UNIVERSITY OF CAPE COAST

FINANCIAL DEVELOPMENT, PUBLIC DEBT AND MONETARY POLICY EFFECTIVENESS IN GHANA

BISMARK ANOKYE

2023

UNIVERSITY OF CAPE COAST

FINANCIAL DEVELOPMENT, COMMERCIAL BANKS RESPONSIVENESS AND MONETARY POLICY EFFECTIVENESS IN GHANA

BY

BISMARK ANOKYE

Thesis submitted to the Department of Economic Studies of the School of Economics, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfilment of the requirements for the award of Doctor of Philosophy degree in Economics

NOVEMBER 2023

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature……... Date: …….

Name: Bismark Anokye

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature: …….. Date: …….

Name: Prof. James Atta Peprah

Co–Supervisor's Signature: …….. Date…….

Name: Prof. Camara Obeng

ABSTRACT

This study examines the relationship among financial development, public debt dynamics, commercial banks' responsiveness and monetary policy effectiveness in Ghana. The objectives (1) examined the role of financial development in the effectiveness of monetary policy, (2) assessed the effect of public debt on financial development, and (3) determined the responsiveness of commercial banks to the monetary policy rate. The study utilizes Structural Vector Autoregression (SVAR), Autoregressive Distributed Lag (ARDL) and Dominance Analysis to analyse monthly data spanning from 2002 to 2020. A purposive sampling procedure was used to select eight (8) participants for the qualitative dimension of the study. The first objective reveals that the interaction between financial development and monetary policy significantly influence inflation, trade openness, and output gap. The study emphasises the importance of a well-developed financial sector in enhancing the transmission mechanism of monetary policy in order to make monetary policy effective. The second objective revealed total debt exhibits a positive long-run association with financial development. However, in the short run, total debt demonstrates a negative relationship. The disaggregated analysis highlights the significant influence of external debt on financial development, emphasizing the importance of prudent international borrowing practices. The third objective suggests that changes in the monetary policy rate have a lasting impact on lending rates, with commercial banks considering clients' ability to pay and assessing monetary transactions in their responses. Ministry of Finance and bank of Ghana should prioritize the development of a robust financial sector, adopt prudent borrowing practices.

KEY WORDS

Central Bank

Commercial Bank's Responsiveness

Financial Development

Monetary Policy

Public Debt

ACKNOWLEDGEMENTS

I extend my deep gratitude to Prof. James Atta Peprah for his invaluable guidance, constructive feedback, and encouragement, which significantly aided in the successful completion of this thesis. Special appreciation goes to Prof. Camara Obeng, who not only served as my co-supervisor but also provided essential support and dedicated time throughout the entire research process. I would also like to acknowledge Prof. Ferdinand Ahiakpor, Prof. Mark K. Armah, and all the faculty members at the School of Economics for their valuable contributions. My sincere thanks go to friends, particularly Mrs. Lawrencia Yeboah-Duah and Dr. William Godfred Cantah, for their unwavering encouragement. I express gratitude to Dr. Evans Kulu and the entire administrative staff of the School of Economics for their support. A special acknowledgment to Vida Afaribea for her continuous support.

DEDICATION

To my wife Vivian Dadzie and my daughter, Annel Anokye Boatemah.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ACBL	Average Commercial Banks Lending Rate
ARDL	Autoregressive Distributed Lag
CLASL	Core Liquid Assets to Short-Term Liabilities
DOM_DEBT	Domestic Debt
EXC	Exchange Rate
EXT_DEBT	External Debt
FINDEV	Financial Development
GDPGRTH	Gross Domestic Growth
HMH	Heterogeneous Market Hypothesis
IMF	International Monetary Fund
INF	Inflation
MOMO	Total value of mobile money
MPR	Monetary Policy Rate
NPL	Non-Performing Loans
OUTGAP	Output Gap
PSC	Private Sector Credit
REER	Real Effective Exchange Rate
REMIT	Remittance
SDGs	Sustainable Development Goals
SVAR	Structural Vector Autoregression
TOT_DEBT	Total Debt
TRADOPEN	Trade Openness
WAMZ	West African Monetary Zone
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION

Monetary policy transmission and its effectiveness have been an important area of interest in the whole wide world, especially in Africa since the financial crisis in 1990 (Akinsola & Odhiambo, 2017; Bleaney et al., 2020; Effiong et al., 2020; Savvides, 1998; Tule et al., 2019). This has piqued the interest of both policymakers and the academic community in exploring the conduit through which monetary policy operates and transmits.

Monetary policy is effective when it can affect both inflation (sustained stable inflation) and output (reduction in output gap) positively (Cantah et al., 2023; Effiong et al., 2020; Wiafe et al., 2022). This infers that the effectiveness of monetary policy rests on the rate at which output, and inflation respond to changes in the monetary policy rate (MPR) by central banks. It is a bare fact that the transmission of monetary policy is a financial phenomenon (Cantah et al., 2023). No wonder the countries that suffer under development of the financial sector are faced with challenges of the ineffectiveness of monetary policy or delay in transmission of policy rate set by the central banks (Ayadi et al., 2015; De la Torre et al., 2013; Yalçinkaya et al., 2021).

The study focuses on financial sector development and financial sector responsiveness as plausible determinants and thus examine whether the financial development (FINDEV), as well as responsiveness of commercial banks significantly impact the efficacy of monetary policy, particularly in shaping output and inflation dynamics in Ghana. This study also examines the determinants of FINDEV with specific focus on public debt and disaggregated public debt (domestic and external debt).

Background to the Study

An effective monetary policy and a well-developed financial sector is an important factor for economic management which requires an eagle eye from December 2000, when the West African Monetary Zone (WAMZ) was established which considers single-digit inflation as a contingency for becoming a member state (Gyamfi et al., 2019; Ilyas et al., 2022; Tule et al., 2019; Tweneboah & Eshun, 2023). Notwithstanding the level of improvement in the financial sector, the responsiveness of the financial institutions to monetary policy rate is also important to consider when talking about monetary policy effectiveness (Cantah, 2018; Iheonu et al., 2020; Lindgren et al., 1996).

Part of the reason for regulating and fixing monetary policy, is to fix short-term interest rates in order to have an impact on prices and/or output (McKinnon & Pill, 1998; Najimu, 2019; Nene et al., 2022; Takyi & Obeng, 2013). When short-term interest rates fluctuate, agents change their consumption and investment patterns depending on how borrowing and lending rates, credit availability, market liquidity, and asset prices are influenced by the monetary policy position (Abradu-Otoo et al., 2003; Aimola & Odhiambo, 2021; Hosono, 2006; Leith & Wren-Lewis, 2009; McKinnon & Pill, 1998). However, no matter how low the MPR or strict regulations and rules of the central bank are, without prompt responsiveness, the MPR will not transmit to have an impact on the economy (Iheonu et al., 2020; Lindgren et al., 1996). This implies that much of the effectiveness of monetary policy depends on the responsiveness of commercial banks in Ghana to MPR (Cantah, 2018).

The commercial banking industry is involved in the business of providing financial services to the Ghanaian economy and the world as a whole

(Kwashie et al., 2022). In playing this intermediation role, the sector acts as the main channel for the economy's monetary policies to be transmitted and at the same time, earns income for its shareholders (Akosah et al., 2017, 2020a). These banking sectors operate under the general guiding principle provided by the monetary authority (the central bank) (Akanyonge et al., 2023; Ofori & Obeng, 2023; Sena et al., 2021; Takyi & Obeng, 2013). This implies that most policies by the central banks are transmitted to these commercial banks and therefore, the failure of the commercial banks to respond to the policy directives of the central banks will affect monetary policy effectiveness and the economy as a whole (Ahiakpor et al., 2019; Akosah et al., 2021; Effiong et al., 2020; Valogo et al., 2023; Wiafe et al., 2022). This emphasizes how dependent financial intermediaries are on the success of monetary policy.

Financial intermediaries' function, particularly that of commercial banks cannot be over emphasised. Akinsola and Odhiambo (2017) argues that the presence of commercial banks will not necessarily result in effective transmission of monetary policy but rather a well-developed financial sector to complement the functions of commercial banks with regard to monetary policy transmissions. Thus, it is important to understand commercial banks as an effective conductor of monetary policy. Several studies have posited that banks' balance sheet is one of the methods by which monetary policy implemented affects the financial operations of agents (Abradu-Otoo et al., 2003; Alpanda & Aysun, 2012; Brissimis & Delis, 2022; Dale & Haldane, 1995; Ghazali & Rahman, 2020; Hosono, 2006; F. Mishkin, 1996; F. S. Mishkin, 1995). According to this view, a monetary contraction forces a contraction in banks' assets and thus a reduction in banks' loans (Brissimis & Delis, 2022). If bank

lending plays a unique economic role in financial intermediation, this reduction in bank loans may be the primary mechanism whereby the result of monetary contraction is a decline in the overall level of economic activity (Alpanda & Aysun, 2012). It is then indisputable that the size of the banking institution matters in the transmission channel (Alpanda & Aysun, 2012; Cetorelli & Goldberg, 2012).

Therefore, it is expected that revision of central bank short-term nominal interest rates should result in a similar change or co-movement in the commercial banking lending rates (Abradu-Otoo et al., 2003; Cristiano, 2016; Frimpong, 2022). Nevertheless, it is generally acknowledged that the lending rate is considerably high even during periods of low/single-digit inflation, as argued by the business community in Ghana (Adu & Marbuah, 2011; Akosah et al., 2017; Asamoah & Adu, 2016; Nchor & Darkwah, 2015). Available data on average lending rate (market-based rate) and monetary policy rates affirms the trending lamentation among the business community in Ghana (Figure 1).

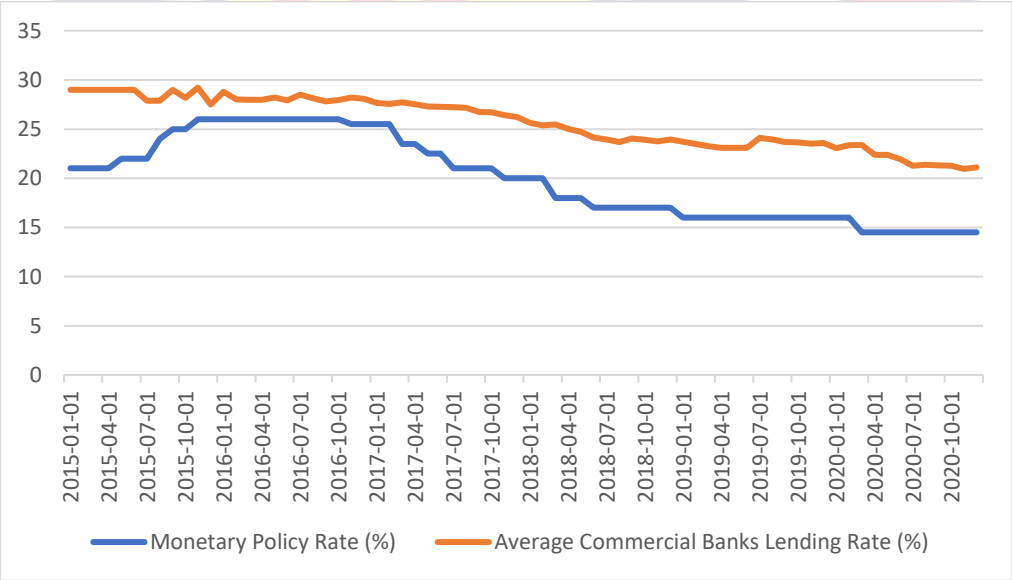


Figure1: Graph of Average lending rate and Monetary policy rate
Source: Author's Construction

Figure 1 covers the period from January 2015 to December 2020 and includes two key interest rates: the MPR (%) and the Average Commercial Banks Lending Rate (ACBL) (%). The MPR represents interest rates that the central bank determines, while the ACBL reflects the average interest rate on loans from commercial banks to customers. Key observations from Figure 1 include the stability of the Monetary Policy Rate during the earlier years, ranging from approximately 21% to 25%, with occasional changes over time. In contrast, the ACBL displays more variabilityThis suggests that commercial banks may have their own considerations and factors influencing the rates they offer to borrowers.

