHI index of assets, deposits, loans and income was examined together with other germane variables that show cost efficiency (the cost-income-ratio), management's expectation of future loan losses (loan-loss-ratio) and the bank's ability to meet its financial obligations as and when due (liquidity), due to the various activities that accompany diversification. The lack of studies on operational diversification of banks and the slow progress of SSA banks despite their degree of diversification motivated the current examination of the effect of operational diversification on bank performance.

3.4.4 Dividend Policy, Agency Costs, Market Risk and Banks' Financial Performance

The figure below depicts the relationship between dividend policy, agency cost and financial performance using market risk as an intervening variable. This is premise on that fact that market risk is inevitable for firms and the ability to manage this risk unhatched is the long term goal of the firm irrespective of the policy implanted by such firm.

Figure 4: Conceptual Framework on Dividend Policy, Agency Costs, Market Risk and Banks' Financial Performance



Source: Author's design (2017)

Figure 4 shows the interrelated links between dividend policy; agency costs and bank performance, with market risk serving as a moderating variable. Market risk is an inherent risk faced by all firms and is not controllable. It can only be managed to reduce its effect on firms' performance. Taking dividend policy as a tool for bank owners to mitigate agency costs, it is expected that a bank that is able to manage and provide for this inherent risk will enhance its performance. Since market risk cannot be controlled by the organisation, bank managers adopt different measures to run the business amidst risk and ensure profitably and that dividends are paid to shareholders. Life itself is a risk; it is risky for commercial banks not to take risk. It is for this reason that this study incorporates market risk in its investigation of the relationship between bank performance and different variables. Market risk is the most common risk faced by banks (McNeil, Frey, & Embrechts, 2015) and as noted by Mehta et al. (2012), effective management of such risk is the long term goal of a bank because it is inevitable and unavoidable. This study thus evaluates how market risk relates to dividend policy, agency costs and bank performance.

3.5 Chapter Summary

This chapter reviewed relevant concepts relating to dividend policy and the kinds of dividend policy; agency costs, diversification and market risk in relation to the banking sector to address the key concepts in the study's four objectives. This was following by a review of the empirical literature to identify the main areas of debate and identify gaps. Finally, the conceptual framework for each objective was presented to show the link between the key variables of interest and how they were used to achieve these objectives.

The following chapter discusses the research methods for each specific objective of the study.

CHAPTER FOUR

METHODOLOGY

4.0 Introduction

This chapter focuses on the methodology adopted to achieve the study's objectives. Section 4.1 discusses the research design; section 4.2 highlights the sample and the nature and sources of data; section 4.3 focuses on the definitions of the variables used for this study and the rationale for using them and section 4.4 discusses the methodology used to establish the determinants of the dividend payout ratio. Section 4.5 discusses the methodology adopted for the causality test of dividend policy and bank performance, while section 4.6 presents the methodology for the estimation of the effect of operational diversification on bank performance. Section 4.7 focuses on the research method used to evaluate the relationship between dividend policy, agency costs, market risk and bank performance. A chapter summary is presented in section 4.8.

4.1 Research Design

This descriptive and correlation research falls under the positivist paradigm and the deductive approach. This paradigm was chosen because the study investigated the relationship between dividend policies, agency costs and bank performance in SSA taking cognisance of market risk as an intervening variable. It is a pure quantitative study that draws on existing theory (Arghode, 2012; Cohen, Manion, & Morrison, 2013; Sarantakos, 2012).

Following, to name but a few, Díez Esteban and López de Foronda Pérez (2001), Flamini et al. (2009), Nnadi et al. (2013), Francis (2013) and Akande and Kwenda (2017) regional studies on African or SSA banks that used unbalanced panel datasets from several commercial banks, this study is based on unbalanced panel of 250 commercial banks from 30 SSA countries. All these countries have similar economic and banking features such that their banking markets are oligopolistic in nature. Panel data was used to cater for the heterogeneity problem that individual bank characteristics might cause (Hsiao, 2014). Not all the data required to capture the variables of interest were available for all the SSA countries for the study period; hence, it was unbalanced.

The unbalanced panel data analysis approach was used rather than a balanced panel because we are less interested in goodness of fit and more concerned with understanding the explanatory and illuminating powers of the specific variables, using the available data. Unbalanced panel data analysis was employed to achieve all the study's objectives because of its advantages over cross-sectional or time series data, including:

i) Panel data allows for more efficient estimation of parameters by giving a better source of variation (Greene, 2003).

ii) Panel data is more informative than time series or cross-sectional data because it has the ability to manage the heterogeneity problem (Gujarati & Porter, 2003; Hsiao, 2014).

iii) Panel data can be used to estimate complex behavioural models and analysis of dynamic adjustments in variables (Baltagi, 2008).

iv) According to Greene (2003) and Kutu and Ngalawa (2016), panel data allows for behavioural differences across cross sections, time-periods or both.

4.2 Sample, Nature and Sources of Data

Using proportionate stratified simple random sampling techniques, annual data were collected from 250 commercial banks' financial profile with up-to-date data available in the BankScope database by Fitch/ IBCA Bureau Van Dijk covering the period 2006 to 2015. The total number of banks with an adequate financial profile for the period of study was 450 in 37 countries. After filtering the data, we found that only 250 listed banks in 30 SSA countries had data on the variables required to achieve this study's objectives. As noted by Beck, Demirgüç-Kunt, and Maksimovic (2004), Houston, Lin, Lin, and Ma (2010) and Akande and Kwenda (2017) BankScope is considered as the most comprehensive and appropriate database to conduct research on the banking sector because it accounts for over 90% of all countries' bank-level data.

The SSA countries considered in this study exclude those regarded as outliers such as South Africa and Mauritius due their highly competitive and sophisticated banking systems (Beck & Cull, 2013). Countries such as such as Democratic Republic of Congo, Comoros, Guinea-Bissau, Sao Tome and Principle and that lacked data due to the effects of war were also excluded (Akande & Kwenda, 2017; Flamini et al., 2009). The countries selected are bank-based economies in which commercial banking holds more than 70% of financial system assets on average. They have similar economic and banking characteristics such as weak creditors' rights, underdeveloped infrastructure, high inflation and poverty rates, external shocks, high concentration, a shallow financial system and non-adherence to global regulatory requirements (Akande & Kwenda, 2017; Allen et al., 2014; Flamini et al., 2009). Specifically, these countries are: Angola, Benin, Burkina Faso, Botswana, Cameroon, Cote d'voire, Djibouti, Ethiopia, Equatorial Guinea, Gabon, Ghana, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Seychelles, Swaziland, Togo, Tanzania, Uganda, Zambia. They are either categorised as economies in CEMAC, EAC, ECOWAS, SADC or WAEMU.The macro-economic variables used in this study are sourced from the World Development Indicators (WDI) and International Financial Statistics (IFS).

4.3 Variable Measurement and Rationale for the Choice of Variables

This section discusses the measurement of the dependent and explanatory variables used in this study, and the rationale for choosing these variables.

Table 2: Definition of Variables

Variables	**Description**	**Formular**	**Prior Research**
Dividend Payout Ratio (DPOR)	This variable is used to capture the dividend payout policy. In the context of this study, we treat payout as the cash dividend payout and not stock dividend or stock repurchase. It shows the proportion of a bank's income distributed to shareholders in the form of cash. This	Total Dividend X 100 Total Earnings	Agyei and Marfo-Yiadom (2011), Nnadi et al. (2013), Agyemang Badu (2013) and Maldajian and El Khoury (2014)

	variable was used by because it shows the proportion of dividend paid out		
Retained Earnings Ratio (RERA)	This variable is chosen to capture the dividend re-investment plan, which is the retention policy of dividend. It shows the proportion of bank earnings ploughed back into investment opportunities that will later yield capital gains. It is also called financial slackness.	Retained earnings X 100 Total earnings For this study, it was extracted directly from BankScope.	Omran and Pointon (2004) and Hamid et al. (2016).
After Tax Income (ATI)	This is also known as profit after tax. The criterion for using this variable in the study is that the Lintner model is a function of the past year's dividend and the current year's earnings after tax.	Natural logarithm of profit after tax	Lintner model, Parasuraman and Ramudu (2012), Bawa and Kaur (2012a) and Boţoc and Pirtea (2014)
Bank Size (SIZ)	This depicts the size of a bank in terms of its total assets. It is a bank-specific factor	Natural Logarithm of total assets.	SCP model, Komrattanapanya and Suntraruk (2013),

	used as one of the determinants of the dividend payout ratio.		Al-Ajmi (2010), Elias (2015) and Kajola et al. (2015)
Growth Prospects (GRO)	This is one of the determinants of the dividend payout ratio. It was used in this research to show the future capacity of banks' assets to increase.	$\frac{\text{Total assets} - \text{Total assets}_{t-1}}{\text{Total assets}_{t-1}} \times 100$	Musiega et al. (2013) and Elias (2015)
Capital Adequacy Ratio (CAR)	This is the ratio that shows a bank's buffer capital. It is a ratio set for the banking sector around the world to protect depositors and promote efficient and stable financial systems. It is an important ratio in the banking sector and apex banks use it as a criterion in evaluating commercial banks' requests to pay dividend. Surprisingly, this ratio has not been widely incorporated as one of	$\frac{\text{Total equity}}{\text{Total Assets}} \times 100$	Dickens et al. (2002); Casey et al. (2009) and Al-Ajmi (2010).

	the determinants of banks' dividend payout ratio.		
Leverage Ratio (LEV)	This ratio shows the proportion of a bank's capital that comes from debt. It was included in this study to examine the effect of leverage on dividend payouts in SSA banks.	$\frac{\text{Total liability}}{\text{Total assets}} \times 100$	Nuhu et al. (2014), Kajola et al. (2015) and Yimam (2016).
Taxation Ratio (TAX)	This is the corporate payment made by banks in line with government regulations. It was included as one of the determinants of dividend payout to show how company income tax affects the dividend payment ratio.	$\frac{\text{Tax paid}}{\text{Total assets}} \times 100$	Amidu and Abor (2006), O. Uwuigbe (2013) and Yusuf and Muhammed (2014).
Return on Assets (ROA)	This measure of performance indicates how profitable a bank is with respect to its total assets. This ratio points to how bank management is at	$\frac{\text{Profit after tax}}{\text{Total assets}} \times 100$	The ratio has been used by various scholars to measure performance, including Ouma (2012),

	using its total assets component to generate earnings.		Agyei and Marfo-Yiadom (2011), Onanjiri and Korankye (2014b) and Ehikioya (2015).
Return on Equity (ROE) :	is the amount of net income expressed as a percentage of shareholders' equity. Return on equity measures a bank's profitability generated with the money shareholders have invested in it.	Profit before interest and tax X 100 / Total equity	U. Uwuigbe et al. (2012) and Ehikioya (2015)
Return on Average Assets (ROAA)	This ratio indicates the profitability of a firm's assets, and it is most often used by banks and other financial institutions to gauge financial performance. For this study, it was used to determine the effect of operational diversification on the financial performance of SSA banks	Total earnings after tax X 100 / Average total assets	Turkmen and Yigit (2012)

Asset Diversification (HHIas)	This is one of the dimensions of operational diversification identified by Using the HHI index that has been identified as the best diversificatio index for corporate financial institutions	1-[(Liquid asset/Total assets)^2 + (Fixed asset/Total assets)^2 + (Non-earnings asset/ Total assets)^2]	I. M. Mulwa et al. (2015).,
Income Diversification (HHIin)	This is also one of the dimensions of operational diversification.	1-[(Net Interest Income/ Net income)^2 +(Fees and commissions income/Net income)^2]	Senyo et al. (2015), Brighi and Venturelli (2014) and Kiweu (2014),
Loan Diversification (HHIlo)	this is also one of the dimensions of operational diversification.	1-[(Impaired loan/Gross loan)^2 + (Loan to customer/ Gross loan)^2]	I. M. Mulwa et al. (2015)
Deposit Diversification (HHIde)	This is another of the dimensions of operational diversification identified by I. M. Mulwa et al. (2015)	1- [(Customers deposit / Total deposits)^2 + (Deposit from banks/Total deposits)^2 + (Other deposit/Total deposits)^2]	Mishra and Sahoo (2012)

Cost Income Ratio (CIR)	This ratio is used to measure banks' cost efficiency. The cost-to-income ratio shows their efficiency in minimising operating costs while increasing the profits emanating from their operations. The lower the CIR, the more efficient the bank is, while the higher the CIR, the less efficient bank management is in reducing operating costs. It was used in this study to serve as a control variable in the operational diversification model.	$\frac{\text{Operating cost}}{\text{Operating income}} \times 100$	Goddard et al. (2008) and Brighi and Venturelli (2014).
Loan Loss Ratio (LLR)	This ratio shows how well a bank has prepared for loan defaults and losses that may emanate from bank loans. It was also used as a control variable for the estimation of the operational	$\frac{\text{Loan loss provision}}{\text{Gross loan}} \times 100$	A. N. Berger et al. (2010)

	diversification model in this study.		
Loan to Deposit Ratio (LOD)	This ratio was used to capture banks' liquidity ratio. The liquidity ratio shows the bank's ability to meet short-term or occasional withdrawals.	$\frac{\text{Gross loan}}{\text{Total deposit}}$ X 100	Demirgüç-Kunt and Huizinga (2010) and Doumpos et al. (2013)
Asset Utilisation Ratio (AUR)	This ratio was used to proxy the agency costs of banks	$\frac{\text{Total income}}{\text{Total assets}}$ X 100	Ang et al. (2000), S. Gul, Sajid, Razzaq, and Afzal (2012) and Nazir, Saita, and Nawaz (2012)
Lending Interest Rate (LIR)	This was used as a measure of market risk	It was extracted from the WDI	Kasman and Carvallo (2013) and Ekinci (2016)
Real Exchange Rate (FEXR)	This was used as a measure of market risk in this study	It was extracted from the WDI and was naturally logged in this study as it is the ratio of the local currency of each country to the US Dollar	Ekinci (2016)

Source: Authors compilation from existing studies.

4.4 Determinants of the Dividend Payout Ratio in SSA Commercial Banks

4.4.1 Model Specification

Following the work of Parasuraman and Ramudu (2012); Lambrecht and Myers (2012); Bawa and Kaur (2012b), Nuhu et al. (2014), and Boţoc and Pirtea (2014), this study used Lintner's model to examine the determinants of the dividend payout ratio, although there are many other models on the dividend payout ratio, including those of Britain, Darting, Pettit, Watts, Aharony and Swary, Charest and Dobrovolsky.

Lintner's model was selected to examine the determinants of the dividend payout ratio in SSA commercial banks because:

- This model was recommended as the best model that still holds good and represents the dividend setting process by incorporating the dominant determinants of the dividend payout ratio (Parasuraman & Ramudu, 2012)
- It has a good and best fit as far as panel data regression is concerned and gives a good explanation of the dividend behaviour in organisations (Bawa & Kaur, 2012b).
- The model is unique and holds to date because its results stabilise dividend policy in organisations by providing an appropriate and suitable dividend payout ratio (Lambrecht & Myers, 2012).

According to this model;

$$\Delta D_{it} = a_0 + c_i \left(D_{it}^{*} - D_{i(t-1)} \right) + U_{it} \text{..............................} (4.4.1)$$

Where; a_0 is a constant term/ intercept, ΔD_{it} = the changes in the dividend ratio in the current year, D_{it} = dividend to be paid in the current year (t) across each bank (i), $D_{i(t-1)}$ = the dividend paid in the preceding year across each bank i over t.

If $D_{it}^{*} = r_i Y_{it}$...(4.4.2)

Where, r_i = the target payout ratio for each bank and is also a parameter and Y_{it} = current year profit after tax across i over t.

$D_{it}^{*} =$ the dividend which the bank would have paid by applying the target payout r_i to current year profit after tax Y_{it}.

c_i is a parameter and is the fraction of the difference between the dividend D_{it}^{*} and the actual dividend in the preceding year $D_{i(t-1)}$.

Generally, banks will always want their current year dividend to either increase or decrease from the previous year's, but, $0 < c_i < 1$.

U_{it} is the error term that denotes observed change in dividend (ΔD_{it}) that cannot be explained by the explanatory variables in the equation:

If equation $(4.4.2)$ is substituted into equation $(4.4.1)$

$$\Delta D_{it} = a_0 + c_i\left(r_i Y_{it} - D_{i(t-1)}\right) + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4.4.3)$$

Following BODMAS, we open the bracket

$$\Delta D_{it} = a_0 + c_i r_i Y_{it} - c_i D_{i(t-1)} + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots(4.4.4)$$

Note that $\Delta D_{it} = D_{it} - D_{i(t-1)}$

$$D_{it} - D_{i(t-1)} = a_0 + c_i r_i Y_{it} - c_i D_{i(t-1)} + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4.4.5)$$

Making D_{it} which is the actual dividend paid in the year subject to the formula,

$$D_{it} = a_0 + c_i r_i Y_{it} + D_{i(t-1)} - c_i D_{i(t-1)} + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4.4.6)$$

$$D_{it} = a_0 + (1 - c_i)D_{i(t-1)} + c_i r_i Y_{it} + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4.4.7)$$

Let $(1 - c_i)$ be β_1 and $c_i r_i$ be β_2. Recall, $c_i and r_i$ are parameters

$$D_{it} = a_0 + \beta_1 D_{i(t-1)} + \beta_2 Y_{it} + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4.4.8)$$

Equation (4.4.8) represents the dividend payout ratio model.

According to Lintner, modifying this equation to incorporate the other control variables examined in this study as cogent factors affecting commercial banks' dividend payout ratio, the formula changes to;

$$D_{it} = a_0 + \beta_1 D_{i(t-1)} + \beta_2 Y_{it} + \beta_3 W_{it} + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.4.9)$$

Where:

W_{it} is the vector of the control variables $X_{1,} X_2, X_3 and X_4$

$$D_{it} = a_0 + \beta_1 D_{i(t-1)} + \beta_2 Y_{it} - \beta_3 X_{1it} + \beta_4 X_{2it} - \beta_5 X_{3it} + \beta_6 X_{4it} + U_{it} \ldots\ldots\ldots . (4.4.10)$$

With the above model; Dividend paid = f (Past year dividend, After tax income, Leverage ratio, Growth prospects, Tax structure and Capital Adequacy Ratio).

$$DPOR_{it} = f\left(DPOR_{i(t-1)}, ATI_{it}, LEV_{it}, GRO_{it}, SIZ_{it}, TAX_{it}, CAR_{it}\right) \ldots\ldots\ldots (4.4.11)$$

$$DPOR_{it} = a_0 + \beta_1 DPOR_{i(t-1)} + \beta_2 \ln ATI_{it} - \beta_3 LEV_{it} + \beta_4 GRO_{it} + \beta_5 SIZ_{it} - \beta_6 TAX_{it} + \beta_7 CAR_{it} + U_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.4.12)$$

Equation (4.4.12) is the dividend payout ratio model of commercial banks in the SSA region.

A priori Expectation:

$\beta_{1,}, \beta_2, \beta_4 and \beta_7 > 0$, while $\beta_3 and \beta_6 < 0$ following bird in the hand postulations and the evidence in the empirical literature.

4.4.2 Estimating Technique

Due to the dynamic nature of Lintner's model upon which this study is hinged, equation 4.4.12 was estimated using dynamic panel analysis with the choice of two-step Differenced and System-Generalised Method of Moments, specifically. In panel estimation, neither the Fixed Effect (FE) estimating technique nor Generalised Least Squares (GLS) technique can produce consistent estimates whenever there is a dynamic model that has the dependent variable as one of its regressors and other endogenous regressors. Following Lintner's model, the dividend payout ratio model we estimate has lagged endogenous regressors with other unobserved bank fixed effect which are correlated with the regressors. Based on this fact, the GMM approach is considered suitable for this study to produce a consistent estimate as the orthogonality condition might not be met for a GLS or FE estimator.

Moreover, GMM eliminates the problem of serial correlation and heteroskedasticity and solves the endogeneity problem in a data set. It is designed for a sample with a small time-period and a large cross section, a linear functional relationship and a dynamic model that has its dependent variable between its regressors (Boţoc & Pirtea, 2014). Our model and panel data set comply with the conditions; therefore, both the Differenced and System-GMM estimator that has the capacity to eliminate any bias that may arise from the dynamic endogeneity and provides powerful instruments that solve the simultaneity bias problem and eliminate unobservable heterogeneity, are employed. According to Roodman (2006), Nzimande and Ngalawa (2017) and Mazorodze (2017), both difference and system GMM estimators are designed for panel analysis based on the following assumptions:

a) The process is dynamic such that current realisations of the dependent variable are influenced by past realisations.

b) Arbitrary distributed fixed individual effects might exist in the dynamic model such that there is a constant and vast change in the dependent variable across some observational units.

c) There are idiosyncratic disturbance terms across cross-sections (individuals).

d) Some regressors are predetermined although not strictly exogenous. It is possible to be independent of the white noise error term, but still influenced by past values, for instance, the lagged dependent variable.

e) The panel is of small T with large N, and some regressors may be endogenous in nature.

f) GMM estimators do not allow external instruments but "internal", chosen based on the sufficient and suitable lag structure of instrumental variables.

Notwithstanding all these assumptions underlying the two estimators, the System-GMM estimator performs relatively better than the Differenced-GMM estimator in its response to finite sample bias and root mean square error (Blundell, Bond, & Windmeijer, 2001; Davidson & MacKinnon, 2004). Hence, given the fact that our model and panel data set suit all the conditions for using GMM, we consider both Differenced and System-GMM as the appropriate estimator to use in this study, to overcome the usual complications that arise from the estimations of linear dynamic panel models and to enhance comparison of findings to obtain the best estimation.

The general model of the data generating process of GMM estimator;

$$Y_{it} = \alpha Y_{i(t-1)} + \beta X'_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(4.4.13)}$$

Based on the fact that the error term is comprised of two orthogonal components u_i (fixed effects) and v_{it} (idiosyncratic shock); the model will be:

$$\Delta Y_{it} = (\alpha - 1)Y_{i(t-1)} + \beta X'_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(4.4.14)}$$

Following the GMM panel estimator;

Where the underlying assumption is that instruments Z are exogenous and can be expressed as:

$E(Z_i u_i) = 0$.

A GMM with the P instrumental variables that consist of a set of P moments is considered. Given that:

$g_i(\beta) = Z'_i u_i = Z'_i (Y_i - X_i\beta)$ .... (4.4.15)

Where:

g_i is P × 1. The exogeneity of the instruments implies that there are P conditional moments, or conditional orthogonality that satisfies the true value of ß:

$$E(g_i(\beta)) = 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(4.4.16)}$$

Each P moment equation corresponds to P sample moment estimator ˆß which can be written as:

$$\breve{g}(\hat{\beta}) = \frac{1}{n}\sum_{i=1}^{n} g_i(\beta) = \frac{1}{n}\sum_{i=1}^{n} z_i'(y_i - x_i) = \frac{1}{n} z'\hat{u} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(4.4.17)}$$

The intuition behind GMM is to choose an estimator for ß that brings g(ˆß) as close to zero as possible. If P = K, then, the equation to be estimated is precisely identified. Thus, we have many equations as unknown for P conditional moments: The K coefficients of ˆß in this case can be solved using g(ˆß) = 0.

However, if the GMM estimator is considered as a special case of the IV estimator where P > K, then, there will be over identification of equations; hence, there are more equations than unknowns. In general, it seems impossible to find a $\hat{\beta}$ that will equate all P samples conditional moments to zero. In this case, a P × P weighting matrix W of conditional moment is considered to construct a quadratic system of equation that leads to the GMM objective function:

$$J(\hat{\beta}) = n\breve{g}(\hat{\beta})'W\breve{g}(\hat{\beta}) \quad \text{...(4.4.18)}$$

The minimization of $J(\hat{\beta})$ gives the GMM estimator $\hat{\beta}$ as:

$$\hat{\beta}_{GMM} \equiv \underset{\hat{\beta}}{\operatorname{argmin}}\, J(\hat{\beta}) = n\breve{g}(\hat{\beta})'W\breve{g}(\hat{\beta}) \quad \text{.................................(4.4.19)}$$

In the linear case, deriving and solving the K first order conditions $\frac{\partial J(\hat{\beta})}{\partial \hat{\beta}} = 0$ (based on the assumption that W is a constant matrix) yields the GMM estimator.

$$\hat{\beta}_{GMM} = (X'ZWZ'X)^{-1}X'ZWZ'Y \quad \text{..(4.4.20)}$$

The GMM estimator is said to be consistent only if the weighting matrix W is symmetric and positive definite. Thus, the number GMM estimators must correspond to the number of choices of weighting matrix (W). Therefore, for us to derive efficient GMM estimators with minimum asymptotic variance, as the estimator defined in Equation (4.4.20) is inefficient due to the arbitrary weighting matrix W, the estimated variance and variance covariance matrix of the conditional orthogonality of the estimator is a key requirement in GMM estimation.

According to Baum, Schaffer, and Stillman (2003), inference, efficiency and the covariance matrix of a conditional orthogonality, an asymptotic variance covariance matrix (S) of the conditional moment g:

$$S = AVar(\breve{g}(\beta)) = \lim_{n\to\infty} \left(\frac{1}{n}\right) E(Z'uu'Z) \quad \text{.. (4.4.21)}$$

Where:

S is an L×L matrix and $\breve{g}(\beta) = \frac{1}{n}Z'u$. That is, S is the variance of the limiting distribution of $\sqrt{n}\breve{g}$.

The distribution of the possible inefficient GMM estimator can be written asymptotically as:

$Q_{XZ} \equiv E(X'_i Z_i)$.

The inefficient GMM estimator defined by an arbitrary weighting matrix W has an asymptotic variance covariance matrix given by:

$V(\hat{ß}_{GMM}) = (Q'_{XZ}WQ_{XZ})^{-1}(Q'_{XZ}WSWQ_{XZ})(Q'_{XZ}WQ_{XZ})^{-1}$........................(4.4.22)

Baum et al. (2003) observe that the inefficient GMM estimator is "√n-consistent" under standard assumptions. That is,

$\sqrt{n}(\hat{ß}_{GMM} - ß) \to N[0, V(\hat{ß}_{GMM})]$.. (4.4.23)

Where, → denotes convergence in distribution.

In performing hypothesis tests on $\sqrt{n}\hat{ß}_{GMM}$, using equation (4.4.22) for the variance-covariance matrix, there is a need to transform the variance-covariance matrix (4.4.22) instead of the coefficient vector (4.4.20).

This can be done by normalizing $V(\hat{ß}_{GMM})$ by 1/n, such that, the resulting variance-covariance matrix is given by:

$V(\frac{1}{\sqrt{n}}\hat{ß}_{GMM}) = \frac{1}{n}(Q'_{XZ}WQ_{XZ})^{-1}(Q'_{XZ}WSWQ_{XZ})(Q'_{XZ}WQ_{XZ})^{-1}$ ....(4.4.24)

The efficient GMM estimator (EGMM) that minimizes the asymptotic variance-covariance matrix of the estimator makes use of an optimal weighting matrix W denoted by S^{-1}.

This is substituted in Equation (4.4.20) and Equation (4.4.24) to obtain the efficient GMM estimator given as:

$\hat{ß}_{EGMM} = (X'ZS^{-1}Z'X)^{-1}X'ZS^{-1}Z'Y$ .... (4.4.25)

with asymptotic variance covariance matrix

$V(\hat{ß}_{EGMM}) = (Q'_{XZ}S^{-1}Q_{XZ})^{-1}$ .... (4.4.26)

Similarly,

$\sqrt{n}(\hat{ß}_{EGMM} - ß) \to N[0, V(\hat{ß}_{EGMM})]$ .... (4.4.27)

However, an inference can be performed on $\sqrt{n}\,\hat{ß}_{EGMM}$ using

$V(\frac{1}{\sqrt{n}}\hat{ß}_{EGMM}) = \frac{1}{n}(Q'_{XZ}S^{-1}Q_{XZ})^{-1}$ ....(4.4.28)

as the variance-covariance matrix of the efficient estimator ($\hat{ß}_{EGMM}$).

To obtain an estimate of Q_{XZ}, we simply apply the sample method given below:

$\frac{1}{n}\sum_{i=1}^{n} X'iZi = \frac{1}{n}X'_iZ_i$ .... (4.4.29)

Therefore, an asymptotic correct inference for any GMM estimator either efficient or inefficient can be conducted by a known estimate of S. Furthermore the S estimate makes the efficient GMM estimator a feasible estimator. Using Equations (4.4.25) and (4.4.28) respectively, in the two-step feasible efficient GMM estimation, the S estimate is computed.

Following this, Arellano and Bond (1991) propose two estimators, one-step and two-step. They affirm that two-step estimator is optimal. Thus, in the context of this study, the two-step estimator of the Differenced-GMM and Blundell and Bond (1998) System-GMM are employed to estimate the coefficients of the SSA banks' dividend payout equation because they are found to be more efficient than the one-step estimator.

With the Hansen or Sargan test for the instrument validity check and Arellano and Bond test for auto correlation in the idiosyncratic disturbance term incorporated in the two-step GMM estimator, the serially correlated errors are catered for and we are sure of a reliable estimation in this study.

The model in GMM form;

$$\Delta DPOR_{it} = a_0 + \beta_1 \Delta DPOR_{i(t-1)} + \beta_2 \ln \Delta ATI_{it} + \beta_3 \Delta CAR_{it} - \beta_4 \Delta LEV_{it} + \beta_5 \Delta SIZ_{it} + \beta_6 \Delta GRO_{it} - \beta_7 \Delta TAX_{it} + U_{it} \text{..} (4.4.30)$$

4.5 Causality between Dividend Policy and Bank Performance in SSA

4.5.1 Model Specification

To establish the causality between dividend policy and bank performance, the percent payout and percent retention theories and the life cycle theory of dividend underpin this study. These theories posit the need to study the life span of the firm before adopting a dividend policy irrespective of the agency problem the firm intends to minimise. It has been affirmed that dividend payments can be a luxury due to the high taxation and other transaction costs they attract if the life span of the firm is not considered. Dividend payouts have been the norm in the banking sector, which could be the reason for its recurrent under-development. If well monitored, a firm can also retain and re-invest in new investment opportunities that would yield greater returns with little or no transaction costs.

Theories such as the bird-in-the-hand, the signalling hypothesis and the empirical findings of Agyei and Marfo-Yiadom (2011); Zakaria, Muhammad, and Zulkifli (2012) and Hamid et al. (2016) highlight the feedback relationship between dividend policy and performance.

Therefore;

$$Y = f(X) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.1)$$

That is,

Performance = f (Dividend policies)

As noted by Waseem et al. (2011) and Hamid et al. (2016), while the dividend policy in the banking sector is unstable, the two commonly adopted policies are the dividend payout policy (in the form of cash) and dividend re-investment plans (DRIP), otherwise known as the retention policy.

Hence,

Performance = f (dividend payout ratio, retention ratio)

In order to avoid omissions and germane variables that can lead to simultaneity bias, the capital adequacy ratio is included as a control variable. This ratio was considered because it is a regulatory one that is one of the apex banks' criteria in evaluating banks' requests to pay dividends (Al-Ajmi, 2010). Thus, in choosing a suitable and implementable dividend policy that will positively affect performance in the banking sector, the capital and conservation buffer ratio laid down in Basel must be taken into consideration.

Performance = f (dividend payout ratio, retention ratio, capital adequacy ratio)

Following L. Crane (2010), ROA and ROE are measures of performance but ROA is the measure of return on firms' assets that shows the overall index of profitability. ROE and ROA were used to measure financial performance so as to be able to proffer solutions to the perennial debate on which policy will result in optimal bank performance (Haniffa & Hudaib, 2006; Ibrahim & Samad, 2011; Klapper & Love, 2004).

Thus, the model for this study is;

$$Y_{it} = \beta i + \beta_1 X_{it}^{'} + R_{it} + u_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.2)$$

$X_{it}^{'}$ Stands for the vector of a bank's dividend policy captured by the Payout and Retention Ratio

R_{it} Captures the control variable; Capital Adequacy Ratio

$$ROA_{it} = f(DPOR_{it}, RERA_{it}, CAR_{it}) \ldots\ldots\ldots\ldots\ldots\ldots.(4.5.3)$$

$$ROA_{it} = \beta i + \beta_1 DPOR_{it} + \beta_2 RERA_{it} + \beta_3 CAR_{it} + u_{it} \ldots\ldots\ldots(4.5.4)$$

Using ROE

$$ROE_{it} = f(DPOR_{it}, RERA_{it}, CAR_{it}) \ldots\ldots\ldots\ldots\ldots\ldots.(4.5.5)$$

$$ROE_{it} = \beta i + \beta_1 DPOR_{it} + \beta_2 RERA_{it} + \beta_3 CAR_{it} + u_{it} \ldots\ldots\ldots\ldots\ldots(4.5.6)$$

All variables are in their natural form.

$\beta_1, \beta_2 and \beta_3$ are the estimated parameters of the respective explanatory variables which show the percentage change in financial performance caused by a percentage change in the explanatory variables;

β_0 is the intercept/constant term.

4.5.2. Estimating Technique

The Panel Granger Causality test is used to test the direction of causality between bank performance and dividend policy in line with Farsio et al. (2004); Goddard et al. (2006) and other studies that used panel Granger causality to investigate dividend policy (T. Chang, Lee, & Chang, 2014; Wolde-Rufael, 2014). The Granger causality test avers that if the past values of dependent variable (Y) significantly contribute to predict the value of an explanatory variable (X), then Y granger causes X, and vice versa, but if the past values of both variables contribute significantly to predict each other, this leads to bi-directional causality.

The rationale of Granger causality in this model is that changes in dividend policy granger cause changes in bank performance if the changes in dividend policy improve the unbiased least square forecast of changes in bank performance. The null hypothesis (H_0) is that dividend policy does not granger cause bank performance; and bank performance does not granger cause dividend policy. Specifically, Pairwise Granger Causality and the Granger causality test from the Panel-Vector Error Correction Block Exogeneity Wald test are used to establish both short and long run uni-directional, bi-directional causality or no-causal relationship between the pairs of variables.

Panel-VECM is preferable for this study due to the following reasons;

(i) Panel-VECM can be used to estimate the long run features of a cointegrated series. If there is no cointegration among the variables, the VECM Granger causality test can still be applicable to establish the relationship that subsists among the variables (Asari et al., 2011).

(ii) Panel-VECM adds error correction terms to a multi variable model and it is suitable if the variables are stationary at I (1) (Baum, 2001).

Following Narayan and Smyth (2008); Hossain (2012) and Odhiambo (2014), the Panel VECM- Based Granger causality model is written as;

Using ROA as financial performance measure:

$$\begin{bmatrix} \Delta ROA_{it} \\ \Delta DPOR_{it} \\ \Delta RERA_{it} \\ \Delta CAR_{it} \end{bmatrix} = \begin{bmatrix} \theta_0 \\ \beta_0 \\ \alpha_0 \\ \delta_0 \end{bmatrix} + \sum_{k=1}^{p} \begin{bmatrix} \theta_{1i} & \theta_{2i} & \theta_{3i} & \theta_{4i} \\ \beta_{1i} & \beta_{2i} & \beta_{3i} & \beta_{4i} \\ \alpha_{1i} & \alpha_{2i} & \alpha_{3i} & \alpha_{4i} \\ \delta_{1i} & \delta_{2i} & \delta_{3i} & \delta_{4i} \end{bmatrix} \begin{bmatrix} \Delta ROA_{i(t-k)} \\ \Delta DPOR_{i(t-k)} \\ \Delta RERA_{i(t-k)} \\ \Delta CAR_{i(t-k)} \end{bmatrix} + \begin{bmatrix} \theta_5 \\ \beta_5 \\ \alpha_5 \\ \delta_5 \end{bmatrix} ECT_{t-1} + \begin{bmatrix} u_{1it} \\ u_{2it} \\ u_{3it} \\ u_{4it} \end{bmatrix}$$

$$\Delta ROA_{it} = \theta_0 + \sum_{k=1}^{p} \theta_{1i} \Delta ROA_{i(t-k)} + \sum_{k=1}^{p} \theta_{2i} \Delta DPOR_{i(t-k)} + \sum_{k=1}^{p} \theta_{3i} \Delta RERA_{i(t-k)} +$$

$$\sum_{k=1}^{p} \theta_{4i} \Delta CAR_{i(t-k)} + \theta_5 ECT_{t-1} + u_{1it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.7)$$

$$\Delta DPOR_{it} = \beta_0 + \sum_{k=1}^{p} \beta_{1i} ROA_{(t-k)} + \sum_{k=1}^{p} \beta_{2i} \Delta DPOR_{i(t-k)} + \sum_{k=1}^{p} \beta_{3i} \Delta RERA_{i(t-k)} +$$

$$\sum_{k=1}^{p} \beta_{4i} \Delta CAR_{i(t-k)} + \beta_5 ECT_{t-1} + u_{2it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.8)$$

$$\Delta RERA_{it} = \alpha_0 + \sum_{k=1}^{p} \alpha_{1i} \Delta ROA_{i(t-k)} + \sum_{k=1}^{p} \alpha_{2i} \Delta DPOR_{i(t-k)} + \sum_{k=1}^{p} \alpha_{3i} \Delta RERA_{i(t-k)} +$$

$$\sum_{k=1}^{p} \alpha_{4i} \Delta CAR_{i(t-k)} + \alpha_5 ECT_{t-1} + u_{3it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.9)$$

$$\Delta CAR_{it} = \delta_0 + \sum_{k=1}^{p} \delta_{1i} \Delta ROA_{i(t-k)} + \sum_{k=1}^{p} \delta_{2i} \Delta DPOR_{i(t-k)} + \sum_{k=1}^{p} \delta_{3i} \Delta RERA_{i(t-k)} +$$

$$\sum_{k=1}^{p} \delta_{4i} \Delta CAR_{i(t-k)} + \delta_5 ECT_{t-1} + u_{4it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.10)$$

Using ROE as a measure of financial Performance:

$$\begin{bmatrix} \Delta ROE_{it} \\ \Delta DPOR_{it} \\ \Delta RERA_{it} \\ \Delta CAR_{it} \end{bmatrix} = \begin{bmatrix} \theta_0 \\ \beta_0 \\ \alpha_0 \\ \delta_0 \end{bmatrix} + \sum_{k=1}^{p} \begin{bmatrix} \theta_{1i} & \theta_{2i} & \theta_{3i} & \theta_{4i} \\ \beta_{1i} & \beta_{2i} & \beta_{3i} & \beta_{4i} \\ \alpha_{1i} & \alpha_{2i} & \alpha_{3i} & \alpha_{4i} \\ \delta_{1i} & \delta_{2i} & \delta_{3i} & \delta_{4i} \end{bmatrix} \begin{bmatrix} \Delta ROE_{i(t-k)} \\ \Delta DPOR_{i(t-k)} \\ \Delta RERA_{i(t-k)} \\ \Delta CAR_{i(t-k)} \end{bmatrix} + \begin{bmatrix} \theta_5 \\ \beta_5 \\ \alpha_5 \\ \delta_5 \end{bmatrix} ECT_{t-1} + \begin{bmatrix} u_{1it} \\ u_{2it} \\ u_{3it} \\ u_{4it} \end{bmatrix}$$

$$\Delta ROE_{it} = \theta_0 + \sum_{k=1}^{p} \theta_{1i} \Delta ROE_{i(t-k)} + \sum_{k=1}^{p} \theta_{2i} \Delta DPOR_{i(t-k)} + \sum_{k=1}^{p} \theta_{3i} \Delta RERA_{i(t-k)} +$$

$$\sum_{k=1}^{p} \theta_{4i} \Delta CAR_{i(t-k)} + \theta_5 ECT_{t-1} + u_{1it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.11)$$

$$\Delta DPOR_{it} = \beta_0 + \sum_{k=1}^{p} \beta_{1i} ROE_{(t-k)} + \sum_{k=1}^{p} \beta_{2i} \Delta DPOR_{i(t-k)} + \sum_{k=1}^{p} \beta_{3i} \Delta RERA_{i(t-k)} +$$

$$\sum_{k=1}^{p} \beta_{4i} \Delta CAR_{i(t-k)} + \beta_5 ECT_{t-1} + u_{2it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.12)$$

$$\Delta RERA_{it} = \alpha_0 + \sum_{k=1}^{p} \alpha_{1i} \Delta ROE_{i(t-k)} + \sum_{k=1}^{p} \alpha_{2i} \Delta DPOR_{i(t-k)} + \sum_{k=1}^{p} \alpha_{3i} \Delta RERA_{i(t-k)} +$$

$$\sum_{k=1}^{p} \alpha_{4i} \Delta CAR_{i(t-k)} + \alpha_5 ECT_{t-1} + u_{3it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.13)$$

$$\Delta CAR_{it} = \delta_0 + \sum_{k=1}^{p} \delta_{1i} \Delta ROE_{i(t-k)} + \sum_{k=1}^{p} \delta_{2i} \Delta DPOR_{i(t-k)} + \sum_{k=1}^{p} \delta_{3i} \Delta RERA_{i(t-k)} +$$

$$\sum_{k=1}^{p} \delta_{4i} \Delta CAR_{i(t-k)} + \delta_5 ECT_{t-1} + u_{4it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.14)$$

$\theta_0, \beta_0, \alpha_0, \delta_0$ are respective constants.