A careful look at Figure 1 reveals a consistent diverging of the two basic interest rates over the period. The second observation is a slight increase in the MPR results in a rise of commercial bank rates. Thus, changes in the MPR can influence lending rates offered by commercial banks. For example, MPR hikes by the central bank may lead to higher lending rates, making borrowing more expensive for individuals and businesses. Conversely, MPR cuts can result in lower lending rates, potentially stimulating borrowing and economic activity. Yet, it is unclear how the extent of the effect and length of time taken for commercial bank rates to respond to monetary policy. Hence, part of this study examines commercial bank responsiveness to monetary policy rate and to what extent can the FINDEV aid the responsiveness of the commercial banks to monetary policy rates? And finally, how long does it take for changes in money market factors and monetary policy to cause shocks to bank lending rates?

There has been an ongoing debate regarding the fundamental mechanism behind the effectiveness of monetary policy (Cantah et al., 2023;

Effiong et al., 2020; Wiafe et al., 2022). Theoretically, the monetary approach places much emphasis on the liquidity channel which posits that an increased money policy causes a decrease in the interest rate which in the long run affects private spending (Abradu-Otoo et al., 2003; Alpanda & Aysun, 2012; Cooley & Quadrini, 2004). Although the responsiveness of financial institutions to the monetary policy rate is paramount, but the degree of the institution's development to promoting smooth transmission is very important. Not only the development of the financial sector, but rather how it also promotes and affects how well financial system works.

Since 1970s, a lot of empirical works have used the ratio of private credit to GDP known as financial depth to GDP and stock market valuation expressed as a percentage of GDP to evaluate FINDEV. (Alnaa & Matey, 2022; Cole & Shaw, 1974; Najimu, 2019; Ofori & Obeng, 2023; Quartey, 2008; Sena et al., 2021; Takyi & Obeng, 2013; Tweneboah et al., 2019; Ziorklui et al., 2001; Ziorklui & Barbee, 2003). Dabla-Norris and Srivisal (2013) also in their empirical work, used private credit to GDP from banks and other financial institutions to approximate FINDEV and found that FINDEV plays a significant role in dampening the volatility of output, consumption, and investment growth, but only up to a certain point. This may have affected the result due to its limited in representation or because of the proxies used. Functionally, FINDEV encompasses the amalgamation of depth: which pertains to the size and liquidity of markets, access: reflecting the ability of individuals and companies to avail financial services, and efficiency: encapsulating the institutions' capability to furnish financial services at a low cost with sustainable revenues, alongside the activity level of capital markets.

This broad multi-dimensional method to defining financial growth follows the matrix of financial system characteristics developed by (Cihák et al., 2012). Irrespective of the significance of FINDEV, there are other factors that affect it which in effect contribute to the prompt responsiveness of commercial banks to the monetary policy rates. A lot of studies have been conducted in Ghana and beyond to assess the determinants of monetary advancement (Ayadi et al., 2015; Najimu, 2019; Takyi & Obeng, 2013). This current study singles out public debt. Public debt management is a crucial aspect of fiscal policy in any economy. In Ghana, as in many other countries, public debt has been on the rise, partly due to infrastructure development and fiscal deficits (Aimola & Odhiambo, 2021; Gomez-Gonzalez, 2021; Hauner, 2009; Ismihan & Ozkan, 2012; Jiménez-Sotelo, 2023; Kutivadze, 2013; Ndikumana & Boyce, 2003; Neaime, 2015; Pedersoli & Presbitero, 2023). While public debt can serve as a tool for financing development projects, its sustainability and implications for FINDEV need to be examined.

Thus, high levels of public debt can crowd out private sector borrowing, thereby limiting access to credit for businesses and individuals (Demetriades & Rousseau, 2010; Shahe Emran & Farazi, 2011; Takyi & Obeng, 2013). This, in turn, can hinder the growth of the financial sector. Additionally, servicing public debt requires a significant portion of government revenue, potentially reducing resources available for investment in the financial sector's improvement (Ayadi et al., 2015; Bui, 2018; Ismihan & Ozkan, 2012).

The relationship between FINDEV and public debt is intricate and multifaceted (Ayadi et al., 2015; Bui, 2018; Demetriades & Rousseau, 2010; Hauner, 2009; Ismihan & Ozkan, 2012; Jiménez-Sotelo, 2023; Sağdiç et al.,

2021; Shahe Emran & Farazi, 2011; Takyi & Obeng, 2013). It involves factors such as the structure of debt (external vs. domestic), the terms of borrowing, and the government's capability to manage debt effectively. Demetriades and Rousseau (2010) investigated the influence of government expenses on the FINDEV of England from 1960-2010. They also spread their analysis to 84 countries and found that in the short run period government borrowing crowd out FINDEV. In addition to these findings, Shahe and Subika (2008) investigated how government borrowing impacts greatly on private credit. To make informed decisions regarding debt management and financial sector development, it is imperative to investigate the influence of public debt on financial development in the Ghanaian context and also other macroeconomic variable responsible for increase in financial development.

There are not enough strong priors about what the relationships will be as has been generally uncovered (Akinsola & Odhiambo, 2017; Cantah et al., 2023; Castro, 2011; Effiong et al., 2020; Ghazali & A. Rahman, 2020; Iddrisu & Alagidede, 2022; International Monetary Fund, 2011; Sena et al., 2021; Yalçinkaya et al., 2021). It could be that a more developed financial sector would negatively affect monetary policy effectiveness, and this could be a result of the fact that as financial innovation proceeds, the improved set of tools enables private agents to insure themselves and also cushion against unexpected monetary shocks, thus reducing the negative implications of their expenditure patterns (Akinsola & Odhiambo, 2017; Ghazali & A. Rahman, 2020; Wiafe et al., 2022). Also, when the financial sector is not well developed there will be lack of competition (Effiong et al., 2020; Hosono, 2006; Takyi & Obeng, 2013). Therefore, as changes in monetary policy will take longer period to influence

Banks credit amounts or lending and borrowing rates, MPR could be less effective, or its impact might come after a long-time lag.

Previous studies have argued that effective financial opposition to inflation is relevant in order for monetary policy institutions to successfully achieve stabilization objectives (Akinsola & Odhiambo, 2017; Ghazali & A. Rahman, 2020; Wiafe et al., 2022). They posited that central bank decisions not only reflect its institutional competencies and legal constraints but that such determinations also respond to the political environment. This means that the central bank can guarantee price stability only as long as the financial sector is ready to support policies associated with reducing inflation. This also implies that when the financial sector is developed there is the likelihood that monetary policy would be more successful in stabilizing the economy especially in the developing economies (Effiong et al., 2020; Hosono, 2006; Takyi & Obeng, 2013).

Cecchetti (1999) finds evidence suggesting that an increase in the depth of the monetary sector and the intermediation process contribute to the reduction in inflation and output variability. At the very least, monetary policy has a short-term impact on the actual economy. (Effiong et al., 2020; Wiafe et al., 2022). Empirical research posit that monetary strategy steps affected the actual result of the economy within two years or more (Abradu-Otoo et al., 2003; Ahiakpor et al., 2019; Akinsola & Odhiambo, 2017; Akosah et al., 2017; Bleaney et al., 2020; Caporale et al., 2018; Dabla-Norris & Floerkemeier, 2006; Effiong et al., 2020; Ghazali & A. Rahman, 2020; Hosono, 2006; Peek & Rosengren, 1995; Sena et al., 2021; Wiafe et al., 2022). Markedly, monetary strategy is extremely

important as a tool for macroeconomic policymaking and macroeconomic management (Mbilla et al., 2021; F. Mishkin, 1996; F. S. Mishkin, 1995).

Furthermore, over the past 20 years, financial systems in the majority of economies have seen tremendous progress.(Chinn & Ito, 2006; Effiong et al., 2020; Ha et al., 2022; Iheonu et al., 2020; Jiang et al., 2021; Sena et al., 2021). This advancement is accompanied by a significant evolution in business and policy practices. While FINDEV brings forth numerous positive economic effects, rapidly expanding financial systems also give rise to concerns. (Akanyonge et al., 2023; Effiong et al., 2020; Ghazali & A. Rahman, 2020; Ha et al., 2022; Iheonu et al., 2020). Most notably, it has immediate impact on the monetary policy set by central banks (Akinsola & Odhiambo, 2017; Effiong et al., 2020; Ghazali & A. Rahman, 2020; Sena et al., 2021). Commercial banks are considered a crucial component of the transmission of monetary policy (Abradu-Otoo et al., 2003; Akosah et al., 2020b; Alper et al., 2017; Brissimis & Delis, 2022; Dabla-Norris & Floerkemeier, 2006; Hosono, 2006; F. Mishkin, 1996; Pruteanu-Podpiera, 2007). These intermediaries would obtain their interest income from the range of the lending rate charged to borrowers and the cost of funds and credit channels (Amidu, 2006; Ghazali & A. Rahman, 2020).

Recognisably, the corelation between FINDEV and the effectiveness of monetary policy stands as a critical focal point within the broader context of Ghana's economic landscape (Akosah et al., 2020b; Amidu, 2006; Bleaney et al., 2020; Cantah et al., 2023; Iddrisu & Alagidede, 2022; Sena et al., 2021; Sowa & Abradu-Otoo, 2009). This study acknowledges that monetary policy, formulated and executed by the central bank, is intrinsically linked with the financial system. This nexus is the conduit through which the policies and

strategies of the central bank are transmitted to the broader economy. Therefore, any shifts or alterations in the structure, circumstances, or robustness of the economic system can significantly impact the transmission mechanism, thereby affecting the value of monetary policy (Wiafe et al., 2022).

This fundamental association between monetary policy efficacy and FINDEV is not merely a theoretical construct; it carries profound implications for economic policymaking, particularly within economies undergoing rapid FINDEV. This current study draws from a lineage of scholarly work that traces back to the seminal contributions of (BIS, 1995; Brownbridge, 1995; Clark et al., 1999; Haldane & Quah, 1999; F. Mishkin, 1996; Montoro et al., 1998; Peersman & Smets, 1999; Savvides, 1998). A more contemporary focus has converged around the diverse monetary policy channels (Akosah et al., 2020b, 2020a; Bleaney et al., 2020; Cantah et al., 2023; Dorn, 2020; Effiong et al., 2020; Emam, 2021; Ghazali & A. Rahman, 2020; Iddrisu & Alagidede, 2022; Katagiri, 2022; Mbilla et al., 2021; Rubbo, 2023; Sena et al., 2021; Small & Sinha, 2022; Wiafe et al., 2022; Yalçinkaya et al., 2021).