$\theta_1 - \theta_5, \beta_1 - \beta_5, \alpha_1 - \alpha_5, \delta_1 - \delta_5$ are respective estimated coefficients.

Δ denotes the first difference operator.

ECT_{t-1} represents the one-year lagged Error Correction Term. It is the co-integrating vector that acts as the speed of adjustment for the long run association between the variables.

$u_{1it} - u_{4it}$ are mutually uncorrelated stochastic (white noise) error terms with a finite covariance matrix and zero mean value.

t is the time period that ranges from $1,2,.......10$, i is the cross-section (banks) that ranges from $1,2,........250$ and lastly, k is the number of lags while p is the optimal lag length selected by using the Sequential modified LR test statistic, Final Prediction Error, Akaike Information Criterion (AIC), Schwarz Bayesian criterion (SBC) and Hannan-Quinn information criterion. To conduct a multivariate causality test, CAR_{it} which is the measure of Capital Adequacy Ratio was included to avoid omission of germane variables that can cause simultaneity bias and thereby lead to a bogus relationship between the variables (Gujarati & Porter, 2003). For any commercial bank to adopt a policy it must be adequately capitalised to justify continuity of banking activities and hence, persistent future growth, since banks address risk by maintaining a high degree of capitalisation.

A priori Expectation

$\beta_1 - \beta_3 > 0$ (Agyei & Marfo-Yiadom, 2011; Hamid et al., 2016). Therefore, it is expected that there should be causal relationship (uni-directional or bi-directional) between either of the dividend policies and banks' financial performance (ROA and ROE).

To run the Panel VECM, panel unit root and panel cointegration tests are required as preliminary analysis to establish the behaviour of our data and establish a long run relationship between our variables.

Panel Unit Root Test

Secondary data is used in this study; however, before analysing this data, a stationary test must be conducted to detect the order of integration in case there is a co-integrating relationship between the variables, in order to avoid a spurious analysis. Empirical findings have affirmed that none of the various unit root tests is free from power properties and size shortcomings; hence, to ensure authentic evidence on the order of integration, several unit root tests such as Levin, Lin, and Chu (2002); Choi (2001) ADF Chi Square; and Maddala and Wu (1999) Fisher type and panel unit root tests were conducted.

Generally, the structure of Panel Unit Root testing is as follows:

$$\Delta m_{it} = \rho_i m_{i(t-1)} + \sum_{j=1}^{p_j} \phi_i \Delta m_{i(t-j)} + \alpha_i n_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(4.5.15)$$

Where, $n_{it} =$ deterministic components.

While the null hypothesis ($\rho_i = 0$) signifies that m process has a unit root for each cross-section i, the alternative hypothesis $\rho_i < 0$ means the process is stationary around the deterministic fraction.

The LLC test assumes a common parameter across cross-sections such that $p_i = p$ for all cross-sections i while the Choi test and Maddala and Wu tests assume cross-sectional dependence across the cross-sections.

The general regression equation of the LLC test is;

$$\Delta m_{it} = \lambda_i m_{i(t-1)} + \sum_{j=1}^{p_i} \phi_{ij} \Delta m_{i(t-j)} + \varphi n_{it}^{'} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(4.5.16)$$

Where $\Delta m_{it} = m_{it} - m_{i(t-1)}$ and the assumption of the test is that; $\lambda = p-1$, that is $p_i = p$ across the cross-sections but give room for variation in the order of lags p_i.

The null and the alternate hypothesis of this test is given as: $H_0 : \lambda = 0$; $H_1 : \lambda \neq 0 but < 0$.

To perform the LLC test statistic; regress Δm_{it} and $m_{i(t-1)}$ on the selected lag structure $\Delta m_{i(t-j)}$ where $j = 1,2,3,4,\ldots\ldots\ldots\ldots\ldots.p_i$ and the independent variable n_{it}.

Explicitly, $\Delta m_{it} = \sum_{j=1}^{p_i} \theta_{ij} \Delta m_{i(t-j)} + \psi n_{it}^{'} + v_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.(4.5.17)$

$$m_{i(t-1)} = \sum_{j=1}^{p_i} \xi_{ij} \Delta m_{i(t-j)} + \beta n_{it}^{'} + u_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.18)$$

The estimated equations of the test statistic are:

$$\Delta \hat{m}_{it} = \sum_{j=1}^{p_i} \hat{\theta}_{ij} \Delta m_{i(t-j)} + \hat{\psi} n_{it}^{'} + v_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots... (4.5.19)$$

$$\hat{m}_{i(t-1)} = \sum_{j=1}^{p_i} \hat{\xi}_{ij} \Delta m_{i(t-j)} + \hat{\beta} n_{it}^{'} + u_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.5.20)$$

Then, LLC define $\Delta\overline{m}_{it}$ by removing deterministic components and auto correlation from Δm_{it};

that is $\Delta\overline{m}_{it} = \Delta m_{it} - \sum_{j=1}^{p_i}\hat{\theta}_{ij}\Delta m_{i(t-j)} - \hat{\psi}n_{it}^{'}$ ………………………………… (4.5.21)

Also, $\overline{m}_{i(t-1)} = m_{i(t-1)} - \sum_{j=1}^{p_i}\hat{\xi}_{ij}\Delta m_{i(t-j)} - \hat{\beta}n_{it}^{'}$, where $\Delta\widehat{m}_{it} = \frac{\Delta\overline{m}_{it}}{z_i}$ and $\widehat{m}_{i(t-1)} = \frac{m_{i(t-1)}}{z_i}$.

Here, z_i is the estimated standard error.

Conclusively, λ is estimated using a pooled proxy equation:

$\Delta\widehat{m}_{it} = \lambda\widehat{m}_{i(t-1)} + \eta_{it}$ ……………………………………………………….(4.5.22)

For the LLC unit root test, the modified t-statistic for the $\widehat{\lambda}$ is asymptotically normally distributed such that; $t_{\lambda}^{*} = \frac{t_{\lambda} - (a\widehat{T})S_a\hat{\sigma}^{-2}se(\hat{\lambda})\mu_{b\widehat{T}}^{*}}{\sigma_{b\widehat{T}}^{*}} \approx A(0,1)$

Explicitly, t_{λ} is the standard t-statistic for the null hypothesis ($H_0 : \lambda = 0$)

$\hat{\sigma}^{-2}$ is the error term η estimated variance; $se(\hat{\lambda})$ is the standard error of $\hat{\lambda}$.

s_a is the mean of the ratio derived using the Kernel technique to estimate standard deviations in the long run. $\widehat{T} = T - \frac{\sum_{i=1} p_i}{a} - 1$ where, $u_{b\widehat{T}}^{*}$ and $\sigma_{b\widehat{T}}^{*}$ are the adjusted factors for the mean and standard deviation, respectively.

The fisher-type test proposed by Maddala and Wu (1999) is based on the assumption that the p-values of all the cross-sections are combined. It is a non-parametric test with chi-square distribution of 2a degree of freedom. In this case, a represents the number of banks in the panel.

Hence the test statistic is: $\varpi = 2\sum_{i=1}^{a}\log_e(p_i) \approx \chi_{2a(d\ f)}^{2}$ ………………………….(4.5.23)

p_i stands for the ADF-unit root p-value of each cross-section (i). The Maddala and Wu test has the merit of not utilising different lags length in the several ADF regressions.

Lastly, Choi (2006) test statistic is as follows;

$$Q = \frac{1}{\sqrt{a}} \sum_{i=1}^{a} \varphi^{-1}(p_i) \approx A(0,1) \quad \text{...(4.5.24)}$$

From this statistic, φ^{-1} stands for the inverse of the standard normal cumulative function of the model.

For this study, all the unit roots at both constant and individual intercepts are considered to truly affirm the stationary level of our data.

Panel Cointegration Test

According to Uddin, Shahbaz, Arouri, and Teulon (2014), the cointegration test is conducted to test for significant deviation of the integrated variables from a certain relationship. Cointegration means the presence of a long-run association between economic variables, such that, the co-integrated variables allow for the correction of short-term disturbances in the long-term. From the evidence of unit root test that the variables are integrated at the same order I (1), there is a need to test for the existence of a long run association between the variables.

In this study, Pedroni (2004), Kao (1999) ADF residual based and Johansen Fisher panel cointegration tests were considered. Pedroni (2004) proposed seven cointegration tests that are asymptotically distributed under two dimensions. The first four groups of tests are termed "within dimension" test statistics with a null hypothesis of no cointegration $(H_0 : \varpi_i = 1)$ for all cross-sections (i) against the alternative hypothesis $(H_1 = \varpi_i = \varpi < 1)$ for all cross-sections (i). The "within dimension" test comprises the panel parametric (ADF); panel non-parametric (PP); panel rho(r) and panel-v statistics. According to Hsaio (1986), the panel-v statistic is a one-sided test that rejects the null hypothesis of no cointegration with a large positive value whereas other test statistics rejects the null hypothesis of no cointegration with large negative values.

The second three (3) groups of tests fall into the "between dimension" category with null and alternate hypotheses $(H_0 : \varpi_i = 1, H_1 : \varpi_i < 1)$ for all cross section (i). These tests are also termed the group mean panel cointegration test statistics (group ADF-statistic; group PP-statistic and group rho-statistic). All seven tests are considered in this study.

The Pedroni's panel cointegration tests are based on the estimated residuals following the long run model below:

$$m_{it} = \phi_i + \sum_{j=1}^{p} \delta_{ij} n_{jit} + \varepsilon_{it} \text{ ………………………………………………………}(4.5.25)$$

$i = 1,2..........K$ for each bank in the panel; $t = 1,2,3.......L$ represents the time period of the study; ϕ_i is a coefficient that allows for bank specific fixed effect; ε_{it} represents the estimated residual that shows deviation from the long run association between the variables where

$$\varepsilon_{it} = \varpi_i \varepsilon_{i(t-1)} + v_{it} \text{ ……………………………………………………}(4.5.26)$$

Similarly, the Kao (1999) ADF type test is used to complement the Pedroni test of cointegration so as to be consistent in our findings.

The Kao cointegration test is computed using the following regression equation;

$m_{it} = \phi_i + \delta n_{it}^{'} + u_{it}$ With estimated residual e_{it},

where $e_{it} = \varpi e_{i(t-1)} + \sum_{j=1}^{p} \zeta_{ij} \Delta e_{i(t-j)} + v_{it}$ ……………………………………(4.5.27)

i is the cross-section and it ranges from $1,2....., k$;

t is the time-period which ranges from $1,2..............L$;

δ is the vector of the slope parameters;

u_{it} is the disturbance white noise error term;

ϕ_i is the constant term; n_{it} is the integrated process of order one (1) for all the cross-sections i that is, $n_{it} \approx I(1) \forall i, \Rightarrow n_{it} = n_{i(t-1)} + \varepsilon_{it}$, $\{m_{it}, n_{it}\}$ are independent across all cross-sections (banks); $\varphi_{it} = (u_{it}, \varepsilon_{it}^{'})^{'}$ is a linear process.

The long-run covariance matrix of $\{\varphi_{it}\}$ is denoted by Ψ leading to the following matrix;

$$\Psi = \sum_{j=\ell}^{\ell} E(\varphi_{ij}, \varphi_{i0}^{'}) = \begin{pmatrix} \psi_u & \psi_{u\sigma} \\ \psi_{\sigma u} & \psi_{\sigma} \end{pmatrix} \text{ and } \sum = E(\varphi_{i0} \varphi_{i0}^{'}) = \begin{pmatrix} \Sigma_u & \Sigma_{u\sigma} \\ \Sigma_{\sigma u} & \Sigma_{\sigma} \end{pmatrix}$$

A Kao test of the null and alternative hypothesis of no cointegration is given as;

$H_0 : \varpi = 1; H_1 : \varpi < 1$

Following the null hypothesis of no cointegration between the variables, the Kao ADF test statistic is written as;

$$ADF = \frac{\dfrac{t_{\hat{\varpi}} + \sqrt{6a\hat{\partial}_v / 2\hat{\partial}_{0v}}}{2\hat{\partial}_{0v}} \approx A(0,1)}{\sqrt{\hat{\partial}_{0v}^2 \big/ 2\hat{\partial}_v^2 + \left(3\hat{\partial}_v^2 / 10\hat{\partial}_{0v}^2\right)}} \text{...(4.5.28)}$$

Where, $\hat{\partial}_v^2 = \hat{\Sigma}_u - \hat{\Sigma}_{u\sigma} - \hat{\Sigma}_\sigma^{-1}$ and $\hat{\partial}_{0v}^2 = \hat{\psi}_u - \hat{\psi}_{u\sigma} - \hat{\psi}_\sigma^{-1}$.

Lastly, the Johansen Fisher panel cointegration test is divided into two statistics, Maximum Eigen value and trace statistics which is based on the aggregates of the Probability values. Assuming ϖ_i is the probability value from the cointegration test for each cross-section i, under the null hypothesis $H_0 : \varpi_i = 1$, the t-statistics is given as: $-2\sum_{i=1}^{p} \log(\varpi_i) \approx \chi_{2a}^2$

In this cointegration test, two test statistics are commonly used, the Trace test and Maximum Eigen value test.

The test statistic (ϖ trace) which tests the null hypothesis, $H_0 : v \leq u$ and alternative hypothesis $H_1 : u = v$.

This is explicitly calculated as:

$$\varpi_{trace}(v) = -T\sum_{i+1}^{p} \ln(1 - \hat{\varpi}_i) \text{ .... (4.5.29)}$$

where $\varpi v + i ....\varpi n$ is the least value of Eigen vectors $(p - v)$.

The maximal Eigen value test $(\varpi_{\max})$ with $H_0 : v$ co-integrating vectors against $H_1 : v + 1$ co-integrating vector is given as;

$$\varpi_{\max}(v, v+1) = -T \ln(1 - \hat{\varpi} v + 1) \text{. .... (4.5.30)}$$

In the Johansen Panel cointegration test, much emphasis is placed on the number of lags. Hence, optimal lag two (2) was used for all the estimations in this study including this test based on the Schwarz Information Criterion (SIC).

4.6 The Effect of Operational Diversification on Financial Performance among SSA Banks

4.6.1 Model Specification

This objective is based on the Manson's Structure Conduct and Performance (SCP) Paradigm following its recommendation by Mishra and Sahoo (2012) and Nabieu (2013) as the best hypothesis to test the relationship between the structure, conduct and performance of the banking sector. The SCP hypothesis shows the relationship that subsists between market structure, firm conduct and firm performance. The model avers that barriers to entry, concentration or the diversification of their activities are the chief determinants of a bank's performance. In the banking context, the term 'structure' in the SCP framework means the concentration or diversification of activities; and the number of banks in the industry; hence, the market structure of banks is affected by internal variables such as diversification, concentration, regulatory controls and other external factors such as economic conditions (Nabieu, 2013).

The term 'Conduct' in the framework denotes how banks behave in the market which includes their response to occasional withdrawals, price fluctuations, marketing strategies and the innate behaviours of the banking business. Finally, 'Performance' refers to the level of returns generated from banks' products and services rendered (Nabieu, 2013). The SCP hypothesis affirms that firms' market structure affects their conduct and performance. Diversification affects their returns because of its potential to minimise risks by spreading their activities (Turkmen & Yigit, 2012).

Why the SCP Model?

The SCP paradigm affirms that the conduct of the firm which is invariably affected by the market structure is a core determinant of performance. This widely-used model is suitable for the banking sector and is chosen for this study because of its advantages over other hypotheses, including:

(i) The SCP model clearly reveals how banks are operating; it shows and clarifies the diverse forces affecting bank operations and make it clear whether they should expand or restrict the scope of their operations in the industry at large (Nabieu, 2013).

(ii) The SCP framework assists in the interpretation of different sources of productivity (Delorme Jr, Kamerschen, Klein, & Voeks, 2002)

(iii) In the absence of any concrete theory, the SCP hypothesis is a rational and widely accepted basis for banking behavioural analysis (Nabieu, 2013).

Following the mathematical equation framework of the SCP hypothesis as used by Delorme Jr et al. (2002); Mishra and Sahoo (2012) and Nabieu (2013), this study adopts the performance equation generated from the hypothesis;

$$S = f(C, P, W)\text{.................................}(4.6.1)$$
$$C = f(S, P, W)\text{.................................}(4.6.2)$$
$$P = f(S, C, W)\text{.................................}(4.6.3)$$

Equation 4.6.3 is the performance model; where, S stands for the Market Structure of the bank; C stands for the conduct of the bank; P is the performance variable and W stands for the vector of control variables that can affect the dependent variable.

Therefore, explicitly writing the model in panel data econometric form;

$$P_{it} = a_0 + \sum_{i=1}^{n} S_{it} + \sum_{i=1}^{n} C_{it} + \sum_{i=1}^{n} W_{it} + \varepsilon_{it}\text{...........................}(4.6.4)$$

Explicitly to reflect the diversification and other selected variables,

$$ROAA_{it} = f(DIV, SIZ, LOD, LLR, CIR)\text{.........}(4.6.5)$$

According to A. N. Berger et al. (2010) and I. M. Mulwa et al. (2015), banking operations can be diversified into four major dimensions, namely, income, loans, deposits and assets.

Hence,

$$ROAA_{it} = f(DIVas_{it}, DIVde_{it}, DIVlo_{it}, DIVin_{it}, SIZ_{it}, LOD_{it}, LLR_{it}, CIR_{it})\text{.........}(4.6.6)$$

$$ROAA_{it} = a_0 + \beta_1 DIVas_{it} + \beta_2 DIVde_{it} + \beta_3 DIVlo_{it} + \beta_4 DIVin_{it} + \beta_5 SIZ_{it} + \beta_6 LOD_{it} + \beta_7 LLR_{it} - \beta_8 CIR_{it} + \varepsilon_{it}\text{..}(4.6.7)$$

Equation (4.6.7) is the operational diversification model of commercial banks in SSA.

Different indices have been used to measure the degree of diversification. However, numerous studies have used HHI across countries in the SSA region, emerging markets and other developed countries. These include Ugwuanyi and Ugwu (2012) in Nigeria; Amediku (2012) in Ghana; Simpasa and Pla (2016a) in Zambia; Kiweu (2014) in Kenya; Amidu and Wolfe (2013) in emerging markets; Mishra and Sahoo (2012) in India; Vieira and Girão (2016) in Brazil; Behr et al. (2007) in Germany; and Kurincheedaran (2015) in Sri Lanka. All these studies concluded that HHI is a commonly accepted index to measure corporate diversification and is the most suitable to measure it in the financial sector. Thus, in this study, the HHI index is used to measure the degree of operational diversification.

The operational diversification model of SSA commercial banks is:

$$ROAA_{it} = a_0 + \beta_1 HHIas_{it} + \beta_2 HHIde_{it} + \beta_3 HHIlo_{it} + \beta_4 HHIin_{it} + \beta_5 SIZ_{it} + \beta_6 LOD_{it} + \beta_7 LLR_{it} - \beta_8 CIR_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.6.8)$$

In the dynamic form for System-GMM, the operational diversification model takes the form;

$$ROAA_{it} = a_0 + \beta_1 ROAA_{i(t-1)} + \beta_2 HHIas_{it} + \beta_3 HHIde_{it} + \beta_4 HHIlo_{it} + \beta_5 HHIin_{it} + \beta_6 SIZ_{it} + \beta_7 LOD_{it} + \beta_8 LLR_{it} - \beta_9 CIR_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots (4.6.9)$$

Taking the clue from the static model, $ROAA_{it}$ is the financial performance measure, a_0 is the constant term, $\beta_2 - \beta_5$ are the estimated coefficients of operational diversification, $\beta_6 - \beta_7$ is the estimated coefficient of the variables that proxy banks' conduct, $\beta_8 - \beta_9$ is the estimated coefficient of the control variables, ε_{it} is the stochastic error term.

A priori Expectation:

Following the SCP paradigm postulations, Resource Based Value (RBV) theory and the empirical findings of the existing literature, $\beta_1 - \beta_8 > 0 and \beta_9 < 0$.

4.6.2. Estimating Techniques

The model specified above is estimated using panel data estimation techniques (Static and Dynamic). The use of panel data helps to increase the sample size, significantly increases the degrees of freedom, and reduces the presence of collinearity between the regressors and hence improves the efficiency of output derived from econometric estimates (Hsiao, 2005, 2014).

This is of great impact in achieving a clearer understanding of the effect of operational diversification on the financial performance of SSA commercial banks.

For the static analysis, the pooled regression model; fixed effects model (FEM) and random effects model (REM) was estimated. The pooled ordinary least square regression assumes that all coefficients and intercepts are the same across all banks. In FEM, the intercept varies across banks, to incorporate unobservable effects, while in REM; it is assumed that the intercept is randomly correlated with the error term. Therefore, in REM, a bank's intercept is viewed as a deviation from a known sample mean. Hence, the Hausman statistical test is conducted to choose the most appropriate model on which recommendations are based under the static regression analysis. The Hausman test is used to select the best estimation from FEM and REM and it is based on the null hypothesis that there is no significant difference between FE estimates and RE estimates using an asymptotic chi- square ($\chi 2$) distribution test-statistic. If the null hypothesis is rejected and the alternate hypothesis is accepted that there is a significant difference between the two estimations, REM is selected as a better estimation than FEM.

Thereafter, the chosen result of static regression after the conduct of the Hausman test is compared with dynamic panel estimation (SYS-GMM) for re-assurance of the best estimation on which we base the findings on operational diversification in SSA banks.

The general framework of the panel regression model is;

$$Y_{it} = a_i + \beta X_{it}^{'} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.6.10)$$

Where, Y_{it} is the dependent variable; $X_{it}^{'}$ is the vector of the regressors; a_i is the constant term and it proxies the unobserved cross-sectional (bank-specific) variable that is assumed to be constant over time; i is the number of cross-sections that range from $1\ldots\ldots\ldots\ldots\ldots N$; t is the time period that ranges from $1\ldots\ldots\ldots\ldots\ldots\ldots T$;

ε_{it} is the stochastic error term that shows the proportion of dependent variable Y_{it} not explained by the explanatory variables X_{it}.

Pooled Regression Model;

$$Y_{it} = a + \beta X_{it}^{'} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.6.11)$$

Here, it is assumed that there is an absence of unobserved individual heterogeneity, meaning that, $\Sigma(X_t, \varepsilon_t) = 0$ for all the time-period t.

Fixed Effect Model;

$$Y_{it} = a_i + \beta X'_{it} + \varepsilon_{it} \quad \text{..}(4.6.12)$$

Here, a_i is treated as a variable that is partially correlated with the observed independent variables and with this, it solves the omitted variable bias that has been one of the problems with the fixed effect model.

Random Effect Model;

This $Y_{it} = a_i + \beta X'_{it} + u_{it}$ ....(4.6.13)

Here, u_{it} is a random error term, that is $u_{it} = a_i + \varepsilon_{it} \approx I.I.D.N(0, \sigma_u^2)$. REM treats a_i as independently distributed of the regressors and assumes that it is random across each cross-section (banks). Moreover, REM takes into consideration the nature of the error term and variations across cross-section i and over time-period t.

Post Estimation Test Statistics:

To detect the heterogeneity effect in the intercept across all the cross-sections (banks), the restricted F-test was conducted to determine if the analysis should proceed from the pooled OLS.

The Restricted F-test statistic takes the form;

$$F_{obs} = \frac{\left(R^2_{UR(FEM)} - R^2_{R(POOLED)}\right) / (N-1)}{\left(1 - R^2_{UR(FEM)}\right) / (NT - N - K)} \cong F_{N, N(T-1)-K} \quad \text{.............................} (4.6.14)$$

The Hausman test was used to choose between the random and the fixed effect estimation. This test has asymptotic chi square distribution that requires comparison between the fixed effect estimator and the random effect estimator.

The FE estimator (Within-estimator) using its demeaned form is written as;

$$\hat{\beta}_{FE} = \left(\Sigma_i \Sigma_t \left(X_{it} - \overline{X}_t\right)\left(X_{it} - \overline{X}_t\right)'\right)^{-1} \left(\Sigma_i \Sigma_t \left(X_{it} - \overline{X}_t\right)\left(Y_{it} - \overline{Y}_t\right)\right) \quad \text{.............................} (4.6.15)$$

Where the vector of the regressors' coefficient is β ; Y is the dependent variable and X is the vector of the regressors.

The RE estimator (Between-Estimator) is written as;

$$\hat{\beta}_{RE} = \left(\Sigma_{it}\left(X_{it} - \hat{\eta}\overline{X}_t\right)\left(X_{it} - \hat{\eta}\overline{X}_t\right)'\right)^{-1}\left(\Sigma_{it}\left(X_{it} - \hat{\eta}\overline{X}_t\right)\left(Y_{it} - \hat{\eta}\overline{Y}_t\right)'\right) \text{.............................} \quad (4.6.16)$$

$$\hat{\eta} = 1 - \sqrt{1 \Big/ \left[1 + n\left(\hat{\sigma}_u^2 \Big/ \hat{\sigma}_e^2\right)\right]} \text{.............................} \quad (4.6.17)$$

Here, n is the number of cross sections; $\hat{\beta}_{FE} = \hat{\beta}_{RE}$ when $\hat{\eta} = 1$.

But most often, $\hat{\eta} \neq 1$; and this requires the Hausman test to compare the weighted squares of both estimators.

To derive the Hausman test statistics;

$$\hat{\beta}_{RE} = \frac{\Sigma XY}{\Sigma X^2} = \beta + \frac{\Sigma uX}{\Sigma X^2} \text{....................................} \quad (4.6.18)$$

$$Var\left(\hat{\beta}_{RE}\right) = \sigma^2 \frac{\Sigma X^2}{\left(\Sigma X^2\right)^2} = \frac{\sigma^2}{\Sigma X^2} \text{....................................} \quad (4.6.19)$$

Normally when $\hat{\beta}_{RE}$ is not biased, $\frac{\Sigma uX}{\Sigma X^2} = 0$.

$$\hat{\beta}_{FE} = \frac{\Sigma RY}{\Sigma R^2} = \beta + \frac{\Sigma uR}{\Sigma XR} \text{....................................} \quad (4.6.20)$$

$$Var\left(\hat{\beta}_{FE}\right) = \sigma^2 \frac{\Sigma R^2}{\left(\Sigma XR^2\right)^2} \text{....................................} \quad (4.6.21)$$

$$\hat{p} = \hat{\beta}_{FE} - \hat{\beta}_{RE},$$

therefore, $$Var\left(\hat{\beta}_{FE}\right) - Var\left(\hat{\beta}_{RE}\right) = \sigma^2 \frac{\Sigma R^2}{(\Sigma XR)} - \frac{\sigma^2}{\Sigma X^2} = \frac{V^2}{\Sigma X^2}\left[\frac{\Sigma R^2 \Sigma X^2}{(\Sigma XR)^2} - 1\right] \text{.................} \quad (4.6.22)$$

If the correlation coefficient is W_{XR} ; then $W_{XR} = \sqrt{\frac{(\Sigma XR)^2}{\Sigma R^2 \Sigma X^2}}$;

$$Var\left(\hat{\beta}_{RE}\right)-Var\left(\hat{\beta}_{FE}\right)=\frac{V^2}{\Sigma X^2}\left(\frac{1}{W_{XR}^2}-1\right) \ldots\ldots (4.6.23)$$

Then the Hausman test statistic: $G=\frac{\left(\hat{\beta}_{FE}-\hat{\beta}_{RE}\right)^2}{Var\left(\hat{\beta}_{RE}\right)-Var\left(\hat{\beta}_{FE}\right)}$ .... (4.6.24)

To write this in a matrix form;

$$\chi_2=\left(\hat{\beta}_{FE}-\hat{\beta}_{RE}\right)'\left[Var(\beta_{FE})^{-1}\left(Var(\beta_{RE})^{-1}\right)\right]\left(\hat{\beta}_{FE}-\hat{\beta}_{RE}\right) \ldots\ldots (4.6.25)$$

4.7 Dividend policy, Agency costs, Market risk and the Performance of SSA Banks

4.7.1 Model Specification

The portfolio theory is used to evaluate the relationship between these variables. It posits that investors are risk averse and prefer managers to construct their portfolio to maximise returns with provision made for a given level of market risk such that risk is treated as an integral component of returns. Banks' profitability is affected by management policies (investment, financing and dividend), location, size and risk, either market or unsystematic risk (Haslem, 1968).

Hence,

Profitability=f (dividend policy, agency cost and market risk) .... (4.7.1)

The following studies were followed to choose proxies for the variables: Agency cost - Ang et al. (2000); Singh and Davidson III (2003); S. Gul et al. (2012); Nazir et al. (2012); Dividend policy - Ling et al. (2007a); Ouma (2012) and Hamid et al. (2016) and Market risk - Feldman and Schmidt (2000); Kasman and Carvallo (2013) and Ekinci (2016).

Performance = f (Dividend payout ratio, Asset utilisation ratio, Lending Interest rate and Exchange rate)

$$ROA = f(DPOR_{it}, AUR_{it}, LIR_{it}, \ln FEXR_{it}) \ldots\ldots (4.7.2)$$

$$ROA_{it}=\beta_0+\beta_1 DPOR_{it}+\beta_2 AUR_{it}-\beta_3 LIR_{it}+\beta_4 \ln FEXR_{it}+\varepsilon_{it} \ldots\ldots (4.7.3)$$

Only exchange rate is in natural logarithm form while the others are in their natural or ratio form.

$$\begin{bmatrix} \Delta ROA_{it} \\ \Delta DPOR_{it} \\ \Delta AUR_{it} \\ \Delta LIR_{it} \\ \Delta \ln FEXR_{it} \end{bmatrix} = \begin{bmatrix} \theta_0 \\ \beta_0 \\ \alpha_0 \\ \delta_0 \\ \psi_0 \end{bmatrix} + \sum_{k=1}^{p} \begin{bmatrix} \theta_{1i} & \theta_{2i} & \theta_{3i} & \theta_{4i} & \theta_{5i} \\ \beta_{1i} & \beta_{2i} & \beta_{3i} & \beta_{4i} & \beta_{5i} \\ \alpha_{1i} & \alpha_{2i} & \alpha_{3i} & \alpha_{4i} & \alpha_{5i} \\ \delta_{1i} & \delta_{2i} & \delta_{3i} & \delta_{4i} & \delta_{5i} \\ \psi_{1i} & \psi_{2i} & \psi_{3i} & \psi_{4i} & \psi_{5i} \end{bmatrix} \begin{bmatrix} \Delta ROA_{i(t-k)} \\ \Delta DPOR_{i(t-k)} \\ \Delta AUR_{i(t-k)} \\ \Delta LIR_{i(t-k)} \\ \Delta \ln FEXR_{i(t-k)} \end{bmatrix} + \begin{bmatrix} \theta_6 \\ \beta_6 \\ \alpha_6 \\ \delta_6 \\ \psi_6 \end{bmatrix} ECT_{t-1} + \begin{bmatrix} \varepsilon_{1it} \\ \varepsilon_{2it} \\ \varepsilon_{3it} \\ \varepsilon_{4it} \\ \varepsilon_{5it} \end{bmatrix}$$

$\theta_0, \beta_0, \alpha_0, \delta_0, \psi_0$ are respective constants.

$\theta_1 - \theta_6, \beta_1 - \beta_6, \alpha_1 - \alpha_6, \delta_1 - \delta_6, \psi_1 - \psi_6$ are respective estimated coefficients.

Δ denotes the first difference operator.

ECT_{t-1} represents the one-year lagged Error Correction Term. It is the co-integrating vector that acts as the speed of adjustment for the long run association between the variables.

$\varepsilon_{1it} - \varepsilon_{5it}$ are mutually uncorrelated stochastic (white noise) error terms with finite covariance matrix and zero mean value.

t is the time-period (years) that ranges from $1,2,.......10$, i is the cross-section (banks) that ranges from $1,2,........250$ and lastly, k is the number of lags while p is the optimal lag length selected by using the Sequential modified LR test statistic, Final Prediction Error, Akaike Information Criterion (AIC), Schwarz Bayesian criterion (SBC) and Hannan-Quinn information criterion.

4.7.2 Estimating Technique

The Panel Vector Error Correction Model, Impulse Response and Variable Decomposition techniques were used to evaluate the dynamic relationship between the variables in model 4.7.3. VECM adds error correction features to a multi factor vector auto regression. It is suitable when the study variables have a long run stochastic trend (co-integrated). The error correction shows that the past year deviation from a long run equilibrium, that is, the error, influences its short run dynamics. Hence, the speed at which the dependent variable (a bank's ROA) returns to equilibrium after a change in other variables was estimated directly by Error Correction Models. ECM methodology was developed by Sargan (1964) while VECM was fully analysed by Johansen (1995) to ensure that long run adjustment of co-integrated series is properly accounted for.

The Panel-VEC model is;

If $Y_{it} = \left(Y_{1it}, Y_{2it}, Y_{3it}, \ldots\ldots\ldots Y_{qit}\right)'$ is a $q \times 1$ vector of cross-sections i in time t

$$Y_{it} = \delta_i b_t + \sum_{k=1}^{m} \Phi_{ik} Y_{i(t-k)} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.7.4)$$

Where, $t = 1,2,3\ldots\ldots, T$; $i = 1,2,3\ldots\ldots., N$; Φ_{ik} is a $q \times q$ matrix;

ε_{it} is the $q \times 1$ vector of disturbances; and

b_t which is a vector of deterministic components is equal to 1.

That is, δ_i is a $q \times 1$ or $q \times 2$ matrix of parameters.

Therefore, $\delta_i b_t$ is a $q \times 1$ vector with the k-th element which is equal to δ_{1ik} or $\delta_{1ik} + \delta_{2ik} + \ldots..t$ denoting the model's deterministic component.

Explicitly,

$$\Delta Y_{it} = \delta_i b_t + \Pi_i Y_{i(t-1)} + \sum_{k=1}^{m-1} \Gamma_{ik} \Delta Y_{i(t-k)} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.7.5)$$

Where, $t = 1,2,3\ldots.t$; $i = 1,2,3\ldots\ldots..N$; $\Gamma_{ik} = -\sum_{w=k+1}^{m} \Phi_{iw}$ for $k = 1,2,3,\ldots\ldots, (m-1)$ and,

$\Pi_i = -\left(\mathrm{I}_j - \sum_{k=1}^{m} \Phi_{ik}\right)$. Moreover, $\Gamma_i = \left(\Gamma_{1i}, \Gamma_{2i}, \Gamma_{3i}, \ldots\ldots.\Gamma_{i(m-1)}\right)$

and $X_{it} = \left(\Delta Y_{i(t-1)}', \Delta Y_{i(t-2)}', \Delta Y_{i(t-3)}', \ldots\ldots\ldots\ldots\Delta Y_{i,t-(m-1)}'\right)'$.

Equation 4.7.5 can be re-written as:

$$\Delta Y_{it} = \delta_i b_t + \Pi_i Y_{i(t-1)} + \Gamma_i X_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.7.6)$$

For a given time-period t, model 4.7.6 can be stacked over the cross-section i to obtain;

$$\Delta Y_t = \delta b_t + \Pi Y_{t-1} + \Gamma X_t + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.7.7)$$

For every t ranges from $1,2,3,\ldots\ldots\ldots\ldots, T$.

In the same manner, equation 4.7.7 can be expressed in a matrix form as:

$$\begin{bmatrix} \Delta Y_{1t} \\ \Delta Y_{2t} \\ . \\ . \\ \Delta Y_{Nt} \end{bmatrix} = \begin{bmatrix} \delta_1 \\ \delta_2 \\ . \\ . \\ \delta_N \end{bmatrix} b_t + \begin{bmatrix} \Pi_1 & & & & \\ & \Pi_2 & & & \\ & & . & & \\ & & & . & \\ & & & & \Pi_N \end{bmatrix} \begin{bmatrix} Y_{1(t-1)} \\ Y_{2(t-1)} \\ . \\ . \\ Y_{N(t-1)} \end{bmatrix} + \begin{bmatrix} \Gamma_1 & & & & \\ & \Gamma_2 & & & \\ & & . & & \\ & & & . & \\ & & & & \Gamma_N \end{bmatrix} \begin{bmatrix} X_{1t} \\ X_{2t} \\ . \\ . \\ X_{Nt} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ . \\ . \\ \varepsilon_{Nt} \end{bmatrix}$$

Equation 4.7.6 is the usual VEC model.

Thus, it is assumed that ε_{it} is I.I.D with a mean value equal to zero and co variance matrix denoted as:

$$\Omega = \begin{bmatrix} \Omega_{11} & . & . & \Omega_{1N} \\ . & . & & \\ . & & . & \\ \Omega_{N1} & . & . & \Omega_{NN} \end{bmatrix}$$. This is $Nq \times Nq$ positive definite matrix such that $\Omega_{ik} \equiv \operatorname{var}(\varepsilon_{it})$.

Following the study of Groen and Kleibergen (2003),

If Π_i is decomposed into $\alpha_i \beta_i^{'}$ where, α_i and β_i are of dimension $q \times r_i$ with r_i equal to rank $(\Pi_i) < q$.

This denotes that the cointegration rank varies across cross-sections, which is in tandem with the existing literature on panel cointegration that posits that individual cross-sections usually have the same cointegration rank; that is $r_i = r$ for all i.

When $\Pi = \alpha\beta^{'}$, then the long run coefficient matrix Π is;

$$\alpha = \begin{bmatrix} \alpha_1 & & & & \\ & \alpha_2 & & & \\ & & . & & \\ & & & . & \\ & & & & \alpha_N \end{bmatrix}, \ \beta = \begin{bmatrix} \beta_1 & & & & \\ & \beta_2 & & & \\ & & . & & \\ & & & . & \\ & & & & \beta_N \end{bmatrix}.$$

Conclusively, a panel-VEC model is written as

$$\Delta Y_{it} = \delta b_{it} + \alpha\beta^{'} Y_{i(t-1)} + \Gamma X_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4.7.8)$$

From equation 4.7.8, the short run matrix, Γ; adjustment matrix, α and the cointegration matrix, β are expressed below respectively.

$$\Gamma = \begin{bmatrix} \Gamma_{11} & \Gamma_{12} & . & . & . & \Gamma_{1N} \\ \Gamma_{21} & \Gamma_{22} & . & . & . & \Gamma_{2N} \\ . & . & . & & & . \\ . & . & & . & & . \\ . & . & & & . & . \\ \Gamma_{N1} & \Gamma_{N2} & . & . & . & \Gamma_{NN} \end{bmatrix}, \qquad \alpha = \begin{bmatrix} \alpha_{11} & \alpha_{12} & . & . & . & \alpha_{1N} \\ \alpha_{21} & \alpha_{22} & . & . & . & \alpha_{2N} \\ . & . & . & & & . \\ . & . & & . & & . \\ . & . & & & . & . \\ \alpha_{N1} & \alpha_{N2} & . & . & . & \alpha_{NN} \end{bmatrix} \text{ and,}$$

$$\beta = \begin{bmatrix} \beta_{11} & \beta_{12} & . & . & . & \beta_{1N} \\ \beta_{21} & \beta_{22} & . & . & . & \beta_{2N} \\ . & . & . & & & . \\ . & . & & . & & . \\ . & . & & & . & . \\ \beta_{N1} & \beta_{N2} & . & . & . & \beta_{NN} \end{bmatrix}.$$

The unrestricted matrices of α and β are of the dimension $Nq \times r$, where, $r \equiv r_1 + r_2 + ... + r_N < Nq$.

Therefore, after this model has been estimated, the impulse response and variable composition is analysed to show the dynamic behaviour of a variable due to a random shock in other variables. Thus, for each variable from each equation, a unit shock to the error is analysed to determine the effects upon the vector error correction mechanism system over time using Cholesky decomposition.

4.8 Chapter Summary

This chapter presented the research method employed to achieve this study's objectives. It started by discussing the research design which is based on an unbalanced panel of 250 licenced commercial banks in 30 SSA countries with similar economic and banking features over a period of 10 years. All the data for this study were sourced from the BankScope database by Bureau Van Dijk (BVD) as it is the most detailed database for banking and includes countries from all over the world. The measurement of variables and the rationale for using those variables was also discussed and the model specifications and estimating techniques used to estimate each model to address the study's four objectives were presented.

CHAPTER FIVE

DETERMINANTS OF THE DIVIDEND PAYOUT RATIO

5.0 Introduction

This chapter discusses the estimation of the Lintner model in other to achieve objective one of this study. The chapter is structured into four sub-sections. Sub-section 5.1 focuses on the descriptive/ summary stactistics of the data; sub-section 5.2 addresses the correlation analysis so as to identify the nature and extent of the relationship between the variables such that there will be no error of multicolineraity in the analysis; sub-section 5.3 discusses the DIFF and SYS-GMM analysis and findings various determinants of dividend payout ratio; and sub-section 5.4 presents the chapter summary.

5.1 Descriptive Analysis

This section presents the summary statistics of pooled observations of the variables employed to investigate the determinants of the dividend payout ratio among SSA banks. Annual data are used to capture these variables. The descriptive characteristics consider the mean, median, standard deviation, and minimum as well as maximum values of the panel data across the variables.

Table 3: Summary Analysis of the Series: DPOR, ATI, GRO, SIZ, LEV, TAX, and CAR

	Obs	Mean	Std. Dev	Min	Max
DPOR	2480	-0.951	0.738	-8.310	0.982
ATI	2453	8.616	2.353	-5.667	13.369
SIZ	2500	13.015	1.347	8.077	17.075
LEV	2499	8.801	17.640	-683.176	339.122
GRO	2500	0.383	3.888	-0.998	147.714
TAX	2500	0.007	0.013	-0.141	0.296
CAR	2500	0.135	0.134	-2.068	1.073

Source: Author’s computation (2017)

Table 2 shows the descriptive analysis of the results for all activities relating to the determinants of dividend payout ratio of SSA banks for the period 2006-2015. It is evident that, all the series display a higher level of consistency as their mean and standard deviation values fall within the range of maximum and minimum values of these series. Furthermore, the relatively low value of standard deviations for most of the series indicates the small level of deviation of the actual data from their mean value.

5.2 Panel Correlation Matrix

This section shows the degree of association between the variables to ensure there is no multi-colinearity problem in our estimations.

Table 4: Correlation Matrix of the Series: DPOR, ATI, GRO, SIZ, LEV, TAX and CAR

	DPOR	ATI	SIZ	LEV	GRO	TAX	CAR
DPOR	1						
ATI	-0.019	1					
SIZ	0.022	0.647	1				
LEV	0.024	-0.065	0.043	1			
GRO	0.014	0.048	0.117	0.005	1		
TAX	-0.038	0.132	-0.068	-0.044	-0.018	1	
CAR	-0.031	-0.011	-0.148	-0.135	-0.013	0.166	1

Source: Author's computation (2017)

From Table 3, the pairs of variables are both positively and negatively correlated with no evidence of strong correlation beyond 0.8, which is the rule of thumb. There is a negative relationship between after-tax-income (ATI), tax ratio (TAX), capital adequacy ratio (CAR) and dividend payout ratio (DPOR) to the tune of -0.0195; -0.0379; -0.0305, although this is very weak. There is also a negative relationship between leverage (LEV), capital adequacy ratio (CAR) and ATI to the rate of -.0649 and -0.0112. Similarly, TAX and CAR are inversely related to bank size (SIZ), bank leverage (LEV) and bank growth prospects (GRO) at the rate of -0.0678 and -0.1478; -0.0442 and -0.1354; -0.0184 and -0.0129, respectively. The only relatively strong correlation is between SIZ and ATI (0.6471), but this is positive in nature. All other relationships tend to be positive but very weak; hence, our estimation is free from the multi-colinearity problem.

5.3 Dynamic Panel Data Estimation: Two- Step System and Difference Panel GMM

Table 5: Two-Step GMM Estimations of the Series: ATI, SIZ, GRO, LEV, TAX and CAR with Dependent Variable: DPOR

	SYS-GMM		DIFF-GMM	
	No of groups: 250		No of groups: 250	
	No of Instruments: 40		No of Instruments: 44	
	F (6, 249) = 8.60		F (7, 250) = 13.54	
	Prob(F) = 0.0000		Prob(F) = 0.0000	
Variable	Coefficient	p>/t/	Coefficient	p>/t/
C	-1.023	0.000***		
DPOR (L1)	0.244	0.000***	0.220	0.000***
ATI	0.035	0.028**	0.082	0.000***
SIZ	-0.017	0.460	-0.050	0.047**
LEV	0.0153	0.002***	0.009	0.017**
GRO	-0.008	0.321	0.008	0.309
TAX	13.578	0.164	2.219	0.632
CAR	-0.003	0.985	0.044	0.813

Source: Author’s computation (2017). Note that “***” and “**” represent 1% and 5% level of significance, respectively.

From Table 4, DPOR (L1), ATI and LEV are found to be significant in both estimations, SIZ inclusive in the DIFF-GMM. Hence, they are all significant determinants of the DPOR of SSA banks at 1 or 5 percent. The significance and positive effect of DPOR (L1) and ATI is in line with Lintner’s model that forms the basis of this study. This implies that the higher the profit generated by SSA banks, the higher the payout dividend to satisfy their owners which might be the reason why the banking sector in all these countries lags behind its international competitors since a larger proportion of their income is paid out and not retained to explore viable and positive NPV investment opportunities.

Even though these banks payout dividends to serve as a signalling effect to attract more investors and reduce free cash flow that leads to expropriation and compounds their agency costs, in most of these countries' banks, managers are not acting in the sole interests of owners. The significance and positive effect of past year dividends denote that they affect today's dividend payment; this is in line with Abdella and Manual (2016), Bawa and Kaur (2012b), Eriotis (2011) and Maldajian and El Khoury (2014) findings. The observed positive relationship between the dividend payout ratio and profitability (ATI) supports the work of Olowe and Moyosore (2014), Amidu and Abor (2006), Agyei and Marfo-Yiadom (2011) and Anil and Kapoor (2008).

Furthermore, the negative effect of SIZ under DIFF and SYS-GMM implies that the larger a bank's asset base, the more investment decisions they make which favour DRIPs and on the other hand reduce the payout ratio. This is in line with Gordon (1963) postulations on the dividend growth model but contrary to those of the life cycle theory. Relating these findings to previous studies, they conform to Maldajian and El Khoury (2014) and Abdella and Manual (2016) but contradict Olowe and Moyosore (2014) argument that larger firms will pay huge dividends to minimise the agency problem and reduce agency costs. The fact that it is significant and also negative under the DIFF-GMM estimation calls for urgent attention to policy formulation among SSA banks as this implies that larger banks pay less dividends which is the opposite of what the life cycle theory posits.

During the early stage of a bank's existence, retention policy should be adopted and when it grows such that it has exhausted all investment opportunities in its environment, a dividend payout can be adopted. Most SSA commercial banks meet the required capital ratio, meaning that they have a large asset base to explore viable investment opportunities and can open branches in other locations and countries where there is the possibility of positive and viable NPV projects; hence, the payout ratio that serves as a signalling effect tend to decrease as a larger bank already has sufficient investors, and focuses on maintaining their investment in the bank.

Following the life cycle theory, at maturity, there should be increased payouts and when growth declines, there should be a generous payout policy. The adverse findings relating to this theory among SSA banks could be one of the reasons for the low level of financial deepening in the region because dividend policy affects the two other important policies (financing and investing). These findings could reflect the political unrest and economic instability that characterise this region and result in significant operational costs and low returns among commercial banks, causing them to retain and trade with their surplus earnings. Nonetheless, SSA banks need to re-visit their dividend policy.

Our finding of a negative and insignificant relationship between CAR and DPOR also contradicts those of Al-Ajmi (2010), B. Chang and Dutta (2012) and Olowe and Moyosore (2014) but is in line with Dickens et al. (2002) study of US banks. Rime (2001) notes that, DRIPs are an internal source of bank equity which is the major component of their capital adequacy (the ratio of equity to total assets). The relationship between CAR and the retention ratio is directly correlated and the fact that it has an inverse relationship with the payout ratio is logical. The negative and insignificant effect of GRO confirms the findings of Ho (2003); Amidu and Abor (2006); Rozeff (1982); Chiang et al. (2006) and Zameer, Rasool, Iqbal, and Arshad (2013) who affirm that the higher the growth prospects of a firm to viable investment opportunities, the higher the retention ratio and hence, the lower the payout ratio. However, for dividend-income oriented shareholders, the higher the growth prospects of a bank, the higher their expectations at the end of the financial year. Our findings reveal that this factor is not of any significance in determining the payout ratio of banks and the higher the growth of banks, the lower the payout ratio.

Our finding on LEV negates the *a priori* expectation and findings of Olowe and Moyosore (2014); Collins, Saxena, and Wansley (1996) and Rozeff (1982) by being positive and significant. This implies that for banks that use dividend payout as a tool to minimise the agency problem that leads to agency costs, the higher the debt, the higher will be the payout. This is because pressure on managers to repay debtors and not default on the agreed terms and conditions of the debt and fears of losing their job will increase their efforts to generate more earnings for the bank which will invariably increase what they pay out at the point of dividend declaration since the dividend payout ratio is a proportion of earnings generated in the financial year. According to Jensen and Meckling (1976), shareholders and managers are 'utility-maximisers' in the sense that they both pursue their particular interests. Managers would not want the bank to collapse because of the threat of losing their job. Thus, if owners are wise enough to use debt as a bond to minimise managers' expropriation, they will always meet their targets, ensuring more reward for the owners in the form of a higher payout ratio in the long run.

Findings on TAX as a determinant of DPOR have been inconclusive within and beyond the banking context. Our findings reveal that it has a positive and insignificant effect on DPOR in banks. This negates our *a priori* expectation that the higher the tax burden, the lower the earnings to distribute. The positive effect implies that higher tax is paid on higher income; therefore, the higher the tax paid, the higher the payout ratio since the latter is proportionate to the earnings generated by the bank. Our findings contradict Abor and Biekpe (2006) but conform to the findings of La Porta et al. (2000) and D. Datta, Ganguli, and Chaturvedi (2014) who affirm that tax has nothing to do with the dividend payout policy. The insignificance of taxation (TAX) could be traced to the fact that not all countries insist on payment of corporate tax and most banks devise ways and means of avoiding tax, which renders the findings inconsistent.

5.3.1 Diagnostic Test (Test for Serial Correlation and Validity of Instrument)

Despite the numerous merits of dynamic data analysis, over-identification has been a common problem associated with the generalised method of moments involving both differenced and the system GMM. According to Hayakawa (2014), two main factors determine the behaviour of the GMM estimator finite sample; viz, the number of moment conditions and the strength of instrument identification. The J-test, also termed the Hansen/ Sagan test has been a widely accepted test for the identification of problem validity in GMM. Pathan and Skully (2010) also recommend that the reliability of SYS-GMM estimates should be checked using the Hansen test to detect the validity of the instrument used in the estimation while the Sargan test is used for DIFF-GMM. One of the problems associated with dynamic panel data estimates is the presence of auto correlation or serial correlation. According to Hayakawa (2014), this limits the efficiency of GMM estimators (both DIFF-GMM and SYS-GMM) and can be tested for using the Arellano and Bond (1991) order one and two tests.

The Hansen and Sargan tests for over-identification of instrument and AR (1) and AR (2) tests for auto correlation are presented in Tables 5, 6 and 7, respectively.

Table 6: Hansen Test

Ho: There is No Over-Identification of Instrument			
SYS-GMM		DIFF-GMM	
Chi^2 (32)	37.67	Chi^2 (37)	42.34
Prob>Chi^2	0.226	Prob>Chi^2	0.252
Hansen Test Excluding Group			
Chi^2 (18)	17.0	Chi^2 (35)	35.75
Prob>Chi^2	0.523	Prob>Chi^2	0.433

Source: Author's Computation (2017)

The above results show that, the prob-value of the Hansen tests for both the including and excluding group are not significant at 5 percent level. Hence, the null hypothesis is accepted that there is no over specification of instruments used in the estimation.

Table 7: Sargan Test

Ho: There is No Over-Identification of Instrument			
SYS-GMM		DIFF-GMM	
Chi^2 (32)	34.22	Chi^2 (37)	31.61
Prob>Chi^2	0.361	Prob>Chi^2	0.719

Source: Author's computation (2017).

These results illustrate that, the prob-value of Sargan tests for both the including and excluding group are not significant at 5 percent level. Hence, the null hypothesis is accepted that there is no over specification of instruments used in the estimation.

Table 8: Arellano and Bond AR (1) and AR (2) Serial Correlation Tests

Ho: There is No Serial Correlation				
	SYS-GMM		DIFF-GMM	
Order	Z	Prob>Z	Z	Prob>Z
AR (1)	-5.02	0.000***	-5.11	0.000***
AR (2)	1.24	0.216	1.48	0.138

Source: Author's computation (2017). Note that "***" represents 1% level of significance.

Table 7 above shows the AR (1) and AR (2) results of the test for auto correlation. At order one, it is expected that there will be serial correlation irrespective of the lag length but it will correct itself at order two. From the findings in Table 7, we reject the null hypothesis in the AR (1) and accept the null hypothesis at AR (2) at lag structure (7/8) and (6/8) used to estimate the SYS-GMM and DIFF-GMM, respectively. Acceptance of the null hypothesis at order two implies that there is no evidence of serial correlation at the chosen lag length. Thus, the estimate of the dividend payout ratio model of SSA banks is efficient, consistent and reliable.

5.4 Chapter Summary

This chapter presented the data analysis and interpretation and implications of the findings for the determinants of dividend payout ratio of the selected banks. Since the Hansen, Sargan, AR (1) and AR (2) tests are passed and the F-test of joint significance between the independent variables reveals that the independent variables are jointly significant at 1 percent, the DIFF and SYS-GMM estimation is efficient and reliable. Hence, the major determinants of SSA commercial banks' payout ratio are DPOR (L1), ATI, SIZ and LEV. Moreover, CAR which has been neglected by previous researchers in examining the determinants of the dividend payout ratio of banks in SSA is found to be an insignificant factor. This reflects the effects of the economic situation that confronts most of the countries examined during the study period. Well-capitalised banks are using their excess inflow to suppress the impact of the economic situation on their operational efficiency in such a way that their asset base will not be jeopardised. Finally, we conclude that Lintner's model which was judged the best model to explain a firm's dividend setting process (Benartzi et al., 1997) holds for SSA banks.

Based on our findings, banks in the SSA region should strictly follow the life cycle and dividend residual theories. They should not prioritise a cash payout policy but explore other dividend policies such as retention policy and share-repurchase, among others. Regarding the payout ratio as the only means of minimising the agency problem (agency costs) through the reduction of excess cash flow in the custody of the managers might not strictly hold in that there is the possibility of managers pursuing vague but profitable investments which could cause more hazards. Most banks that pay dividends are maximising profit and not wealth in the real sense (Abdullah, Razazila, Ismail, Sadique, & Bi, 2005). In this regard, if payment of cash dividends has been the most common policy to minimise the agency problem (costs), banks should switch to retention policy and monitor managers' investment decisions, resulting in long-term benefits for shareholders. Hence, we recommend that SSA banks adopt Lintner's model to set their dividend payment formula in order to protect all stakeholders' interests and in the long-run, promote future growth.

CHAPTER SIX

CAUSALITY BETWEEN DIVIDEND POLICY AND FINANCIAL PERFORMANCE

6.0 Introduction

This chapter discusses the estimation of the effect of operational diversification on financial performance of banks in SSA. The chapter is divided into six sub-sections. Sub-section 6.1 focuses on the descriptive analysis; sub-section 6.2 shows the correlation analysis of the variables; sub-section 6.3 reveals the static regression (pooled, fixed and random) analysis; sub-section 6.4 reveals the post estimation tests; sub section 6.5 shows the dynamic panel analysis (SYS-GMM); and the chapter summary is presented in sub-section 6.6.

6.1 Return on Assets (ROA) as a Measure of Financial Performance

6.1.1 Panel Unit Root

Table 9: Levin Lin and Chu (LLC); Augmented Dickey Fuller (ADF); Maddala and Wu (PP) Fisher-type Unit Root Tests

Variable	Levin, Lin, Chu (None)			Levin, Lin, Chu (Individual intercept)		
	Order	t* Stat	Prob- Value	Order	t* Stat	Prob- Value
ROA	I(1)	-48.665	0.000***	I(1)	-36.651	0.000***
DPOR	I(1)	-45.744	0.000***	I(1)	48.816	0.000***
RERA	I(1)	-49.643	0.000***	I(1)	322.727	0.000***
CAR	I(1)	-56.096	0.000***	I(1)	-46.358	0.000***
Variable	ADF Fisher Chi-square Unit-root test (None)			ADF Fisher Chi-square Unit-root test (Individual intercept)		
	Order	t* Stat	Prob- Value	Order	t* Stat	Prob- Value
ROA	I(1)	1960.44	0.000***	I(1)	1061.55	0.000***
DPOR	I(1)	2118.55	0.000***	I(1)	1152.86	0.000***

RERA	I(1)	2138.62	0.000***	I(1)	1147.86	0.000***
CAR	I(1)	1944.10	0.000***	I(1)	1122.12	0.000***
Variables	PP Fisher-type Chi Square Unit root-test (None)			PP Fisher-type Chi Square Unit root-test (Individual intercept)		
	Order	t* Stat	Prob-Value	Order	t* Stat	Prob-Value
ROA	I(1)	3188.80	0.000***	I(1)	2352.11	0.000***
DPOR	I(1)	3345.97	0.000***	I(1)	2410.29	0.000***
RERA	I(1)	3434.75	0.000***	I(1)	2447.75	0.000***
CAR	I(1)	3398.07	0.000***	I(1)	2702.61	0.000***

Source: Author's computation (2017). Note that "***" represents 1% level of significance.

The panel unit root test presented in the above table shows that all the variables were stationary at first differencing (order one). Return on assets, the dividend policy ratio, retention ratio and capital adequacy ratio were all stationary at order one (I (1)) at both cross-section and individual level during the period under investigation. The reason is that the probability of Levin, Lin and Chin t statistic values: 0.000, 0.000, 0.000 and 0.000; the Augmented Dickey Fuller (ADF) test statistic and Philip Perron statistic values: 0.000, 0.000, 0.000 and 0.000 for each of the variables was less than the probability of the error margin 0.05 allowed for the estimate in this study. This implies that there is a short run equilibrium relationship between the variables under investigation. The short run stability of these variables revealed by the panel unit root test led to further description of the variables, the level of correlation between them and the estimation of cointegration to determine the long run equilibrium relationship or stability of the linear combination of the variables in the long run.

6.1.2 Descriptive Statistics of the Variables

This section purviews all the variables used in this study for the period under investigation with reference to the mean, median, standard deviation, skewness, kurtosis, probability, and minimum and maximum statistics of the variables.

Table 10: Descriptive Analysis of Series: ROA, DPOR, RERA, CAR

	ROA	DPOR	RERA	CAR
Mean	0.021	-0.950	0.541	0.135
Median	0.019	-0.825	0.564	0.112
Maximum	0.425	0.982	1.000	1.073
Minimum	-0.392	-8.310	-1.671	-2.067
Std. Dev.	0.030	0.738	0.239	0.134
Skewness	1.173	-3.226	-0.893	0.006
Kurtosis	51.667	27.046	7.362	58.619
Probability	0.000	0.000	0.000	0.000

Source: Author's computation (2017)

Table 9 shows the descriptive analysis results of all the activities in relation to the causal relationship of dividend policy and bank performance for the period 2006-2015. Return on Asset (ROA) measured the performance of the banking industry while the dividend payout ratio (DPOR), retention ratio (RERA) and capital adequacy ratio (CAR) were used to capture the dividend policy. The results reveal that the average ROA, DPOR, RERA and CAR is 0.02, -0.95, 0.54 and 0.14. This implies that the average performance of the banking industry as determined by the ROA is very low and not encouraging. The DPOR revealed that shareholders are not adequately rewarded; this circumscribes the performance of the banking industry.

The maximum and the minimum ROA, DPOR, RERA and CAR are 0.43 and -0.39, 0.98 and -8.31, 1.00 and -1.67 and 1.07 and -2.07, respectively. The standard deviation values of 0.03, 0.74, 0.24 and 0.13, reveal the rate at which ROA, DPOR, RERA and CAR deviated from their respective average or expected value. It was also found that skewness of ROA and CAR which are 1.17 and 0.01, respectively are positively skewed because their distributions have a long tail to the right while DPOR and RERA which are -3.23 and -0.89, respectively are negatively skewed because their distribution has a long tail to the left. However, the kurtosis of the financial variables shows that all the variables under consideration are leptokurtic in nature because the kurtosis coefficient indexes are all positive. The probability values of 0.0000 show that the variables are of good fit to significantly impact the performance of the SSA banking industry.

6.1.3 Correlation Analysis

This section explains how the variables under study relate to each other so as to show the linear relationship between the pairs of variables and also ensure that there is no multi-colinearity problem in our estimations.

Table 11: Correlation Matrix of the Series: ROA, DPOR, RERA, CAR

	ROA	DPOR	RERA	CAR
ROA	1.000			
DPOR	-0.070	1.000		
RERA	0.083	-0.808	1.000	
CAR	0.138	-0.018	0.018	1.000

Source: Author's computation (2017)

From the above table, DPOR has a negative relationship of -0.070 with ROA, while RERA and CAR have a positive relationship of 0.083 and 0.138 with ROA, respectively. CAR has an inverse relationship with DPOR to the tune of -0.018. This implies that a bank that fully meets the CAR requirement laid down by the Basel committee has little chance of paying out dividends. In the matrix, all the relationships between the pairs of variables are weak except for the strong correlation coefficient between RERA and DPOR (-0.808), but this is an inverse relationship which is logical because banks' policy is to either pay out dividends or to plough back profit to grow the bank. A higher RERA leads to a lower DPOR.

6.1.4. Vector AutoRegressive Optimal Lag Selection

To determine the optimal lag for this study, different criteria are used to choose the optimal lag structure for the model. According to Hyndman and Athanasopoulos (2014), AIC criteria tend to choose a larger number of lags; hence, for VAR and VEC analysis SIC is preferable.

Table 12: Optimal Lag Selection of Series: ROA, DPOR, RERA, and CAR

LAG	LOGL	LR	FPE	AIC	SIC	HQIC
0	1059.431	NA	1.46e-07	-4.388	-4.354	-4.375
1	1704.240	1276.214	1.07e-08	-7.003	-6.829	-6.935
2	1777.123	143.038	8.43e-09	-7.239	-6.927*	-7.117*
3	1787.682	20.548	8.63e-09	-7.217	-6.765	-7.039
4	1815.669	53.995	8.21e-09	-7.267	-6.676	-7.034
5	1836.931	40.667*	8.03e-09*	-7.289*	-6.559	-7.002
6	1846.703	18.528	8.24e-09	-7.263	-6.395	-6.922
7	1857.278	19.874	8.43e-09	-7.240	-6.233	-6.844
8	1866.838	17.808	8.66e-09	-7.213	-6.067	-6.763

Source: Author's computation (2017). Note that (*) indicates the lag order selected by each criterion; LR: Sequential modified LR test statistic (each at 5% level of significance); FPE: Final Prediction Error; AIC: Akaike Information Criterion; SIC: Schwarz information criterion; HQIC: Hannan-Quinn information criterion.

Table 12 shows the result of the vector error correction model of lag length to be selected for this study. A vector error correction model of lag order of four (5) is found using AIC with a value of -7.289 while a vector error correction model of lag order of two (2) is revealed using SIC and HQIC with values given as -6.927 and -7.117, respectively. All these information criteria are statistically significant at 5 percent level. Based on this evidence, a vector error correction model of lag order two (2) which is the smallest lag order as revealed by SIC and HQIC is selected for this study.

6.1.5 Panel Cointegration Test

Table 13: Pedroni Residual Cointegration of Series: ROA, DPOR, RERA, and CAR

Ho: There is No Cointegration $(H_0 : \varpi = 1)$	
No Deterministic Trend	Deterministic Trend and Intercept

Within Dimension					Within Dimension			
	Unweighted		Weighted		Unweighted		Weighted	
	Stat	Prob	Stat	Prob	Stat	Prob	Stat	Prob
Panel v	-3.389	0.999	-8.124	1.000	-6.475	1.000	-14.008	1.000
Panel rho	5.642	1.000	7.624	1.000	13.089	1.000	13.425	1.000
Panel PP	-15.459	0.000***	-11.660	0.000***	-19.491	0.000***	-24.979	0.000***
Panel ADF	-15.049	0.000***	-10.822	0.000***	-16.013	0.000***	-16.962	0.000***
Between Dimension					Between Dimension			
	Unweighted		Weighted		Unweighted		Weighted	
	Stat	Prob	Stat	Prob	Stat	Prob	Stat	Prob
Group rho	14.999	1.000			19.567	1.000		
Group PP	-16.109	0.000***			-31.254	0.000***		
Group ADF	-10.189	0.000***			-14.865	0.000***		

Source: Author's computation (2017). Note that "***" represents rejection of the null hypothesis at 5% level of significance.

From Table 13, considering the seven (7) Pedroni tests that yielded 11 statistics at both deterministic trend or no trend, four tests, yielding eight statistics (Panel PP, Panel ADF, Group PP and Group ADF) of the 11 statistics were significant at 5 percent, which implies the rejection of the null hypothesis of no cointegration and hence, we accept that there is long run relationship between the study variables.

Table 14: Kao ADF Residual based Cointegration Test of Series: ROA DPOR RERA CAR

Ho: There is No Cointegration $(H_0 : \varpi = 1)$		
Trend Assumption: No deterministic Trend		
	t-Statistic	Prob
ADF	-14.683	0.000***

Source: Author's computation (2017). Note that "***" represents rejection of the null hypothesis at 5% level of significance.

The estimate from the Kao Residual ADF test in the table above is significant at 5 percent with t-statistics at -14.683. Hence the null hypothesis is rejected and there is confirmed evidence that the variables are co-integrated in the long run.

Table 15: Johansen Fisher-Based Cointegration Test of Series: ROA, DPOR, RERA CAR

Ho: There is No Cointegration				
Cointegration Rank Test using Trace Statistic				
Eigen value	Trace Statistic	5% Critical Value	Prob	Hypothesized No. of CE(s)
0.156	727.652	47.856	0.000	None ***
0.102	437.535	29.797	0.000	At most 1 ***
0.075	253.948	15.495	0.000	At most 2 ***
0.067	119.638	3.841	0.000	At most 3 ***
Cointegration Rank Test using Maximum Eigen Value Statistic				
Eigen value	Maximum Eigen Value Statistic	5% Critical Value	Prob	Hypothesized No. of CE(s)
0.155713	290.117	27.584	0.000	None ***
0.101574	183.588	21.132	0.000	At most 1***
0.075369	134.309	14.265	0.000	At most 2 ***
0.067420	119.638	3.841	0.000	At most 3 ***

Source: Author's Computation (2017). Note that "***" represents rejection of the null hypothesis at 5% level of significance.

In the Johansen Panel cointegration test, much emphasis is laid on the number of lags. Hence, optimal lag two (2) was used for all the estimations in this study including this test based on the Schwarz Information Criterion (SIC). Using the Johansen Fisher based cointegration test methodology to estimate the co-integrating rank test; two likelihood estimators were used for the co-integrating rank: a trace test and a maximum Eigen value test. The co-integrating rank was formally tested using the trace and the maximum Eigen value statistic. These test statistics indicates four co-integrating vectors at 5 percent level of significance as presented in Table 14 above. This finding implies that a long-run equilibrium relationship exists between the variables under study.

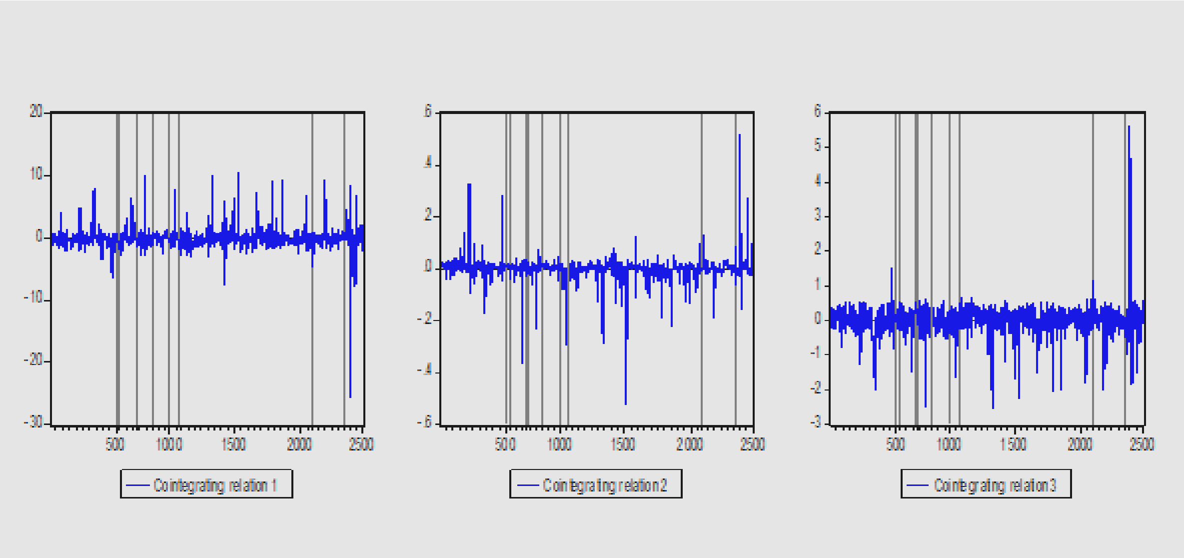
Thus, the stability of the dividend policy captured by the dividend payout ratio, retention ratio and capital adequacy ratio will affect banking performance measured by return on assets in both the short and long run. From the above tables, the maximum-Eigen value test indicates three normalized co-integrating equation(s) at 5 percent significance level. The details of the three normalized co-integrating equations and their adjustment coefficients are presented in Table 16 below.

Table 16: Cointegration Equations

ROA	RERA	CAR	DPOR
1.000	0.000	0.000	0.008 (0.002)
0.000	1.000	0.000	0.167 (0.015)
0.000	0.000	1.000	0.091 (0.018)
Adjustment coefficients (standard error in parentheses)			
D(ROA)	-0.381 (0.026)	-0.002 (0.005)	-0.009 (0.006)
D(RERA)	0.096 (0.193)	-0.488 (0.039)	0.029 (0.041)
D(CAR)	0.468 (0.075)	-0.031 (0.015)	-0.195 (0.016)
D(DPOR)	-0.652 (0.621)	0.719 (0.126)	-0.346(0.134)

Source: Author's computation (2017)

Figure 5: Graphical Representation of Cointegrating Equations



Source: Author's computation (2017)

Table 16 and Figure 5 present the normalized co-integrating equation(s) coefficients with their standard error in parentheses. The normalized co-integrating coefficients only load on the DPOR with positive coefficients. Thus, the coefficients of DPOR 0.0084, 0.1675 and 0.0912 which are statistically significant based on the standard error test reveal that banking performance as shown by the co-integrating equations can be determined by future-state and the stability of ROA, the retention ratio and capital adequacy while the dividend payout ratio mainly determines the current level of banking performance to move in the right direction to bring the system back to equilibrium. The cointegration adjusted coefficients measure the long-run equilibrium or the stability of banking performance.

The ROA value of -0.382 in the first co-integrating equation reveals a discouraging level of performance and calls for improvement. The DPOR of -0.653 reveals the negative impact of dividend payout policy on the banking performance in SSA. This is similar to the findings of M'rabet and Boujjat (2016) and Farsio et al. (2004); however, the RERA and CAR values of 0.097 and 0.468, respectively contribute positively to ROA in SSA (Omran & Pointon, 2004). In the second and third co-integrating equation, the banking industry's performance improved as, while still negative, the performance level stood at -0.002 and -0.009, respectively. This result was enhanced by improvement in DPOR which contributes positively and significantly at 0.719 to ROA despite the negative impact of RERA and CAR. It implies that the more attention that is paid to satisfying shareholders through dividend payments, the better the performance of the banking industry in the long run.

6.1.6 Vector Error Correction Estimations

According to Mahadevan and Asafu-Adjaye (2007), the two common methods of detecting the direction of causality between co-integrated variables are VAR and VECM. VECM is used in this study to show both long and short run causality between the variables based on affirmation of the long run association between the variables. The VECM with four (4) simultaneous equations is estimated to examine the short run properties of the long run relationships between the series. A VECM is a restricted VAR that is used for non-stationary co-integrated series.

VEC is of more merit than VAR because its cointegration relations are built into its specification such that the endogenous variables' long-run behaviour is restricted to cause convergence in the co-integrating relationships, enabling short-run adjustment dynamics in the series. The cointegration term built into the VECM is called the error correction term (ECT) since any deviation from the long-run equilibrium is expected to be corrected with a gradual speed of short-run adjustment. Following Asari et al. (2011) and Hyndman and Athanasopoulos (2014) studies, SIC is also used as a criterion to choose optimal lag two (2) used in this study as AIC tends to choose a larger number of lags that can render the VEC estimate insignificant.

Table 17: Vector Error Correction Estimates

Co-integrating Eq:	CointEq1	CointEq2	CointEq3	
ROA(-1)	1.000	0.000	0.000	
RERA(-1)	0.000	1.000	0.000	
CAR(-1)	0.000	0.000	1.000	
DPOR(-1)	0.008 (0.003)	0.167 (0.016)	0.091(0.018)	
C1	-0.014	-0.383	-0.050	
Error Correction:	Δ ROA	Δ RERA	Δ CAR	Δ DPOR
CointEq1	-0.382(0.026)	0.096(0.1934)	0.468(0.075)	-0.652(0.621)

CointEq2	-0.002(0.005)	-0.488(0.039)	-0.031(0.015)	0.719(0.126)
CointEq3	-0.008(0.006)	0.029(0.042)	-0.195(0.016)	-0.346(0.134)
ΔROA(-1)	-0.226(0.027)	-0.099(0.201)	-0.302(0.078)	0.395(0.646)
ΔROA(-2)	-0.097(0.02)	-0.007(0.165)	-0.106(0.064)	0.198(0.532)
ΔRERA(-1)	0.005 (0.006)	-0.195(0.045)	0.012(0.018)	-0.407(0.145)
ΔRERA(-2)	0.004(0.005)	-0.027(0.036)	0.007(0.014)	-0.145(0.116)
ΔCAR(-1)	-0.001(0.007)	-0.078(0.055)	-0.156(0.021)	0.354(0.175)
ΔCAR(-2)	0.009(0.006)	0.014 (0.048)	-0.036(0.019)	0.094(0.154)
Δ DPOR(-1)	0.003(0.001)	0.033(0.013)	0.010(0.005)	-0.454(0.043)
Δ DPOR(-2)	0.002(0.002)	0.026 (0.012)	0.007(0.005)	-0.166 (0.037)
C2	-0.000(0.001)	-0.003(0.005)	0.001(0.002)	0.006(0.015)
R-squared	0.308348	0.270238	0.146439	0.179245
Adj. R-squared	0.303878	0.265522	0.140923	0.173940
Sum sq. Resids	1.138343	63.79993	9.576733	658.5193
S.E. equation	0.025862	0.193611	0.075012	0.622020
F-statistic	68.97955	57.29713	26.54541	33.79087
Log likelihood	3838.618	388.1833	2013.411	-1612.262
Akaike AIC	-4.465132	-0.438954	-2.335369	1.895288
Schwarz SC	-4.427000	-0.400821	-2.297237	1.933421
Mean dependent	-0.000533	-0.003395	0.000984	0.006297
S.D. dependent	0.030997	0.225913	0.080931	0.684382

Source: Author's computation (2017). Note that standard errors (SE) are in parenthesis.

The presence of cointegration between variables suggests a long-term relationship between the variables under consideration. The VECM can then be applied. The vector error correction estimate with the standard error in parenthesis for the long run relationship between dividend policy and banking performance for three co-integrating equations is presented in Table 17 above. To establish a long-run relationship, the ECT, that is, the coefficients of $\theta_5, \beta_5, \alpha_5 and \delta_5$ should be negative and statistically significant. A negative and significant ECT coefficient indicates that any short-term fluctuations between the regressors and the dependent variable will result in a stable long run relationship between the variables.

The ECTs (ECT_{t-1}) are correctly signed and significant for the three (3) co-integrating equations except RERA and CAR in COINTEQ1, DPOR in COINTEQ2 and RERA in COINTEQ3. This signals further that there is a possibility of causation between the variables in the models whose error terms are correctly signed. Furthermore, the C1 in the co-integrating equation is also correctly signed and it reveals that it will take 0.014, 0.383 and 0.050 percent, respectively for the maladjustment in the co-integrating equations 1, 2 and 3 to adjust to the long run equilibrium or stability. In examining the impact of the error correction of the dividend policy on banking performance, it was found from the fitted vector error correction mechanism that ROA at lag one and two and capital adequacy at lag one, have an inverse relationship with banking performance. Thus, $ROA_{(-1)}$, $ROA_{(-2)}$ and $CAR_{(-1)}$ will worsen ROA by 22.65, 9.79 and 0.14 percent, respectively.