The claim that financial frictions enhance the monetary policy transmission mechanism lies at the heart of the credit channel hypothesis. (Koch, 2011; F. Mishkin, 1996; Pruteanu-Podpiera, 2007). Dale and Haldane (1995) lend support to this idea by demonstrating that the impact of monetary policy on lending behaviour is more pronounced for banks with less liquid balance sheets, underlining the significance of the bank lending channel. This study seeks into the dynamic relationship between FINDEV and the effectiveness of financial policy in Ghana. By analysing important measures of FINDEV, including bank assets, credit availability, and market sophistication,

the study will shed light on whether the effectiveness of monetary policy has evolved in tandem with the financial sector's development. Understanding these dynamics is vital for both policymakers and the broader economic community in Ghana as it can lead to more informed decisions, ensuring the continued stability and growth of the nation's economy.

Moreover, public debt is a significant component of a country's financial landscape, and its implications for FINDEV are multifaceted (Aimola & Odhiambo, 2021; Jiménez-Sotelo, 2023; Pedersoli & Presbitero, 2023). In the Ghanaian context, where the government has incurred varying levels of debt to fund infrastructure projects and address fiscal deficits, the connection between FINDEV and public debt is an area that warrants thorough investigation (Aimola & Odhiambo, 2021).

Public debt, when managed effectively, can be a source of financial stability and development (Ayadi et al., 2015; Bui, 2018; Hauner, 2009; Ismihan & Ozkan, 2012; Jiménez-Sotelo, 2023). It provides a pool of savings for investments in critical sectors, and the issuance of government securities can contribute to the development of financial markets. On the other hand, high and unsustainable levels of public debt can strain financial markets and crowd out private sector credit, impeding FINDEV (Pedersoli & Presbitero, 2023; Sağdiç et al., 2021).

The nature and structure of public debt in Ghana, encompassing both domestic and external components, raise questions about how different types of debt may impact financial intermediation, credit availability, and the overall health of the financial sector (Aimola & Odhiambo, 2021; Hauner, 2009; Ismihan & Ozkan, 2012; Kutivadze, 2013; Pedersoli & Presbitero, 2023). Public

debt, when managed prudently, can positively impact financial sector development. When the government borrows from domestic sources (domestic debt), it can enhance financial sector development by providing a stable source of funds to banks and financial institutions. These funds can be channeled into loans for businesses and individuals, promoting economic growth. According to the Loanable Funds Theory, an increase in government borrowing may lead to higher interest rates, which can attract more funds from savers. This, in turn, can stimulate financial intermediaries to increase lending activities, thereby promoting financial sector development. Understanding the relationship between public debt dynamics and FINDEV is pivotal in guiding debt management strategies and fostering a sustainable financial environment.

Domestic debt, issued in the local currency, can get a significant impact on financial sector development (Altayligil & Akkay, 2013; Sağdiç et al., 2021). It can provide a benchmark for the pricing of various financial instruments. Furthermore, it can increase liquidity in the financial markets by creating a liquid asset class for investors. The Domestic Financial Intermediation Theory suggests that a well-developed domestic debt market can enhance financial intermediation by providing banks and other financial institutions with a variety of investment options, reducing liquidity constraints, and improving overall financial sector development (Jiménez-Sotelo, 2023). External debt, often denominated in foreign currencies, can have both positive and negative effects on financial sector development (Bouraoui, 2019; Moazzam, 2023; Saheed et al., 2015). When managed properly, external debt can bring in foreign exchange reserves, which can be used to stabilize domestic currency and fund various economic activities. However, excessive external debt can lead to exchange rate

risks and financial instability. The Twin Crises Theory highlights the interplay between external debt and financial sector stability (Chauhan & Ramesha, 2016). High levels of external debt can increase a country's liability to financial crises, as abrupt changes in exchange rates or global economic conditions may strain the financial sector.

The financial sector in Ghana has undergone a transformative evolution, with a surge in the number of banks, changes in regulatory frameworks, and technological advancements (Najimu, 2019; Ofori & Obeng, 2023; Takyi & Obeng, 2013). This evolving landscape has implications for how commercial banks respond to monetary policy decisions, particularly the Monetary Policy Rate set by the Bank of Ghana (Sena et al., 2021; Tweneboah et al., 2019). Commercial banks, as noted earlier, are pivotal in the spread of monetary policy. Their reactions to changes in the MPR influence lending rates, credit availability, and ultimately, the broader economy (da Silva et al., 2022; Yalçinkaya et al., 2021). In an environment of financial sector development, it is essential to understand how these institutions navigate the intricate relationship between monetary policy and their operations.

As Ghana's financial sector continues to adapt, questions arise about the responsiveness of commercial banks to the MPR. Do they transmit monetary policy changes to lending rates effectively? How do their strategies align with evolving monetary policy tools and market dynamics? Moreover, the effective pass through of monetary policy rate hinges on the extent to which commercial banks adjust their lending rates in response to alterations in the Monetary Policy Rate (MPR). This dynamic relationship between central bank policy and the behavior of commercial banks plays a pivotal role in influencing broader

economic conditions. As commercial banks respond to changes in the MPR, their lending practices have a cascading impact on various facets of the economy, influencing investment, consumption, and overall economic stability. Therefore, understanding the nuanced dynamics of this relationship is crucial for policymakers seeking to craft effective monetary strategies. This study aligns with the Sustainable Development Goals (SDGs), particularly those pertaining to economic growth, financial inclusion, and economic stability, all of which are paramount in the Ghanaian context (Maphiri et al., 2021). The study is specifically related to SDG 8, which is to support full and productive employment, decent work for all, and sustained, inclusive, and sustainable economic growth. The goal of the study is to provide guidance for policies and strategies that are in line with Ghana's particular economic challenges and goals by looking at the effects of public debt on FINDEV, the relationship between FINDEV and monetary policy effectiveness, and the responsiveness of commercial banks to monetary policy in the country.

Statement of the Problem

The evolution of monetary policy approaches, ranging from direct control to inflation targeting, has been a subject of extensive research and discussion worldwide (Abango et al., 2019; Bleaney et al., 2020; Iddrisu & Alagidede, 2021; Klutse et al., 2022; Ryczkowski, 2021; Sakyi et al., 2017; Tweneboah & Alagidede, 2019; Wasserfallen, 2019). This evolution reflects the ongoing pursuit of stable inflation rates and the reduction of output gaps, prompting fundamental questions about the efficacy of monetary policy across diverse economic contexts. Several factors, including excessive deficit financing, financial sector development, and the responsiveness of commercial

banks to policy rates, have raised questions about the efficacy of monetary policy in most economies and Ghana's distinctive economic landscape is no exception (Aimola & Odhiambo, 2021; Akanyonge et al., 2023; Amberger et al., 2017; Gross & Semmler, 2019; Lai, 2017; Mahawiya, 2015; Ofori & Obeng, 2023; Takyi & Obeng, 2013).

The transitions from one monetary policy regime to another, such as Ghana's shift towards inflation targeting, have been prompted by the need to regulate inflation and mitigate volatility in output gap (Abango et al., 2019; Iddrisu & Alagidede, 2021; Sakyi et al., 2017; Tweneboah & Alagidede, 2019). However, in many developing economies, including Ghana, the impact of various monetary policy regimes on price levels and output gaps has been mixed (Akosah, 2015; Bleaney et al., 2020; Sowa, 1994; Umar & Dahalan, 2017). While empirical evidence in advanced economies suggests that monetary policy can significantly affect real economic activities in the short run and prices in the long run (Ghazali & A. Rahman, 2020; Haldane & Quah, 1999; Kallmes, 2018; Meade & Thornton, 2012; Mizen, 2003; Nguyen et al., 2018; Pruteanu-Podpiera, 2007), the same may not hold for developing economies (Akinsola & Odhiambo, 2017; Al Hajj et al., 2015; Alagidede et al., 2012; Alichi et al., 2018; Alper et al., 2017; Bleaney et al., 2020; Effiong et al., 2020; Houssa et al., 2010; Iddrisu & Alagidede, 2022; Tule et al., 2019).

The effectiveness of monetary policy directly impacts economic growth, as highlighted in Sustainable Development Goal 8 (SDG 8) which is one of the fundamental aspirations for any economy, including Ghana (Maphiri et al., 2021). When monetary policy is ineffective, it can lead to economic instability, high inflation, and reduced economic growth-hindering the creation of decent

work opportunities and sustainable economic development (Akinsola & Odhiambo, 2017; Bleaney et al., 2020; Cantah & Ahiakpor, 2017; Effiong et al., 2020; Ghazali & A. Rahman, 2020; Haldane & Quah, 1999; Houssa et al., 2010; Meade & Thornton, 2012; Mizen, 2003; Nelson, 2003). Most work done to gage the financial development (private credit to GDP and others) were seen as underrepresentation for financial development.

FINDEV is a critical component of economic growth and job creation. However, the complex link between the effectiveness of monetary policy and FINDEV remains understudied, particularly in the context of developing economies like Ghana (Akinsola & Odhiambo, 2017; Brissimis & Delis, 2022; Cantah et al., 2023; Effiong et al., 2020; Ghazali & A. Rahman, 2020; Pruteanu-Podpiera, 2007; Sowa & Abradu-Otoo, 2009; Yalçinkaya et al., 2021). Hence, understanding the relationship between FINDEV and monetary policy effectiveness is essential for achieving SDG 8's objectives in Ghana.

A clear indication of understanding how crucial FINDEV is to monetary policy's efficacy is shown in Figure 2. The USA has a higher level of FINDEV than Ghana as indicated in Figure 2 hence a very effective monetary policy transmission compared to Ghana as posited in previous studies (Caporale et al., 2018; Meade & Thornton, 2012). Mishkin (1996) posited that the financial sector plays a key role in the channels of monetary policy rate transmission like the traditional interest rate channel or the newer credit channels where lending is a key component.