However, $RERA_{(-1)}$ and $RERA_{(-2)}$, CAR(-2) and $DPOR_{(-1)}$ and $DPOR_{(-2)}$ have a direct relationship with ROA. This finding is in tandem with the empirical finding of Omran and Pointon (2004); U. Uwuigbe et al. (2012); Zhou and Ruland (2006); Ajanthan (2013); Ehikioya (2015) and Agyei and Marfo-Yiadom (2011) who concluded that dividend policy, be it payout or retention, has a positive relationship with and can affect value and shareholders' wealth across sectors and economies. However, our finding negates Onanjiri and Korankye (2014a) and Farsio et al. (2004) work that found that dividend policy has no moderating effect or relationship on/with performance. The results further reveal that $RERA_{(-1)}$, $RERA_{(-2)}$, $CAR_{(-2)}$, $DPOR_{(-1)}$ and $DPOR_{(-2)}$ will lead to improved performance of the banking industry by 0.46, 0.43, 0.90, 0.26 and 0.21 percent, respectively with CAR ranking the highest. CAR serves as a cushion for banking activities; thus, a bank that meets capital requirements has the capacity to adopt policies that enhance the viability, sustainability and continuity of banking activities with few challenges. Furthermore, banks that maintain a high capital ratio level have lower funding costs because they will suffer minimal prospective bankruptcy costs (Brighi & Venturelli, 2013; Magret, 2016; Odunga, Nyangweso, Carter, & Mwarumba, 2013).

Furthermore, the relationship between $RERA_{(-1)}$, $RERA_{(-2)}$ with DPOR is inverse/negative to the tune of 40.6 and 14.5 percent, respectively, and there is a direct/positive relationship between $DPOR_{(-1)}$, $DPOR_{(-2)}$ with RERA at 0.33 and 2.59 percent, respectively. This suggests a change in the channel of the relationship between these two dividend-polices in the SSA commercial banking sector. The C2 estimate of -0.00047 reveals the risk involved (0.047%) in enhancing improved bank performance through dividend policy during the period under investigation in SSA even though it is so small. The significance of the VECM is examined using the R-square statistic and it is shown that a 30.83 percent variation in the error associated with the performance of the banking industry can be explained by the dividend policy captured by the retention ratio, dividend payout ratio and capital adequacy ratio. The F- statistic value of 68.98 > $F_{0.05}(3, 1714) = 3.00$ shows that the fitted VCEM is statistically significant and hence adequate and reliable in determining the causal relationship between the dividend policy and banking performance.

6.1.7 Granger Causality Estimation

The fact that there is cointegration between two variables does not specifically show the direction of the causal relationship existing between the variables, if any. According to Fisher (1993), economic theory points to a causal relationship in at least one direction in any co-integrated series. Granger causality tests (the Block Exogeneity Wald test and Pairwise) are conducted to detect the existence and direction of causation between the variables. In line with E. Gul and Ekinci (2006), the causal relationship (both short and long run causality) between variables can be established using probability and chi-square statistics under the null hypothesis of no causality. Table 18 below presents the estimate of chi-square statistics and the probability values.

Table 18: VEC Block Exogeneity Wald Test

Null hypothesis (H_0): There is no causality			
Dependent variable: ΔROA			
Excluded	Chi-sq	Df	Prob.
$\Delta RERA$	0.891	2	0.041**
ΔCAR	2.316	2	0.314

$\Delta DPOR$	2.688	2	0.261
All	5.548	6	0.476
Dependent variable: $\Delta RERA$			
ΔROA	0.314	2	0.855
ΔCAR	2.521	2	0.283
$\Delta DPOR$	7.453	2	0.024**
All	11.313	6	0.079*
Dependent variable: ΔCAR			
ΔROA	15.209	2	0.001***
$\Delta RERA$	0.461	2	0.795
$\Delta DPOR$	4.171	2	0.124
All	23.773	6	0.001***
Dependent variable: $\Delta DPOR$			
ΔROA	0.378	2	0.828
$\Delta RERA$	8.089	2	0.018**
$\Delta DPOR$	4.091	2	0.129
All	13.309	6	0.038**

Source: Author's computation (2017). Note that ***, **, * represent rejection of H_o at 1%, 5% and 10%, respectively.

The results on vector error correction Granger causality between financial performance and the dividend policy variables under consideration show the direction of the causal relationship between each pair of the variables such as ROA, retention ratio, capital adequacy ratio and dividend payout ratio. The table shows that there is uni-directional causality between RERA and ROA in SSA. This is in tandem with the findings of Omran and Pointon (2004) but contradicts those of Mougoué and Rao (2003). DPOR also has uni-directional causality with RERA. At the long run, ROA, CAR and DPOR granger cause RERA at 10 percent level of significance. ROA also has a uni-directional causality with CAR and at the long run ROA, RERA and DPOR granger cause CAR at 5 percent. There is also uni-directional causality between RERA and DPOR which implies that there is bi-directional causality between the retention ratio and dividend policy ratio but at the long run, ROA, RERA and CAR granger cause DPOR at 5 percent level of significance.

The findings across different economies have switched in this study in the sense that RERA granger causes ROA as opposed to DPOR even though it is uni-directional. This implies that dividend payout policy is a luxury and a negative NPV transaction as posited by Allen and Michaely (2003); DeAngelo et al. (2006); David and Ginglinger (2016) and Karpavičius (2014); while RERA is regarded as a policy that enhances performance and promotes future growth that leads to value creation among SSA banks. This finding of uni-directional causality between RERA and ROA in SSA banks re-affirms the findings of Al-Twaijry and Powers (2007). These scholars averred that dividend payout policy has nothing to do with future income but is simply a signal of past performance. Damodaran (2009) maintained that valuation of banks via payout policy is vague s it does not show the real value of the bank. Managers strive to satisfy their shareholders' expectations due to the uncertainty, doubt and refinancing problems that might occur if they dabble in DRIPs and stop paying dividends (V. V. Acharya, Gabarro, & Volpin, 2012).

When banks retain their profit, they have capacity to fund viable projects that yield more capital gain in the long run. The risk of uncertainty is minimal provided that the management team is monitored to undertake viable investments. According to Mizuno (2007), firms should only adopt payout policy that signals past performance to shareholders if they cannot identify and explore viable investment opportunities which will yield higher returns. It is high time that banks, especially those in SSA, realise that not all dividend paying banks are healthy and that healthy companies often cut dividend payments to shareholders and explore investment opportunities (see, http://www.flickrusertaxrebate.org.uk).

To re-confirm the causal relationship between these variables, the Pairwise Granger causality test is conducted following the empirical study of Dhamala, Rangarajan, and Ding (2008) who established a causal relationship between variables using F-statistics and their respective probability values.

Table 19: Pairwise Granger Causality Test

Null hypothesis	F-Statistics	P-Value	Decision	Type of Causality
DPOR does not Granger Cause ROA	1.942	0.143	Accept	No causality
ROA does not Granger Cause DPOR	0.675	0.509	Accept	No causality
RERA does not Granger Cause ROA	2.863	0.050**	Reject @5%	RERA→ROA Uni-directional
ROA does not Granger Cause RERA	1.583	0.205	Accept	No Causality
CAR does not Granger Cause ROA	6.542	0.002***	Reject@1%	CAR↔ROA Bi-directional
ROA does not Granger Cause CAR	35.273	9.E16***	Reject@1%	ROA↔CAR Bi-directional
RERA does not Granger Cause DPOR	2.767	0.063*	Reject@10%	RERA↔DPOR Bi-directional
DPOR does not Granger Cause RERA	2.333	0.097*	Reject@10%	DPOR↔RERA Bidirectional
CAR does not Granger Cause DPOR	0.178	0.837	Accept	No causality
DPOR does not Granger Cause CAR	2.789	0.062*	Reject@10%	DPOR→CAR Uni-directional
CAR does not Granger Cause RERA	0.819	0.441	Accept	No causality
RERA does not Granger Cause CAR	2.361	0.095*	Reject@10%	RERA→CAR Uni-directional

Source: Author's computation (2017). Note that ***, **, * represent rejection of H_o at 1%, 5% and 10%, respectively; while → denotes unidirectional causality and ↔ denotes bi-directional causality.

From the pairwise test in Table 19, RERA also granger cause ROA at 5 percent level of significance and this conforms to the findings generated from the VEC block exogeneity Wald test to confirm that among SSA banks, retention policy causes performance. There is also a bi-directional relationship between CAR and ROA. While it is uni-directional under the VEC Wald test, this implies that when banks adhere to the required capital conservation and buffer ratio, they will generate higher returns and if they operate with sufficient returns, they will be sufficiently liquid to finance all their activities and satisfy the requirements of the regulatory bodies, including capital adequacy.

Like the VEC Wald test, this study finds bi-directional causality between RERA and DPOR at 10 percent level of significance, which implies that when a bank explores growth opportunities, in the long run, the value created must fully maximise owners' wealth and lead to payout. Following the life cycle theory of dividend, a mature firm will need to payout dividends as much as possible because there will be limited opportunities to invest at this stage. Conclusively, this test finds that both policies, DPOR and RERA, granger cause CAR at 10 percent level. This implies that effective, suitable and implementable dividend policy results in adherence to capital requirements in the selected SSA banks for the period examined.

6.2 Return on Equity (ROE) as a Measure of Financial Performance

The ROE is used as a robustness check of our findings on the causal relationship between dividend policy and bank performance using ROA as the measure of performance.

6.2.1 Panel Unit Root

Table 20: Panel Unit Root test at Order One (I(1)) for the Variables

Variables	Levin, Lin & Chu t* Statistic	Prob	ADF Statistic	Prob	PP Statistic	Prob
ROE	-59.674	0.0000	18.421	0.0001	18.421	0.0001
RERA	-2.881	0.0020	136.346	0.0000	147.042	0.0000
CAR	-5.642	0.0000	195.317	0.0000	212.920	0.0000
DPOR	-8.759	0.0000	188.866	0.0000	163.428	0.0000

Source: Author's Computation (2017)

The panel unit root test presented in Table 20 above shows that all the variables were stationary. The ROE, dividend policy ratio (DPOR), retention ratio (RERA), and capital adequacy ratio (CAR) were all stationary at order one for both cross-section and individual level during the period under investigation. This is evident as the probability of Levin, Lin and Chur t-statistic values: 0.000, 0.002, 0.000 and 0.000; the Augmented Dickey Fuller (ADF) test-statistic and Philip Perron statistic values: 0.000, 0.000, 0.000, 0.000 and 0.000 for each of the variables was less than the probability of the error margin 0.05 allowed for the estimate in this study. This result implies that there is a short-run equilibrium relationship among the variables under investigation. The short-run stability of these variables revealed by the panel unit root test led to the estimation of co-integration to determine the long-run equilibrium relationship or stability of the linear combination of the variables in the long-run.

6.2.2 Panel Cointegration Test

Table 21: Co-integration Rank Test using Trace Statistic

Eigen value	Trace Statistic	5% Critical Value	Prob	Hypothesized No. of CE(s)
0.220906	1933.973	69.819	1.0000	None *
0.165168	935.2810	29.797	0.0001	At most 1 *
0.124231	527.2958	15.495	0.0001	At most 2 *
0.095763	227.5006	3.841	0.0000	At most 3 *

Source: Author's Computation (2017)

Table 22: Co-integration Rank Test using Maximum Eigen Value Statistic

Eigen value	Maximum Eigen Value Statistic	5% Critical Value	Prob	Hypothesized No. of CE(s)
0.220906	564.149	33.876	0.0001	None *
0.165168	407.985	21.132	0.0001	At most 1 *
0.124231	299.795	14.265	0.0001	At most 2 *
0.095763	227.501	3.841	0.0000	At most 3 *

Source: Author's Computation (2017)

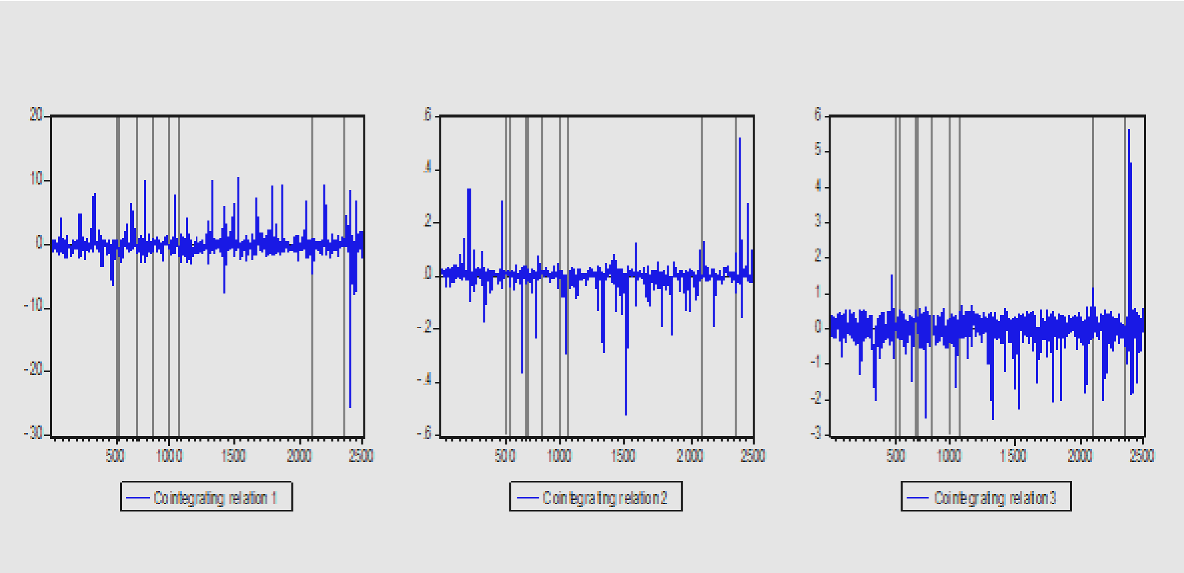
The co-integrating rank test is estimated using Johansen's methodology. This approach derives two likelihood estimators for the co-integrating rank: a trace test and a maximum Eigen value test. The co-integrating rank was formally tested using the trace and the maximum eigen value statistic. These test statistics indicate three co-integrating vectors at 5 percent level of significance as presented in Tables 21 and 22 above. This implies that a long-run equilibrium relationship exists among the variables under study. Thus, the stability of the dividend policy captured by the DPOR, RERA, and CAR has affected SSA banks' performance measured by ROE in both the short and long-run. The above tables also show, that the maximum-eigen value test indicates three normalized co-integrating equation(s) at 5 percent significant level. The details of these three normalized co-integrating equations and their adjustment coefficients are presented in Table 23 below.

Table 23: Co-integration Equations

ROE	RERA	CAR	DPOR
1.000000	0.000000	0.000000	0.068(0.036)
0.000000	1.000000	0.000000	0.378(0.010)
0.000000	0.000000	1.000000	0.182568(0.014)
Adjustment coefficients (standard error in parentheses)			
D(ROE)	-0.912529(0.03621)	0.047255(0.17490)	-0.063485(0.08983)
D(RERA)	-0.005543(0.00864)	-0.369680(0.04174)	-0.205679(0.02144)
D(CAR)	0.007637(0.00428)	0.050936(0.02069)	-0.053140(0.01063)
D(DPOR)	-0.008845(0.00835)	-0.200160(0.04032)	-0.352320(0.02071)

Source: Author's Computation (2017)

Figure 6: Graphical Representation of Cointegrating Equations



Source: Author's Computation (2017)

Table 23 and Figure 6 present the normalized co-integrating equation(s) coefficients with their standard error in parentheses. The normalized co-integrating coefficients only load on the dividend payout ratio with both positive and negative coefficients. The coefficients of the dividend payout ratio, 0.068, 0.378 and 0.183 are statistically significant based on the standard error test. This implies that banking performance as shown by the cointegrating equations can be determined by future-state and the stability of ROE, RERA, and CAR while the DPOR mainly determines the current level of banking performance and its movement in the right direction to bring the system back to equilibrium. The co-integration adjusted coefficients measure the long-run equilibrium or stability of banking performance. The ROE value of -0.913 in the first co-integrating equation reveals the performance level of the selected SSA banks which is not encouraging and calls for improvement. The adjustment coefficients values of -0.006 and -0.009 from co-integrating equation one reveal the negative impact of the RERA and DPOR, both dividend policies, on banking performance. However, the capital adequacy ratio value of 0.007 contributes positively to SSA banking performance. In the second co-integrating equation, the performance of the banking industry improved, as the performance level stood at 0.047. This was hampered in the third equation as a result of the negative impact of the DPOR in the first and second co-integrating equation which limits the performance of the banking industry by 0.009 and 0.200, respectively. The negative impact of the retention ratio in the second co-integrating equation also hampered SSA bank performance during the period under study. This implies that the more attention that is devoted to formulating effective dividend policy, the better will be the performance of the SSA banking industry.

6.2.3 VAR Optimal Lag Selection

Table 24: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2654.561	NA	9.20e-06	2.593428	2.607144	2.598458
1	-1527.413	2247.701	3.14e-06	1.518686	1.600979	1.548864
2	-1437.331	179.1966	2.95e-06	1.455223	1.606093*	1.5105*
3	-1403.290	67.55168	2.92e-06*	1.44641*	1.665854	1.526880
4	-1385.211	35.78683	2.94e-06	1.453156	1.741181	1.558778
5	-1362.029	45.77771	2.95e-06	1.454928	1.811530	1.585698
6	-1335.590	52.07799	2.94e-06	1.453525	1.878705	1.609443
7	-1321.220	28.23597	2.97e-06	1.463891	1.957647	1.644957
8	-1295.670	50.07920*	2.97e-06	1.463354	2.025688	1.669568

Source: Author's Computation (2017)

Table 24 above shows the result of the vector autoregressive lag length to choose the optimal lag for this study. The result shows a lag order of three (3) using the Akaike information criterion with a value of 1.446 while the lag order of two (2) using the Schwarz information criterion and Hannan-Quinn information criterion has values of 1.606 and 1.511, respectively. All these information criteria were statistically significant at 5 percent level. Based on this evidence, lag order two (2) which was the smallest minimum lag order revealed by Schwarz information criterion and Hannan-Quinn information criterion was selected for this study.

6.2.4 Panel Vector Error Correction Estimates

Table 25: Vector Error Correction Estimates

Cointegrating Eq:	CointEq1	CointEq2	CointEq3	

ROE(-1)	1.000	0.000	0.000	
RERA(-1)	0.000	1.000	0.000	
CAR(-1)	0.000	0.000	1.000	
DPOR(-1)	0.068	0.378	0.183	
	(0.036)	(0.010)	(0.014)	
C1	-0.131	-0.183238	0.038	
Error Correction:	∆ ROE	∆ RERA	∆ CAR	∆ DPOR
CointEq1	-0.913(0.036)	-0.006(0.009)	0.008(0.004)	0.009(0.027)
CointEq2	0.047(0.175)	-0.370(0.042)	0.051(0.021)	-0.504(0.128)
CointEq3	-0.063(0.090)	-0.206(0.024)	-0.053(0.011)	-0.352(0.021)
∆ ROE(-1)	-0.067(0.030)	-1.05E-05(0.007)	-0.009 (0.004)	-0.004 (0.007)
∆ ROE(-2)	-0.035(0.022)	-0.002 (0.005)	-0.006(0.003)	0.001(0.005)
∆ RERA(-1)	-0.006(0.173)	-0.296 (0.041)	-0.038(0.021)	0.163(0.040)
∆ RERA(-2)	-0.162(0.142)	-0.097(0.034)	-0.026(0.017)	0.085(0.033)
∆ CAR(-1)	-0.014(0.185)	-0.156(0.044)	-0.101(0.022)	0.120(0.043)
∆ CAR(-2)	0.043(0.176)	-0.042 (0.042)	-0.117(0.021)	0.014(0.041)
∆ DPOR(-1)	0.013(0.056)	-0.013(0.013)	0.003(0.007)	0.001(0.013)
∆ DPOR(-2)	0.006 (0.046)	0.004(0.011)	-0.003(0.005)	-0.014(0.011)
C2	8.81E-05(0.019)	0.000(0.004)	-0.000(0.002)	-0.000(0.004)
R-squared	0.493118	0.267416	0.190113	0.288941
Adj. R-squared	0.489957	0.262848	0.185063	0.284507
Sum sq. resids	1797.073	102.3385	25.14159	95.52210
S.E. equation	0.894694	0.213507	0.105825	0.206274
F-statistic	156.0030	58.53543	37.64233	65.16166
Log likelihood	-2947.799	290.3617	1876.613	368.2505
Akaike AIC	2.621946	-0.243683	-1.647445	-0.312611

Schwarz SC	2.659931	-0.205698	-1.609460	-0.274626
Mean dependent	-0.000383	-0.000275	-0.000289	0.000223
S.D. dependent	1.252770	0.248675	0.117227	0.243860

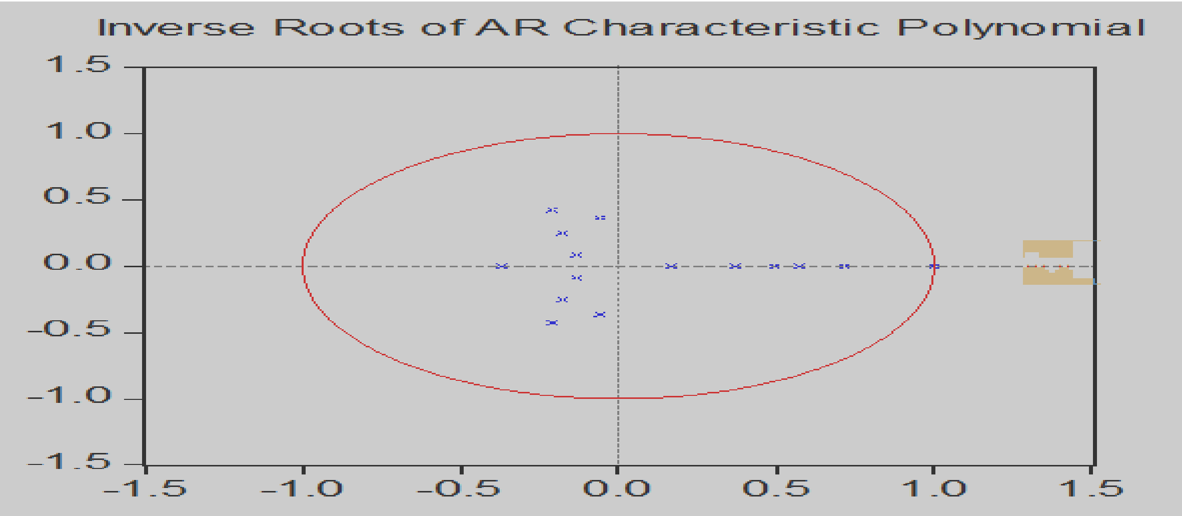
Source: Author's Computation (2017)

The presence of cointegration between variables suggests a long-term relationship among the variables under consideration. The VCEM can then be applied. The vector error correction estimate with standard error in parenthesis for the long run relationship between dividend policy and banking performance for three co-integrating equations is presented in Table 25 above. The C1 in the co-integrating equation are correctly signed, revealing that it will take 13 and 18 percent, respectively for the maladjustment in the co-integrating equation 1, and 2 to attain or adjust to the long run equilibrium or stability.

In examining the impact of the error correction of the dividend policy on banking performance, it was found from the fitted VECM that ROE at lag one and two, RERA at lag one and two, and CAR at lag one have an inverse relationship with the banks' ROE (performance). Thus, ROE at lag one and two, RERA at lag one and two, and CAR at lag one will worsen the banks' ROE ratio (performance measure) by 6.68, 3.46, 0.62, 16.24, and 1.43 percent, respectively. This implies that particular circumstances in the countries examined during the study period impacted the influence of the dividend retention policy on bank performance because all things being equal, this should not be a negative effect. This finding is contrary to U. Uwuigbe et al. (2012) and Agyei and Marfo-Yiadom (2011) studies that found that either payout or retention dividend policy has a positive relationship with performance. However, CAR at lag two, and DPOR at lags one and two have a direct relationship with banking performance. This is in tandem with the findings of Brighi and Venturelli (2014) and Odunga et al. (2013). The results further reveal that CAR at lag two and DPOR at lags one and two improved the performance of banking industry by 4.33, 1.26 and 0.57 percent, respectively. This positive effect reveals the signalling effect of dividends during this period such that it had a direct effect on bank performance as revealed by Ehikioya (2015). The positive relationship between capital adequacy and performance implies the significance of capital adequacy in formulating dividend policy. As noted by Nnadi et al. (2013), a bank must be adequately capitalised before making dividend decisions. The positive relationship further depicts the nexus between the capital ratio and funding costs. A bank with a high capital ratio incurs lower funding costs because of reduced bankruptcy costs (Brighi & Venturelli, 2013). The C2 estimate of 8.81E-05 reveals that the banking industry's performance could have been enhanced and improved through dividend policy during the period under investigation without serious risk.

The significance of the VECM was examined using the R-square statistic and it was revealed that 49 percent of the variation in the error associated with the performance of SSA banks can be explained by the dividend policy captured by the RERA, CAR and DPOR. The F- statistic value of 156.00 > $F_{0.05}(3, 1714) = 3.00$ shows that the fitted VECM was statistically significant and hence adequate and reliable in determining the causal relationship between the dividend policy and banking performance (ROE) in SSA.

Figure 7: Diagrammatic Representation of VECM Stability Condition Check



Source: Author's Computation (2017)

The results in Figure 8 show the VECM stability condition for the relationship among ROE, RERA, CAR and DPOR. However, the figure shows that, all the roots or the eigen values were within the unit circle. This implies that the VECM satisfied the stability condition. It can hence be used for policy formulation and implementation.

6.2.5 Panel Granger Causality Test

Table 26: VEC Block Exogeneity Wald Tests

Null hypothesis (H_0): There is no causality

Dependent variable: D(ROE)			
Excluded	Chi-sq	Df	Prob.
D(RERA)	1.931	2	0.381
D(CAR)	0.087	2	0.957
D(DPOR)	1.756	2	0.415
All	6.394	6	0.603
Dependent variable: D(RERA)			
D(ROE)	0.360	2	0.835
D(CAR)	12.540	2	0.002**
D(DPOR)	17.955	2	0.000***
All	37.319	6	0.000***
Dependent variable: D(CAR)			
D(ROE)	0.061813	2	0.9696
D(RERA)	3.784374	2	0.1507
D(DPOR)	19.16546	2	0.000***
All	44.22851	6	0.000***
Dependent variable: D(DPOR)			
D(ROE)	0.947218	2	0.623
D(RERA)	16.75244	2	0.000***
D(CAR)	8.226999	2	0.016**
All	68.30802	6	0.000***

Source: Author's Computation (2017). Note that *, **, and *** stands for 10, 5 and 1% level of significance respectively

The result of vector error correction Granger causality among the financial variables under consideration are presented in Table 26 above to show the direction of causal relations between each pair of the financial variables such as return on equity, retention ratio, capital adequacy ratio and dividend payout ratio. There is a unidirectional causality of error between the capital adequacy ratio and retention ratio; dividend payout ratio and retention ratio; and dividend payout ratio and capital adequacy ratio. It was also found that there was bidirectional causality of error between the retention ratio and dividend payout ratio; and capital adequacy ratio and dividend payout ratio. This is evident in the estimated probability of Chi-square statistic values of 0.002, 0.000; 0.016, and 0.001< 0.05. Thus, error as a result of the capital adequacy ratio and dividend payout ratio Granger causes error that arises as a result of the retention ratio; and errors as a result of the retention ratio and capital adequacy ratio Granger cause the dividend payout ratio. Furthermore, the combined error of return on equity, capital adequacy ratio and dividend payout ratio Granger causes error of the retention ratio. The combined error of return on equity, retention ratio, and dividend payout ratio Granger causes error of the capital adequacy ratio and the combined error from return on equity, retention ratio, and capital adequacy ratio Granger causes error that occurs from the dividend payout ratio at 5 percent level of significance. In other words, knowing the combined error from the retention ratio and dividend payout ratio, the level of error from the capital adequacy ratio can be determined. The combined error from return on equity, retention ratio and capital adequacy ratio also determines the level of error from the dividend payout ratio.

Similarly, following the study conducted by Dhamala et al. (2008) where it was established that causality can be tested using F-statistics and probability values under the null hypothesis of no causality, the Pairwise causality test was used to test the causality between dividend policies and the ROE of SSA commercial banks as shown in Table 27 below, since none of the policies granger cause ROE in the estimate of the block exogeneity Wald test.

Table 27: Pairwise Granger Causality Test

Null Hypothesis	F-Statistic	Prob	Decision	Type of Causality
RERA does not Granger Cause ROE	0.231	0.793	Accept	No causality
ROE does not Granger Cause RERA	0.965	0.381	Accept	No causality
CAR does not Granger Cause ROE	0.847	0.428	Accept	No causality
ROE does not Granger Cause CAR	3.229	0.039**	Reject@5%	ROE → CAR Uni-directional

DPOR does not Granger Cause ROE	0.969	0.379	Accept	No causality
ROE does not Granger Cause DPOR	3.601	0.027**	Reject@5%	ROE → DPOR Uni-directional
CAR does not Granger Cause RERA	1.185	0.306	Accept	No causality
RERA does not Granger Cause CAR	4.364	0.013***	Reject@1%	RERA → CAR Uni-directional
DPOR does not Granger Cause RERA	8.442	0.002***	Reject@1%	DPOR ↔ RERABi-directional
RERA does not Granger Cause DPOR	20.3805	1.7E-09***	Reject@1%	RERA ↔ DPOR Bi-directional
DPOR does not Granger Cause CAR	1.18027	0.307	Accept	No causality
CAR does not Granger Cause DPOR	2.57339	0.043**	Reject@5%	CAR → DPOR Uni-directional

Source: Author's Computation (2017). Note that ***, **, * represent rejection of H_o at 1%, 5% and 10% respectively; while → denotes unidirectional causality and ↔ denotes bi-directional causality.

The result of the Granger causality among the financial variables under consideration is presented in Table 27 to show the direction of causal relations between each pair of the financial variables such as ROE RERA, CAR and DPOR. The result shows that, there was a unidirectional causality between ROE and CAR; ROE and DPOR; RERA and CAR; and capital adequacy and DPOR and bidirectional causality between DPOR and RERA. This is evident from the estimated probability of F-statistic values given as 0.039, 0.027, 0.013, 0.000, 0.002 and 0.043 < 0.05. Thus, i) ROE Granger causes capital adequacy and this implies that banks' returns determine their ability to be adequately capitalized. ii) ROE Granger causes DPOR, implying that the more banks earn from equity, the more they implement payout policy as against retention policy. iii) RERA Granger causes capital adequacy and this implies that the more banks adopt dividend reinvestment plans, the more they generate earnings to increase their assets and solidify their capital base. This will not only serve as a cushion in times of shocks but promote their future growth.

6.3 Chapter Summary

This chapter presented the data analysis and interpretation and implications of the findings for the causality between dividend policies and bank performance using both ROA and ROE. Having established the causal relationship between dividend policy and bank performance in order to bring to light different views on the two contesting policies in the banking sector, this study's findings reveal that both policies have a positive relationship with performance, but only retention policy (RERA) granger causes performance (ROA) in SSA banks. Further conducting a robustness check using ROE as the measure of financial performance, our findings revealed that ROE Granger causes DPOR (unidirectional causality between ROE and DPOR) while neither DPOR nor RERA Granger cause ROE. This implies that when banks generate income from total shareholders' equity, they will stick to payout policy even though this policy does not enhance their performance (ROE) in SSA. In conclusion, paying out does not create value because the unidirectional causality was from banks' ROE to DPOR. A win-lose game will result if banks continue to payout, as is the case with SSA banks. An optimal dividend policy that promotes the firm's future growth must cater for future financing and increased assets. This finding is logical as what is generated should normally determine what will be paid out. However, given that SSA regional economic growth depends majorly on the financial system and that the banking sector is at the forefront of the financial landscape, banks should adopt policy that will enhance growth.

Banks across the world have long been known for their payout policy at the expense of viable investment opportunities that would enhance their activities (Jiraporn, Kim, & Kim, 2011). However, not all banks that are paying out are healthy. The following reasons are identified as reasons for firms to cut dividend payments and start re-investing their earnings: a) when the business model is less effective and long term growth is unlikely due to economic changes and externalities; b) the company needs to undertake a viable project or to complete the acquisition of a rival company; c) there is high degree of competition that is slowing down the growth of the company (See, www.imfultralong.org.uk).

The final condition is indeed the situation in the banking sector in SSA. The Lerner's index of competition for SSA commercial banks is less than 0.5 which shows that they are highly competitive and have low market power. Hence, they struggle to survive and need to promote value creation by maximising all available investment opportunities to ensure that not only profit but wealth is fully maximised. The only way to create future value and not merely to signal past earnings, is to adopt DRIPs which is the policy this study finds causes SSA commercial banks' financial performance. This thus sheds light on the puzzle of the dividend in the region's banking sector.

CHAPTER SEVEN

OPERATIONAL DIVERSIFICATION AND FINANCIAL PERFORMANCE

7.0 Introduction

This chapter discusses the estimation of the effect of operational diversification on financial performance of commercial banks in SSA. The chapter is divided into six sub-sections. Sub-section 7.1 focuses on the descriptive analysis; sub-section 7.2 shows the correlation analysis of the variables; sub-section 7.3 reveals the static regression (pooled, fixed and random) analysis; sub-section 7.4 reveals the post estimation tests; sub section 7.5 shows the dynamic panel analysis (SYS-GMM); and the chapter summary is presented in sub-section 7.6.

7.1 Descriptive Statistics of the Variables

This section examines the pooled observation of the variables used in this study for the period under investigation relating to the operational diversification of SSA banks with reference to the mean, standard deviation, skewness, kurtosis, and minimum and maximum statistics. Annual panel data are used to capture these variables with all in ratio form except SIZ that is in natural logarithm form.

Table 28: Summary Analysis of the Series: ROAA, HHIas, HHIde, HHIlo, HHIin, SIZ, LOD, LLR, and CIR

	ROAA	HHIas	HHIde	HHIlo	HHIin	SIZ	LOD	LLR	CIR
Mean	1.860	789232	267600.3	0.842	370380.1	13.191	4.360	5.173	65.681
Med	1.855	0.08594	0.1316	0.406	0.604	13.14	0.636	3.013	59.21
Max	38.713	3.12E+09	9394044	611.75	8.38E+08	18.30	3960	100.0	850.0
Min	-54.733	6.38E-06	7.59E-07	0.000	4.33E-06	3.778	0.000	0.000	0.000
St-D	3.3494	1.29E+08	3954318.	12.901	17615701	1.569	96.669	7.178265	48.334

Skew	-1.600	18.263	17.444	46.919	47.560	-0.864	35.48	6.125	7.285
Kurt	60.816	360.873	340.36	2221.8	2263.0	8.997	1351	65.52	89.91
Prob	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Obs	2265	2265	2265	2265	2265	2265	2265	2265	2265

Source: Author's computation (2017)

Table 28 shows the results of the descriptive analysis of all the activities regarding operational diversification and the financial performance of commercial banks in SSA for the period 2006-2015. The return on average assets (ROAA) measured the performance of the banking industry while HHIas, HHIde, HHIlo, HHIin which are proxies for assets, deposits, loans and income diversification are used to measure banks' operational diversification. The average rate of ROAA is 1.860 percent, which implies that the average performance of the SSA commercial banking industry is not low but encouraging. All the series display a high level of consistency as their mean, median and standard deviation values consistently fall within the range of minimum and maximum values of the series.

Furthermore, the relatively low value of standard deviations for most of the series except HHIin indicates the small level of deviation of actual data from their mean or expected average value. From the skewness statistics, only ROAA and SIZ are negatively skewed because their distributions have a long tail to the left while other variables in the series are positively skewed with their distribution having a long tail to the right. However, the kurtosis of the financial variables showed that all the variables under consideration are of a leptokurtic nature because the kurtosis coefficient indexes are all positive. Probability values of 0.000 for all the variables in the series show that the model is of good fit and all the variables in the study are expected to significantly impact the financial performance of the SSA banking industry. Due to availability of data, only 2 265 observations are recorded for all the variables in the series instead of 2500.

7.2 Correlation Analysis

To show the existence and direction of the association or relationship between pairs of variables in the operational diversification model, this section presents the correlation coefficients matrix. However, correlation analysis only depicts the degree and direction of linear relationships between pairs of variables.

Table 29: Correlation Matrix of the Series ROAA, HHIas, HHIde, HHIlo, HHIin, SIZ, LOD, LLR, CIR

VARI-ABLE	ROAA	HHIas	HHIde	HHIlo	HHIin	SIZ	LOD	LLR	CIR
ROAA	1								
HHIas	0.005	1							
HHIde	-0.016	0.800	1						
HHIlo	-0.000	-0.001	-0.001	1					
HHIin	0.003	0.010	0.007	0.001	1				
SIZ	0.125	-0.363	-0.392	0.020	0.035	1			
LOD	-0.343	-0.002	-0.002	-0.001	-0.001	0.095	1		
LLR	-0.145	-0.035	-0.014	-0.013	-0.011	-0.013	0.095	1	
CIR	-0.420	-0.011	0.006	-0.004	0.000	-0.218	0.009	0.042	1

Source: Author's computation (2017)

From Table 29, the nature of the relationship between the variables is mixed. While HHIas, HHIin and SIZ depict a positive but weak relationship with ROAA, other variables such as HHIde, HHIlo, LOD, LLR and CIR show a negative relationship of -0.016; -0.000; -0.343, -0.145; -0.420, respectively even though the HHIde and HHIlo correlation degree is extremely low and weak. However, the degree of LOD and CIR that is relatively high is still not a signal of multi-colinearity as it is not up to 0.8 which is the rule of thumb. From the HHIas perspective, only HHIde and HHIin are positively associated with HHIas while all other variables in the series are negatively correlated with HHIas.

In the stream of HHIde, only HHIin and CIR are positively related while the others remain negative, but none is sufficiently high to depict multi-colinearity. In the HHIlo stream, only HHIin and SIZ show positive correlation while others remain negative but are all extremely weak. While SIZ and CIR have positive but very weak correlation with HHIin, LOD and LLR have a negative relationship. From the SIZ, LOD, LLR and CIR perspectives, only CIR and LLR have a negative relationship with SIZ to the tune of -0.013 and -0.218, respectively. In conclusion, from the correlation matrix of this series, there is no evidence of a strong relationship that can lead to the problem of multi-colinearity in our estimations, but the correlation matrix is limited because it cannot show reliable relationships between variables with the inclusion of other explanatory variables. The degree and direction of association between pairs of variables derived from the correlation matrix does not give the result of each variable's association with all other explanatory variables in the series. It is for this reason that the study proceeded further to multivariate regression analysis such as static-Pooled, fixed effect, and random effect frameworks.

7.3 Pooled, FEM and REM Estimation

Pooled estimation places restrictions on the heterogeneity/uniqueness of the cross-sectional units by stacking all the observations without considering their cross-sectional or time series features with the assumption that both the regressors and constant estimates are the same across all banks (cross sectional subjects) and over time. In other words, subject and period-related effects are not considered in the estimation.

Relative to the pooled regression estimator, the fixed effect estimator takes cognizance of subject and/or period heterogeneity/uniqueness that may exist in the regression model. Thus, such heterogeneity effect is incorporated in the constant term for each of the corresponding cross-sectional units and/or period.

Because of inherent problems in the fixed effect model, such as the possibility of multi-colinearity; loss of degree of freedom as more dummy variables are added to the model and inability to track the effects of time-invariant variables, random effect estimation assumes that the heterogeneity is random rather than fixed and that the random effect is incorporated into the error term, thus forming a composite error term.

Table 30: Regression Estimations of Series: HHIas, HHIde, HHIlo, HHIin, SIZ, LOD, LLR, and CIR with Dependent Variable: ROAA

	POOLED		FEM		REM	
VARIABLE	COEFF	P>/t/	COEFF	P>/t/	COEFF	P>/t/
C	3.511	0.000***	-0.889	0.407	1.565	0.043**
HHIas	6.98e-10	0.364	1.81e-10	0.895	1.07e-09	0.270
HHIde	-2.75e-08	0.309	-4.41e-09	0.880	-2.34e-08	0.365
HHIlo	-6.18e-10	0.853	-3.35e-10	0.912	-3.93e-10	0.895
HHIin	0.000	0.972	0.001	0.815	0.001	0.858
SIZ	0.037	0.379	0.333	0.000***	0.161	0.004***
LOD	-0.011	0.000***	-0.011	0.000***	-0.011	0.000***
LLR	-0.044	0.000***	-0.024	0.016**	-0.030	0.001***
CIR	-0.028	0.000***	-0.022	0.000***	-0.025	0.000***
R-square	0.302		Within=0.273 Between = 0.314 Overall = 0.279		Within=0.271 Between = 0.382 Overall = 0.297	
Adj R-Squared	0.299					
F-stat	F(8,2256)=121.71		F(8, 2010) = 94.32			
Chi2-Stat					Wald Chi2(8)= 882.13	
Prob	Prob>F = 0.0000***		Prob>F = 0.0000***		Prob>Chi2 = 0.000***	

Source: Author's computation (2017). Note that ***, ** denotes significance at 1% and 5% level, respectively.

Table 31 shows the static regression estimate of the pooled, fixed and random effect models of operational diversification in SSA banks. From all three estimates, none of the dimensions of operational diversification (that is, assets, deposits, loans and income) are statistically significant, but the direction of the relationship recorded in the coefficients is different for all the estimations. For pooled FEM and REM, HHIde and HHIlo's coefficients were negative which denotes that a higher HHIde and HHIlo in banks leads to a lower ROAA even though they are too small to be significant at any level. HHIas and HHIin's coefficients for all the estimations are positive but also insignificant in explaining the financial performance (ROAA) of banks in SSA. This shows that, for SSA banks, as income that is classified into interest income or fees and commission is used for a different spread of banking activities, it causes a decrease in the banks' financial performance. Likewise, an increase in assets assigned to fixed, liquid and non-earning assets to finance different activities inhibits banks' financial performance. Liquidity captured by LOD and other control variables; LLR and CIR is statistically significant at 1 percent but all with negative relationships with SSA banks' financial performance measure (ROAA).

While LOD and LLR oppose *a priori* expectation, the negative effect of CIR aligns with *a priori* expectation because a reduction in CIR depicts managerial efficiency which is also a signal of improved performance. This negative effect of all these ratios implies that the higher all these ratios, the lower the performance for SSA banks. However, SIZ posits a positive relationship with ROAA in all the estimations and is significant at 1 percent for the FEM and REM estimation, while the pooled effect remains insignificant. The significance of the constant term at 5 percent shows that the models are well fitted to explain the operational diversification of banks in SSA. The R-Square of pooled, FEM and REM are 30, 31 and 38 percent, respectively.

7.4 Post Estimation Tests

To verify the best estimator which is relatively efficient and consistent among the Pooled GLS regression estimator, FEM estimator and REM estimator, the Restricted F-test and Hausman test are conducted.

7.4.1 Restricted F-test of Fixed Heterogeneity Effect

The summary of test statistics used to validate the presence of heterogeneity between cross-sectional units (banks) is shown in this section to establish whether there is a significant difference between the constant terms (differential intercept) across cross-sections. This is performed to validate whether there is an established validation for the restriction of the pooled GLS estimation.

Table 31: Restricted F-Test of Heterogeneity

Null Hypothesis	F-statistics	Probability	Degree of Freedom
Ui=0	4.57	0.000***	(246, 2010)

Source: Author's computation (2017). Note that *** denotes significance at 1% level.

From Table 31, the F-statistics values of 4.57 with probability values of 0.0000 imply that there is sufficient evidence to reject the null hypothesis that all differential intercepts corresponding to the cross-sectional specific units are equal to zero. Therefore, it can be concluded, that there is cross-sectional uniqueness/heterogeneity effect between the 250 SSA commercial banks used in this study to determine the effect of operational diversification on financial performance. Thus, pooled regression estimator restriction is not valid as the cross-sectional heterogeneity effect is too significant to be overlooked and ignored.

7.4.2 Hausman Test

To identify the most reliable estimation between the fixed effect estimation and the random effect estimation, the Hausman test is conducted to test if there is a substantial difference between the estimates of the fixed effect estimator and that of the random effect estimator. The null hypothesis underlying the test is that, fixed effect estimates do not differ substantially from the random effect estimates. The test statistics developed by Hausman have an asymptotic chi-square distribution.

Table 32: Hausman Test of FEM and REM

Null Hypothesis: There is No Substantial Difference between Fixed Effect and Random Effect Estimates		
Test-Estimate	Chi-Square Statistics	Probability
chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)	34.22	0.000***

Source: Author's computation (2017). Note that *** denotes 1% significant level, b = consistent under H_0 and H_1; obtained from xtreg and B = inconsistent under H_1, efficient under H_0; obtained from xtreg

From Table 32, the chi-square value of 34.22 alongside a probability value of 0.0000 shows that there is sufficient evidence to reject the null hypothesis; hence, the difference in coefficients is unsystematic and highly substantial. This implies that there is correlation between the random effects incorporated into the composite error term and one or more of the independent variables. Thus, the FEM estimation is the best model that is most efficient, consistent and preferred, while REM estimation is considered inefficient.

From the foregoing, of the three estimators (pooled regression estimator, fixed effect estimator and random effect estimator) used for static analysis of operational diversification and financial performance in SSA banks, the fixed effect estimator is the most appropriate. Nonetheless, given the fact that in a model where there is large N (cross-sections) and T (time-period) is relatively small; the fixed effect estimator becomes inconsistent because it is simply an OLS estimator based on first difference. In this situation, the GMM estimator becomes more reliable, efficient and superior (Han & Phillips, 2010).

The model used for this study is for 10 years (2006-2015) due to availability of data. As noted by Han and Phillips (2010), when T is small, the estimator becomes asymptotically random. System GMM was proposed by Arellano and Bover (1995); Blundell and Bond (1998) and Hsiao, Pesaran, and Tahmiscioglu (2002) to solve this problem because it uses level equation based moment conditions with the usual orthogonality conditions of Arellano and Bond's GMM type. Hence, this study proceeds to the System GMM analysis due to the inconsistency of the FE estimator selected by the Hausman test.

7.5 Dynamic Panel Analysis

This section presents the results of the dynamic analysis conducted to determine the effect of operational diversification on banks' financial performance in SSA when the influence of past realisation of return on average assets (measure of financial performance) is taken into consideration. Although GMM can be used for diverse purposes in econometric analysis, for this study, it was used to measure the effect of past realisations of the dependent variable. Arellano and Bond (1991) pointed out that GMM estimators relative to the first-difference estimator, OLS estimator, IV estimator, etc, exhibit bias and variance; thus, the rationale behind the choice of estimator (Two- step) employed in this study.

Table 33: Two-Step SYS-GMM of the Series: HHIas, HHIde, HHIlo, HHIin, SIZ, LOD, LLR, and CIR with Dependent Variable: ROAA

No of groups: 246		
No of Instruments:110		
F (9, 245) = 1.54e+06		
Prob (F) = 0.0000***		
Variable	Coefficient	p>/t/
C	2.560	0.000***
ROAA(L1)	0.171	0.000***
HHIas	6.84e-10	0.000***
HHIde	-2.07e-08	0.000***
HHIlo	9.59e-09	0.000***
HHIin	0.006	0.000***
SIZ	0.044	0.000***
LOD	-0.006	0.000***
LLR	0.004	0.000***
CIR	-0.024	0.000***

Source: Author's computation (2017). Note that ***, ** denote significance at 1% and 5% level, respectively.

From the SYS-GMM analysis in Table 33, all the variables of interest including the ROAA (L1) were significant at 1 percent level with only HHIde, LOD and CIR which is a measure of banks' efficiency, having a negative relationship with ROAA. The significant and positive effect of HHIas, HHIlo and HHIin conforms to the resource-based value (RBV) theory that postulates that firms can boost their performance using their available resources via competitive advantage, and scope and scale efficiency from synergy. Assets, income, loans and deposits are various resources at the disposal of commercial banks which they can actively utilise to boost their performance and growth.

The negative effect of HHIde, although with a very small coefficient, may be due to the problem of managerial entrenchment and hubris. This is a newly introduced dimension of diversification in the banking sector as banks previously focused on revenue diversification; this reduced their market power in deposit diversification (Skully & Perera, 2012). Deposits are the banking sector's main liability with a large proportion from customers (customers' deposits) and managers are in charge of its utilisation to induce growth and wealth maximisation. Due to the agency problem, most managers regard diversification as an opportunity to increase their power and prestige and hence fail to manage diversified activities in a manner that creates more value for the firm.

The positive and significant effect of HHIas, HHIlo, HHIin conforms to the findings of Ugwuanyi and Ugwu (2012); Turkmen and Yigit (2012); Gurbuz, Yanik, and Ayturk (2013); Senyo et al. (2015); Sissy (2015) and I. M. Mulwa et al. (2015) that diversification reduces systematic risk, reduces earnings volatility and decreases agency costs but contradict Behr et al. (2007); Mishra and Sahoo (2012) and Armstrong and Fic (2014) findings that diversification in banks has failed to create value such that those with greater operational diversification tends to witness fluctuations in financial performance due to their failure to determine the optimum degree of diversification and their inability to identify the most viable diversification activities.

The negative findings on HHIde might be due to the economic instability and challenges faced by most of the SSA countries included in this study during the sampled time frame because the major component of bank deposits is from customers and banks' degree of market power in this dimension of diversification is still too low to render them competitive and able to enjoy economies of scale and scope from bank deposits. However, this finding conforms to those of Baele et al. (2007).

The findings on all the other control variables conform to the *a priori* expectation except liquidity (LOD) that has negative relationship with ROAA. Commercial banks in most SSA countries operate beyond the prudentially prescribed liquidity ratio limit because of the high proportion of their liquid assets to absorb unexpected liquidity shocks that can hinder their stability and growth. The negative effect of liquidity calls for prompt attention to ensure that banks are not over or under liquid as this can cause the agency problem (costs) due to injudicious use of the free cash flow or lack of finance. While over liquidity implies that banks will be unable to meet unexpected or occasional withdrawal of funds, under or low liquidity implies that they may not have sufficient funds to explore opportunities and hence, will generate low earnings (Demirgüç-Kunt & Huizinga, 2010). Banks must exercise caution in choosing their dividend policy so that their liquidity is not jeopardised. While dividend payout reduces free cash flow, dividend retention enables adequate financing of viable projects that enhance growth.

SIZ's positive and significant effect on ROAA conforms to the findings of Stiroh (2004a); DeYoung and Rice (2004a); Stiroh and Rumble (2006) and Afzal and Mirza (2012). Bank size is a variable used in the banking sector to control for risk and cost difference. The study's finding implies that the higher a bank's total assets, the more it can diversify into viable investment opportunities, explore diverse business lines, build market power and hence, create more value that will boost exploitation of economies of scale and scope and enhance financial performance.

Regarding the Cost to Income Ratio (CIR), higher CIR depicts increased inefficiency (poor performance) and a reduction in CIR depicts managerial efficiency which is expected to boost banks' financial performance (Goddard et al., 2008). Hence, the negative effect of CIR on ROAA implies decreasing cost inefficiency which is a good signal of managerial efficiency and the fact that banks in SSA are going concerns because commercial banks' performance is improved whenever they are cost and operationally efficient (Simpasa & Pla, 2016b).

7.5.1 Diagnostic Test

Despite the numerous merits of dynamic data analysis, the presence of auto correlation or serial correlation and over-identification of instrument has been a common problem attached with generalised method of moments (GMM). These problems limit the efficiency of GMM estimators (Hayakawa, 2014). Moreover, as noted by Hayakawa (2014), two main factors determine the GMM estimator's finite sample behaviour; viz, the number of moment conditions and the strength of instrument identification. The J-test (Hansen/ Sagan test) has been widely accepted to test for the identification of problem validity in GMM, but the validity of the instrument and the reliability of SYS-GMM estimation is checked using the Hansen test while the serial correlation is tested using the Arellano and Bond (1991) order one and two tests.

Therefore, following Pathan and Skully (2010), the Hansen test for over-identification of the instrument, and AR (1) and AR (2) tests for auto correlation are used as the post estimation check for the justification of an efficient estimate in our dynamic panel analysis conducted for operational diversification and financial performance of banks in SSA.

Table 34: Hansen Test

Ho: There is No Over-Identification of Instrument		
Chi^2 (100)	93.13	
Prob>Chi^2	0.562	
Hansen Test for all Levels		
Excluding group	Chi^2(50)	52.03
	Prob >Chi^2	0.395
Difference (H_0=exogenous)	Chi^2 (50)	45.10
	Prob >Chi^2	0.670

Source: Author's computation (2017)

Using SIZ as the instrument for orthogonal deviation, the results from Table 34 show that, the probability value of the Hansen tests for both the including and excluding group (56.2, 39.5 and 67%, respectively) are greater than 5 percent and are considered insignificant. Hence, we conclude that our SYS-GMM estimation is efficient and reliable with a valid instrument as the null hypothesis is accepted that there is no over specification of instruments used in the operational diversification model analysis.

Table 35: Arellano and Bond AR (1) and AR (2) Serial Correlation Tests

Ho: There is No Serial Correlation		
Order	Z	Prob>Z
AR (1)	-3.59	0.000***
AR (2)	1.42	0.156

Source: Authors' computation (2017). Note that "***" represents 1% level of significance.

Table 35 shows the AR (1) and AR (2) results of the test for serial/auto correlation. At order one, it is expected that there will be serial correlation irrespective of the lag length but it will correct itself at order two. From the findings in Table 35, we reject the null hypothesis in the AR (1) with 0.000 probability value and accept the null hypothesis at AR (2) with 15.6 percent at lag structure (2/2) used to estimate the SYS-GMM. Acceptance of the null hypothesis at order two implies that there is no evidence of serial correlation at the chosen lag length. Thus, the findings from the operational diversification model estimation in SSA banks are efficient, consistent and reliable.

7.6 Chapter Summary

This chapter presented the data analysis and interpretation and implications of the findings for the effect of operational diversification on the financial performance of the selected SSA banks. Given the merits and robustness of the SYS-GMM analysis, the findings from SYS-GMM form the basis for conclusions and recommendations on SSA banks' operational diversification model. Hence, this study concludes that diversification of operational activities in SSA commercial banks has a direct and significant effect on their financial performance. However, care should be taken to monitor the diversification strategy to ensure that no dimension of banks' activities is neglected. It is better for banks to build market power from all their resources as this gives them a competitive edge.

Furthermore, managers' pecuniary benefits and incentives should be controlled to ensure that the problem of managerial hubris and managerial entrenchment is reduced to the barest minimum. Aggarwal and Samwick (1999) maintain that increased diversification is characterised by higher managerial incentives which can perpetrate exorbitant agency costs that hinder bank performance if not monitored. Managers take advantage of diversification to boost their image as well as their income. It is possible for them to maximise profit but not wealth due to their fringe benefits. This could be the reason why the SSA banking sector (excluding South Africa and Mauritius for obvious reasons) remains immature even though its banks are competitive and have built individual market power to some extent.

For instance, the Kenyan banking sector consists of 43 commercial banks and even Nigeria which has the second largest banking market has expanded into other activities aside from its primary intermediation role such as Banc-assurance, financial advisers, mortgage banking, asset advisory and management, pension administrators and export-trade financing. Following the RBV theory, all the banking sector's operational resources (assets, loans, deposits and income) are tools to explore wider, new and viable investment opportunities in addition to their traditional intermediary role. This would enable banks to gain market power and withstand competition as the SSA banking sector is highly competitive. However, successfully achieving the goals of diversification calls for training, development and deployment.

Given that the number of instruments (110) is far less than the number of groups (246); that all the Hansen, AR (1) and AR (2) tests are passed and that the F-test of joint significance of independent variable depicts that all the independent variables in the operational diversification model are jointly significant at 1 percent, the SYS-GMM estimate is an efficient estimate and the basis upon which our recommendations are made in the concluding chapter.

CHAPTER EIGHT

DIVIDEND POLICY, AGENCY COSTS, MARKET RISK AND BANK PERFORMANCE

8.0 Introduction

This chapter discusses the estimation of the modern portfolio theory model on dividend policy, agency costs, market risk and bank performance. The chapter is divided into nine sub-sections. Sub-section 8.1 focuses on the new generation unit root test; sub-section 8.2 addreses the descriptive analysis; sub-section 8.3 shows the correlation analysis of the variables; sub-section 8.4 analysis the optimal lag selection; sub-section 8.5 reveals the cointegration analysis; sub section 8.6 shows the vector error correction model estimates; sub-sectio 8.7 reveals the analysis on impulse response function; sub-section 8.8 shows the variable decomposition estimates and the chapter summary was presented in sub-section 8.9.

8.1 Panel Unit Root

Secondary data is used in this study; however, before analysing this data, the stationary test must be conducted so as to detect the order of integration in case there is a co-integrating relationship between the variables and to avoid a spurious analysis. The empirical findings affirmed that none of the various unit root tests is free from power properties and size shortcomings; hence, to ensure authentic evidence on the order of integration, several unit root tests such as Levin et al. (2002); Choi (2001) ADF Chi Square; and Maddala and Wu (1999) Fisher type panel unit root tests were conducted.

Table 36: Levin Lin and Chu (LLC), Im, Pesaran and Chin, Augmented Dickey Fuller (ADF) and Maddala and Wu (PP) Fisher-type Unit Root Tests

Variables		Levin, Lin, and Chu (None)		Levin, Lin, and Chu (Individual Intercept)	
	Order	t*Stat	Prob-Value	t*Stat	Prob-Value
ROA	I(1)	-48.6650	0.0000***	-36.6509	0.0000***
DPOR	I(1)	-46.7454	0.0000***	-11.2482	0.0000***
AUR	I(1)	-31.3919	0.0000***	-17.1476	0.0000***

LIR	I(1)	-191.822	0.0000***	-185.195	0.0000***
FEXR	I(1)	-6.29359	0.0000***	-55.8357	0.0000***
Variables		Im, Pesaran and Chin (None)		Im, Pesaran and Chin (Individual intercept)	
	Order	t*Stat	Prob-Value	t*Stat	Prob-Value
ROA	I(1)	N/A	N/A	-13.4432	0.0000***
DPOR	I(1)	N/A	N/A	-14.9463	0.0000***
AUR	I(1)	N/A	N/A	-6.23261	0.0000***
LIR	I(1)	N/A	N/A	-39.8551	0.0000***
FEXR	I(1)	N/A	N/A	-25.0120	0.0000***
Variables		ADF Fisher Chi-square Unit-root test (None)		ADF Fisher Chi-square Unit-root test (Individual intercept)	
	Order	t*Stat	Prob-Value	t*Stat	Prob-Value
ROA	I(1)	1960.44	0.0000***	1061.55	0.0000***
DPOR	I(1)	2093.19	0.0000***	1142.17	0.0000***
AUR	I(1)	913.316	0.0000***	410.733	0.0000***
LIR	I(1)	1422.29	0.0000***	958.485	0.0000***
FEXR	I(1)	520.324	0.0000***	333.150	0.0000***
Variables		PP Fisher-type Chi Square Unit root-test (None)		PP Fisher-type Chi Square Unit root-test (Individual intercept)	
	Order	t*Stat	Prob-Value	t*Stat	Prob-Value
ROA	I(1)	3188.80	0.0000***	2352.11	0.0000***
DPOR	I(1)	3376.91	0.0000***	2417.23	0.0000***
AUR	I(1)	1555.13	0.0000***	917.255	0.0000***
LIR	I(1)	1458.73	0.0000***	980.303	0.0000***
FEXR	I(1)	1815.24	0.0000***	1756.79	0.0000***

Source: Author's Computation (2017). Note that "***" represents 1% level of significance.

The panel unit root test presented in the table above shows that all the variables were stationary at first differencing (order one). Return on assets, the dividend payout ratio, asset utilisation ratio, lending interest rate and foreign exchange rate were all stationary at order one (I (1)) at both cross section and individual level during the study period. The reason is that the probability of Levin, Lin and Chin; Im, Pesaran and Chin t-statistic values: 0.000, 0.000, 0.000 and 0.000; Augmented Dickey Fuller (ADF) test statistic and Philip Perron statistic values: 0.000, 0.000, 0.000 and 0.000 for each variable was less than the probability of the error margin 0.05 allowed for in the estimate in this study.

This result implies that there is a short run equilibrium relationship between the variables under investigation. The short run stability of these variables as revealed by the panel unit root test led to further description of the variables, the level of correlation between them and estimation of cointegration to determine the long run equilibrium relationship or stability of the linear combination of the variables in the long run.

8.2 Descriptive Statistics of the Variables

This section presents all the variables used in this study for the period under investigation with reference to their mean, median, standard deviation, skewness, kurtosis, Jarque-Bera, probability, and minimum and maximum statistics.

Table 37: Descriptive Analysis of Series: ROA, DPOR, AUR, LIR and FEXR

	ROA	DPOR	AUR	LIR	FEXR
Mean	0.021383	0.458260	2.257544	18.73833	4.283412
Median	0.019331	0.435560	2.420000	16.08661	4.454357
Maximum	0.425368	2.670570	41.10000	65.41750	8.987665
Minimum	-0.392891	0.000000	-48.89000	4.585314	-0.079552
Std. Dev.	0.030300	0.239113	4.637912	12.11102	2.260500
Skewness	1.174345	0.886296	-1.668572	1.640658	-0.366750

Kurtosis	51.94766	7.329711	28.79675	5.817594	2.253093
Jarque-Bera	250144.7	2264.546	48603.07	1646.116	111.9179
Probability	0.000000	0.000000	0.000000	0.000000	0.000000
Observations	2500	2483	1724	2112	2451

Source: Author's computation (2017)

Table 37 above shows the descriptive analysis results of all the activities with regard to the relationship between dividend policy, agency costs, market risk and bank performance for the period 2006-2015. The ROA measured the performance of the banking industry; the DPOR was used to capture the dividend policy, the asset utilisation ratio (AUR) captures agency costs and the lending interest rate (LIR) and foreign exchange rate (FEXR) proxy market risk and both capture market risk in this study. The results revealed that the average ROA, DPOR, AUR, LIR and FEXR are 0.021383; 0.458260; 2.257544; 18.73833 and 4.283412. This implies that the average performance of the banking industry as determined by ROAs is very low and not encouraging. The DPOR revealed that SSA commercial banks paid out about 46% on average during the years examined.

The maximum and minimum ROA, DPOR, AUR, LIR and FEXR are -0.392891 and 0.425368; 0.000000 and 2.670570; -48.89000 and 41.10000; 4,585314 and 65.41750; -0.079552 and 8.987665, respectively. The standard deviation values of 0.030300, 0.239113, 4.637912, 12.11102, 2.260500 revealed the rate at which the ROA, DPOR, AUR, LIR and FEXR deviated from their respective average or expected value. It was also found that skewness of the ROA, dividend payout, and LIR (market risk proxy) which are 1.174345, 0.0886296 and 1.640658, respectively are positively skewed because their distributions have a long tail to the right while the AUR and FEXR (market risk proxy) which are -1.668572 and -0.366750, respectively are negatively skewed because their distributions have a long tail to the left. However, the kurtosis of the financial variables showed that all the variables under consideration are leptokurtic in nature because the kurtosis coefficient indexes are all positive. The probability values show that the variables are of good fit to significantly impact the performance of the SSA banking industry.

8.3 Correlation Analysis

This section explains how the variables under study relate to each other to show the linear relationship that exists between the pairs of variables and ensure that there is no multi-colinearity problem in our estimations.

Table 38: Correlation Matrix of the Series: ROA, DPOR, AUR, LIR and FEXR

	ROA	DPOR	AUR	LIR	FEXR
ROA	1.000000				
DPOR	-0.100131	1.000000			
AUR	-0.015945	-0.046986	1.000000		
LIR	-0.027607	-0.015794	-0.077375	1.000000	
FEXR	0.038356	0.011522	-0.079586	0.533316	1.000000

Source: Author's computation (2017)

From the above table, only FEXR which is one of the market risk proxies is positively related with banks' performance measured by ROA, dividend payout and the LIR (market risk). Their correlation coefficients are 0.04, 0.01 and 0.53, respectively. The implication is that any improvement in the exchange rate will lead to an affordable lending interest rate and encourage dividend payout that will enhance ROA. The AUR which is a proxy of agency costs is negatively related with bank performance and dividend payout with the degree of relationship given as -0.02 and -0.05, respectively. Thus, as agency costs increase, the DPOR will drop and the bank's performance will be negatively affected because ROA will continue to decrease.

This result also buttresses our finding from objective two that the retention ratio influences bank performance. The DPOR has a negative relationship with bank performance with a correlation coefficient of -0.10. This implies that a bank that fully meets the capital adequacy ratio requirements laid down by the Basel committee has little prospect of paying dividends. From the correlation matrix, the strongest relationship between the pairs of variables is between the two proxies of market risk (the foreign exchange and interest rates) with a correlation coefficient of 0.53, but it is not as strong as the 0.8 predicted by the rule of thumb that can lead to multi-colinearity problems in this study.

8.4. Vector Auto-Regression Optimal Lag Selection

Different criteria are used to choose the optimal lag structure for the model. According to Hyndman and Athanasopoulos (2014), AIC criteria tend to choose a larger number of lags, hence, for VAR and VEC analysis, SIC is preferable.

Table 39: Optimal Lag Selection of Series: ROA, DPOR, AUR, LIR and FEXR

LAG	LOGL	LR	FPE	AIC	SIC	HQIC
0	-2055.709	NA	0.126493	12.12182	12.17812	12.17812
1	-539.9492	2978.022	1.97e-05	3.352642	3.690490	3.690490
2	-427.0536	218.4861	1.17e-05	2.835609	3.454998*	3.454998*
3	-405.6905	40.71548	1.20e-05	2.857003	3.757932	3.757932
4	-374.9725	57.64146	1.16e-05*	2.823368*	4.005836	4.005836
5	-359.6769	28.25190	1.23e-05	2.880452	4.344461	4.344461
6	-327.4859	58.51192*	1.18e-05	2.838152	4.583701	4.583701

Source: Author's computation (2017). Note that (*) indicates the lag order selected by each criterion; LR: Sequential modified LR test statistic (each at 5% level of significance); FPE: Final Prediction Error; AIC: Akaike Information Criterion; SIC: Schwarz information criterion; HQIC: Hannan-Quinn information criterion.

The table above shows the result of the Vector Auto Regression lag length criteria to select the most appropriate lag for this study. The VECM model of lag order of four (4) is revealed using the Akaike information and Final Prediction Error criterion with values of 2.823368 and 1.16e-05*, respectively, the sequential modified LR test statistic selects lag 6 with a value 58.51192, and the VECM of lag order of two (2) is revealed using the Schwarz information criterion and Hannan-Quinn information criterion with the same values given as 3.454998. All these information criteria are statistically significant at 5 percent level. Based on this evidence, a

VECM of lag order two (2) which is the smallest lag order revealed by the Schwarz information criterion and Hannan-Quinn information criterion, is selected for this study.

8.5 Panel Cointegration Test

According to Abadir and Taylor (1999), the cointegration test is conducted to test for significant deviation of the integrated variables from a certain relationship. Cointegration means the presence of a long-run association between economic variables such that co-integrated variables enable the correction of short-term disturbances in the long-term. From the evidence of the unit root test that the variables are integrated at the same order I (1), there is a need to test for the existence of a long run association between the variables. Therefore, the Kao ADF Residual based and Johansen Fisher-Based Cointegration tests are used to test the long run co-movement of these series.

Table 40: Kao ADF Residual Based Cointegration Test of Series: ROA, DPOR, AUR, LIR, and FEXR

Ho: There is No Cointegration		
Trend Assumption: No deterministic Trend		
	t-Statistic	Prob. Value
ADF	-3.154711	0.0008***

Source: Author's Computation (2017). Note that "***" represents rejection of the null hypothesis at 5% level of significance.

The estimate from the Kao Residual ADF test in the table above was significant at 5 percent with t-statistics -3.154711; hence, the null hypothesis is rejected and there is confirmed evidence that the variables are co-integrated in the long run.

Table 41: Johansen Fisher-Based Cointegration Test of Series: ROA, DPOR, AUR, LIR, and FEXR

Ho: There is No Cointegration
Cointegration Rank Test using Trace Statistic

Eigen value	Trace Statistic	5% Critical Value	Prob. Value	Hypothesized No. of CE(s)
0.198180	396.4800	69.81889	0.0001	None ***
0.164119	233.6979	47.85613	0.0001	At most 1 ***
0.094171	101.5771	29.79707	0.0000	At most 2 ***
0.037893	28.68408	15.49471	0.0003	At most 3 ***
0.000291	0.214301	3.841466	0.6434	At most 4
Cointegration Rank Test using Maximum Eigen Value Statistic				
Eigen value	Maximum Eigen Value Statistic	5% Critical Value	Prob. Value	Hypothesized No. of CE(s)
0.198180	162.7821	33.87687	0.0001	None ***
0.164119	132.1208	27.58434	0.0000	At most 1***
0.094171	72.89301	21.13162	0.0000	At most 2 ***
0.037893	28.46978	14.26460	0.0002	At most 3 ***
0.000291	0.214301	3.841466	0.6434	At most 4

Source: Author's Computation (2017). Note that "***" represents rejection of the null hypothesis at 5% level of significance.

Using the Johansen Fisher based cointegration test to estimate the co-integrating rank test, two likelihood estimators are used for the co-integrating rank: a trace test and a maximum Eigen value test. The co-integrating rank was formally tested using the trace and the maximum Eigen value statistic. This trace statistic indicates five co-integrating vectors at 5 percent level of significance as presented in Table 41 above. This implies that a long run equilibrium relationship exists between the variables under study.

Thus, the stability of the relationship between dividend policy captured by DPOR, agency costs captured by AUR and market risk captured by LIR and FEXR will affect banking performance measured by ROA in both the short and long run. From the above tables, the maximum-Eigen value test indicates four normalized co-integrating equation(s) at 5 percent significant level.

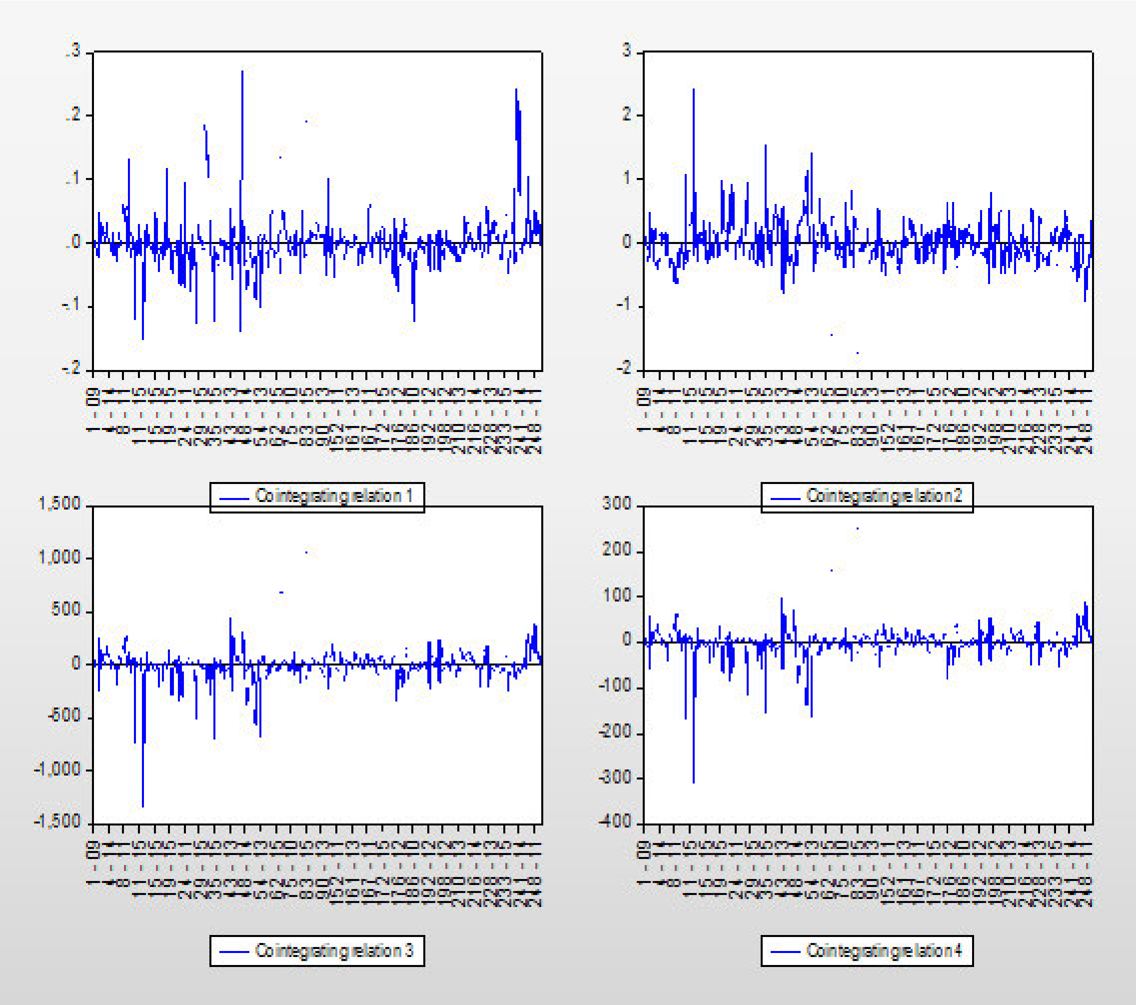
The details of these normalized co-integrating equations and their adjustment coefficients are presented in Table 42 and Figure 8 below.

Table 42: Cointegration Equations

ROA	DPOR	LIR	FEXR	AUR
1.000000	0.000000	0.000000	0.000000	0.004475 (0.00075)
0.000000	1.000000	0.000000	0.000000	-0.049142 (0.00777)
0.000000	0.000000	1.000000	0.000000	29.15276 (2.37089)
0.000000	0.000000	0.000000	1.0000000	6.751219 (0.53217)
0.000000	0.000000	0.000000	0.000000	1.0000000
Adjustment Coefficients (Standard Error in Parentheses)				
D(ROA)	-0.359(0.029)	-0.008(0.004)	3.25E-05(9.5E-05)	2.41E-05(0.000)
D(DPOR)	-0.010(0.218)	-0.288(0.035)	-1.21E-05(0.00069)	-0.002(0.003)
D(LIR)	-1.221(4.159)	-1.2575(0.671)	-0.052(0.013)	0.233(0.057)
D(FEXR)	0.095(0.127)	-0.001(0.021)	0.001(0.000)	-0.003(0.002)
D(AUR)	-2.946(4.310)	-0.789(0.696)	0.007(0.013)	-0.095(0.060)

Source: Author’s computation (2017)

Figure 8: Graphical Representation of Cointegrating Equations



Source: Author's computation (2017)

The table and figure above present the normalized co-integrating equation(s) coefficients with their standard error in parentheses. The normalized co-integrating coefficients only load on the asset utilization ratio with both positive and negative coefficients. The coefficients of AUR: 0.004, -0.049, 29.153, 6.751 and 1.000 which are statistically significant based on the standard error test revealed that banking performance as shown by the co-integrating equations can be determined by future-state and the stability of ROA, DPOR, LIR and FEXR while AUR (agency costs) is the major determinant of the current level of ROA for it to move in the right direction to bring the system back to equilibrium. The cointegration adjusted coefficients measure the long-run equilibrium or stability of banking performance.

The ROA value -0.359 in the first co-integrating equation revealed the performance level of the banking industry which is not encouraging and calls for improvement. DPOR, LIR and AUR given as: -0.010, -1.221, -2.497, respectively revealed the negative impact of DPOR, LIR and AUR on ROA, even though the FEXR value of 0.096 contributes positively to ROA. In the second, third and fourth co-integrating equation the performance of the banking industry improved as the performance level stood at -0.008 and 0.000, respectively. This result was enhanced by improvement in FEXR, AUR and LIR that contributes positively and significantly at 0.001, 0.007 and 0.233 to banking performance in the third and fourth co-integrating equation. This implies that the more attention the regulatory authority pays to stable and favourable foreign exchange and lending interest rates (measures of market risk), as well as management of agency costs, the better the SSA banking industry will perform.

8.6 Vector Error Correction Estimations

According to Mahadevan and Asafu-Adjaye (2007), the two common methods of detecting the direction of causality between co-integrated variables are VAR and VECM; hence, VECM is used in this study to show the long run relationship between the variables based on affirmation of the long run association between the variables. The VECM with five (5) simultaneous equations is estimated to examine the short run properties of the long run relationships between the study series. A VECM is a restricted VAR used for non-stationary co-integrated series.

VEC is of more merit than VAR because its cointegration relations are built in its specification such that the endogenous variables' long-run behaviour is restricted to cause convergence in the co-integrating relationships, allowing for short-run adjustment dynamics in the series. The cointegration term built in the VECM is called the error correction term since any deviation from the long-run equilibrium is expected to be corrected with a gradual speed of short-run adjustment. Following the studies of Asari et al. (2011) and Hyndman and Athanasopoulos (2014), SIC is also used as a criterion to choose optimal lag two (2) in this study as AIC tends to choose a larger number of lags that can render the VEC estimate insignificant.