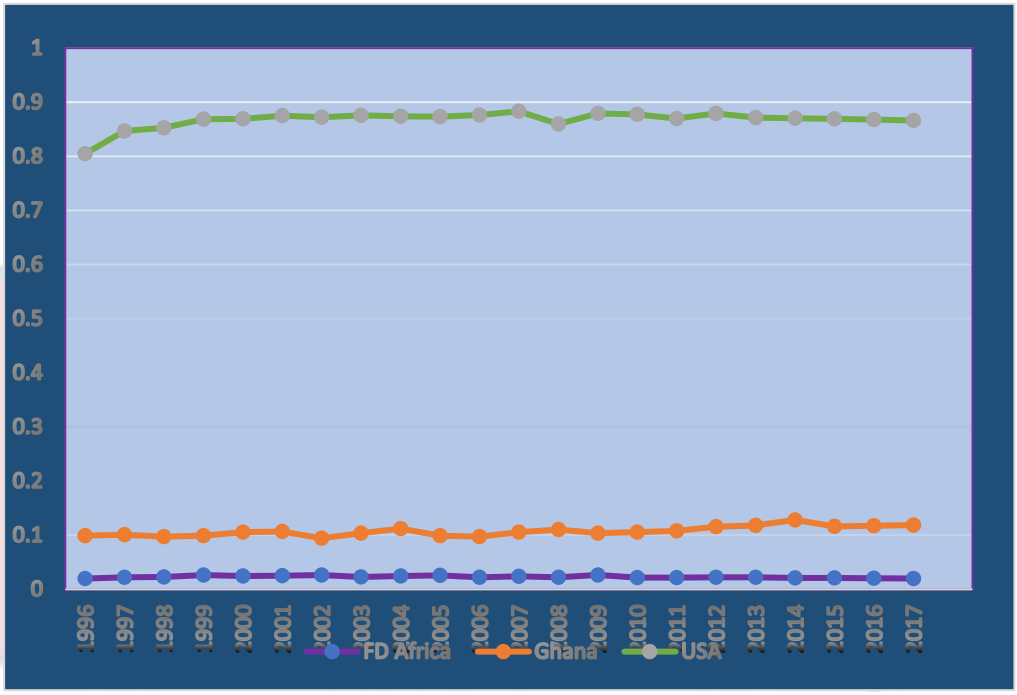


Figure 2: Trend of Financial Development

Source: Auther's construction

In recent years, Ghana has witnessed a substantial increase in its public debt levels, driven by various fiscal challenges and government borrowing initiatives (Aimola & Odhiambo, 2021; Ismihan & Ozkan, 2012; Ndikumana & Boyce, 2003). This surge in public debt raises significant concerns about its potential consequences for the country's FINDEV (Abdel-Halim & Al-Assaf, 2022; Gomez-Gonzalez, 2021; Kusairi et al., 2019; Pedersoli & Presbitero, 2023). As the government borrows extensively from domestic and international sources to finance its budgetary needs and development projects, questions arise regarding how these rising debt levels affect the overall health and vibrancy of the financial sector in Ghana (Aimola & Odhiambo, 2021; Dafe et al., 2018). Therefore, assessing the impact of public debt on FINDEV is crucial for aligning fiscal policies with the goal of promoting economic growth. This problem also seeks to shed light on the channels through which public debt

dynamics may affect FINDEV and the potential trade-offs or synergies between government borrowing and the broader financial sector's performance.

The responsiveness of commercial banks to changes in the monetary policy rate is another pivotal aspect. Specifically, understanding the responsiveness of commercial banks, as key intermediaries in the financial system, to changes in the monetary policy rate is crucial for ensuring that monetary policy remains an effective tool for achieving the country's most important economic objectives (Akinsola & Odhiambo, 2017; Brissimis & Delis, 2022; Cantah et al., 2023; Effiong et al., 2020; Ghazali & A. Rahman, 2020; Pruteanu-Podpiera, 2007; Sowa & Abradu-Otoo, 2009; Yalçinkaya et al., 2021). In terms of financial institutions' responsiveness to monetary policy, Commercial banks play an important role in the economy, impacting access to credit, interest rates, and overall economic stability. The problem at hand centres on the assessment of the responsiveness of commercial banks in Ghana in adjusting their lending as well as deposit rates in reaction to fluctuations in the monetary policy rate set by the central bank. It involves investigating whether changes in the policy rate have the intended impact on commercial banks' behaviour regarding interest rates, credit provision, and liquidity management. Examining their behaviour in response to monetary policy adjustments is essential for ensuring that the financial sector actively contributes to Ghana's economic growth and the creation of enabling environment for economic growth. In order for the monetary policy rate to be transmitted to affect the economy, the question therefore to be asked here is, how effective are the commercial banks in Ghana in responding to the MPR?

Thus, the study delves into the complexities of monetary policy effectiveness, the study seeks to find out the relevance of FINDEV in the effectiveness of MPR, how public debt can influence the level of FINDEV and commercial banks' responsiveness to MPR in Ghana. These issues have direct implications for SDG 8, as they affect the country's ability to foster economic growth, achieving price stability, and create decent work opportunities. By addressing these issues, this study aims to offer evidence-based recommendations and policy insights that can contribute to Ghana's progress as well as effective and prompt transmission of monetary policy rate to reduce out gap and inflation.

Purpose of the Study

The aim of the study is to examine the relationship among financial development, public debt dynamics, commercial banks' responsiveness, and monetary policy effectiveness in Ghana.

Research Objectives

The aim of the study can be achieved through the specific objectives. The objectives are to:

1. examine the role of financial development in the effectiveness of monetary policy in Ghana
2. assess the effect of public debt on financial development in Ghana.
3. find out the responsiveness of commercial banks to the monetary policy rate given development in the financial sector in Ghana.

Research Hypotheses

Following are the research hypotheses:)

1 H_0: The level of financial development in Ghana does not significantly influences the effectiveness of monetary policy

H_1: The level of financial development in Ghana significantly influences the effectiveness of monetary policy

2 H_0: public debt does not have influence on financial development in Ghana .

H_1: public debt has influence on financial development in Ghana.

3 H_0: commercial banks do not respond monetary policy in Ghana.

H_1: commercial banks respond to monetary policy rate in Ghana.

Significance of the Study

The significance of this thesis is rooted in its endeavour to unravel the intricate web of relationships among FINDEV, public debt dynamics, commercial banks' responsiveness, and monetary policy effectiveness in the specific context of Ghana.

The study's primary aim is to explore the influence of FINDEV on the effectiveness of monetary policy in Ghana. This aspect is of paramount significance because it directly impacts the central bank's ability to achieve its single-digit target for inflation which is a requirement for the member state by understanding how FINDEV affects monetary policy outcomes, this research can offer valuable insights to policymakers and central bank authorities, helping them craft more effective and targeted monetary policies which has been ignored in literature.

The thesis also assesses the effect of public debt on FINDEV in Ghana and identified its substantial importance. Given the increasing reliance on public debt and also increasing level government debt every year for financing government operations and development projects, comprehending how public debt dynamics shape the financial sector's development is crucial. Notwithstanding the prudent attempt by government to manage public debt, government debt increased to GH₵575.5 billion as of June 2023, representing 71.9% of Gross Domestic Debt (GDP). According to the Bank of Ghana's Summary of Economic and Financial Data for September 2023, the country's public debt has increased by GH₵27.7 billion since January 2023. Again, policy makers are informed based on the results of the dominance analysis to direct policy towards the most important determinants of FINDEV. Thus, the findings of this study can guide fiscal authorities, policymakers, and debt managers in making informed decisions about borrowing strategies and debt management practices that align with the objectives of financial sector growth and stability.

Assessing the responsiveness of commercial banks to changes in the monetary policy rate within the evolving financial sector landscape is also a significant aspect. Commercial banks are pivotal intermediaries in the transmission of monetary policy, making their behavior a critical determinant of policy effectiveness. This work brings to bare the relevance of the views of the stakeholders of the monetary policy rate transmission as the appropriate heads of the commercial banks are interviewed regarding the workings of monetary policy transmission and responsiveness. This implies that the results of the study would help to understand monetary policy effectiveness in Ghana

and how best it could be promptly transmitted to affect the purported real economic activities. Understanding the factors that influence commercial banks' responsiveness can assist central banks and regulators in refining their strategies and regulations to ensure a more effective transmission mechanism.

The study's focus on Ghana, a developing economy with its unique challenges and opportunities, enhances its significance. Ghana's policymakers and central bank authorities grapple with specific macroeconomic issues that require tailored solutions. This study provides locally relevant insights that can directly inform policy decisions and actions in Ghana, contributing to the country's economic development and stability.

The research expands our corpus of knowledge by examining the interplay of FINDEV, public debt, commercial banks' responsiveness, and monetary policy effectiveness within a specific economic context. This contributes valuable empirical evidence and insights that can further enrich the global discourse on monetary policy and financial sector development.

Delimitation of the Study

The scope of the study is to examine the effectiveness of monetary policy in Ghana using mixed methods approaches. First, the study employs Structural Vector Autoregression (SVAR) to examine the impact of FINDEV on the effectiveness of monetary policy in Ghana using data obtained from the IMF database from 2002 to 2020. The linear Autoregressive Distributed Lag (ARDL) model was employed to ascertain the impact of public debt on FINDEV in Ghana. The study also divided government debt into two categories: external and domestic to examine its effect on FINDEV. In the same objective, dominance analysis was used to rank the variables employed in the study based

on their effect on FINDEV. Finally, the study employed linear ARDL approach to assess the responsiveness of commercial banks to the monetary policy rate given development in the financial sector in Ghana. In the same objective interviews were conducted with heads of risk department of the eight selected commercial banks (Absa Bank Ghana Limited, GCB Bank Ghana Limited, Eco Bank Ghana Limited, Zenith Bank Ghana Limited, Prudential Bank Ghana Limited, Fidelity Bank Ghana Limited, Standard Chartered Bank Ghana and Consolidated Bank Ghana Limited) at headquarters to find out their expert opinions on how their respective banks respond to MPR. The variables included in the study are monthly series. These were selected because they were based on empirical and theoretical reviews (Ministry of Finance, 2022; United Nations Conference on Trade and Development, 2021). Nonetheless, the variables included in the study can provide a general solution to the problem under study.

Limitations of the Study

The study is robust but restricted in some forms. Quantile ARDL estimations could also provide detailed findings due to the heterogeneity in the data. Also, the study could have decomposed the series to provide frequency-dependent asymmetric results for the ARDL estimations. Nonetheless, the inference techniques employed in the study provide short- and long-term results and minimise the data's noise, which is detailed based on the discussions. Also, the first two objectives of study are strictly quantitative, ignoring the qualitative aspect of the variable that could have provided additional information to the results and discussions. The conversion of some of the data like financial development which was an annual series to monthly series was seen as a challenge. However, the quantitative results are reliable and objective.

Organisation of the Study

The thesis is structured into seven distinct chapters, each serving a specific purpose within the research framework. In Chapter One, the study commences with an introduction, encompassing key elements such as the background, problem statement, research objectives and questions, significance of the study, and an outline of the organizational structure. In Chapter Two, the research delves into an extensive review of pertinent literature. This chapter presents a synthesis of both theoretical and empirical perspectives, directly aligned with the research objectives.

Chapter Three provides an intricate exploration of the research methods adopted in the study. It elucidates the processes involved in model specification and the methodological approach applied. Additionally, this chapter expounds on data sources and measurement techniques utilized. Chapters Four, Five, and Six are dedicated to the presentation and analysis of research findings, each corresponding to a specific research objective. These chapters meticulously examine and elucidate the results, offering valuable insights and interpretations. In Chapter Seven, the thesis culminates by encapsulating the research journey. It furnishes a concise summary of key findings, draws conclusions, provides recommendations based on empirical evidence, and extends suggestions for prospective areas of study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

The study examines the relationship among FINDEV, public debt dynamics, commercial banks' responsiveness, and monetary policy effectiveness in Ghana. This chapter has four broad sections: theoretical, conceptual, and empirical review, and the conceptual framework. This chapter investigates the related theoretical and empirical literature that exists on the responsiveness of commercial banks in Ghana, FINDEV and efficiency of a monetary policy, and macroeconomic variables that affect FINDEV. The first section looks at the theoretical literature that connects FINDEV with the effectiveness of monetary policy. It also provides some definitions, highlights the significance of FINDEV, and looks at how responsive commercial banks are to the policy rate. This chapter also consists of a review of existing empirical works on the effectiveness of monetary policy and FINDEV and its pass-through mechanism, the responsiveness of the commercial banks to the policy rate, and determinants of FINDEV. The chapter ends with a summary of all that has been discussed.