Table 43: Vector Error Correction Estimates

Co-integrating Eq:	CointEq1	CointEq2	CointEq3	CointEq4	
ROA(-1)	1.000	0.000	0.000		
DPOR(-1)	0.000	1.000	0.000		
LIR(-1)	0.000	0.000	1.000		
FEXR(-1)	0.000	0.000	0.000	1.000	
AUR(-1)	0.004(0.000)	-0.049(0.008)	29.153(2.375)	6.751 (0.533)	
C1	-0.033	-0.359	-79.116	-18.713	
Error Correction:	ΔROA	$\Delta DPOR$	ΔLIR	$\Delta FEXR$	ΔAUR
CointEq1	-0.359074 (0.02971)	-0.010315 (0.21812)	-1.221 (4.168)	-0.095 (0.128)	-2.946 (4.319)
CointEq2	-0.008 (0.005)	-0.288 (0.035)	-1.258 (0.673)	-0.001 (0.021)	-0.789 (0.697)
CointEq3	-3.25E-05 (9.5E-05)	-1.21E-05 (0.001)	-0.052 (0.013)	-0.001 (0.000)	-0.006 (0.013)
CointEq4	-2.41E-05 (0.000)	-0.002 (0.003)	0.233 (0.058)	-0.004 (0.002)	-0.095 (0.059)
$\Delta ROA_{(-1)}$	-0.215 (0.033)	-0.002 (0.245)	-11.211 (4.687)	-0.224 (0.143)	0.243 (4.859)
$\Delta ROA_{(-2)}$	-0.024 (0.026)	0.057 (0.189)	-10.919 (3.615)	-0.252 (0.111)	0.004 (3.747)
$\Delta DPOR_{(-1)}$	0.004 (0.005)	-0.278 (0.039)	1.193 (0.746)	0.0179 (0.023)	1.657 (0.773)

$\Delta DPOR_{(-2)}$	-0.002 (0.004)	-0.069 (0.033)	-0.632 (0.622)	-0.009 (0.019)	-0.269 (0.645)
$\Delta LIR_{(-1)}$	-0.000 (0.000)	0.004 (0.001)	0.201 (0.036)	-0.002 (0.001)	-0.037 (0.037)
$\Delta LIR_{(-2)}$	-0.000 (0.000)	-0.004 (0.002)	-0.035 (0.031)	0.000 (0.001)	0.003 (0.032)
$\Delta FEXR_{(-1)}$	0.010 (0.010)	-0.022 (0.074)	11.596 (1.405)	0.154 (0.043)	-0.347 (1.456)
$\Delta FEXR_{(-2)}$	0.001 (0.009)	0.082 (0.069)	-5.157 (1.314)	0.055 (0.040)	2.775 (1.362)
$\Delta AUR_{(-1)}$	0.000 (0.000)	6.63E-05 (0.002)	-0.052 (0.036)	-0.003 (0.001)	-0.275 (0.038)
$\Delta AUR_{(-2)}$	0.000 (0.000)	0.001 (0.002)	-0.051 (0.032)	-0.003 (0.000)	-0.145 (0.032)
C2	-0.001 (0.001)	-0.004 (0.008)	-0.529 (0.152)	0.052 (0.005)	-0.261 (0.157)
R-squared	0.314458	0.286398	0.235589	0.063	0.413165
Adj. R-squared	0.301165	0.272561	0.220766	0.044420	0.401786
Sum sq. Resids	0.390751	21.06088	7688.658	7.199286	8260.288
S.E. equation	0.023264	0.170793	3.263297	0.099856	3.382431
F-statistic	23.65585	20.69774	15.89412	3.443757	36.30919
Log likelihood	1733.570	264.3227	-1909.858	659.8836	-1936.285
Akaike AIC	-4.663691	-0.676588	5.223496	-1.750023	5.295209
Schwarz SC	-4.570016	-0.582913	5.317172	-1.656348	5.388885
Mean dependent	-0.000388	-0.002160	-0.152319	0.062185	-0.159729

S.D. dependent	0.027829	0.200249	3.696773	0.102151	4.373213

Source: Author's computation (2017). Note that standard errors (SE) are in parenthesis.

The presence of cointegration between variables suggests a long-term relationship between the variables under consideration. The VECM can then be applied. The vector error correction estimate with standard error in parenthesis for the long run relationship between dividend policy and banking performance for three co-integrating equations is presented in the table above. To establish a long-run relationship, the ECT, that is, the coefficients should be negative and statistically significant. A negative and significant ECT coefficient indicates that any short-term fluctuations between the regressors and the dependent variable will result in a stable long run relationship between the variables.

The ECTs (ECT_{t-1}) are correctly signed and significant for the four (4) co-integrating equations except LIR in COINTEQ4. Furthermore, the C1 in the co-integrating equation is also correctly signed and it reveals that it will take 0.033, 0.359, 79.116 and 18.713 percent, respectively for the maladjustment in co-integrating equations 1, 2 and 3 to adjust to the long run equilibrium or stability. In examining the impact of the error correction of dividend policy, agency costs and market risk on bank performance, it was found from the fitted vector error correction mechanism that $ROA_{(-1)}$, $ROA_{(-2)}$ and $CAR_{(-1)}$ have an inverse relationship with ROA.

Thus, $ROA_{(-1)}$, $ROA_{(-2)}$, $DPOR_{(-2)}$, $LIR_{(-1)}$, $LIR_{(-2)}$ and $AUR_{(-2)}$ will worsen the performance of banking industry by 21.527, 0.235, 0.217, 0.0242, 0.0213 and 0.0225 percent, respectively. However, $DPOR_{(-1)}$; $FEXR_{(-1)}$; $FEXR_{(-2)}$, $AUR_{(-1)}$ and $AUR_{(-2)}$ have a direct relationship with ROA at 0.385; 1.022; 0.125 and 0.022 percent, respectively. The positive relationship of FEXR which is one of the proxies of market risk conforms to the *a priori* expectation and Ekinci (2016), while the negative relationship of LIR with ROA conforms to the *a priori* expectation, Kasman and Carvallo (2013) and Ekinci (2016). In the same vein, the finding on DPOR is in tandem with the *a priori* expectation and the empirical findings of Agyei and Marfo-Yiadom (2011); U. Uwuigbe et al. (2012); Ajanthan (2013) and Ehikioya (2015), while the mixed findings on agency costs are in tandem with Wang (2010) and Alencar and Nakane (2004). The results further reveal that $ROA_{(-1)}$, $DPOR_{(-1)}$, $DPOR_{(-2)}$, $LIR_{(-2)}$ and $FEXR_{(-1)}$ have negative relationships with DPOR to the tune of 0.0240; 27.776; 6.959; 0.044 and 2.15 percent, while $ROA_{(-2)}$; $LIR_{(-1)}$; $FEXR_{(-2)}$, $AUR_{(-1)}$ and $AUR_{(-2)}$ posit positive relationships with DPOR at 5.7014; 0.0409; 8.223; 0.0000 and 0.01325 percent, respectively.

From the perspective of LIR and FEXR, DPOR (-1) depicts a positive relationship with market risk, that is, LIR and FEXR at 111.92 and 1.7911 percent, respectively; LIR(-1) shows a 20.07 percent positive relationship with LIR and LIR(-2) illustrates a 0.0189 percent relationship with FEXR. Similarly, FEXR(-1) depicts a positive relationship with market risk, i.e. LIR and FEXR at 115.964 and 15.441 percent, respectively. FEXR(-2) has a 5.474 percent positive relationship with FEXR. Agency costs measured by the AUR following the empirical studies of Ang et al. (2000) and S. Gul et al. (2012), shows a negative relationship with market risk, that is, both LIR and FEXR, at 5.24 and 0.344; 5.076 and 0.259 percent, respectively.

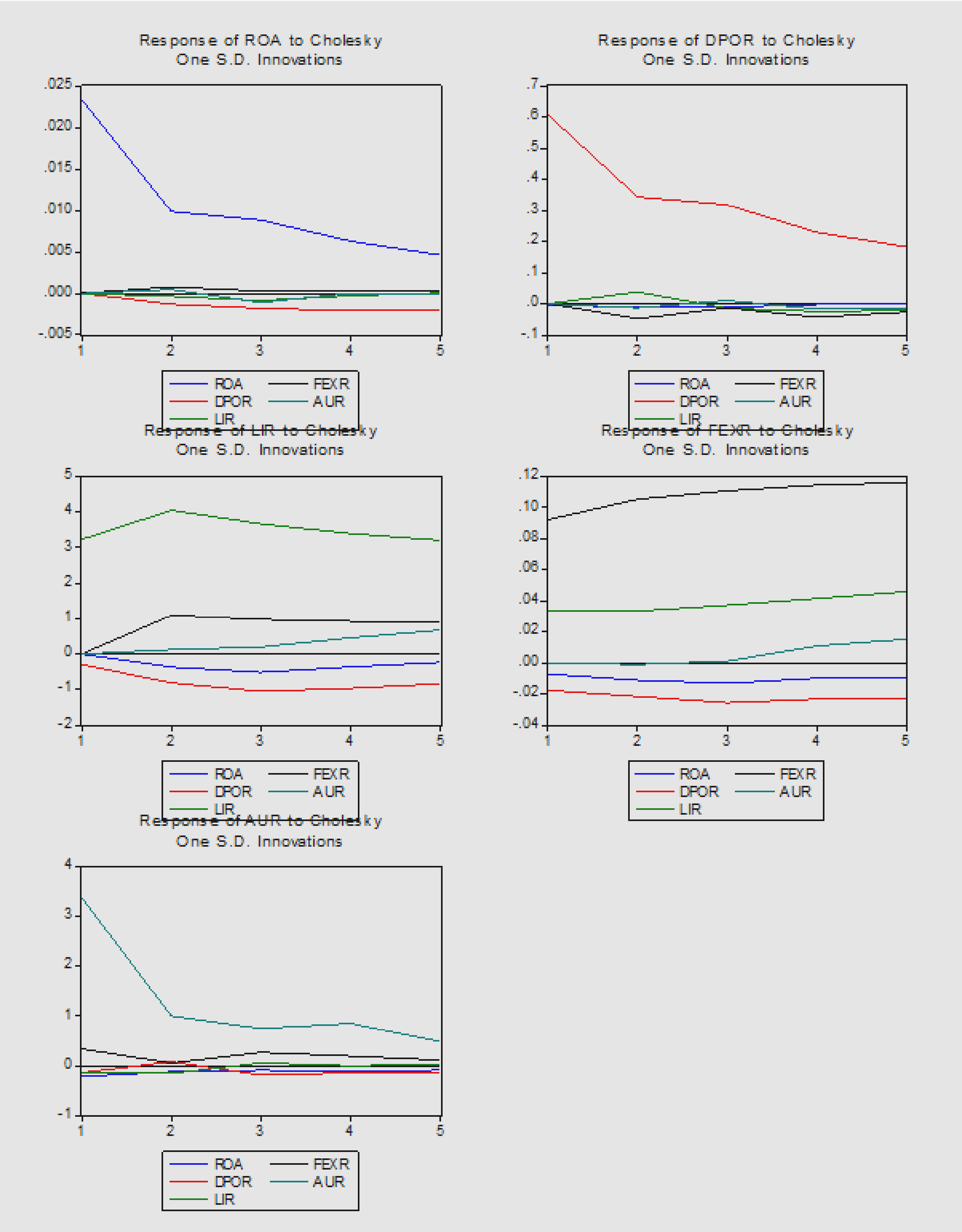
From an agency cost (AUR) perspective, $ROA_{(-1)}$ and $ROA_{(-2)}$ have a positive relationship with the AUR of SSA banks at of 24.308 and 0.369 percent, respectively. This conforms to Ang et al. (2000) who averred that it is impossible for a well-performing firm to incur zero agency costs. Furthermore, $DPOR_{(-1)}$; $LIR_{(-2)}$ and $FEXR_{(-2)}$ have a positive relationship with agency costs (AUR) at 16.568, 0.3215, 277.53 percent, respectively. In contrast, $AUR_{(-1)}$ and $AUR_{(-2)}$ negatively relate to AUR at 27.481 and 14.509 percent, respectively.

In conclusion, the C2 estimate of -0.0010101 reveals the risks involved (0.010%) in enhancing bank performance through dividend policy, agency costs and market risk during the period under investigation in SSA even though it is so small. The significance of the VECM was examined using the R-square statistic and revealed that 30.11 percent of the variation in the error associated with the performance of banking industry can be explained by the dividend policy (DPOR), agency costs (AUR) and market risk (interest rate and foreign exchange ratio). The F- statistic value of 23.655 > $F_{0.05}$ (4, 1720) = 2.37 shows that the fitted VECM is statistically significant and hence adequate and reliable in evaluating the relationship between dividend policy, agency costs, market risk and banking performance.

8.7 Impulse Response Functions

Impulse response functions provide information to analyse the dynamic behaviour of a variable due to a random shock in other variables. Thus, for each variable from each equation, a unit shock to the error is analysed to determine the effects upon the vector error correction mechanism over time using Cholesky decomposition. Cholesky decomposition is also referred to as the Wold Causal Chain (Wold, 1954). It is a method to orthogonalise the reduced form shocks in the VECM. According to Sims (1980) and Ronayne (2011), Cholesky decompositions are simple to understand and easy to implement but they impose a recursive structure on the coeval relationships between the variables in the series. However, it should be noted that in this approach, the ordering of the variables in the VECM is important. Based on this fact and following O. O. Akinlo and Lawal (2015), this study observed the response of shocks in all the variables interchangeably with the emphasis on how ROA responds to shocks in dividend payout, LIR, FEXR and AUR as depicted in Figure 9 below.

Figure 9: Combined Graphical Illustration of the Impulse Response Function of the respective Variables



Source: Author's computation (2017)

The responses of DPOR, LIR, FEXR and AUR to changes or variations in ROA were illustrated for all five years under study. The response of DPOR and LIR to variation in ROA was negative throughout the five years except the 1st year, which was zero. DPOR and LIR responded negatively to a ROA shock in the 2nd year through the 5th year. These results indicate that, an increase in ROA causes an increase in the DPOR and LIR of SSA banks. On the other hand, the response of FEXR to change in ROA was practically zero in the 1st year and positive in the 2nd, 3rd, 4th and 5th years. The response of AUR to a ROA shock was zero in the 1st year but positive in the 2nd year and negative in the 3rd year through the 5th year. Theoretically, this result implies that a change in ROA affects DPOR, LIR, FEXR and AUR. In other words, it indicates that all the variables investigated responded to shocks in ROA directly (positively) or indirectly (negatively) during the years under consideration for SSA banks.

8.8 Variance Decomposition of the Variables

As noted by O. O. Akinlo and Lawal (2015), impulse response functions do not reveal the magnitude of the effects of variables in a series. This creates a need to proceed to variable decomposition to show the proportion of forecast error in each variable that innovations in each endogenous variable will account for. Variance decomposition disintegrates variation in an endogenous variable into the component shocks of the endogenous variables in the VECM. This assists in measuring the proportion of forecast error variance in a variable that is explained by innovations and the other variables in the series. The technique breaks down the variance of the forecast error for each variance in response to the shock of a variable and thus identifies variables which are strongly affected by these shocks.

Table 44: Variance Decomposition of Return on Asset-ROA (Bank Performance)

Year	S.E.	ROA	DPOR	LIR	FEXR	AUR
1	0.023398	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.025449	79.58873	10.26500	0.020198	1.093468	9.032608
3	0.027040	78.91666	10.68124	0.119505	1.092558	9.190038
4	0.027842	78.40540	11.19012	0.123622	1.101568	9.179290
5	0.028296	77.93419	11.65612	0.120087	1.114003	9.175596

Source: Author’s computation (2017)

The variance decomposition suggests that shocks to ROA as shown in Table 43 constitute the main source of variation for all the variables in the model. The shocks due to ROA ranged between 100 percent in the first year and about 78.92 percent in the third year and 77.93 percent in the fifth year. DPOR, LIR, FEXR and AUR also accounted for variation in performance levels even though the market risk proxy (LIR) was insignificant for the five (5) years. More specifically, shocks in the variables DPOR, LIR, FEXR, and AUR did not initially contribute to the shocks in ROA in the first year but, DPOR, FEXR and AUR rose from years two to five and significantly impacted the performance of SSA banks to the tune of 10.27, 10.68, 11.19, 11.66; 1.09, 1.09, 1.10, 1.11 and 9.03, 9.19, 9.18, 9.18 percent, respectively. In summary, of the variables examined, only dividend policy and agency costs had a significant impact on banks' performance even though the impulse response function shows that, they have a negative effect. This implies that variation in SSA banks' performance only responds to changes in dividend policy, agency costs and the foreign exchange rate of the economy in which they operate.

Table 45: Variance Decomposition of Dividend Payout Ratio - DPOR (Dividend Policy)

Year	S.E.	ROA	DPOR	LIR	FEXR	AUR
1	0.608631	0.008827	99.99117	0.000000	0.000000	0.000000
2	0.702190	12.02238	79.18994	0.290499	0.462090	8.035089
3	0.771557	10.03984	77.22457	1.277324	4.410965	7.047298
4	0.806791	10.03701	68.87558	2.343514	9.657559	9.086336
5	0.828127	13.03538	68.73060	1.394180	8.730075	8.109762

Source: Author's computation (2017)

From Table 45, the variance decomposition reveals that DPOR constitutes the major source of variation to itself than the other variables in the model. The shocks in DPOR were 99.99 percent in the first year, and declined to about 77.22 percent in the third year and to 68.73 percent in the fifth year. ROA's contribution to shocks in DPOR in the first year is 0.01 percent and is insignificant. The shocks increased to 10.04 percent in the third year and 13.04 in the fifth year. On the other hand, LIR and FEXR did not contribute to shocks in DPOR in the first year but increased to 0.29, 1.27, 2.34, 1.39 and 0.46, 4.41, 9.66 and 8.73 percent in the second to fifth years. However, AUR's contribution rose to 8.04 percent in the second year and settled at 8.11 percent in the fifth year.

Table 46: Variance Decomposition of Lending Interest Rate - LIR (Market Risk)

Year	S.E.	ROA	DPOR	LIR	FEXR	AUR
1	3.245511	0.000134	0.827800	99.17207	0.000000	0.000000
2	5.380114	0.464690	2.587068	92.77373	4.121072	0.053440
3	6.691038	0.894673	4.122327	90.05007	4.812846	0.120080
4	7.646051	0.910491	4.754204	88.73574	5.155880	0.443682
5	8.415321	0.827403	4.913932	87.79021	5.458625	1.009831

Source: Author's computation (2017)

The forecast error variance decomposition of LIR presented in Table 46 revealed that its own shocks seem to have a sustainable impact on itself with an initial impact of 99.17 percent, declining to 90.05 percent in the third year and 87.79 percent at the fifth year. Shocks in ROA and DPOR caused LIR to rise from 0.00 and 0.83 percent in the first year to 0.89 and 4.12 percent, respectively in the third year. These shocks stood at 0.83 and 4.91 percent, respectively in the fifth year. The initial shock of LIR due to the FEXR and AUR ratio was 0.00 and 0.00 percent; this increased to 4.81 and 0.12 percent, respectively in the third year. These shocks increase further to 5.46 and 1.01 percent, respectively in the fifth year. Surprisingly, ROA does not significantly impact variations in LIR in all five years. From the impulse response function, ROA and DPOR have negative relationships with LIR, whereas, agency costs has a positive relationship with LIR from the third year.

Table 47: Variance Decomposition of Foreign Exchange Ratio - FEXR (Market Risk)

Year	S.E.	ROA	DPOR	LIR	FEXR	AUR
1	0.100126	0.519381	3.091359	11.62827	84.76099	0.000000
2	0.151152	0.768363	3.394047	9.986252	85.84708	0.004257

3	0.193242	0.930307	3.827914	9.827699	85.40852	0.005561
4	0.230093	0.838464	3.717934	10.20697	85.00601	0.230618
5	0.263390	0.758178	3.576253	10.84321	84.31089	0.511470

Source: Author's computation (2017)

Table 47 shows the forecast error variance decomposition for FEXR and reveals that its own shocks make a major contribution to the variation in the model. The shocks increased from 84.76 percent in the first year to 85.41 percent in the third year and stood at 84.31 percent in the fifth year. The contributions of ROA, DPOR and LIR to shocks in FEXR were 0.52, 3.09 and 11.63 percent, respectively in the first year. These shocks marginally increased to 0.93 and 3.83 percent with respect to ROA and DPOR shocks and decreased to 9.83 percent because of LIR shocks in the third year. DPOR shocks declined to 3.58 percent while, LIR shocks increased to 10.84 percent in the fifth year. ROA and AUR's contribution to shocks in FEXR were found to be insignificant as they are less than 1 percent for all five years. From the impulse response function, ROA and DPOR have a negative relationship with FEXR, whereas, agency costs have a positive relationship with FEXR from the third year.

Table 48: Variance Decomposition of Asset Utilization Ratio - AUR (Agency Costs)

Year	S.E.	ROA	DPOR	LIR	FEXR	AUR
1	3.410943	0.408850	10.17546	0.155847	0.969891	88.28995
2	3.561306	0.496247	10.20824	0.329734	0.911919	88.05386
3	3.655565	0.536221	10.47490	0.333548	1.400253	87.25508
4	3.762782	0.595243	10.59465	0.314921	1.583155	86.91203
5	3.799771	0.643266	10.74125	0.311810	1.634922	86.66875

Source: Author's computation (2017)

The results in Table 48 show the forecast error variance decomposition for AUR and reveal that its own shocks are the major cause of shocks to itself. The shocks declined from 88.29 percent in the first year to 87.26 percent in the third year and 86.67 percent in fifth year. The contribution of DPOR is the most significant of all the variables in the model, whereas, ROA and LIR were insignificant as they are not up to 1 percent. However, FEXR's impact on the shocks in AUR became significant at years three to five to the tune of 1.40, 1.58 and 1.63 percent, respectively.

8.9 Chapter Summary

This chapter presented the data analysis and interpretation and implications of the findings for dividend policy, agency costs, market risk and bank performance in the selected SSA countries. The evaluation of the relationship between dividend policy, agency costs, market risk and bank performance reveals that there is a long-run co-movement which implies that changes in bank performance are explainable by the other selected variables in the near future. The positive effect of the foreign exchange rate (market risk proxy) on bank performance in SSA as evident from P-VECM, the impulse response function and its significant effect on the variable decomposition of ROA, conforms to *a priori* expectation. This finding implies that a higher rate of the local currency compared to the US Dollar, leads to expansionary monetary policy by a country's apex bank. An economy with expansionary monetary policy experiences exchange rate depreciation which leads to cheaper domestic goods. Moreover, there will be huge capital inflow that will pass through the financial system of such an economy. In discharging its intermediary activities, the banking sector tends to experience improved performance due to better economic performance which leads to an improved financial system. Most of the countries examined faced a dwindling exchange rate from 2006-2015 which led to exchange rate depreciation; however, this enhances commercial banks' performance.

The inverse relationship of the LIR with bank performance in SSA as evident from P-VECM, the impulse response function and its insignificant effect in the variable decomposition of ROA is in tandem with the *a priori* expectation. This finding implies that a higher interest rate discourages banks' customers from taking loans and advances. Loans serve as banks' major asset to trade with, such that when customers are discouraged from borrowing, this negatively impact banks' performance. The monetary policy rate, which is the rate at which the reserve/central bank discounts its first-class bills, determines the lending rate in an economy. When this rate is high, the lending interest rate also has the tendency to increase and vice versa. However, a lower lending interest rate leads to improved bank performance.

The direct relationship between agency costs and bank performance evident from P-VECM and the impulse response function, with its significant contribution to the shocks of performance in SSA banks as shown by the variable decomposition, conforms to the *a priori* expectation and implies that the higher the monitoring and bonding costs incurred by banks, the better their performance. The cost function holding the agency costs of firms is such that the marginal benefit is always higher than the marginal cost. In conclusion, dividend policy captured by the dividend payout ratio has a negative impact on banks' performance from the P-VECM and impulse response function analysis even though it contributes significantly to the shocks of performance in the variable decomposition analysis. This implies that SSA banks need to review their choice of dividend policy as the payout policy which is the most common, has had a negative and significant impact on their performance.

CHAPTER NINE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

9.0 Introduction

This chapter presents a summary of the study's findings and the implications of such findings relating to the determinants of the dividend payout ratio; the causal relationship between dividend policy and bank performance; operational diversification and bank performance; and the interrelationship among dividend policy, agency costs, market risk and bank performance. This is followed by the policy recommendations arising from the findings and the study's contribution to knowledge. Finally, the chapter highlights the study's limitations and makes suggestions for further research.

9.1 Summary of Research Findings

Formulation of effective and implementable dividend policy is instrumental in improved financial performance in the banking sector as it has long been established that effective dividend policy is a sound tool for managers to mitigate agency problems (costs) which hinder improved performance. Thus, dividend policy cannot be divorced from a bank's performance. This study focused on the dynamics of dividend policy, agency costs and the performance of 250 SSA commercial banks for the period 2006 to 2015. It examined the determinants of the dividend payout ratio; established the causation between dividend policy and financial performance; determined the effect of operational diversification on financial performance and evaluated the relationship among dividend policy, agency costs, market risk and bank performance. To achieve these objectives, data were collected on 250 commercial banks from the BankScope database. The data were analysed by means of descriptive and other econometric techniques.

The first chapter of this thesis introduced the topic by presenting various views on dividend policy. It was concluded that effective dividend policy has a major impact on bank assets, which determine a bank's contribution to the growth of the SSA entire region. In formulating dividend policy, all stakeholders' interests should be taken into account in order to minimise the agency costs of debt and equity. This will maximise shareholders' wealth and enable banks to fulfil their role as the engines of economic growth in SSA. Despite the crucial role of dividend policy in mitigating agency problems (costs), most studies have focused on non-financial institutions and the few conducted in a banking context have not specifically identified the most appropriate dividend policy, as they considered the dividend payout ratio as a proxy for dividend policy and neglected retention policy. Furthermore, to the best of the author's knowledge, no study has determined the best formula for the dividend payout ratio in SSA, or established the causality between dividend policy and bank performance, analysed the effect of banks' operational diversification on their performance or evaluated the relationship among dividend policy, agency costs, market risk and bank performance in this region. This study sought to fill this gap.

Chapter two reviewed the theoretical literature and presented the theoretical framework that underpinned this study. It discussed relevant theories on dividend policy, diversification and risk in the banking context. The study's first objective drew on the bird-in-the-hand theory, while, for objective two, the percent payout, percent retention and life cycle theories were used and the resource based view (RBV) theory was employed for objective three. Finally, objective four was underpinned by the modern portfolio theory.

Chapter three identified and defined the concepts relevant to this study and reviewed the empirical literature on dividend policy, agency costs and diversification in banks to address each objective in detail. The various kinds of dividend policy and indices of diversification were discussed. The relevant literature on the SSA region and other developed economies was reviewed in light of each of the study's objectives and the gaps in respect of each objective were identified.

Chapter four provided a detailed description of the research methods and econometric tools employed to achieve each of the study's objectives. It discussed the study's paradigm, research design, sample characteristics, and the nature and sources of data. The definitions of all the variables used in this study were discussed with their respective formulas and the rationale for choosing them. The models used to address each objective and their respective estimating techniques such as panel-GMM (differenced and system), panel-VECM, the block endogeneity Wald test, pairwise Granger causality, pooled, fixed and random effect regression, impulse response function and variable decomposition, among others were discussed. The techniques used for the preliminary and post-estimation tests such as panel unit root, cointegration, restricted F-test, Hausman, Sargan and Hansen tests were also discussed in detail.

Chapters five, six, seven and eight presented the model estimation, data analysis and interpretation of the findings for each objective in chronological order.

The findings from the econometric analysis for each objective are as follows:

a) The main determinants of the dividend payout ratio in the selected SSA commercial bank for the period covered in this study are past year dividend, after tax income, bank size and the leverage ratio. The capital adequacy ratio of SSA banks was found to be an insignificant factor in determining the dividend payout ratio. This could be due to the economic down-turn that affected most of the countries examined during the study period. It is clear that well capitalised banks are using their excess inflow to cater for the impact of economic factors on their operational efficiency and to prevent their asset base from being jeopardised. The study concluded that Lintner's model still holds good and explains the dividend setting process of SSA commercial banks.

b) There is a long-run association between dividend policy and bank performance. The disequilibrium in this series will return to the state of equilibrium at annual 38.15% speed of adjustment.

c) Both the dividend payout ratio and retention ratio positively relate to bank performance but only the retention ratio (RERA) has a uni-directional causality with financial performance using ROA, while ROE has a unidirectional causality with the dividend payout ratio (DPOR) among SSA banks during the study period.

d) Using HHI, assets, loans and income diversification have a direct and significant effect on banks' financial performance in the examined SSA countries while deposit diversification (HHIde) has a negative but significant effect on banks' financial performance (Return on Average Assets).

e) There is long run co-movement between dividend policy, agency costs, market risk and bank performance among SSA commercial banks for the period 2006 to 2015. The dividend payout ratio at lag two and lending interest rate at lags one and two have a negative relationship with bank performance. In contrast, the dividend payout ratio at lag one; asset utilisation ratio at lags one and two; and foreign exchange ratio at lags one and two have positive relationships with bank performance. The error correction term (ECT) shows that, the disequilibrium in the series will return to the state of equilibrium at the speed of 39.5%.

f) Agency costs of banks positively relate to market risk in the SSA region. Hence, the effect of declining foreign exchange and lending interest rates contributes to banks' agency costs, negatively affecting banks' performance.

g) Dividend policy, market risk and agency costs responded directly or indirectly to variations (shocks) in the performance of SSA banks during the years under consideration, but only the dividend policy and agency costs significantly contributed to the variation over the next five years.

9.2 Policy Recommendations

Arising from the study's findings, the following policies are recommended to promote effective dividend policy and improved performance for shareholders which will increase SSA banks' growth potential:

i) SSA commercial banks should adopt the Lintner model to set their dividend formula when they choose to pay dividends. For dividend policy to be optimal, it must be consistent. SSA banks should use the formula derived under this study as they share the same features. The Lintner model has long been averred to be the best dividend setting model, and this study found that it still holds good. Globally, the major factors that are taken into consideration in setting the dividend payment formula are past year dividend, after tax income, bank size and leverage ratio; SSA banks should thus follow suit.

ii) The banking sector in SSA should recognise that dividend payout policy is a luxury and a negative NPV transaction and adopt the retention ratio as a dividend policy that enhances performance and future growth that leads to value creation. When banks retain their profit, they have the capacity to fund viable projects that solidify their assets and yield additional capital gain in the long run. Retention as a source of equity reduces exorbitant transaction costs and future finance costs and attracts little taxation. The risk of uncertainty is minimal as management teams are monitored when undertaking investments. Banks should only adopt payout policy if they cannot identify and explore viable investment opportunities which will yield higher returns than a mere "signal of past performance" to shareholders. The commercial banking sector in SSA should note that not all dividend paying banks are healthy and that healthy companies often cut dividend payments to shareholders and explore viable investment opportunities.

iii) In setting effective and implementable dividend policy, the age/ life stage of the bank should be taken into account in order to formulate policies that satisfy both dividend-income and growth-oriented shareholders. Mature banks should adopt payout policy, while growing or newly incorporated ones should plough their profits back into the business in order to be able to explore investment opportunities. Hence, the life cycle theory is recommended to SSA banks in setting an effective dividend policy.

iv) The deposit insurance scheme should be enforced in the same manner as the capital adequacy ratio of banks. This would protect creditors' rights and minimise arguments in setting suitable dividend policy among SSA banks.

v) More attention should be paid to monitoring the diversification strategy in the SSA banking sector such that no dimension of banking operations is neglected. SSA banks should build market power from all their resources as this would give them a competitive edge. Furthermore, the Board of Directors should control managers' pecuniary benefits and incentives to ensure that the problems of managerial hubris and managerial entrenchment are reduced to the barest minimum.

vi) From the review of banking sector features across countries, it is recommended that banks lift restrictions on lending to address inequality between the poor and the rich. The main limitation suffered by these countries' banking sectors is limited access to finance. Thus, services should be extended to the less privileged even though they might not have formal documentation to warrant financial transactions.

vii) Since one of the major limitations confronted by the SSA banking system is lack of infrastructure, commercial banks should adopt a 'Bring Your Own Infrastructure' (BYOI) policy. These banks can no longer wait for government to provide amenities. Given the high rate of poverty in the SSA region, banks should provide their own infrastructure using their earnings (retention policy) to enhance their performance. In so doing, they will also be fulfilling their corporate social responsibility to community members that will benefit from such provision.

viii) The lending interest rate for SSA countries should be reviewed as this has a negative effect on bank performance.

ix) The banking sector in SSA should focus more on endogenous factors and review some of their policies as these contribute more significantly to variations in their performance than exogenous factors.

9.3 Contribution to Knowledge

This study contributes to the existing body of knowledge in five ways. First, it offers further insight into the dividend payout ratio puzzle by identifying the major determinants of the dividend payout ratio and recommending a uniform dividend payment formula for SSA banks. The major determinants of the dividend payout ratio among SSA banks are past year dividend, after tax income, bank size and the leverage ratio. Second, as the first of its kind globally, this study established that dividend policy and financial performance are co-integrated and that only retention policy causes bank performance because there is unidirectional causality from DRIPs (retention policy) to financial performance among SSA commercial banks. This opposes the notion that only dividend payout policy can signal performance following the dividend signalling hypothesis.

Third, this study which is the first of its kind in the region shows that operational diversification significantly affects banks' financial performance in SSA and revealed the significant effect of assets, loans, deposits and income diversification on these banks' performance. The fourth contribution to knowledge is that this study established that there is a long run association between dividend policy, agency costs, market risk and bank performance, and that endogenous factors affect banks' performance more than exogenous factors.

Finally, this study contributed to the formulation of a model on the determinants of the retention ratio taking cognisance of agency costs because any firm operating agency relationships cannot incur zero agency costs. In line with the life cycle theory of a firm, its growth stage should be considered in adopting an appropriate dividend policy that will enhance wealth maximisation. According to Jensen and Meckling's theory of the firm, it is assumed that bonding expenditure attracts the same rewards as monitoring expenditure and the higher these costs, the better the performance of firms from which they formulate dividend policy. Monitoring and bonding costs reduce managers' pecuniary benefits and sub-optimality, which later increases the entire worth of the firm. The cost function holding bonding and monitoring costs is such that the marginal benefit is always higher than the marginal cost (Ang et al., 2000). Hence, the retention ratio is expected to be a function of agency costs incurred, after-tax earnings (profit after tax) and the age of the banks following the life cycle theory of a firm.

Thus, the model is:

$$Y_{it} = f(X_{it}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(9.1)$$

Where, Y_{it} = the retention ratio (RERA)

X_{it} = Profit after tax (PAT), agency costs (AC) and age of banks (AG)

And agency costs are divided into monitoring costs (MC) and bonding costs (BC).

Therefore,

$$RERA_{it} = c_0 + \beta_1 PAT_{it} + \beta_2 \sum_{i=1}^{n} MC_{it} + \beta_3 \sum_{i=1}^{n} BC_{it} - \beta_4 AG_{it} + u_{it} \ldots\ldots\ldots\ldots(9.2)$$

And the *a priori* expectation is that $\beta_1 - \beta_3 > 0, \beta_4 < 0.$

9.4 Limitations of the Study

All research suffers certain limitations. The major limitation of this study was its inability to cover all commercial banks in the 46 SSA countries (World Bank database) due to a lack of sufficient, reliable and complete data. Moreover, a few other variables that could have been used to capture agency costs, that is, the detailed measure of monitoring and bonding costs were not incorporated since this data was not available. All these data are embedded in the notes to financial statements and it was practically impossible to access the detailed financial statements of all 250 banks in 30 countries. Data that are accessible in BankScope are purely bank profile data compiled from financial statements. The lack of sufficient data is tantamount to laxity in implementation of national standards by SSA banks such that most countries have yet to adopt the international financial reporting standards (IFRS) and deposit insurance schemes. However, these limitations do not affect the strength and veracity of this study's findings, as strong and reliable alternatives were explored.

9.5 Suggestions for Further Research

Further research should examine the determinants of the retention ratio in the region using the suggested model as this is policy was found to cause banks' financial performance. Other models for the dividend payout ratio could also be tested, such as the Britain Model, Darling Model, etc. In similar vein, other indices such as the Ogive index, Entropy index, and others mentioned in the literature review could be used to measure operational diversification in the region aside from the HHI that was used in this study. This would enable future researchers to compare their findings with those of the current study. The nexus of dividend policy, agency costs and bank performance could be evaluated within a wider scope using economic regions such as CEMAC, EAC, SADC and WAEMU within SSA as case studies. Finally, further research could extend the scope of this study by engaging data covering more than ten (10) years and focus on all banks in Africa.

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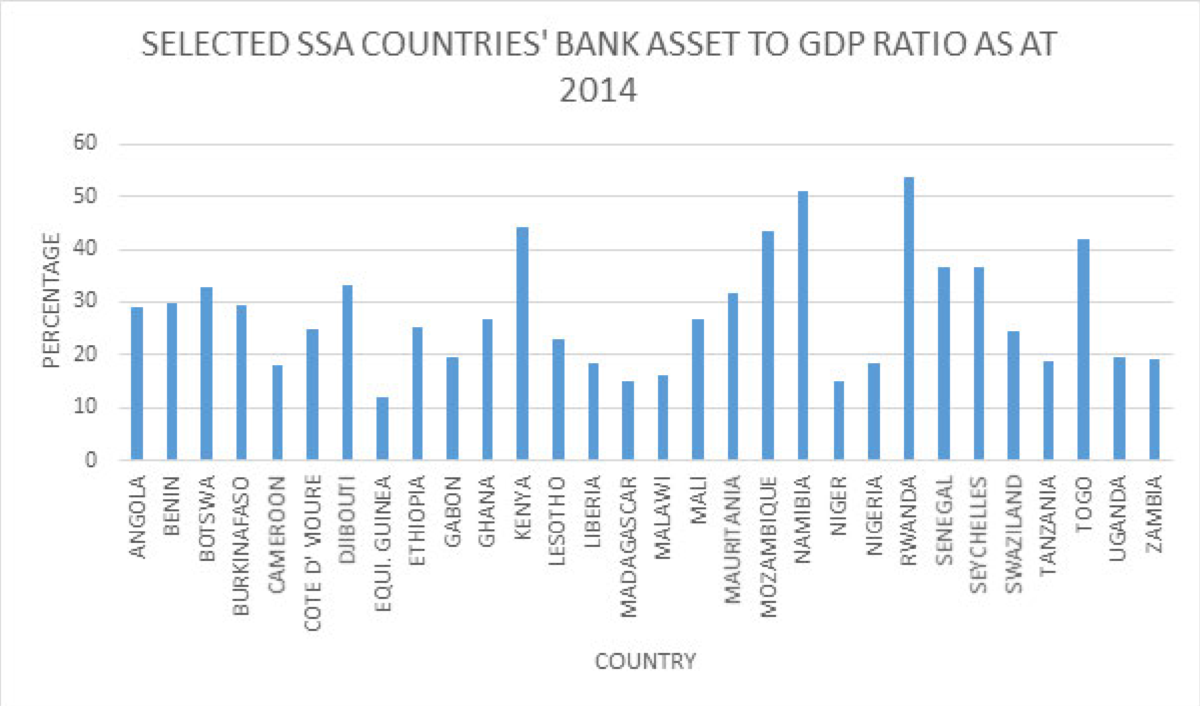
APPENDICES

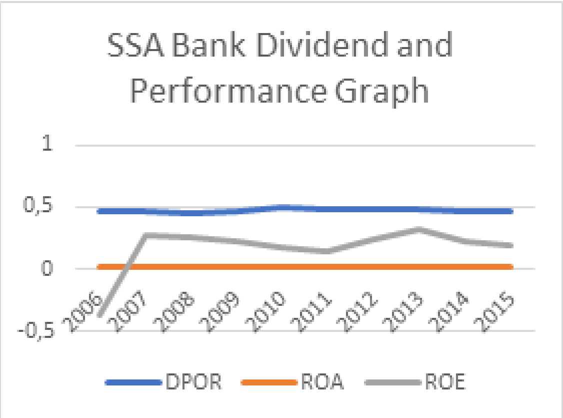
APPENDIX 1

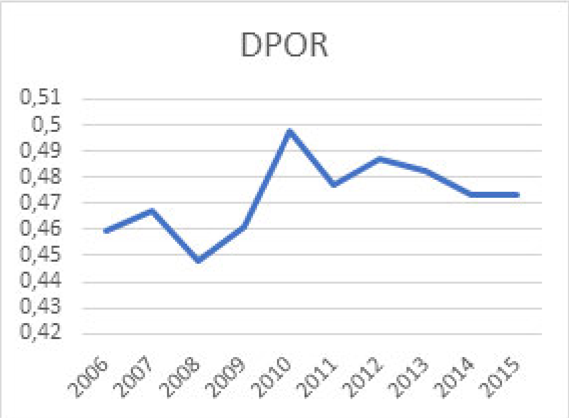
Graphical Illustrations on SSA Commercial Bankings Sector



Source: Author's calculation from data sourced from TheGlobaleconomy.com and The International Monetary Fund

a) Combined Graph of Dividend and

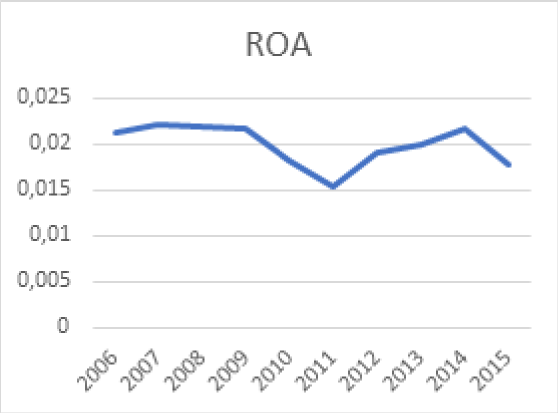


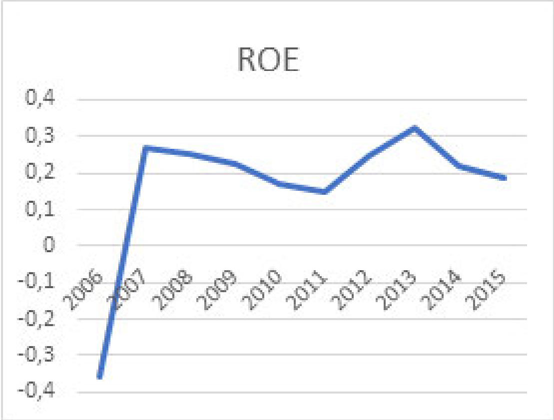


Performance

b) Dividend payout Ratio in SSA banks

c) Return on Asset of SSA countries





d) Return on Equity of SSA countries

Source: Authors' computation from data collected from BankScope for 2006-2015. Note that only 30 SSA countries are represented.