Theoretical Review

There have been transmission developments in the interest of financial sector development and implementation of monetary policy. Therefore, this study adopts the following theories to elaborate on the purpose of the study: (1) Monetary Policy Transmission Related to the Banking Sector and (2) Credit Channel of Monetary Policy Transmission. The study also employed McKinnon and Shaw Hypothesis and "Lazy Banks" and "Safe Asset" hypotheses.

Monetary Policy Transmission Related to the Banking Sector

The effect of monetary policy shocks on macroeconomic variables example inflation and the output of an economy works through many channels (Akosah et al., 2021; Alpanda & Aysun, 2012; Amrial, Mikail, et al., 2019; Effiong et al., 2020; Ghazali & A. Rahman, 2020; F. Mishkin, 1996; F. S. Mishkin, 1995; Pruteanu-Podpiera, 2007; Sakyi et al., 2017; Saygılı, 2020). The schema of the transmission process in any economy begins with the discretionary actions of the monetary authorities and the response of financial aggregates (money, and interest rates) (Bleaney et al., 2020; Effiong et al., 2020; Iddrisu & Alagidede, 2022; Rubbo, 2023; Sena et al., 2021). The second stage involves the link between changes in financial variables, aggregate demand, and prices (Akosah et al., 2020b; Mbilla et al., 2021; Robinson, 1964; Wiafe et al., 2022). Monetary policy changes are first transmitted to the financial markets, which as the monetarists explain, arises from the fact that information and transaction costs are lower (Ghazali & A. Rahman, 2020; Sena et al., 2021; Wiafe et al., 2022). The question, therefore, is how does the monetary policy rate transmit in the financial sector? This leads to the review of the channels of monetary transmission.

Interest Rate Channel of Monetary Policy Transmission

The impact of the policy interest rate, which will trickle down to the market and retail interest rates and ultimately impact the actual economy, is explained by the interest rate channel (aggregate output) (Belongia & Ireland, 2021; Dabla-Norris & Floerkemeier, 2006; Emam, 2021; F. Mishkin, 1996; Montiel et al., 2010). The short-term money market rate will rise in response to the central bank's contractionary monetary policy, which raises the policy

interest rate. This will ultimately raise the short-term retail interest rate. (Dale & Haldane, 1995; Mbilla et al., 2021; Montiel et al., 2010). The rise in short-term real interest rates will follow an increase in short-term nominal interest rates due to price stickiness. (Belongia & Ireland, 2021; F. Mishkin, 1996).

Since the average expectation of future short-term interest rates is regarded as the long-term interest rates, an increase in the short-term real interest rate will result in an increase in the long-term real interest rate, according to the expectations hypothesis of the interest rate term structure. (Ibrahim Anyars & Adabor, 2023; F. Mishkin, 1996; Yusif et al., 2023). Therefore, as the cost of capital rises due to an increase in the real interest rate, investment spending, aggregate demand, and aggregate production all decline. (Gentle et al., 2005; Kusairi et al., 2019; Taylor & Sarno, 2004). Kyei et al. (2023) elucidate how the interest rate channel affects credit supply and financial intermediation, or the banking industry. Interest rate pass-through provides an explanation for this position, as an increase in the policy interest rate will impact the banking industry by raising bank retail interest rates (deposit rate and lending rate) (Kyei et al., 2023). In effect, the demand and supply of loans by firms and individuals would be reduced causing firms' investment consumption to reduce significantly.

An increase in the real interest rate will also affect consumer spending (Gentle et al., 2005; Isiksal et al., 2019; Taylor & Sarno, 2004). This progression is explained by the income effect and the substitution effect of the interest rate channel (Isiksal et al., 2019). Both the return on saving and the future costs of spending might rise in response to an increase in the real interest rate. (Akosah et al., 2020; Gentle et al., 2005; Gentle & Thornton, 2014; Kusairi et al., 2019;

Nkalu, 2020). Due to the deferral of consumption, this will reduce aggregate output and the consumption of non-durable commodities (the substitution impact). (Kumiarso et al., 2002).

Regarding borrowers and creditors, the effect can be explained by the income effect. An increase in the real interest rate may also result in lower consumption spending if the economic agents are borrowers since it will lower their future discounted income and cash flow. (Gentle et al., 2005; Gentle & Thornton, 2014; Isiksal et al., 2019; Kumiarso et al., 2002; Taylor & Sarno, 2004). However, if the economic agents are creditors, then a rise in the real interest rate will make them wealthier, which will lead to a rise in spending on consumption. (Égert et al., 2011; Kumiarso et al., 2002). Therefore, if the study considers The impact of policy instruments through the interest rate channel, which is the result of monetary policy's effect on consumption expenditure, will vary depending on which effects—the substitution effect, the income effect for borrowers, and the income effect for lenders—have the greatest sway over the interest rate channel.

In sum, Since the impact of the policy interest rate (monetary policy shock) will be felt in the banking sector through its effects on money market rates and retail interest rates at commercial banks, the interest rate channel can be thought of as one of the avenues through which monetary policy is transmitted to the banking sector (retail interest rate). Demand and supply for bank loans are impacted, which has an impact on investment and the economy.

Credit Channel of Monetary Policy Transmission

The following important expectations of credit channel have to be considered in order to study the credit channel theory: (1) the bank loan supply

has been influenced by the central banks (Alpanda & Aysun, 2012; Gertler & Gilchrist, 1993; Ghazali & A. Rahman, 2020; Koch, 2011); (2) banks are the main source of funds for borrowers and firms (Dale & Haldane, 1995; Ghazali & A. Rahman, 2020; F. Mishkin, 1996; Pruteanu-Podpiera, 2007); (3) the replacement of loans with other funding sources (such bonds and other instruments) is not flawless) (Belongia & Ireland, 2021; Ghazali & A. Rahman, 2020; F. S. Mishkin, 1995); and (4) the nominal price is sticky, which results in the monetary policy having an effect on actual economic activity through the credit channel. (Alpanda & Aysun, 2012; Arnold, 2000; Gupta, 2018).

This channel focuses on the asset side of commercial banks' balance sheets (Alpanda & Aysun, 2012). Shocks to commercial banks' balance sheets can affect borrowers, businesses, and households, who are unable to turn to the capital market. Dale and Haldane (1995) showed that the credit channel could increase the effectiveness of monetary policy if bank lending rates move more than one-for-one with changes in market interest rates.

Furthermore, the credit channel explains how the availability of loans allows monetary policy to influence the actual economy (Ghazali & A. Rahman, 2020). A shift in the policy interest rate will have an impact on the availability of loans, which will then have an impact on business and household investment and consumer expenditure, which will have an impact on the real economy.(Alpanda & Aysun, 2012; F. Mishkin, 1996). Firms' balance sheets are also impacted by monetary policy through the credit channel since changes in policy interest rates have an impact on cash flow and the health of the balance sheet. (Ghazali & A. Rahman, 2020; F. Mishkin, 1996; Pruteanu-Podpiera, 2007). It then emphasized how important the credit channel is as an additional

means of transmitting money in addition to the conventional interest rate route because of unequal access or disparity in information, which leads to issues with moral hazard and adverse selection in financial markets (F. Mishkin, 1996). There are two types of credit channels: the bank lending channel and the balance sheet channel (Arnold, 2000; Cetorelli & Goldberg, 2012; Ghazali & A. Rahman, 2020; Koch, 2011).

Bank Lending Channel

The bank loaning channel operates mainly through the giving of credit to firms; mostly, the small enterprises where the challenges of information asymmetry are in the ascendancy, additionally, they are unable to obtain loans through the stock and bond markets. (Belongia & Ireland, 2021; Ghazali & A. Rahman, 2020; Montiel et al., 2010; Pruteanu-Podpiera, 2007). Banks reserve, as well as bank deposit, is reduced when there is an implementation of contractionary monetary policy in an economy and as a result, the quantity of credit available to bank-dependent borrowers, which causes output to decline and investment spending to decline.(Belongia & Ireland, 2021; Pruteanu-Podpiera, 2007). This indicates that monetary policy is likely to have a more significant impact on the expenditures of infant firms, which heavily rely on bank loans, compared to large firms that can access credit through the stock and bond markets

Balance Sheet Channel

Opposingly, the balance sheet channel is linked to the role of collateral in mitigating adverse selection and moral hazard (Alpanda & Aysun, 2012; Arnold, 2000; Dale & Haldane, 1995; Hosono, 2006). It also posits that a contractionary monetary policy reduces equity prices and net-assets of firms

through their liquidity flows, the value of collateral, and credit ratings, which in effect causes increasing adverse selection and moral hazard problems (Abradu-Otoo et al., 2003; Cetorelli & Goldberg, 2012). This causes a decrease in the level of loans accessible to firms bringing about a decline in investment and output.

In addition, Hosono (2006) describe a broader credit channel, the balance sheet channel, where financial market imperfections also play a key role. Hosono emphasizes that in the presence of financial market imperfections, a firm's cost of credit, whether from banks or any other external source, rises when the strength of its balance sheet deteriorates. A direct effect of monetary policy on the firm's balance sheet comes about when an increase in interest rates works to increase the payments that the firms must make to service their floating rate debt (Alpanda & Aysun, 2012; Brissimis & Delis, 2022; Cetorelli & Goldberg, 2012). An indirect effect arises, too, when the same increase in interest rates works to reduce the capitalized value of the firm's long-lived assets (Brissimis & Delis, 2022). Hence, a policy-induced increase in the short-term interest rate not only acts immediately to depress spending through the traditional interest rate channel, but it also acts, possibly with a lag, to raise each firm's cost of capital through the balance sheet channel, deepening and extending the initial decline in output and employment.

Exchange Rate channel

A shift in the policy interest rate will also impact the domestic interest rate in relation to the foreign interest rate, which will impact the foreign investment returns in comparison to the domestic investment returns.(Abradu-Otoo et al., 2003; Dabla-Norris & Floerkemeier, 2006; Guender & Xie, 2007).

Others drew attention to the fact that monetary policy operates through exchange rates and net exports which in the end affect output and the price level (Abradu-Otoo et al., 2003; Berg et al., 2007; Montiel et al., 2010). Monetary policy can influence the exchange rate through interest rates, direct intervention in the foreign exchange market, or inflationary expectations.

The changes in the exchange rate, in turn, affect aggregate demand through the cost of imported goods, the cost of production and investment, international competitiveness, and firms‟ balance sheets in the case of high-liability dollarisation (Dabla-Norris & Floerkemeier, 2006). They suggest that output and consumer prices are sluggish in responding to shocks to monetary variables in the economy monetary policy can impact the exchange rate through inflationary expectations as predicted by Dabla-Norris and Floerkemeier or by direct intermediation in the foreign exchange market (2006). Stated differently, fluctuations in exchange rates impact not only the level of prices but also aggregate demand by affecting the overall cost of production and investment.

Asset Price Channel

The asset price channel is the monetary transmission channel that is responsible for the distribution of the effects induced by monetary policy decisions made by the central bank of a country that affect the price of assets (Andolfatto et al., 2016; da Silva et al., 2022; Deshui, Akbar, et al., 2023; Dwyer et al., 2023; Fuhrer & Moore, 1992; Hu et al., 2023; Isayev et al., 2023; Obstfeld, 1980; Stein, 1998; Svensson, 1989). These effects on the prices of assets will in turn affect the economy. Changes in asset markets can have a substantial impact on the both inflation and real economic activity (Jones et al., 2008; Ndikumana & Boyce, 2003; Obstfeld, 1980; Walsh, 1982).

It is therefore significant to ask whether there are any actions central banks can and should take to reduce the likelihood of macroeconomic instability arising from extreme fluctuations in asset prices. Developments in asset markets can have significant effects on real economic activity as witnessed by numerous historical episodes ranging from Wall Street's 1929 crash to the Tokyo housing and equity bubble in the late 1980s and the severe crises afflicting South-East Asian equity, commercial and currency markets in 1997-98 (Abdel-Halim & Al-Assaf, 2022; Andolfatto et al., 2016; da Silva et al., 2022; Holz, 2007; Hung, 2020; Jones et al., 2008; Obstfeld, 1980; Walsh, 1982).

In competitive market models without frictions, the prices of assets, like the prices of goods, are determined by the forces of supply and demand (Lutsyshyn & Reznikova, 2013; Senjur, 2010). Assets studied typically include a broad array of tradable claims, such as bonds, equities, real estate, plant and equipment, patents etc. (Kaldor, 1966). The theoretical basis of the asset price channel operating through stock prices was laid down in Tobin's Q Theory proposed by Kaldor (1966) as a ratio of the market value of a firm to the cost of replacement of its assets. Essentially, this states that lowering interest rates (an act of expansionary monetary policy) make investors prefer stocks (equity) relative to bonds whose relative yields decline (Arango, 2019; Benigno & Nisticó, 2017; Ferrero et al., 2021; Hung, 2020; Kaldor, 1966). As a result, stock prices rise.

In addition to Tobin's Q Theory, the wealth effect provides a theoretical explanation of the asset price channel of monetary policy transmission (Bernardo et al., 2016; Ghossoub & Reed, 2014; Holz, 2007). It is based on the Life Cycle Hypothesis which states that consumption spending is a function of

the lifetime resources owned by individuals and not just their current income (Hollander, 1990). Therefore, consumers are more likely to increase their consumption if their wealth increases and reduce their consumption spending if their wealth declines. Thus, during expansionary monetary policy, stock prices increase. Individual investors will now value their wealth as being higher than before. According to Modigliani's Life Cycle Hypothesis, the perceived increase in wealth leads to an increase in consumption. Ultimately, this leads to an increase in national income (Hollander, 1990).

McKinnon and Shaw Hypothesis

The McKinnon and Shaw hypothesis is a financial liberalization hypothesis that postulates that the level of financial liberalization in a financially repressed economy, mostly developing countries, enhances savings which assist in increasing the credit supply to ensure the accumulation of capital, hence investment and induce growth in the economy (Ziorklui & Barbee, 2003). It was argued by McKinnon and Shaw that the introduction of strict regulations and practices (for instance minimum or maximum lending rates, restrictions on lending quantity and deposit interest rate ceiling) in the financial sector market leads to repression in the financial sector (Forson et al., 2023; Huang, 2006; Ndebbio, 2004).

Thus, the regulations introduced lead to a reduction in the rate of interest and hence cause a fall in domestic investment and savings and therefore in effect hinders growth and development in the economy (Cantah, 2018; Wong & Zhou, 2011). The hypothesis, therefore, supports or speaks in favor of liberalization in the financial system where there exists a high and positive real interest rate to help induce financial savings, which will lead to an increase in credit supply to

firms in other to enable them to carry out projects with a positive net present value Forson et al., 2023; Sena et al., 2021; Takyi & Obeng, 2013). The results will be an increase in capital formation, investment, and hence growth and development in the economy. This is an indication that the activities of the financial market significantly affect the growth of the economy.

"Lazy Banks" and "Safe Asset" Hypotheses

The "Lazy Banks" and "Safe Asset" hypotheses are critical concepts in the realm of public debt and FINDEV (Abdel-Halim & Al-Assaf, 2022; Hauner, 2009; Sağdiç et al., 2021; Shahe Emran & Farazi, 2011). These perspectives shed light on how public debt influences financial systems.

The "Safe Asset" view underscores the positive impact of public debt on FINDEV (Abdel-Halim & Al-Assaf, 2022; Hauner, 2009). It highlights that public debt can act as a secure asset, addressing the institutional limitations that often hinder the use of real estate or movable property as collateral, as discussed by Hauner (2009). Furthermore, the presence of liquid collateral is essential for the growth of derivative markets and efficient payment and settlement systems.

Government bonds also serve as benchmarks for pricing corporate bonds and equities, offering a yield curve reference (Sağdiç et al., 2021; Shahe Emran & Farazi, 2011). On the balance sheets of financial institutions, these bonds serve as collateral, which boosts depositor confidence in a generally risky financial environment (Hauner, 2009). Essentially, the "Safe Asset" perspective suggests that without public debt, fewer savings would be channelled into the financial system. Borrowers might face higher costs and shorter maturities for loans.

It is worth noting that the "Safe Asset" and "Lazy Banks" views are not necessarily mutually exclusive. Public debt's impact on FINDEV may exhibit non-linear behaviour, with positive effects up to a certain threshold of credit allocated to public debt and negative effects beyond that threshold.

The "Lazy Banks" hypothesis presents an alternative viewpoint regarding the influence of public debt on FINDEV (Abdel-Halim & Al-Assaf, 2022; Hauner, 2009; Sağdiç et al., 2021; Shahe Emran & Farazi, 2011). This perspective focuses on structural characteristics of banks that excessively rely on public debt. In such cases, banks may become more profitable but less efficient. This could potentially impede financial deepening.

Banks that heavily engage in public sector lending might have reduced incentives to actively develop the broader banking market, particularly in challenging banking environments typical of developing countries. This can hinder financial deepening, which is often linked to factors like the expansion of bank branches (Demetriades & Rousseau, 2010). Low bank efficiency can also amplify the deadweight loss in financial intermediation, further hampering FINDEV (Fry, 1978). This "Lazy Banks" view aligns with findings Hauner (2009), which suggest that higher government ownership of banks is associated with less efficient and less developed banking sectors.

In summary, whether banks' lending primarily to the public sector are more profitable depends on various factors such as the risk-adjusted returns on private sector lending and the degree of financial liberalization or repression (Abdel-Halim & Al-Assaf, 2022; Hauner, 2009). In repressed financial systems, public debt may indeed be more profitable due to credit rate ceilings and other distortions. These distortions can lead to segmented credit markets where banks

prefer public debt over private sector lending. Regardless of the specific mechanisms, a heavy reliance on public sector lending is generally associated with reduced incentives for banks to contribute to deposit and private credit market development.

In empirical analyses, the "Lazy Banks" perspective suggests a positive effect of public sector credit on bank profitability and a negative effect on bank efficiency in repressed banking systems, while highly liberalized systems may not exhibit these effects (Abdel-Halim & Al-Assaf, 2022; Hauner, 2009; Sağdiç et al., 2021; Shahe Emran & Farazi, 2011). At the country level, the "Lazy Banks" view aligns with a negative impact of public sector credit on financial deepening, whereas the "Safe Asset" view implies a positive impact, especially below a certain threshold of public debt allocation. These competing perspectives provide valuable insights into the complex relationship between public debt and FINDEV.

Conceptual Review

This conceptual review seeks to unravel the intricate relationships among monetary policy, financial development, public debt dynamics, and the responsiveness of commercial banks within the Ghanaian context. These four components, interwoven and interdependent, collectively shape the economic narrative of Ghana, with profound implications for its socio-economic development and the pursuit of Sustainable Development Goal 8 (SDG 8). Within this rich fabric, the effectiveness of monetary policy serves as a linchpin for economic stability and growth. As monetary authorities grapple with the task of maintaining price stability, enhancing financial sector development, and fostering sustainable economic growth, a nuanced understanding of the

multifaceted relationships among these critical elements becomes indispensable.

Financial development

Most definitions of FINDEV do focus on different aspects and measures (Akanyonge et al., 2023; Alnaa & Matey, 2022; Dar & Nain, 2023; Effiong et al., 2020; Ha et al., 2022; Huang, 2006; Jiménez-Sotelo, 2023; Ofori & Obeng, 2023; Pedersoli & Presbitero, 2023; Pushkareva, 2021; Sağdiç et al., 2021; Sena et al., 2021). Thus, there exists no common definition that totally explains what FINDEV is about. Briefly, some of these definitions are explained below. According to Huang, (2006), "FINDEV generally has been defined as increasing the efficiency of allocating financial resources and monitoring capital projects, through the encouragement of competition and increasing the importance of the financial system" in other words, development in the financial system is determined by the structure, size, and efficiency in the financial system.

Financial liberalisation is one way through which such development has been known (Baker & Wurgler, 2007; Chauhan & Ramesha, 2016; Chinn & Ito, 2005; Yusif et al., 2023). Thus, the process that gets rid of inefficiencies and setbacks in financial institutions puts pressure on financial infrastructures to undergo transformation, resulting in a financial system that is more efficient.(Obuobi et al., 2020). As information asymmetry may be lessened while moral hazard and adverse selection are limited, there will be an improvement in the accessibility of finance (Huang, 2006; Ziorklui et al., 2001).

Financial development can be explained as the factors, policies, and institutions that lead to effective financial intermediation and markets, and deep

and broad access to capital and financial services (Alnaa & Matey, 2022; Ofori & Obeng, 2023; Quartey, 2008; Tweneboah et al., 2019). This is made up of financial intermediaries, business environments, and markets that offer elementary support for the financial system (Alnaa & Matey, 2022; Najimu, 2019; Sena et al., 2021; Takyi & Obeng, 2013). The institutions and policies needed for effective development are dependent on some important factors (Najimu, 2019; Takyi & Obeng, 2013). These factors include facilitating environment, size, structure, regulations, and enforcement. The absence of these factors will then result in FINDEV that cannot be well improved, implemented, or sustained.

Financial development takes place when markets, financial instruments, and the effects of information are restructured, re-enforced, and a cut in transaction costs (Sena et al., 2021; Ziorklui et al., 2001; Ziorklui & Barbee, 2003). A combination of information and diverse types, enforcement, and transaction costs combined with legal, regulatory, and tax systems have influenced contracts, markets, and intermediaries. The definitions are put differently by each other though, they all focus on the relevance of efficient financial systems in FINDEV (Tweneboah et al., 2019; Ziorklui et al., 2001). Functionally, FINDEV involves the pooling of savings, allocating capital to productive investments, monitoring those investments, risk diversification, and exchange of goods and services (Alnaa & Matey, 2022; Ofori & Obeng, 2023).

These FINDEV functions are important for the smooth running of firms' investment activities and also enhance economic performance (Dar & Nain, 2023; Effiong et al., 2020). Multi-dimensionally, the ability of people and businesses to obtain financial services, the depth (size and liquidity of markets),

the efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues), and the level of activity of capital markets are the components that make up FINDEV.) (Alnaa & Matey, 2022; Ghazali & A. Rahman, 2020; Ha et al., 2022; Iheonu et al., 2020; Opuala-Charles et al., 2022; Sena et al., 2021; Sohail & Li, 2023). This conceptual broad approach to the definition of FINDEV has been used for the development of the index for FINDEV and this is at the background of this research.