APPENDIX 2

Pictorial View of SSA Banks' Compliance with Regulatory Standards

Table 1.3: **SSA Financial Sector Supervisory Standards**

	Accounting Standard	Capital Adequacy standard	Deposit Insurance	Assets Classification
Angola	National	No Basel II yet	No	< 90 days
Botswana	IFRS	Basel II in progress	No	90 days
Burundi	IFRS Plan	Basel II in progress	No	> 90 days
Cabo Verde	IFRS	Basel II in progress	No	< 90 days
CEMAC	IFRS Plan	No Basel II yet	Implemented	> 90 days
Comoros	National	Basel II in progress	No	N/A
Congo, Dem. Rep.	National	No Basel II yet	No	90 days
Eritrea	N/A	N/A	No	N/A
Ethiopia	IFRS Plan	No Basel II yet	No	90 days
Gambia	IFRS Plan	No Basel II yet	No	90 days
Ghana	IFRS	No Basel II yet	No	90 days
Guinea	National	No Basel II yet	No	N/A
Kenya	IFRS	Parts of Basel II/III	Implemented	90 days
Lesotho	IFRS	No Basel II yet	No	90 days
Liberia	IFRS	Basel II in progress	No	90 days
Madagascar	National	No Basel II yet	No	90 days
Malawi	IFRS	Basel II	No	90 days
Mauritius	IFRS	Basel II	No	90 days
Mozambique	IFRS	Basel II	No	> 90 days
Namibia	IFRS	Parts of Basel II	No	90 days
Nigeria	IFRS	Basel II in progress	Implemented	90 days
Rwanda	IFRS	Basel II in progress	No	90 days
So Tom and Prncipe	IFRS Plan	Basel II in progress	No	N/A
Seychelles	IFRS Plan	No Basel II yet	No	90 days
Sierra Leone	IFRS	No Basel II yet	No	90 days
South Africa	IFRS	Basel III	No	90 days
South Sudan	National	No Basel II yet	No	N/A
Swaziland	IFRS	No Basel II yet	No	90 days
Uganda	IFRS	No Basel II yet	Implemented	90 days
Tanzania	IFRS	No Basel II yet	Implemented	90 days
WAEMU	IFRS Plan	No Basel II yet	No	> 90 days
Zambia	IFRS	No Basel II yet	No	90 days
Zimbabwe	IFRS	Basel II in progress	Implemented	91 days

Source: Montfort et al. (2016), Pg.41

Summary of the Selected Countries' Economic and Banking Characteristics

NPLs	9.7% - 20%	4.8% - 22%	5.2% - 40%	2% -9.3%	14.4% -
LIQUIDITY	20% - 35%	20% - 44.2%	10.5% - 53.3%	12.5%-28.1%	27.6% - 33.6%
CAPITAL RATIO	2.8% - 11.7%	18.9% - 23.2%	16% - 17.5%	8% - 24.4%	11.3% - 12.9%
GDP	-1.1% - 6.9%	4.9% – 10.8%	-1.7% - 7.5%	0.5% - 6.5%	4% - 8.5%
INFLATION RATE	0.6% - 11.7%	2.5% - 36.4%	6.3% - 18%	-0.5% - 25.5%	0.3% – 3%
POVERTY RATE	33% - 47%	19.3% - 67.9%	24.2% - 70%	28.7% - 60.5%	40% -76%
CHALLENGES	Political unrest, terrorism and external shocks	Weak infrastructure, poor governance and external shocks	Political unrest, Ebola outbreak, terrorism and	External shocks, climatic problems like	Corruption, political unrest, Ebola outbreak and
FINANCIAL DEPTH	Shallow and underdeveloped	Shallow but partially developed	Small but developed	Small and well developed	Small shallow and underdevelop
PERFROMANCE (ROA	0.8% - 1.2%	1.7% - 3.7%	0.5% - 2.5%	1.1% - 4.6%	0.9% - 1.9%
ASSET CONCENTRATION	70-80%	50-85%	45.6%-75%	56.5% - 90%	50%-98%
DOMINANT BANKS	3	1-6	3-5	3-5	3-4
ECONOMIC CLASS	Lower income countries and upper-middle income countries	Lower income countries and lower-middle income countries	Low income countries and lower-middle income	Lower income and upper-middle	Lower income except Côte d'Ivoire that
BLOC	CEMAC	EAC	ECOWAS	SADC	WEAMU
COUNTRIES	Cameroon, Equatorial Guinea, Gabon	Kenya, Rwanda, Tanzania, Uganda, Ethiopia, Djibouti	Nigeria, Liberia, Ghana, Niger	Botswana, Mozambique, Zambia,	Burkina Faso, Benin, Côte d'Ivoire, Mali, Togo

APPENDIX 3

Results of the Analysis for the four objectives

Determinants of Dividend Payout Ratio in SSA Banks

correlate dpor ati siz lev gro tax2 car (obs=2432)

	dpor	ati	siz	lev	gro	tax2	car
dpor	1.0000						
ati	-0.0195	1.0000					
siz	0.0222	0.6471	1.0000				
lev	0.0241	-0.0649	0.0427	1.0000			
gro	0.0144	0.0480	0.1171	0.0054	1.0000		
tax2	-0.0379	0.1327	-0.0678	-0.0442	-0.0184	1.0000	
car	-0.0305	-0.0112	-0.1478	-0.1354	-0.0129	0.1660	1.0000

summarize dpor ati siz lev gro tax2 car,d DPOR

	Percentiles	Smallest		
1%	-3.108453	-8.310179		
5%	-2.201841	-8.298058		
10%	-1.7623	-8.294049	Obs	2480
25%	-1.226282	-8.056609	Sum of Wgt.	2480
50%	-.8246336		Mean	-.9500708
		Largest	Std. Dev.	.7379277
75%	-.474992	.4700036		
90%	-.2348161	.5877867	Variance	.5445374
95%	-.1445125	.8643922	Skewness	-3.225876
99%	-.0016213	.9822919	Kurtosis	27.0455

ATI

	Percentiles	Smallest		
1%	0	-.5666638		
5%	4.136904	0		
10%	6.411026	0	Obs	2453
25%	7.797831	0	Sum of Wgt.	2453

50%	9.002757		Mean	8.616494
		Largest	Std. Dev.	2.453041
75%	10.0428	13.25771		
90%	11.00031	13.2813	Variance	6.01741
95%	11.63514	13.31485	Skewness	-1.803826
99%	12.54197	13.36913	Kurtosis	7.422829

SIZ

Percentiles		Smallest		
1%	10.0889	8.076888		
5%	10.91837	8.552997		
10%	11.41105	8.639628	Obs	2500
25%	12.09744	8.785625	Sum of Wgt.	2500
50%	12.92715		Mean	13.01529
		Largest	Std. Dev.	1.346619
75%	13.84864	17.01329		
90%	14.69028	17.01838	Variance	1.813382
95%	15.51204	17.05809	Skewness	.2899429
99%	16.59455	17.07523	Kurtosis	3.278871

LEV

Percentiles		Smallest		
1%	.0204037	-683.1762		
5%	2.114858	-167.1419		
10%	3.730151	-75.36477	Obs	2499
25%	5.493832	-68.17714	Sum of Wgt.	2499
50%	7.799543		Mean	8.800948
		Largest	Std. Dev.	17.64009
75%	11.02494	102.3636		
90%	15.40825	110.7526	Variance	311.1727
95%	19.27234	191.2574	Skewness	-21.3241
99%	35.71667	339.1219	Kurtosis	1007.483

GRO

Percentiles Smallest

1% -.9451134 -.998308

5% -.772958 -.9938247

10% -.4832703 -.9915255 Obs 2500

25% -.041223 -.9914219 Sum of Wgt. 2500

50% .1051218 Mean .3826581

Largest Std. Dev. 3.887776

75% .2746514 37.76652

90% .5557222 53.75148 Variance 15.1148

95% .9715293 63.31003 Skewness 26.1208

99% 6.622768 147.7136 Kurtosis 880.3784

TAX2

Percentiles Smallest

1% -.0155506 -.1413071

5% -.0016378 -.0896071

10% 6.33e-06 -.0751537 Obs 2500

25% .0018882 -.0740265 Sum of Wgt. 2500

50% .0062008 Mean .0074279

Largest Std. Dev. .0134027

75% .0111111 .1163846

90% .0160157 .1206629 Variance .0001796

95% .0208375 .2607043 Skewness 7.001583

99% .0463578 .2966628 Kurtosis 156.1544

CAR

Percentiles Smallest

1% .0067483 -2.067475

5% .0455035 -1.685176

10% .0583422 -.4447174 Obs 2500

25% .0815116 -.4228909 Sum of Wgt. 2500

50% .1127277 Mean .1353118 Largest Std. Dev. .1335447

75% .1532966 .9800043

90% .2074987 .9803056 Variance .0178342

95% .2794167 .9921837 Skewness .0059764

99% .7402984 1.073452 Kurtosis 58.99349

Dynamic panel-data estimation, two-step difference GMM

Group variable: id Number of obs = 1932

Time variable : year Number of groups = 250

Number of instruments = 44 Obs per group: min = 4

F(7, 250) = 13.54 avg = 7.73

Prob > F = 0.000 max = 8

----

dpor	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
dpor						
L1.	.2202949	.0480617	4.58	0.000	.1256375	.3149522
ati	.0822599	.0120548	6.82	0.000	.058518	.1060018
siz	-.0504515	.0253166	-1.99	0.047	-.1003125	-.0005906
lev	.0088542	.0036787	2.41	0.017	.0016089	.0160994
gro	.0079522	.0078022	1.02	0.309	-.0074141	.0233186
tax2	2.2186	4.633248	0.48	0.632	-6.906575	11.34377
car	.044493	.187543	0.24	0.813	-.3248726	.4138586

Warning: Uncorrected two-step standard errors are unreliable.

Instruments for orthogonal deviations equation

Standard

FOD.(siz car)

GMM-type (missing=0, separate instruments for each period unless collapsed)

L(6/8).(L.dpor ati lev gro tax2)

Arellano-Bond test for AR(1) in first differences: z = -5.11 Pr > z = 0.000

Arellano-Bond test for AR(2) in first differences: z = 1.48 Pr > z = 0.138

Sargan test of overid. restrictions: chi2(37) = 31.61 Prob > chi2 = 0.719

(Not robust, but not weakened by many instruments.)

Hansen test of overid. restrictions: chi2(37) = 42.34 Prob > chi2 = 0.252

(Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:

iv(siz car)

```
   Hansen test excluding group:     chi2(35)   =  35.75  Prob > chi2 =  0.433
   Difference (null H = exogenous): chi2(2)    =   6.58  Prob > chi2 =  0.037
Dynamic panel-data estimation, two-step system GMM
------------------------------------------------------------------------------
Group variable: id                      Number of obs      =      2182
Time variable : year                    Number of groups   =       250
Number of instruments = 40              Obs per group: min =         5
F(7, 249)     =      8.60                              avg =      8.73
Prob > F      =     0.000                              max =         9
------------------------------------------------------------------------------
        dpor |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        dpor |
         L1. |   .2441716   .0457522     5.34   0.000     .1540608    .3342823
         ati |   .0349817   .0158102     2.21   0.028     .0038429    .0661205
         siz |  -.0173591   .0234626    -0.74   0.460    -.0635696    .0288514
         lev |   .0152787   .0049252     3.10   0.002     .0055784     .024979
         gro |  -.0081234   .0081766    -0.99   0.321    -.0242274    .0079807
        tax2 |   13.57836   9.726076     1.40   0.164    -5.577507    32.73422
         car |  -.0031724   .1738158    -0.02   0.985     -.345509    .3391642
       _cons |  -1.023325   .2486222    -4.12   0.000    -1.512996   -.5336543
------------------------------------------------------------------------------
Warning: Uncorrected two-step standard errors are unreliable.
Instruments for orthogonal deviations equation
  Standard
    FOD.(siz car)
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L(7/8).(L.dpor ati lev gro tax2)
Instruments for levels equation
  Standard
    siz car _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL6.(L.dpor ati lev gro tax2)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -5.02  Pr > z =  0.000
Arellano-Bond test for AR(2) in first differences: z =   1.24  Pr > z =  0.216
------------------------------------------------------------------------------
```

Sargan test of overid. restrictions: chi2(32) = 34.22 Prob > chi2 = 0.361
(Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(32) = 37.67 Prob > chi2 = 0.226
(Robust, but weakened by many instruments.)
Difference-in-Hansen tests of exogeneity of instrument subsets:
GMM instruments for levels
Hansen test excluding group: chi2(18) = 17.00 Prob > chi2 = 0.523
Difference (null H = exogenous): chi2(14) = 20.68 Prob > chi2 = 0.110
iv(siz car)
Hansen test excluding group: chi2(30) = 35.22 Prob > chi2 = 0.235
Difference (null H = exogenous): chi2(2) = 2.45 Prob > chi2 = 0.294

Causality between dividend policy and financial performance

Date: 02/07/17 Time: 19:28

Sample (adjusted): 2009 2015

Included observations: 1714 after adjustments

Trend assumption: Linear deterministic trend

Series: ROA RERA CAR DPOR

Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.155713	727.6523	47.85613	0.0001
At most 1 *	0.101574	437.5352	29.79707	0.0001
At most 2 *	0.075369	253.9477	15.49471	0.0001
At most 3 *	0.067420	119.6382	3.841466	0.0000

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.155713	290.1171	27.58434	0.0001
At most 1 *	0.101574	183.5875	21.13162	0.0001
At most 2 *	0.075369	134.3095	14.26460	0.0001
At most 3 *	0.067420	119.6382	3.841466	0.0000

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

ROA	RERA	CAR	DPOR
-41.15834	0.934548	2.809799	0.068024
-2.289783	-8.135945	0.346383	-1.350297
3.343121	1.924810	8.448436	1.121011
1.508804	-5.426420	3.017188	-2.903770

Unrestricted Adjustment Coefficients (alpha):

D(ROA)	0.008924	0.000359	-0.004018	-0.001496
D(RERA)	-0.005454	0.060036	0.002843	-0.018510
D(CAR)	-0.012774	-0.002073	-0.018688	-0.005061
D(DPOR)	0.017739	-0.096478	-0.042933	0.136794

1 Cointegrating Equation(s): Log likelihood 5246.628

Normalized cointegrating coefficients (standard error in parentheses)

ROA	RERA	CAR	DPOR
1.000000	-0.022706	-0.068268	-0.001653
	(0.01370)	(0.01259)	(0.00465)

Adjustment coefficients (standard error in parentheses)

D(ROA)	-0.367283
	(0.02601)
D(RERA)	0.224469
	(0.20148)
D(CAR)	0.525769
	(0.07685)
D(DPOR)	-0.730102
	(0.62692)

2 Cointegrating Equation(s): Log likelihood 5338.422

Normalized cointegrating coefficients (standard error in parentheses)

ROA	RERA	CAR	DPOR
1.000000	0.000000	-0.068795	0.002102
		(0.01264)	(0.00243)
0.000000	1.000000	-0.023213	0.165375
		(0.08091)	(0.01557)

Adjustment coefficients (standard error in parentheses)

D(ROA)	-0.368105	0.005419
	(0.02605)	(0.00517)
D(RERA)	0.087000	-0.493546
	(0.19268)	(0.03828)

D(CAR)	0.530516	0.004931
	(0.07694)	(0.01529)
D(DPOR)	-0.509187	0.801520
	(0.62046)	(0.12326)

3 Cointegrating Equation(s): Log likelihood 5405.576

Normalized cointegrating coefficients (standard error in parentheses)

ROA	RERA	CAR	DPOR
1.000000	0.000000	0.000000	0.008377
			(0.00263)
0.000000	1.000000	0.000000	0.167493
			(0.01547)
0.000000	0.000000	1.000000	0.091214
			(0.01756)

Adjustment coefficients (standard error in parentheses)

D(ROA)	-0.381536	-0.002314	-0.008744
	(0.02582)	(0.00525)	(0.00556)
D(RERA)	0.096505	-0.488074	0.029493
	(0.19330)	(0.03932)	(0.04164)
D(CAR)	0.468039	-0.031041	-0.194498
	(0.07489)	(0.01523)	(0.01613)
D(DPOR)	-0.652718	0.718882	-0.346294
	(0.62101)	(0.12632)	(0.13379)

Vector Error Correction Estimates

Date: 02/07/17 Time: 19:34

Sample (adjusted): 2009 2015

Included observations: 1714 after adjustments

Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	CointEq2	CointEq3	
ROA(-1)	1.000000	0.000000	0.000000	
RERA(-1)	0.000000	1.000000	0.000000	
CAR(-1)	0.000000	0.000000	1.000000	
DPOR(-1)	0.008377	0.167493	0.091214	
	(0.00264)	(0.01548)	(0.01757)	
	[3.17904]	[10.8180]	[5.19234]	
C1	-0.013610	-0.382556	-0.049722	
Error Correction:	**D(ROA)**	**D(RERA)**	**D(CAR)**	**D(DPOR)**
CointEq1	-0.381536	0.096505	0.468039	-0.652718
	(0.02583)	(0.19341)	(0.07493)	(0.62137)
	[-14.7684]	[0.49897]	[6.24606]	[-1.05045]
CointEq2	-0.002314	-0.488074	-0.031041	0.718882
	(0.00526)	(0.03934)	(0.01524)	(0.12639)
	[-0.44032]	[-12.4059]	[-2.03646]	[5.68759]
CointEq3	-0.008744	0.029493	-0.194498	-0.346294
	(0.00557)	(0.04167)	(0.01614)	(0.13387)
	[-1.57105]	[0.70779]	[-12.0478]	[-2.58679]
D(ROA(-1))	-0.226030	-0.099993	-0.301950	0.395660
	(0.02688)	(0.20123)	(0.07796)	(0.64648)
	[-8.40924]	[-0.49692]	[-3.87305]	[0.61202]
D(ROA(-2))	-0.097907	-0.007107	-0.106291	0.198423

	(0.02212)	(0.16558)	(0.06415)	(0.53195)
	[-4.42684]	[-0.04293]	[-1.65693]	[0.37301]
D(RERA(-1))	0.004556	-0.195165	0.011714	-0.406726
	(0.00602)	(0.04506)	(0.01746)	(0.14477)
	[0.75700]	[-4.33109]	[0.67098]	[-2.80945]
D(RERA(-2))	0.004329	-0.026805	0.006538	-0.145025
	(0.00483)	(0.03617)	(0.01401)	(0.11621)
	[0.89596]	[-0.74102]	[0.46652]	[-1.24792]
D(CAR(-1))	-0.001372	-0.077732	-0.155873	0.354491
	(0.00729)	(0.05459)	(0.02115)	(0.17539)
	[-0.18815]	[-1.42389]	[-7.36971]	[2.02120]
D(CAR(-2))	0.009034	0.014480	-0.036481	0.094367
	(0.00642)	(0.04808)	(0.01863)	(0.15448)
	[1.40651]	[0.30113]	[-1.95825]	[0.61086]
D(DPOR(-1))	0.002645	0.032758	0.009571	-0.454891
	(0.00179)	(0.01338)	(0.00518)	(0.04298)
	[1.47988]	[2.44836]	[1.84635]	[-10.5826]
D(DPOR(-2))	0.002061	0.025929	0.007428	-0.166377
	(0.00153)	(0.01148)	(0.00445)	(0.03690)
	[1.34337]	[2.25779]	[1.66940]	[-4.50937]
C2	-0.000472	-0.002926	0.001358	0.006221
	(0.00063)	(0.00468)	(0.00181)	(0.01503)
	[-0.75581]	[-0.62524]	[0.74889]	[0.41377]
R-squared	0.308348	0.270238	0.146439	0.179245
Adj. R-squared	0.303878	0.265522	0.140923	0.173940
Sum sq. resids	1.138343	63.79993	9.576733	658.5193

S.E. equation	0.025862	0.193611	0.075012	0.622020
F-statistic	68.97955	57.29713	26.54541	33.79087
Log likelihood	3838.618	388.1833	2013.411	-1612.262
Akaike AIC	-4.465132	-0.438954	-2.335369	1.895288
Schwarz SC	-4.427000	-0.400821	-2.297237	1.933421
Mean dependent	-0.000533	-0.003395	0.000984	0.006297
S.D. dependent	0.030997	0.225913	0.080931	0.684382

Determinant resid covariance (dof adj.)	2.20E-08
Determinant resid covariance	2.14E-08
Log likelihood	5405.576
Akaike information criterion	-6.237545
Schwarz criterion	-6.046883

VEC Granger Causality/Block Exogeneity Wald Tests

Date: 02/07/17 Time: 22:18

Sample: 2006 2015

Included observations: 1714

Dependent variable: D(ROA)

Excluded	Chi-sq	df	Prob.
D(RERA)	0.890986	2	0.0405
D(CAR)	2.315774	2	0.3141
D(DPOR)	2.688046	2	0.2608
All	5.547671	6	0.4757

Dependent variable: D(RERA)

Excluded	Chi-sq	Df	Prob.
D(ROA)	0.313638	2	0.8549
D(CAR)	2.521486	2	0.2834
D(DPOR)	7.453895	2	0.0241
All	11.31361	6	0.0792

Dependent variable: D(CAR)

Excluded	Chi-sq	Df	Prob.
D(ROA)	15.20859	2	0.0005
D(RERA)	0.460199	2	0.7945
D(DPOR)	4.170835	2	0.1243
All	23.77259	6	0.0006

Dependent variable: D(DPOR)

Excluded	Chi-sq	Df	Prob.
D(ROA)	0.378027	2	0.8278
D(RERA)	8.088820	2	0.0175
D(CAR)	4.091463	2	0.1293
All	13.30867	6	0.0384

Descriptive Analysis

	ROA	DPOR	RERA	CAR

Mean	0.021365	-0.950071	0.541186	0.135268
Median	0.019327	-0.824634	0.563995	0.112539
Maximum	0.425368	0.982292	1.000000	1.073452
Minimum	-0.392891	-8.310179	-1.670570	-2.067475
Std. Dev.	0.030403	0.737928	0.238725	0.134026
Skewness	1.173231	-3.225876	-0.893293	0.006392
Kurtosis	51.66782	27.04550	7.361602	58.61945
Jarque-Bera	245319.8	64047.18	2295.598	319664.1
Probability	0.000000	0.000000	0.000000	0.000000
Sum	52.98585	-2356.175	1342.141	335.4656
Sum Sq. Dev.	2.291405	1349.908	141.2775	44.53017
Observations	2480	2480	2480	2480

System: UNTITLED

Estimation Method: Least Squares

Date: 02/14/17 Time: 14:06

Sample: 2009 2015

Included observations: 1723

Total system (unbalanced) observations 6883

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.382428	0.025739	-14.85778	0.0000
C(2)	-0.002503	0.005233	-0.478292	0.6325
C(3)	-0.008628	0.005552	-1.553902	0.1203
C(4)	-0.225114	0.026801	-8.399318	0.0000
C(5)	-0.097648	0.022064	-4.425661	0.0000
C(6)	0.004623	0.005999	0.770741	0.4409

C(7)	0.004260	0.004819	0.883924	0.3768
C(8)	-0.001394	0.007276	-0.191601	0.8481
C(9)	0.009217	0.006399	1.440477	0.1498
C(10)	0.002640	0.001782	1.481048	0.1386
C(11)	0.002081	0.001528	1.362499	0.1731
C(12)	-0.000501	0.000622	-0.805191	0.4207
C(13)	0.131704	0.195064	0.675183	0.4996
C(14)	-0.488907	0.039657	-12.32852	0.0000
C(15)	0.027743	0.042079	0.659309	0.5097
C(16)	-0.131653	0.203114	-0.648172	0.5169
C(17)	-0.022288	0.167212	-0.133294	0.8940
C(18)	-0.192943	0.045460	-4.244261	0.0000
C(19)	-0.028355	0.036520	-0.776418	0.4375
C(20)	-0.078796	0.055139	-1.429054	0.1530
C(21)	0.008540	0.048492	0.176117	0.8602
C(22)	0.033175	0.013508	2.455914	0.0141
C(23)	0.024784	0.011577	2.140764	0.0323
C(24)	-0.000824	0.004715	-0.174773	0.8613
C(25)	0.467084	0.074626	6.258996	0.0000
C(26)	-0.030773	0.015171	-2.028352	0.0426
C(27)	-0.194490	0.016098	-12.08154	0.0000
C(28)	-0.300878	0.077706	-3.872019	0.0001
C(29)	-0.106708	0.063971	-1.668071	0.0953
C(30)	0.011487	0.017392	0.660493	0.5090
C(31)	0.006571	0.013972	0.470307	0.6382
C(32)	-0.155785	0.021094	-7.385142	0.0000

C(33)	-0.036144	0.018552	-1.948297	0.0514
C(34)	0.009536	0.005168	1.845304	0.0650
C(35)	0.007462	0.004429	1.684726	0.0921
C(36)	0.001361	0.001804	0.754707	0.4505
C(37)	-0.652718	0.621372	-1.050447	0.2935
C(38)	0.718882	0.126395	5.687588	0.0000
C(39)	-0.346294	0.133870	-2.586788	0.0097
C(40)	0.395660	0.646484	0.612018	0.5405
C(41)	0.198423	0.531949	0.373011	0.7092
C(42)	-0.406726	0.144771	-2.809452	0.0050
C(43)	-0.145025	0.116213	-1.247925	0.2121
C(44)	0.354491	0.175387	2.021195	0.0433
C(45)	0.094367	0.154482	0.610859	0.5413
C(46)	-0.454891	0.042985	-10.58263	0.0000
C(47)	-0.166377	0.036896	-4.509374	0.0000
C(48)	0.006221	0.015034	0.413774	0.6791

Determinant residual covariance2.26E-08

Equation: D(ROA) = C(1)*(ROA(-1) + 0.00837736416661*DPOR(-1) -

0.0136103882211) + C(2)*(RERA(-1) + 0.167492505057*DPOR(-1) -

0.382555789738) + C(3)*(CAR(-1) + 0.0912137208275*DPOR(-1) -

0.0497217010172) + C(4)*D(ROA(-1)) + C(5)*D(ROA(-2)) + C(6)

*D(RERA(-1)) + C(7)*D(RERA(-2)) + C(8)*D(CAR(-1)) + C(9)*D(CAR(

-2)) + C(10)*D(DPOR(-1)) + C(11)*D(DPOR(-2)) + C(12)

Observations: 1723

R-squared	0.308392	Mean dependent var	-0.000567
Adjusted R-squared	0.303946	S.D. dependent var	0.030934
S.E. of regression	0.025808	Sum squared resid	1.139631
Durbin-Watson stat	1.939880		

Equation: D(RERA) = C(13)*(ROA(-1) + 0.00837736416661*DPOR(-1) -

0.0136103882211) + C(14)*(RERA(-1) + 0.167492505057*DPOR(-1)

- 0.382555789738) + C(15)*(CAR(-1) + 0.0912137208275*DPOR(-1) -

0.0497217010172) + C(16)*D(ROA(-1)) + C(17)*D(ROA(-2)) + C(18)

*D(RERA(-1)) + C(19)*D(RERA(-2)) + C(20)*D(CAR(-1)) + C(21)

*D(CAR(-2)) + C(22)*D(DPOR(-1)) + C(23)*D(DPOR(-2)) + C(24)

Observations: 1723

R-squared	0.265566	Mean dependent var	-0.001469
Adjusted R-squared	0.260845	S.D. dependent var	0.227494
S.E. of regression	0.195586	Sum squared resid	65.45260
Durbin-Watson stat	1.971953		

Equation: D(CAR) = C(25)*(ROA(-1) + 0.00837736416661*DPOR(-1) -

0.0136103882211) + C(26)*(RERA(-1) + 0.167492505057*DPOR(-1)

- 0.382555789738) + C(27)*(CAR(-1) + 0.0912137208275*DPOR(-1) -

0.0497217010172) + C(28)*D(ROA(-1)) + C(29)*D(ROA(-2)) + C(30)

*D(RERA(-1)) + C(31)*D(RERA(-2)) + C(32)*D(CAR(-1)) + C(33)

*D(CAR(-2)) + C(34)*D(DPOR(-1)) + C(35)*D(DPOR(-2)) + C(36)

Observations: 1723

R-squared	0.146435	Mean dependent var	0.001020
Adjusted R-squared	0.140947	S.D. dependent var	0.080731
S.E. of regression	0.074826	Sum squared resid	9.579701
Durbin-Watson stat	2.101565		

Equation: D(DPOR) = C(37)*(ROA(-1) + 0.00837736416661*DPOR(-1) -

0.0136103882211) + C(38)*(RERA(-1) + 0.167492505057*DPOR(-1)

- 0.382555789738) + C(39)*(CAR(-1) + 0.0912137208275*DPOR(-1) -

0.0497217010172) + C(40)*D(ROA(-1)) + C(41)*D(ROA(-2)) + C(42)

*D(RERA(-1)) + C(43)*D(RERA(-2)) + C(44)*D(CAR(-1)) + C(45)

*D(CAR(-2)) + C(46)*D(DPOR(-1)) + C(47)*D(DPOR(-2)) + C(48)

Observations: 1714

R-squared	0.179245	Mean dependent var	0.006297
Adjusted R-squared	0.173940	S.D. dependent var	0.684382
S.E. of regression	0.622020	Sum squared resid	658.5193
Durbin-Watson stat	1.936763		

Pairwise Granger Causality Tests

Date: 02/14/17 Time: 15:04

Sample: 2006 2015

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DPOR does not Granger Cause ROA	1968	1.94201	0.1437
ROA does not Granger Cause DPOR		0.67541	0.5091
RERA does not Granger Cause ROA	2000	2.86302	0.0503
ROA does not Granger Cause RERA		1.58319	0.2056
CAR does not Granger Cause ROA	2000	6.54151	0.0015
ROA does not Granger Cause CAR		35.2727	9.E-16
RERA does not Granger Cause DPOR	1968	2.76686	0.0631
DPOR does not Granger Cause RERA		2.33314	0.0973
CAR does not Granger Cause DPOR	1968	0.17766	0.8372
DPOR does not Granger Cause CAR		2.78934	0.0617
CAR does not Granger Cause RERA	2000	0.81935	0.4409
RERA does not Granger Cause CAR		2.36086	0.0946

VAR Lag Order Selection Criteria

Endogenous variables: ROA RERA CAR DPOR

Exogenous variables: C

Date: 02/14/17 Time: 15:10

Sample: 2006 2015

Included observations: 2481

Lag	LogL	LR	FPE	AIC	SC	HQ
0	1059.431	NA	1.46e-07	-4.388485	-4.353759	-4.374836
1	1704.240	1276.214	1.07e-08	-7.003078	-6.829446	-6.934833

2	1777.123	143.0380	8.43e-09	-7.239597	-6.927058*	-7.116755*
3	1787.682	20.54757	8.63e-09	-7.216974	-6.765529	-7.039536
4	1815.669	53.99549	8.21e-09	-7.266815	-6.676464	-7.034782
5	1836.931	40.66732*	8.03e-09*	-7.288695*	-6.559437	-7.002065
6	1846.703	18.52819	8.24e-09	-7.262799	-6.394635	-6.921572
7	1857.278	19.87432	8.43e-09	-7.240240	-6.233170	-6.844418
8	1866.838	17.80843	8.66e-09	-7.213463	-6.067487	-6.763044

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

	ROE	RERA	CAR	DR
Mean	0.198431	0.544922	0.135358	0.459001
Median	0.222880	0.567239	0.112732	0.437637
Maximum	13.88820	1.000000	1.073452	2.670570
Minimum	-31.53604	-1.670570	-2.067475	0.000000
Std. Dev.	0.859533	0.241318	0.133588	0.237609
Skewness	-21.07763	-0.849753	0.005022	0.866069
Kurtosis	827.0631	7.155175	58.96471	7.421875
Jarque-Bera	69958055	2097.675	325994.1	2314.531
Probability	0.000000	0.000000	0.000000	0.000000
Observations	2466	2498	2498	2463

Pool unit root test: Summary

Date: 11/07/17 Time: 22:25

Sample: 2006 2015

Series: ROE_A_, ROE_B_, ROE_C_, ROE_D_, ROE_E_, ROE_F_, ROE_G_, ROE_H_, ROE_AB_, ROE_AC_, ROE_AD_, ROE_AE_, ROE_AF_, ROE_AG_, ROE_AH_, ROE_BC_, ROE_BD_, ROE_BE_, ROE_BF_, ROE_BG_, ROE_BH_, ROE_CD_, ROE_CE_, ROE_CF_, ROE_CG_

Exogenous variables: Individual effects

User specified maximum lags

Automatic selection of lags based on SIC: 0

Newey-West bandwidth selection using Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-59.6740	0.0000	1	2196
Breitung t-stat	-44.0977	0.0000	1	2195
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-51.5367	0.0000	1	2196
ADF - Fisher Chi-square	18.4207	0.0001	1	2196
PP - Fisher Chi-square	18.4207	0.0001	1	2196
Null: No unit root (assumes common unit root process)				
Hadri Z-stat	-0.07150	0.5285	1	2466

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Pool unit root test: Summary

Date: 11/07/17   Time: 22:28

Sample: 2006 2015

Series: RERA_A_, RERA_B_, RERA_C_, RERA_D_, RERA_E_, RERA_F_, RERA_G_, RERA_H_, RERA_AB_, RERA_AC_, RERA_AD_, RERA_AE_, RERA_AF_, RERA_AG_, RERA_AH_, RERA_BC_, RERA_BD_, RERA_BE_, RERA_BF_, RERA_BG_, RERA_BH_, RERA_CD_, RERA_CE_, RERA_CF_, RERA_CG_

Exogenous variables: Individual effects

User specified maximum lags

Automatic selection of lags based on SIC: 2

Newey-West bandwidth selection using Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.88111	0.0020	1	1742
Breitung t-stat	-13.6955	0.0000	1	1741
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-14.1300	0.0000	1	1742
ADF - Fisher Chi-square	136.346	0.0000	1	1742
PP - Fisher Chi-square	147.042	0.0000	1	2246
Null: No unit root (assumes common unit root process)				
Hadri Z-stat	3.40915	0.0003	1	2498

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Pool unit root test: Summary

Date: 11/07/17 Time: 22:29

Sample: 2006 2015

Series: CAR_A_, CAR_B_, CAR_C_, CAR_D_, CAR_E_, CAR_F_,
CAR_G_, CAR_H_, CAR_AB_, CAR_AC_, CAR_AD_,
CAR_AE_, CAR_AF_, CAR_AG_, CAR_AH_, CAR_BC_,
CAR_BD_, CAR_BE_, CAR_BF_, CAR_BG_, CAR_BH_,
CAR_CD_, CAR_CE_, CAR_CF_, CAR_CG_

Exogenous variables: Individual effects

User specified maximum lags

Automatic selection of lags based on SIC: 1

Newey-West bandwidth selection using Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.64249	0.0000	1	1995
Breitung t-stat	-17.5749	0.0000	1	1994
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-20.3059	0.0000	1	1995
ADF - Fisher Chi-square	195.317	0.0000	1	1995
PP - Fisher Chi-square	212.920	0.0000	1	2246
Null: No unit root (assumes common unit root process)				
Hadri Z-stat	-0.32078	0.6258	1	2498

** Probabilities for Fisher tests are computed using an asympotic Chi

-square distribution. All other tests assume asymptotic normality.

Pool unit root test: Summary

Date: 11/07/17 Time: 22:30

Sample: 2006 2015

Series: DPORR_A_, DPOR_B_, DPOR_C_, DPOR_D_, DPOR_E_, DPOR_F_, DPOR_G_, DPOR_H_, DPOR_AB_, DPOR_AC_, DPOR_AD_, DPOR_AE_, DPOR_AF_, DPOR_AG_, DPOR_AH_, DPOR_BC_, DPOR_BD_, DPOR_BE_, DPOR_BF_, DPOR_BG_, DPOR_BH_, DPOR_CD_, DPOR_CE_, DPOR_CF_, DPOR_CG_

Exogenous variables: Individual effects

User specified maximum lags

Automatic selection of lags based on SIC: 1

Newey-West bandwidth selection using Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.75976	0.0000	1	1934
Breitung t-stat	-17.7736	0.0000	1	1933
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-19.4650	0.0000	1	1934
ADF - Fisher Chi-square	188.866	0.0000	1	1934
PP - Fisher Chi-square	163.428	0.0000	1	2196
Null: No unit root (assumes common unit root process)				
Hadri Z-stat	3.23872	0.0006	1	2463

** Probabilities for Fisher tests are computed using an asympotic Chi

-square distribution. All other tests assume asymptotic normality.