Overview of the Financial Sector in Ghana

The industry of financial services is made up of a big range of organizations that operate generally with the management of money (Makina, 2017; Pushkareva, 2021). In Ghana, there is a categorization of the financial services sector into three primary areas. (Ahiawodzi, 2012; International Monetary Fund, 2011; Ofori & Obeng, 2023; Takyi & Obeng, 2013; Tweneboah et al., 2019). These include Banking and Finance (made up of Non-Bank Financial Services and Forex Bureau), financial market/capital markets, and insurance. With a broad range of financial institutions, Ghana has a tiered financial system (Najimu, 2019; Takyi & Obeng, 2013). The financial system is made up of commercial banks, insurance companies, discount houses, rural banks, savings and loan associations, credit unions, stock exchanges, and leasing companies (Bank of Ghana, 2022). Even by the standard of Sub-Saharan Africa, many of these institutions however remain underdeveloped (Akinsola & Odhiambo, 2017; Brei et al., 2020; Ndebbio, 2004; Ziorklui & Barbee, 2003). The 2003 Financial Sector Adjustment Programme assessment determined that there were very few financial intermediaries in the economy.(Ziorklui & Barbee, 2003).

Financial Policy Regimes in Ghana

The financial sector in Ghana has gone from an interventionist to a liberalized financial policy regime over the last three decades (Ofori & Obeng, 2023; Sena et al., 2021; Tweneboah et al., 2019). Undoubtedly, the choice of financial policy has been influenced by altering economic conditions, development thought, and general apathy toward the system (Ofori & Obeng, 2023; Quartey, 2008; Ziorklui & Barbee, 2003). The Ghanaian experience clearly exposes an outstanding attachment to dominant and prevailing development policy as the economies of the world evolve.

The repressions or interventionist policies were adopted by Ghana in the 1970s when these policies were thoroughly pursued and advocated in the development literature (Ziorklui et al., 2001; Ziorklui & Barbee, 2003). With the emergence and proclamation of the McKinnon-Shaw hypothesis as a new orthodoxy of financial liberalization throughout the developing world in the 1980s however, the financial sector became once more, a major device for experimentation of policy (International Monetary Fund, 2011; McKinnon, 1974; McKinnon & Pill, 1998; Ofori & Obeng, 2023; Sena et al., 2021). It was argued by the new orthodoxy view as opposed to the interventionist proposition that, liberalized real interest rate policy will boost savings and lead to more productive investment in the real sector which will cause growth in the economy.

Financial sector development before the reforms

It was evident at the beginning of the 1980s that the financial system was powerless in delivering its promises (Ziorklui & Barbee, 2003). Characterized by government dominance, the financial system had led to a lack

of market efficiencies, political patronage in the banking system, and a competitive environment (Ofori & Obeng, 2023; Quartey, 2008; Takyi & Obeng, 2013). Again, Ziorklui et al. (2001), explains that since managers of such institutions did not share any risk of loss, they did undertake further risk by not paying any price for their actions. It was as well failing in the provision of its supportive role towards the development of the monetary sector aside from failing in the mobilization of enough financial resources for speedy growth and development (Amankwah-Poku & Preko, 2022; Iddrisu & Alagidede, 2022; Quartey, 2008). The way and manner the various policies were not functioning and were mostly overlooked in the operations of the institutions best reflected the letdowns of the system.

With respect to financial deepening, broad macroeconomic indicators first displayed that Ghana lagged other nations in Africa. In 1977, Ghana ranked the third position for 10 nations in Africa in comparing the ratio of the money supply to GDP (M2/Y) ratios (Ahiawodzi, 2012; Iddrisu & Alagidede, 2022; Takyi & Obeng, 2013; Ziorklui & Barbee, 2003). It ranked after Kenya, Ivory Coast, Senegal, and Togo in fifth position by 1978. Ghana was ranked sixth in 1979, seventh in 1980 and also ranked ninth in 1981. Ghana, therefore, stayed at the tail end of the rankings between the years 1983 and 1986. As a matter of fact, the splitting of financial depth, which is measured by the ratio of the money supply to GDP, starting from about 19.62 percent in the year 1979 to only about 9.75 percent in the year 1984 displayed the adverse influence of the repressive policies on the financial sector development. Most of the other indicators of FINDEV fell in size between the years 1979 and 1984. That is savings and time deposits reduced from 7.1 percent to 2.6 percent, credit to the private sector to

GDP reduced from 2.82 percent to 1.54 percent and demand deposits also decreased from 11.6 percent to 4.6 percent.

Again, the formalisation of the financial markets paralleled the fall of the formal real sectors under persistent controls, lack of foreign exchange through official channels, and a tremendously overvalued exchange rate (Ziorklui et al., 2001; Ziorklui & Barbee, 2003). Thirdly, excessive borrowing by the government from the banking institutions was a common feature of the Ghanaian financial system. Commercial banks were given the go-ahead to include short-term government Treasury bills as part of the short-term liquid assets that could satisfy their requirement of cash reserve as a way of persuading the banking sector to give loans to the government so as to provide solutions to its budget deficits (Ziorklui et al., 2001). This as a result led to the dominance of short-term instruments in the liability structure of banks. By 1980 for instance, demand and savings deposits constituted about 70 percent of the banking system's liabilities.

Generally, the adequacy ratio above a minimum of 5 percent was achieved by only very few banks in 1984. Low lending volumes in very short-term instruments were a feature of assets of the banking system before the reforms. The loan/deposit ratio averaged 4 percent for expatriate banks and 50 percent for the indigenous commercial banks before the reforms. There was about 15 percent of total deposits liabilities were excess reserves held by banks. This is made up of 5 percent in cash reserves and 10 percent in government paper. Finally, in directing credit, credit ceilings on bank lending to the private sector, the fixed interest rates and mandatory guidelines appeared not to be

effective (Amankwah-Poku & Preko, 2022; Ziorklui et al., 2001; Ziorklui & Barbee, 2003).

The low performance was credited to both internal and external factors. The internal factors also known as the endogenous shocks were mostly the domestic policies termed "inappropriate" and distorted relative prices and Ghana's comparative advantage in the production of non-tradeable and tradeable goods, brain drain, corruption and the likes. The external factors also known as the exogenous shocks have to do with the drought of 1975 to 1977 and 1981 to 1983. Thus, worsening of the terms of trade of the country, the 1970s oil shocks, high and rising rates of interest on external debts coming as a result of adjustments in the economies of the developed markets to control inflation, and decreasing volumes of exports since exports of Ghana as a proportion of the world imports fell to 0.05 percent by 1981 as compared to the 0.15 percent fall in 1970.

Fixing of the rate of exchange for a considerable number of years with little attention to the deteriorating economic circumstances that contribute to an unacceptably overvalued exchange rate, financing the forever increasing fiscal deficits by borrowing from the banking system and directed credit programs by way of commodity price and distribution controls are some of the inappropriate policies (Aboagye et al., 2008; Gockel, 2010). The financial liberalization school criticised the government's control of and direct intervention in the financial system and explained that it is the cause of underdevelopment and inefficiencies in the financial sector (Cole & Shaw, 1974; Fry, 1978; Fry-McKibbin & Souza, 2018; McKinnon, 1974). The confidence of the private sector in the system as a whole was meant to be weakened by the various

restrictions and obstacles. The controls were seen by the policy-makers not to be very much effective and there was a need for financial market liberalization. Notwithstanding the state of the financial system as outlined above, financial sector reforms were actually in need in the promotion of the development of the financial market, creation of new financial instruments to enable people to invest, deepening of the financial intermediation, and building of new financial institutions that aim at improving the financial sector and the economy at large.

Structure of Ghana's Financial System

The majority of the banks in Ghana's financial sector are foreign-owned. Seventy-five percent of the financial system's assets are held by commercial banks, with pension funds coming in second with a 12 percent share, and the insurance industry with a mere 4 percent.(Bank of Ghana, 2015, 2020, 2022). Thirteen of Ghana's 26 commercial banks—whose market share is estimated to be 51 percent of bank assets—are subsidiaries of international banks. State-Owned Banks control the majority of the domestic banking sector. (SBs) (Kwashie et al., 2022). Through direct and indirect investment by the government, the BOG, and the state-controlled pension fund SSNIT, the state holds a majority stake in five commercial banks (Boadi, 2016; Boadi et al., 2017; Obuobi et al., 2020). The assets of the banking system comprise 29% of SBs. As a result, there is a significant connection between banking and sovereign risks. Specifically, the government has a history of using SBs to fund expenses that are outside of the budget, and SBs' subpar performance has resulted in contingent liabilities for the government. (Alhassan et al., 2014; Kwashie et al., 2022; Yakubu, 2019). High budget deficits have resulted in arrears, which have fueled bank non-performing loans (NPLs). Furthermore,

oversight has been weakened by the conflict of interest brought about by the BOG's dual roles as a regulator and a shareholder. (International Monetary Fund, 2011).

Domestic financial conglomerates are increasing in importance even though they do not yet have a dominant presence (Alhassan et al., 2014; Amidu, 2006; Yakubu, 2019). The exact scope of conglomeration in Ghana's financial sector is not fully known. However, at least nine banks, which account for 53 percent of the banking system assets, have subsidiary securities firms and, in selected cases, industrial and insurance companies (Obuobi et al., 2020). Since the banks are not yet supervised on a consolidated basis, and there is no mapping of shareholders and common directors, it is possible that affiliate companies exist, thus, allowing related party lending to occur unnoticed. These growing inter-linkages increase the potential for risks to have a system-wide impact (IMF, 2011).

The financial sector has grown rapidly, although the growth has not had the intended effect of reducing intermediation costs (Boadi, 2016; Boadi et al., 2017; Obuobi et al., 2020). There has been tremendous growth in the total financial system assets over the last ten years (IMF, 2011). The growth has been underpinned by an increase in the number of players in the banking, insurance, capital markets, and microfinance sectors. However, while private sector credit increased, a significant segment of the economy continues to have limited access to finance. The competition also exerted more pressure on staff and funding costs while lending rates remained high (IMF, 2011).

Financial Development and Effectiveness of Monetary Policy

Two viewpoints exist on the interrelatedness between the financial system and the monetary transmission mechanism (Akinsola & Odhiambo, 2017; Effiong et al., 2020; Ghazali & A. Rahman, 2020; Sena et al., 2021). These include the traditional money and credit views of monetary policy transmission (Abradu-Otoo et al., 2003; Cetorelli & Goldberg, 2012; Dale & Haldane, 1995; F. Mishkin, 1996; F. S. Mishkin, 1995). Both channels underscore the relevance of the financial system in the transmission of monetary policy and thus share a common link: monetary policy actions transmitted to the real economy influence first and foremost financial sector variables, and later aggregate demand behaviour (Abradu-Otoo et al., 2003; Akosah et al., 2020b; Alpanda & Aysun, 2012). The traditional money view sees the financial system as being passive and a mere pass-through mechanism for monetary policy transmission.