Date: 11/08/17 Time: 14:59

Sample (adjusted): 3 2500

Series: ROE RERA CAR DPOR

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Prob.**
None *	0.220906	1933.973	1.0000
At most 1 *	0.165168	935.2810	0.0001
At most 2 *	0.124231	527.2958	0.0001
At most 3 *	0.095763	227.5006	0.0000

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Prob.**
None *	0.220906	564.1485	0.0001
At most 1 *	0.165168	407.9852	0.0001
At most 2 *	0.124231	299.7953	0.0001
At most 3 *	0.095763	227.5006	0.0000

ROE	RERA	CAR	DPOR
1.924707	0.242917	-0.241781	0.075069
0.024613	-3.243929	-0.111955	-2.328438
-0.012668	8.607132	-0.082010	1.951899

0.044560	-1.347007	7.729343	0.102167	

D(ROE)	-0.473981	0.000374	-0.000535	-0.009908
D(RERA)	-0.003381	-0.031732	0.024672	0.047012
D(CAR)	0.004734	0.004011	-0.034805	0.015200
D(DPOR)	0.003273	0.224138	-0.062803	-0.124288

1 Cointegrating Equation(s):		Log likelihood	
ROE	RERA	CAR	DPOR
1.000000	0.126210	-0.125620	0.039003
	(0.19790)	(0.18061)	(0.06267)
D(ROE)	-0.912274		
	(0.03621)		
D(RERA)	-0.006507		
	(0.00903)		
D(CAR)	0.009112		
	(0.00451)		
D(DPOR)	0.006299		
	(0.02818)		

2 Cointegrating Equation(s):		Log likelihood	
ROE	RERA	CAR	DPOR
1.000000	0.000000	-0.129851	-0.051539
		(0.18111)	(0.03651)
0.000000	1.000000	0.033527	0.717392
		(0.12382)	(0.02496)

D(ROE)	-0.912265	-0.116351	
	(0.03621)	(0.06119)	
D(RERA)	-0.007288	0.102114	
	(0.00894)	(0.01511)	
D(CAR)	0.009211	-0.011861	
	(0.00451)	(0.00762)	
D(DPOR)	0.011816	-0.726292	
	(0.02667)	(0.04507)	

3 Cointegrating Equation(s):		Log likelihood	
ROE	RERA	CAR	DPOR
1.000000	0.000000	0.000000	1.421807
			(0.08590)
0.000000	1.000000	0.000000	0.336980
			(0.00941)
0.000000	0.000000	1.000000	11.34643
			(0.61946)
D(ROE)	-0.912505	0.046535	
	(0.03620)	(0.17305)	
D(RERA)	-0.006643	-0.336446	
	(0.00870)	(0.04157)	
D(CAR)	0.009188	0.004054	
	(0.00451)	(0.02155)	
D(DPOR)	0.011614	-0.588635	
	(0.02666)	(0.12746)	

4 Cointegrating Equation(s):		Log likelihood	
ROE	RERA	CAR	DPOR
1.000000	0.000000	0.000000	0.068027
			(0.03589)
0.000000	1.000000	0.000000	0.377640
			(0.01003)
0.000000	0.000000	1.000000	0.182568
			(0.01407)
0.000000	0.000000	0.000000	-0.390428
			(0.02104)
Adjustment coefficients (standard error in parentheses)			
D(ROE)	-0.912529	0.047255	-0.063485
	(0.03621)	(0.17490)	(0.08983)
D(RERA)	-0.005543	-0.369680	-0.205679
	(0.00864)	(0.04174)	(0.02144)
D(CAR)	0.007637	0.050936	-0.053140
	(0.00428)	(0.02069)	(0.01063)
D(DPOR)	0.008815	-0.504038	0.546862
	(0.02655)	(0.12823)	(0.06586)

VAR Lag Order Selection Criteria

Endogenous variables: ROE RERA CAR DPOR

Exogenous variables: C

Date: 11/08/17 Time: 15:29

Sample: 1 2500

Included observations: 2051

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2654.56	NA	9.20e-06	2.593428	2.607144	2.598458
1	-1527.41	2247.701	3.14e-06	1.518686	1.600979	1.548864
2	-1437.33	179.1966	2.95e-06	1.455223	1.606093*	1.510549*
3	-1403.29	67.55168	2.92e06*	1.446407*	1.665854	1.526880
4	-1385.21	35.78683	2.94e-06	1.453156	1.741181	1.558778
5	-1362.02	45.77771	2.95e-06	1.454928	1.811530	1.585698
6	-1335.59	52.07799	2.94e-06	1.453525	1.878705	1.609443
7	-1321.22	28.23597	2.97e-06	1.463891	1.957647	1.644957
8	-1295.67	50.07920*	2.97e-06	1.463354	2.025688	1.669568

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Vector Error Correction Estimates

Date: 11/08/17   Time: 15:15

Sample (adjusted): 4 2500

Included observations: 2260 after adjustments

Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	CointEq2	CointEq3
ROE(-1)	1.000000	0.000000	0.000000

RERA(-1)	0.000000	1.000000	0.000000	
CAR(-1)	0.000000	0.000000	1.000000	
DPOR(-1)	0.068027	0.377640	0.182568	
	(0.03592)	(0.01003)	(0.01408)	
	[1.89405]	[37.6351]	[12.9653]	
C	-0.131002	-0.183238	0.038462	
Error Correction:	D(ROE)	D(RERA)	D(CAR)	D(DPOR)
CointEq1	-0.912529	-0.005543	0.007637	0.008815
	(0.03624)	(0.00865)	(0.00429)	(0.02657)
	[-25.1826]	[-0.64106]	[1.78175]	[0.33180]
CointEq2	0.047255	-0.369680	0.050936	-0.504038
	(0.17502)	(0.04177)	(0.02070)	(0.12831)
	[0.27000]	[-8.85141]	[2.46057]	[-3.92819]
CointEq4	-0.063485	-0.205679	-0.053140	0.546862
	(0.08989)	(0.02145)	(0.01063)	(0.06591)
	[-0.70623]	[-9.58804]	[-4.99786]	[8.29773]
D(ROE(-1))	-0.066835	-1.05E-05	-0.000862	0.003088
	(0.03043)	(0.00726)	(0.00360)	(0.02231)
	[-2.19663]	[-0.00144]	[-0.23941]	[0.13841]
D(ROE(-2))	-0.034568	-0.002248	-0.000578	-0.001755
	(0.02241)	(0.00535)	(0.00265)	(0.01643)
	[-1.54281]	[-0.42045]	[-0.21808]	[-0.10685]
D(RERA(-1))	-0.006249	-0.296242	-0.038291	0.304893
	(0.17328)	(0.04135)	(0.02050)	(0.12704)
	[-0.03606]	[-7.16408]	[-1.86826]	[2.39996]

D(RERA(-2))	-0.162397	-0.097199	-0.025696	0.333519
	(0.14162)	(0.03379)	(0.01675)	(0.10383)
	[-1.14674]	[-2.87615]	[-1.53405]	[3.21228]
D(CAR(-1))	-0.014263	-0.156189	-0.100861	0.361759
	(0.18496)	(0.04414)	(0.02188)	(0.13560)
	[-0.07712]	[-3.53865]	[-4.61034]	[2.66778]
D(CAR(-2))	0.043268	-0.042329	-0.117200	0.156728
	(0.17573)	(0.04194)	(0.02079)	(0.12884)
	[0.24622]	[-1.00937]	[-5.63850]	[1.21647]
D(DPOR(-1))	0.012641	-0.012609	0.003116	-0.095871
	(0.05576)	(0.01331)	(0.00659)	(0.04088)
	[0.22673]	[-0.94769]	[0.47244]	[-2.34533]
D(DPOR(-2))	0.005704	0.003621	-0.002557	0.022402
	(0.04561)	(0.01088)	(0.00539)	(0.03344)
	[0.12508]	[0.33269]	[-0.47402]	[0.66998]
C	8.81E-05	0.000140	-0.000235	0.000379
	(0.01882)	(0.00449)	(0.00223)	(0.01380)
	[0.00468]	[0.03116]	[-0.10550]	[0.02744]
R-squared	0.493118	0.267416	0.190113	0.255185
Adj. R-squared	0.489957	0.262848	0.185063	0.250541
Sum sq. resids	1797.073	102.3385	25.14159	965.9482
S.E. equation	0.894694	0.213507	0.105825	0.655947
F-statistic	156.0030	58.53543	37.64233	54.94091
Log likelihood	-2947.799	290.3617	1876.613	-2246.290
Akaike AIC	2.621946	-0.243683	-1.647445	2.001141
Schwarz SC	2.659931	-0.205698	-1.609460	2.039127

Mean dependent	-0.000383	-0.000275	-0.000289	0.001239
S.D. dependent	1.252770	0.248675	0.117227	0.757695

Determinant resid covariance (dof adj.)	2.78E-06
Determinant resid covariance	2.69E-06
Log likelihood	-1538.752
Akaike information criterion	1.445799
Schwarz criterion	1.686372

VEC Granger Causality/Block Exogeneity Wald Tests

Date: 11/08/17 Time: 15:23

Sample: 1 2500

Included observations: 2260

Dependent variable: D(ROE)

Excluded	Chi-sq	Df	Prob.
D(RERA)	1.930692	2	0.3809
D(CAR)	0.087883	2	0.9570
D(DPOR)	1.756823	2	0.4154
All	6.394357	6	0.6031

Dependent variable: D(RERA)

Excluded	Chi-sq	Df	Prob.

D(ROE)	0.360031	2	0.8353
D(CAR)	12.54067	2	0.0019
D(DPOR)	17.95587	2	0.0001
All	37.31987	6	0.0000

Dependent variable: D(CAR)

Excluded	Chi-sq	Df	Prob.
D(ROE)	0.061813	2	0.9696
D(RERA)	3.784374	2	0.1507
D(DPOR)	19.16546	2	0.0001
All	44.22851	6	0.0000

Dependent variable: D(DPOR)

Excluded	Chi-sq	Df	Prob.
D(ROE)	0.947218	2	0.6228
D(RERA)	16.75244	2	0.0002
D(CAR)	8.226999	2	0.0164
All	68.30802	6	0.0000

Pairwise Granger Causality Tests

Date: 11/13/17 Time: 15:32

Sample: 1 2500

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability

RERA does not Granger Cause ROE	2401	0.23145	0.79340
ROE does not Granger Cause RERA		0.96503	0.38112
CAR does not Granger Cause ROE	2402	0.84799	0.42840
ROE does not Granger Cause CAR		3.22989	0.03973
DPOR does not Granger Cause ROE	2363	0.96910	0.37958
ROE does not Granger Cause DPOR		3.60122	0.02744
CAR does not Granger Cause RERA	2487	1.18586	0.30566
RERA does not Granger Cause CAR		4.36451	0.01282
DPOR does not Granger Cause RERA	2403	8.44241	0.00022
RERA does not Granger Cause DPOR		20.3805	1.7E-09
DPOR does not Granger Cause CAR	2404	1.18027	0.30737
CAR does not Granger Cause DPOR		2.57339	0.04349

Operational Diversification and financial performance of SSA banks

```
. reg roaa hhias hhide hhilo hhiin siz lod llr cir
      Source |       SS       df       MS   Number of obs =    2265
-------------+------------------------------ F(8,  2256) =  121.71
       Model |  7657.06863     8  957.133579 Prob > F      =  0.0000
    Residual |  17741.7907  2256  7.86426894 R-squared     =  0.3015
-------------+------------------------------ Adj R-squared =  0.2990
       Total |  25398.8594  2264  11.2185775 Root MSE      =  2.8043
------------------------------------------------------------------------------
        roaa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       hhias |   6.98e-10   7.68e-10     0.91   0.364    -8.08e-10    2.20e-09
       hhide |  -2.57e-08   2.53e-08    -1.02   0.309    -7.53e-08    2.39e-08
       hhilo |  -6.18e-10   3.35e-09    -0.18   0.853    -7.18e-09    5.94e-09
```

```
       hhiin |   .0001626   .0045731     0.04   0.972    -.0088053    .0091306
         siz |   .0372227   .0422826     0.88   0.379    -.0456942    .1201397
         lod |  -.0114171   .0006132   -18.62   0.000    -.0126195   -.0102146
         llr |  -.0444729   .0082637    -5.38   0.000    -.0606782   -.0282676
         cir |   -.028335   .0012568   -22.55   0.000    -.0307995   -.0258705
       _cons |   3.511268   .5893003     5.96   0.000      2.35564    4.666895
------------------------------------------------------------------------------
end of do-file
. do "C:\Users\24\AppData\Local\Temp\STD00000000.tmp"
. xtreg roaa hhias hhide hhilo hhiin siz lod llr cir,fe
Fixed-effects (within) regression  Number of obs      =      2265
Group variable: id                 Number of groups   =       247
R-sq:  within  = 0.2729            Obs per group: min =         1
       between = 0.3139                           avg =       9.2
       overall = 0.2785                           max =        10
                                   F(8,2010)          =     94.32
corr(u_i, Xb)  = 0.0288            Prob > F           =    0.0000
------------------------------------------------------------------------------
        roaa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       hhias |   1.81e-10   1.37e-09     0.13   0.895    -2.51e-09    2.87e-09
       hhide |  -4.41e-09   2.92e-08    -0.15   0.880    -6.17e-08    5.28e-08
       hhilo |  -3.35e-10   3.01e-09    -0.11   0.912    -6.24e-09    5.57e-09
       hhiin |   .0009624   .0041212     0.23   0.815    -.0071199    .0090448
         siz |   .3331882   .0800313     4.16   0.000     .1762352    .4901412
         lod |  -.0108327   .0005597   -19.35   0.000    -.0119304   -.0097351
         llr |   -.024109   .0100117    -2.41   0.016    -.0437434   -.0044745
         cir |   -.022458    .001299   -17.29   0.000    -.0250054   -.0199105
       _cons |  -.8892303   1.072905    -0.83   0.407    -2.993353    1.214893
-------------+----------------------------------------------------------------
     sigma_u |  1.8101997
     sigma_e |  2.3796641
         rho |  .36655041   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(246, 2010) =     4.57           Prob > F = 0.0000
```

end of do-file

. do "C:\Users\24\AppData\Local\Temp\STD00000000.tmp"

. estimate store fe

end of do-file

. do "C:\Users\24\AppData\Local\Temp\STD00000000.tmp"

. xtreg roaa hhias hhide hhilo hhiin siz lod llr cir,re

```
Random-effects GLS regression       Number of obs      =      2265
Group variable: id                  Number of groups   =       247
R-sq:  within  = 0.2708             Obs per group: min =         1
       between = 0.3815                            avg =       9.2
       overall = 0.2971                            max =        10
                                    Wald chi2(8)       =    882.13
corr(u_i, X)   = 0 (assumed)        Prob > chi2        =    0.0000
------------------------------------------------------------------------------
        roaa |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
       hhias |   1.07e-09   9.67e-10     1.10   0.270    -8.29e-10    2.96e-09
       hhide |  -2.34e-08   2.59e-08    -0.91   0.365    -7.42e-08    2.73e-08
       hhilo |  -3.93e-10   2.98e-09    -0.13   0.895    -6.24e-09    5.46e-09
       hhiin |   .0007296    .004088     0.18   0.858    -.0072828     .008742
         siz |    .160817   .0566003     2.84   0.004     .0498826    .2717515
         lod |  -.0110665   .0005519   -20.05   0.000    -.0121483   -.0099847
         llr |   -.030196   .0088605    -3.41   0.001    -.0475622   -.0128298
         cir |  -.0245717   .0012302   -19.97   0.000    -.0269828   -.0221607
       _cons |   1.565398   .7751142     2.02   0.043     .0462021    3.084594
-------------+----------------------------------------------------------------
     sigma_u |  1.4498576
     sigma_e |  2.3796641
         rho |  .27071697   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

end of do-file

. do "C:\Users\24\AppData\Local\Temp\STD00000000.tmp"

. estimate store re

end of do-file

. do "C:\Users\24\AppData\Local\Temp\STD00000000.tmp"

. estimate store re

end of do-file

. do "C:\Users\24\AppData\Local\Temp\STD00000000.tmp"

. hausman fe re

Note: the rank of the differenced variance matrix (5) does not equal the number of coefficients being tested (8); be sure this is what you expect, or there may be

problems computing the test. Examine the output of your estimators for anything unexpected and possibly consider scaling your variables so that the

coefficients are on a similar scale.

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
hhias	1.81e-10	1.07e-09	-8.86e-10	9.72e-10
hhide	-4.41e-09	-2.34e-08	1.90e-08	1.35e-08
hhilo	-3.35e-10	-3.93e-10	5.84e-11	3.95e-10
hhiin	.0009624	.0007296	.0002329	.0005221
siz	.3331882	.160817	.1723712	.0565811
lod	-.0108327	-.0110665	.0002337	.0000928
llr	-.024109	-.030196	.006087	.0046611
cir	-.022458	-.0245717	.0021137	.0004172

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 34.22

Prob>chi2 = 0.0000

end of do-file

Dynamic panel-data estimation, two-step system GMM

Group variable: id Number of obs = 2044

Time variable : year Number of groups = 246

Number of instruments = 110 Obs per group: min = 1

F(9, 245) = 1.54e+06 avg = 8.31

```
Prob > F      =     0.000                          max =         9
------------------------------------------------------------------------------
        roaa |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        roaa |
         L1. |   .1711913   .0012606   135.80   0.000     .1687083    .1736743
             |
       hhias |   6.84e-10   9.83e-12    69.64   0.000     6.65e-10    7.04e-10
       hhide |  -2.07e-08   1.54e-10  -134.02   0.000    -2.10e-08   -2.04e-08
       hhilo |   9.59e-09   2.14e-09     4.49   0.000     5.38e-09    1.38e-08
       hhiin |   .0058587   .0009729     6.02   0.000     .0039423    .0077751
         llr |   .0037591   .0009831     3.82   0.000     .0018227    .0056955
         cir |  -.0238368   .0003055   -78.04   0.000    -.0244384   -.0232351
         lod |  -.0062261   .0000383  -162.59   0.000    -.0063015   -.0061506
         siz |   .0438818   .0010632    41.27   0.000     .0417877     .045976
       _cons |   2.559945   .0294771    86.85   0.000     2.501884    2.618006
------------------------------------------------------------------------------
Warning: Uncorrected two-step standard errors are unreliable.
Instruments for orthogonal deviations equation
  Standard
    FOD.siz
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    L2.(L.roaa hhias hhide hhilo hhiin llr cir lod)
Instruments for levels equation
  Standard
    siz
    _cons
  GMM-type (missing=0, separate instruments for each period unless collapsed)
    DL.(L.roaa hhias hhide hhilo hhiin llr cir lod)
------------------------------------------------------------------------------
Arellano-Bond test for AR(1) in first differences: z =  -3.59  Pr > z =  0.000
Arellano-Bond test for AR(2) in first differences: z =   1.42  Pr > z =  0.156
------------------------------------------------------------------------------
Sargan test of overid. restrictions: chi2(100)  = 249.48  Prob > chi2 =  0.000
  (Not robust, but not weakened by many instruments.)
```

Hansen test of overid. restrictions: chi2(100) = 97.13 Prob > chi2 = 0.562
(Robust, but weakened by many instruments.)
Difference-in-Hansen tests of exogeneity of instrument subsets:
GMM instruments for levels
Hansen test excluding group: chi2(50) = 52.03 Prob > chi2 = 0.395
Difference (null H = exogenous): chi2(50) = 45.10 Prob > chi2 = 0.670
iv(siz)
Hansen test excluding group: chi2(99) = 96.16 Prob > chi2 = 0.562
Difference (null H = exogenous): chi2(1) = 0.98 Prob > chi2 = 0.323
end of do-file

Dividend Policy, Agency Cos, Market Risk and Bank Performance.

	ROA	DPOR	AUR	LIR	FEXR
ROA	1.000000	-0.100131	-0.015945	-0.027607	0.038356
DPOR	-0.100131	1.000000	-0.046986	-0.015794	0.011522
AUR	-0.015945	-0.046986	1.000000	-0.077375	-0.079586
LIR	-0.027607	-0.015794	-0.077375	1.000000	0.533316
FEXR	0.038356	0.011522	-0.079586	0.533316	1.000000

VAR Lag Order Selection Criteria

Endogenous variables: ROA DPOR LIR FEXR AUR

Exogenous variables: C

Date: 05/07/17 Time: 21:22

Sample: 2006 2015

Included observations: 2340

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2055.709	NA	0.126493	12.12182	12.17812	12.17812
1	-539.9492	2978.022	1.97e-05	3.352642	3.690490	3.690490
2	-427.0536	218.4861	1.17e-05	2.835609	3.454998*	3.454998*

3	-405.6905	40.71548	1.20e-05	2.857003	3.757932	3.757932
4	-374.9725	57.64146	1.16e-05*	2.823368*	4.005836	4.005836
5	-359.6769	28.25190	1.23e-05	2.880452	4.344461	4.344461
6	-327.4859	58.51192*	1.18e-05	2.838152	4.583701	4.583701

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Date: 05/07/17 Time: 21:40

Sample (adjusted): 2009 2015

Included observations: 1737 after adjustments

Trend assumption: Linear deterministic trend

Series: ROA DPOR LIR FEXR AUR

Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.198180	396.4800	69.81889	0.0001
At most 1 *	0.164119	233.6979	47.85613	0.0001
At most 2 *	0.094171	101.5771	29.79707	0.0000
At most 3 *	0.037893	28.68408	15.49471	0.0003
At most 4	0.000291	0.214301	3.841466	0.6434

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.198180	162.7821	33.87687	0.0001
At most 1 *	0.164119	132.1208	27.58434	0.0000
At most 2 *	0.094171	72.89301	21.13162	0.0000
At most 3 *	0.037893	28.46978	14.26460	0.0002
At most 4	0.000291	0.214301	3.841466	0.6434

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

ROA	DPOR	LIR	FEXR	AUR
17.66316	1.403200	-0.003883	0.051437	0.244153
29.44278	0.369926	-0.003102	-0.022985	-0.132021
0.184421	5.327922	0.023621	-0.067510	-0.028166
-4.815034	0.927183	-0.107932	0.470826	-0.034967
-0.175339	0.296346	-0.006795	-0.589741	-0.014364

Unrestricted Adjustment Coefficients (alpha):

D(ROA)	-0.005155	-0.009069	0.000358	0.000223	-1.94E-05
D(DPOR)	-0.009774	0.004095	-0.049936	-0.010582	-0.000609
D(LIR)	0.315761	-0.163477	-0.377070	0.397817	0.036198

D(FEXR)	0.009651	-0.003981	-0.000970	-0.008868	0.001457
D(AUR)	-1.336348	0.700520	0.155157	-0.000679	0.019077

1 Cointegrating Equation(s): Log likelihood-1244.846

Normalized cointegrating coefficients (standard error in parentheses)

ROA	DPOR	LIR	FEXR	AUR
1.000000	0.079442	-0.000220	0.002912	0.013823
	(0.02339)	(0.00047)	(0.00320)	(0.00119)

Adjustment coefficients (standard error in parentheses)

D(ROA)	-0.091058
	(0.01624)
D(DPOR)	-0.172635
	(0.11587)
D(LIR)	5.577331
	(2.15177)
D(FEXR)	0.170468
	(0.06515)
D(AUR)	-23.60412
	(2.24603)

2 Cointegrating Equation(s): Log likelihood-1178.785

Normalized cointegrating coefficients (standard error in parentheses)

ROA	DPOR	LIR	FEXR	AUR
1.000000	0.000000	-8.38E-05	-0.001474	-0.007923
		(0.00038)	(0.00263)	(0.00097)
0.000000	1.000000	-0.001712	0.055217	0.273733
		(0.00841)	(0.05776)	(0.02139)

Adjustment coefficients (standard error in parentheses)

D(ROA)	-0.358066	-0.010589
	(0.02937)	(0.00124)
D(DPOR)	-0.052060	-0.012200
	(0.22517)	(0.00952)
D(LIR)	0.764126	0.382601
	(4.17753)	(0.17656)
D(FEXR)	0.053248	0.012070
	(0.12654)	(0.00535)
D(AUR)	-2.978858	-1.616023
	(4.27359)	(0.18062)

3 Cointegrating Equation(s): Log likelihood-1142.339

Normalized cointegrating coefficients (standard error in parentheses)

ROA	DPOR	LIR	FEXR	AUR
1.000000	0.000000	0.000000	-0.002400	-0.011725
			(0.00267)	(0.00120)
0.000000	1.000000	0.000000	0.036328	0.196120
			(0.03435)	(0.01548)
0.000000	0.000000	1.000000	-11.03365	-45.33785
			(7.98897)	(3.60013)

Adjustment coefficients (standard error in parentheses)

D(ROA)	-0.358000	-0.008682	5.66E-05
	(0.02936)	(0.00472)	(2.1E-05)
D(DPOR)	-0.061269	-0.278255	-0.001154
	(0.21598)	(0.03474)	(0.00015)

D(LIR)	0.694586	-1.626400	-0.009626
	(4.14983)	(0.66740)	(0.00292)
D(FEXR)	0.053069	0.006900	-4.80E-05
	(0.12654)	(0.02035)	(8.9E-05)
D(AUR)	-2.950243	-0.789356	0.006681
	(4.26907)	(0.68658)	(0.00300)

4 Cointegrating Equation(s): Log likelihood-1128.104

Normalized cointegrating coefficients (standard error in parentheses)

ROA	DPOR	LIR	FEXR	AUR
1.000000	0.000000	0.000000	0.000000	0.004475
				(0.00075)
0.000000	1.000000	0.000000	0.000000	-0.049142
				(0.00777)
0.000000	0.000000	1.000000	0.000000	29.15276
				(2.37089)
0.000000	0.000000	0.000000	1.000000	6.751219
				(0.53217)

Adjustment coefficients (standard error in parentheses)

D(ROA)	-0.359074	-0.008475	3.25E-05	2.41E-05
	(0.02965)	(0.00479)	(9.5E-05)	(0.00041)
D(DPOR)	-0.010315	-0.288066	-1.21E-05	-0.002208
	(0.21767)	(0.03515)	(0.00069)	(0.00301)
D(LIR)	-1.220914	-1.257551	-0.052563	0.232758
	(4.15901)	(0.67167)	(0.01327)	(0.05745)
D(FEXR)	0.095767	-0.001322	0.000909	-0.003522

	(0.12727)	(0.02055)	(0.00041)	(0.00176)
D(AUR)	-2.946972	-0.789986	0.006754	-0.095634
	(4.31084)	(0.69619)	(0.01375)	(0.05955)

Vector Error Correction Estimates

Date: 05/07/17 Time: 21:46

Sample (adjusted): 2009 2015

Included observations: 1737 after adjustments

Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1	CointEq2	CointEq3	CointEq4
ROA(-1)	1.000000	0.000000	0.000000	0.000000
DPOR(-1)	0.000000	1.000000	0.000000	0.000000
LIR(-1)	0.000000	0.000000	1.000000	0.000000
FEXR(-1)	0.000000	0.000000	0.000000	1.000000
AUR(-1)	0.004475	-0.049142	29.15276	6.751219
	(0.00075)	(0.00779)	(2.37582)	
	[5.98411]	[-6.30794]	[12.2706]	[12.6599]
			(0.53328)	
C	-0.032702	-0.359440	-79.11583	-18.71324

Error Correction:	D(ROA)	D(DPOR)	D(LIR)	D(FEXR)	D(AUR)
CointEq1	-0.359074	-0.010315	-1.220914	0.095767	-2.946972
	(0.02971)	(0.21812)	(4.16764)	(0.12753)	(4.31979)
	[-12.0856]	[-0.04729]	[-0.29295]	[0.75095]	[-0.68220]
CointEq2	-0.008475	-0.288066	-1.257551	-0.001322	-0.789986
	(0.00480)	(0.03523)	(0.67307)	(0.02060)	(0.69764)

	[-1.76627]	[-8.17754]	[-1.86839]	[-0.06418]	[-1.13237]
CointEq3	3.25E-05	-1.21E-05	-0.052563	0.000909	0.006754
	(9.5E-05)	(0.00070)	(0.01329)	(0.00041)	(0.01378)
	[0.34318]	[-0.01742]	[-3.95374]	[2.23460]	[0.49017]
CointEq4	2.41E-05	-0.002208	0.232758	-0.003522	-0.095634
	(0.00041)	(0.00301)	(0.05757)	(0.00176)	(0.05968)
	[0.05882]	[-0.73277]	[4.04274]	[-1.99895]	[-1.60255]
D(ROA(-1))	-0.215274	-0.002040	-11.21125	-0.224072	0.243076
	(0.03342)	(0.24535)	(4.68775)	(0.14344)	(4.85889)
	[-6.44172]	[-0.00832]	[-2.39160]	[-1.56208]	[0.05003]
D(ROA(-2))	-0.023553	0.057014	-10.91964	-0.251733	0.003692
	(0.02577)	(0.18922)	(3.61529)	(0.11063)	(3.74728)
	[-0.91384]	[0.30132]	[-3.02040]	[-2.27550]	[0.00099]
D(DPOR(-1))	0.003846	-0.277760	1.192651	0.017911	1.656818
	(0.00532)	(0.03902)	(0.74563)	(0.02282)	(0.77285)
	[0.72359]	[-7.11756]	[1.59952]	[0.78499]	[2.14377]
D(DPOR(-2))	-0.002168	-0.069596	-0.632656	-0.008943	-0.268867
	(0.00444)	(0.03259)	(0.62275)	(0.01906)	(0.64548)
	[-0.48834]	[-2.13530]	[-1.01591]	[-0.46931]	[-0.41654]
D(LIR(-1))	-0.000242	0.004094	0.200744	-0.002783	-0.037181
	(0.00026)	(0.00189)	(0.03607)	(0.00110)	(0.03739)
	[-0.94088]	[2.16870]	[5.56553]	[-2.52107]	[-0.99452]
D(LIR(-2))	-0.000213	-0.004400	-0.035079	0.000189	0.003215
	(0.00022)	(0.00160)	(0.03064)	(0.00094)	(0.03175)
	[-0.97593]	[-2.74405]	[-1.14506]	[0.20177]	[0.10126]
D(FEXR(-1))	0.010221	-0.021500	11.59641	0.154410	-0.347080

	(0.01002)	(0.07354)	(1.40504)	(0.04299)	(1.45634)
	[1.02044]	[-0.29238]	[8.25343]	[3.59143]	[-0.23832]
D(FEXR(-2))	0.001248	0.082225	-5.157803	0.054739	2.775273
	(0.00937)	(0.06877)	(1.31405)	(0.04021)	(1.36202)
	[0.13327]	[1.19558]	[-3.92512]	[1.36133]	[2.03761]
D(AUR(-1))	0.000222	6.63E-05	-0.052402	-0.003438	-0.274805
	(0.00026)	(0.00193)	(0.03680)	(0.00113)	(0.03814)
	[0.84515]	[0.03444]	[-1.42410]	[-3.05338]	[-7.20515]
D(AUR(-2))	-0.000225	0.001325	-0.050761	-0.002586	-0.145098
	(0.00022)	(0.00165)	(0.03153)	(0.00096)	(0.03268)
	[-1.00086]	[0.80294]	[-1.61018]	[-2.68065]	[-4.44050]
C	-0.001010	-0.003918	-0.528706	0.051524	-0.260854
	(0.00109)	(0.00797)	(0.15226)	(0.00466)	(0.15782)
	[-0.93038]	[-0.49170]	[-3.47235]	[11.0585]	[-1.65286]
R-squared	0.314458	0.286398	0.235589	0.062596	0.413165
Adj. R-squared	0.301165	0.272561	0.220766	0.044420	0.401786
Sum sq. resids	0.390751	21.06088	7688.658	7.199286	8260.288
S.E. equation	0.023264	0.170793	3.263297	0.099856	3.382431
F-statistic	23.65585	20.69774	15.89412	3.443757	36.30919
Log likelihood	1733.570	264.3227	-1909.858	659.8836	-1936.285
Akaike AIC	-4.663691	-0.676588	5.223496	-1.750023	5.295209
Schwarz SC	-4.570016	-0.582913	5.317172	-1.656348	5.388885
Mean dependent	-0.000388	-0.002160	-0.152319	0.062185	-0.159729
S.D. dependent	0.027829	0.200249	3.696773	0.102151	4.373213

Determinant resid covariance (dof adj.) 1.63E-05

Determinant resid covariance	1.47E-05
Log likelihood	-1128.104
Akaike information criterion	3.319142
Schwarz criterion	3.912420

Kao Residual Cointegration Test

Series: ROA DPOR LIR FEXR AUR

Date: 05/07/17 Time: 21:49

Sample: 2006 2015

Included observations: 2500

Null Hypothesis: No cointegration

Trend assumption: No deterministic trend

User-specified lag length: 1

Newey-West automatic bandwidth selection and Bartlett kernel

	t-Statistic	Prob.
ADF	-3.154711	0.0008
Residual variance	0.001413	
HAC variance	0.001111	

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RESID)

Method: Least Squares

Date: 05/07/17 Time: 21:49

Sample (adjusted): 2008 2015

Included observations: 1920 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

RESID(-1)	-0.965623	0.039271	-24.58848	0.0000
D(RESID(-1))	0.049524	0.026420	1.874512	0.0612

R-squared	0.529041	Mean dependent var	-0.000174
Adjusted R-squared	0.528527	S.D. dependent var	0.030981
S.E. of regression	0.021273	Akaike info criterion	-4.860617
Sum squared resid	0.415419	Schwarz criterion	-4.850130
Log likelihood	2237.884	Hannan-Quinn criter.	-4.856615
Durbin-Watson stat	1.883941		

VARIANCE DECOMPOSITION

Varience Decomposition of ROA:

Period	S.E.	ROA	DPOR	LIR	FEXR	AUR
1	0.023398	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.025449	79.58873	10.26500	0.020198	1.093468	9.032608
3	0.027040	78.91666	10.68124	0.119505	1.092558	9.190038
4	0.027842	78.40540	11.19012	0.123622	1.101568	9.179290
5	0.028296	77.93419	11.65612	0.120087	1.114003	9.175596

Variance Decomposition of DPOR:

Period	S.E.	ROA	DPOR	LIR	FEXR	AUR
1	0.608631	0.008827	99.99117	0.000000	0.000000	0.000000
2	0.702190	12.02238	79.18994	0.290499	0.462090	8.035089
3	0.771557	10.03984	77.22457	1.277326	4.410965	7.047298
4	0.806791	10.03701	68.87558	2.343514	9.657559	9.086336
5	0.828127	13.03538	68.73060	1.394180	8.730075	8.109762

Variance Decomposition of LIR:

Period	S.E.	ROA	DPOR	LIR	FEXR	AUR
1	3.245511	0.000134	0.827800	99.17207	0.000000	0.000000
2	5.380114	0.464690	2.587068	92.77373	4.121072	0.053440
3	6.691038	0.894673	4.122327	90.05007	4.812846	0.120080
4	7.646051	0.910491	4.754204	88.73574	5.155880	0.443682
5	8.415321	0.827403	4.913932	87.79021	5.458625	1.009831

Variance Decomposition of FEXR:

Period	S.E.	ROA	DPOR	LIR	FEXR	AUR
1	0.100126	0.519381	3.091359	11.62827	84.76099	0.000000
2	0.151152	0.768363	3.394047	9.986252	85.84708	0.004257
3	0.193242	0.930307	3.827914	9.827699	85.40852	0.005561
4	0.230093	0.838464	3.717934	10.20697	85.00601	0.230618
5	0.263390	0.758178	3.576253	10.84321	84.31089	0.511470

Variance Decomposition of AUR:

Period	S.E.	ROA	DPOR	LIR	FEXR	AUR
1	3.410943	0.408850	10.17546	0.155847	0.969891	88.28995
2	3.561306	0.496247	10.20824	0.329734	0.911919	88.05386
3	3.655565	0.536221	10.47490	0.333548	1.400253	87.25508
4	3.762782	0.595243	10.59465	0.314921	1.583155	86.91203
5	3.799771	0.643266	10.74125	0.311810	1.634922	86.66875

Cholesky Ordering: ROA
DPOR LIR FEXR AUR

IMPULSE RESPONSE

Response of ROA:

Period	ROA	DPOR	LIR	FEXR	AUR
1	0.023398	0.000000	0.000000	0.000000	0.000000
2	0.00987	-0.00131	-0.00036	0.000778	0.000460
3	0.008845	-0.00180	-0.00086	0.000267	-0.00108
4	0.006289	-0.00206	-0.00029	0.00033	1.70E-05
5	0.004620	-0.00200	5.70E-05	0.000354	-0.00012

Response of DPOR:

Period	ROA	DPOR	LIR	FEXR	AUR
1	-0.00571	0.608604	0.000000	0.000000	0.000000
2	-0.00881	0.344496	0.037847	-0.04773	-0.01315
3	-0.01126	0.318760	-0.01478	-0.01296	0.010419
4	-0.00192	0.230018	-0.02418	-0.04282	-0.01674
5	0.00131	0.183022	-0.02161	-0.02695	-0.01381

Response of LIR:

Period	ROA	DPOR	LIR	FEXR	AUR
1	-0.00375	-0.29528	3.232048	0.000000	0.000000
2	-0.36673	-0.81341	4.050655	1.092186	0.124372
3	-0.51578	-1.04724	3.668988	0.980735	0.195682
4	-0.36297	-0.96635	3.400201	0.927106	0.453460

5	-0.23163	-0.83697	3.208452	0.922731	0.675094

Response of FEXR:

Period	ROA	DPOR	LIR	FEXR	AUR
1	-0.00721	-0.01760	0.034143	0.092182	0.000000
2	-0.01111	-0.02157	0.033403	0.105431	-0.00098
3	-0.01310	-0.02557	0.037261	0.110817	0.001051
4	-0.00982	-0.02321	0.041640	0.114502	0.010955
5	-0.00906	-0.02264	0.046028	0.116128	0.015256

Response of AUR:

Period	ROA	DPOR	LIR	FEXR	AUR
1	-0.21810	-0.14287	-0.13465	0.335920	3.381652
2	-0.12397	0.07744	-0.15390	0.053061	1.000249
3	-0.09336	-0.19248	0.052466	0.267321	0.748514
4	-0.11234	-0.14398	-0.00395	0.192441	0.851454
5	-0.09273	-0.15109	0.020778	0.109101	0.485765

Cholesky Ordering: ROA DPOR LIR FEXR AUR

APPENDIX 4

TURNITIN REPORT

DIVIDEND POLICY, AGENCY COST AND BANK PERFORMANCE IN SUB-SAHARAN AFRICA BANKS

by Olarewaju Odunayo

Submission date: 19-Nov-2017 07:59PM (UTC+0200)

Submission ID: 882409846

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Word count: 90636

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DIVIDEND POLICY, AGENCY COST AND BANK PERFORMANCE IN SUB-SAHARAN AFRICA BANKS

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APPENDIX 5

ETHICAL CLEARANCE

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

05 December 2016

Mrs Ddunayo Magret Olarewaju (216076257)
School of Accounting, Economics & Finance
Westville Campus

Dear Mrs Olarewaju,

Protocol reference number: HSS/2102/016D
Project title: Dividend Policy, agency cost and bank performance in sub-Saharan Africa

Full Approval – No Risk / Exempt Application

In response to your application received on 04 November 2016, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol have been granted **FULL APPROVAL.**

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

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

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

You[redacted]

....

Dr Shenuka Singh (Chair)

/ms

Cc Supervisor: Professor SO Migiro and Dr Mabutho Sibanda
Cc Academic Leader Research: Dr Harold Ngalawa
Cc School Administrator: Ms Seshni Naidoo

Humanities & Social Sciences Research Ethics Committee
Dr Shenuka Singh (Chair)
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