Under this changes in money supply (or outside money) affects the interest rates and aggregate demand through separate effects on investment demand and the exchange rate respectively (Montiel et al., 2010; Rossi et al., 2019; Schmidt, 2020; Suriani et al., 2021). Monetary tightening, for instance, causes a rise in the interest rates and leads to a fall in investment spending (Akosah et al., 2020b; Dale & Haldane, 1995; Kumiarso et al., 2002). In the same vein, a higher interest rate causes an appreciation of the domestic currency, and thus an expenditure-switching effect from foreign to domestically produced goods. For its functionality, this view rests on the conditions of limited price elasticity and the absence of market imperfections.

On a different level, the credit view allocates an active role to the financial system because of the relevance of credit markets to the monetary transmission mechanism (Boehl, 2022; Ghazali & A. Rahman, 2020; Koch, 2011; F. Mishkin, 1996; Pruteanu-Podpiera, 2007). Building on the enlarged literature on the role of financial intermediaries and credit market frictions associated with information asymmetry problems of adverse selection and moral hazard in an economy, the credit view shows that financial frictions generate an external finance premium – the cost of external and internal finance – which helps elucidate the impact of monetary policy on the real economy (Koch, 2011).

The credit view works through two channels: the bank lending channel which traces the impact of monetary policy on the supply of bank loanable funds and the balance sheet channel, which focuses on how such policy changes influence the borrower's financial position in terms of net worth, cash flow and debt collateral (Amidu, 2006; Arnold, 2000; Basile & Joyce, 2001; Ghazali & A. Rahman, 2020; Hosono, 2006; Mukhtar & Younas, 2019). Both the bank lending and balance sheet channels provide the theoretical linkage of how the supply and demand sides of the financial system are respectively influenced by changes in monetary policy (Ghazali & A. Rahman, 2020; Hosono, 2006). Overall, the strength of the credit view depends on the degree of financial friction. Higher levels of financial frictions generate an amplified effect of monetary policy on the real economy through the larger impact on the external finance premium.

This implies that notwithstanding the complexity of the relationship between financial development and monetary policy effectiveness, it is

generally accepted that a well-functioning financial system is a prerequisite for an effective monetary policy transmission (Adabor, 2023; Cantah et al., 2023; Effiong et al., 2020; Minsky, 1969; Wiafe et al., 2022). Nevertheless, differences in adverse effects of monetary policy may result from significant differences in the monetary transmission mechanism caused by a country's financial structure. (Effiong et al., 2020).

For example, greater financial innovation tends to decrease the effectiveness of monetary policy in an economy with a competitive and developed financial sector because it gives private actors a safety net against unforeseen financial shocks and volatility in spending. (Cantah et al., 2023; Effiong et al., 2020; Wiafe et al., 2022). Whereas it could be stronger for economies with a weak financial system but high firms' dependence on bank credit. With undercapitalized banks, credit expansion is significantly constrained, and monetary policy may become less effective or at best have a long-time staggering effect on the real economy (Ghossoub, 2010; Hosono, 2006; Shahe Emran & Farazi, 2011).

Thus, the relationship between FINDEV and the efficiency of monetary policy can be explained by both positive and negative interactions.(Cantah et al., 2023; Effiong et al., 2020; Minsky, 1969; Wiafe et al., 2022). The empirical analysis of the relationship is relatively nascent as only a limited number of studies have examined the question of whether FINDEV influences the effectiveness of the monetary policy (Adabor, 2023; Cantah et al., 2023; Effiong et al., 2020; Minsky, 1969; Wezel et al., 2012; Wiafe et al., 2022). Most of these studies are dominated by micro and macro analyses of the relationship for developed economies such as the Euro area and the United States, with few

exceptions including some developing countries in their samples as indicated in the works Carranza et al., 2010; Ma and Lin, 2016. Overall, empirical evidence on the relationship is mixed and inconclusive.

The fundamental premise of the financial system-based monetary policy transmission models is, in part, that the level of financial sector development determines how effective monetary policy. (Effiong et al., 2020). Put differently, countries with less developed financial systems and those where businesses rely on banks for credit funding will see greater efficacy from monetary policy. This is because firms' restricted access to the credit market and banks' non-reservable deposits will not eliminate the contractionary impact of monetary tightening on bank loans and balance sheets, respectively. (Cantah et al., 2023; Effiong et al., 2020). According to previous studies, the bank lending channel, since the monetary policy will have an impact on the availability of loans, particularly in situations where banks' balance sheets are less liquid. (Amidu, 2006; Basile & Joyce, 2001; Ghazali & A. Rahman, 2020; Mukhtar & Younas, 2019).

There is also evidence that the bank lending channel's impact is lessening with increased financial securitization, as opposed to the balance sheet channel, where the effect is more pronounced.(Ghazali & A. Rahman, 2020; Mukhtar & Younas, 2019). Monetary policy has a larger impact on banks with asset-back securitization than non-securitizing banks (Fujiki et al., 2016; Kontonikas & Montagnoli, 2006; Mukhtar & Younas, 2019). Also, when financial frictions are present, the credit channel is more potent because it increases the impact of monetary policy shocks on output and inflation. (De Paoli, 2009; Geromichalos & Herrenbrueck, 2016; Ikeda, 2022; Koch, 2011;

Lagos, 2011). Prior evidence show that monetary policy has a larger impact when the financial system is less developed, albeit with longer gestation period than in a more developed financial system (Akinsola & Odhiambo, 2017; Ghazali & A. Rahman, 2020; Wiafe et al., 2022). Montiel et al. (2010) demonstrate how the bank lending channel typically predominates over other routes of monetary transmission in low-income countries (LICs) with low levels of FINDEV. Additionally, research indicates a negative correlation between the efficiency of monetary policy and FINDEV because higher levels of FINDEV are associated with lower levels of output and inflation caused by monetary policy. (Akinsola & Odhiambo, 2017; Ghazali & A. Rahman, 2020; Wiafe et al., 2022). Moreover, there is the positive effect of FINDEV on monetary policy effectiveness (Alpanda & Aysun, 2012; Effiong et al., 2020; Sena et al., 2021).

Evidence suggests that variations in the financial system, particularly within a monetary union, are a direct cause of cross-country variations in the transmission of monetary policy. With the underlying assumption that regional monetary policy will have diverse effects among member nations due to heterogeneity in their financial institutions, the majority of these research concentrate on the European Monetary Union.(Arnold, 2000; BIS, 1995; de Haan & Elbourne, 2021; Ha et al., 2022). Cecchetti (1999) finds that monetary policy shocks on output and inflation vary across member countries of the EU. Such variation is explained by each country's financial system which is "different in the size, concentration, and health of the banking system and exhibit differences in the availability of primary capital market financing". Therefore, in nations where the banking sector is weak, monetary policy will be more sensitive. Elbourne & de Haan (2021) discover minimal evidence linking

monetary policy shocks in transitioning EU nations with financial structure variables.

. addition, other schools of thought suggest an ambiguous link between the effectiveness of monetary policy and FINDEV (Akinsola & Odhiambo, 2017; Effiong et al., 2020; Sena et al., 2021). They posit that Countries with lower levels of development cannot successfully transfer monetary policy. This disadvantage results from the fact that there are far more currency leaks from the system in nations with less sophisticated financial systems.

For less developed nations that already have limited capital, this factor may be more crippling. The effect of monetary policy on economic output is one way to gauge its efficacy. In less financially developed nations, there are fewer and less varied sources of funding, and reliance on bank funding increases the risk of cash leaks, which could reduce the impact of monetary policy on output. The two impacts mentioned above imply that there is uncertainty in the relationship between FINDEV and the efficacy of monetary policy. It's hard to predict if FINDEV will have a positive or negative impact on output.

Monetary policy effectiveness is increased as a result of financial sector innovation through the interest rate channel (Takyi & Obeng, 2013). This is because financial innovation leads to a decrease in the transaction cost with the result of an increase in the holding of financial asset and facilitate funding and investment strategies. Firms have large access to securities markets due to the financial innovations which lead to a decrease the information asymmetries.

Public Debt and Financial Development

Public debt, often used by governments worldwide to fund essential public projects and manage fiscal deficits, has long been a topic of economic

debate and study (Abdel-Halim & Al-Assaf, 2022; Hauner, 2009; Ismihan & Ozkan, 2012; Jiménez-Sotelo, 2023; Kutivadze, 2013; Ndikumana & Boyce, 2003; Pedersoli & Presbitero, 2023). Public debt, often used as a means of financing government expenditures and investments, encompasses various forms such as domestic and external debt, short-term and long-term debt, and concessional and non-concessional debt (Aimola & Odhiambo, 2021; Bui, 2018). It represents a significant liability for the government and, by extension, the economy.

In Ghana, the management of public debt has undergone substantial changes in recent years, marked by an increase in borrowing for infrastructure projects, social programs, and budgetary support (Aimola & Odhiambo, 2021). Public debt, the accumulated financial obligations of a government, plays a pivotal role in shaping a nation's economic landscape (Bui, 2018; Ismihan & Ozkan, 2012; Pedersoli & Presbitero, 2023). Among its myriad effects, one of the most crucial and far-reaching is its influence on FINDEV. Financial development is a multifaceted concept that encompasses the growth and deepening of financial markets and institutions within an economy.

Financial development, on the other hand, encompasses a wide array of dimensions, including the size and efficiency of financial markets, access to financial services, the depth of banking systems, and the level of financial intermediation (Ofori & Obeng, 2023; Quartey, 2008; Takyi & Obeng, 2013; Tweneboah et al., 2019). A well-developed financial sector is essential for resource mobilization, efficient capital allocation, and economic growth. In Ghana, efforts have been made to deepen the financial sector, with measures aimed at improving access to financial services, promoting financial inclusion,

and enhancing the regulatory environment (Sena et al., 2021; Ziorklui et al., 2001).

A fundamental transmission mechanism linking public debt to FINDEV is the crowding out effect (Bui, 2018; Wai & Wong, 1982). When a government seeks to finance its budget deficits by borrowing from domestic sources, it typically increases the demand for loans within the domestic financial markets (Awad & Eid, 2017; Shahe Emran & Farazi, 2011). The increased demand for funds puts upward pressure on interest rates, causing them to rise (Bui, 2018; Burns, 2016; Ghossoub, 2010). Consequently, higher interest rates can have a detrimental impact on private sector borrowers, including businesses and households, as the cost of borrowing becomes more expensive. The crowding out effect thus restricts access to credit for private sector participants, stifling investment, and consumption, which in turn can hinder the growth and maturity of the financial sector (Akber et al., 2020; Akber & Paltasingh, 2019; Bui, 2018).

Public debt's influence on FINDEV is also mediated through its impact on interest rate volatility (Gomez-Gonzalez, 2021; Hauner, 2009; Kutivadze, 2013). High levels of government debt can lead to fluctuations in interest rates, creating uncertainty within financial markets (Aimola & Odhiambo, 2021; Ndikumana & Boyce, 2003; Pedersoli & Presbitero, 2023). Investors and financial institutions prefer stable interest rate environments for long-term planning, investment decisions, and risk assessment (Abdel-Halim & Al-Assaf, 2022; Bui, 2018). Consequently, when interest rates are volatile, private sector investment and lending may decrease, impeding the development of a vibrant and stable financial ecosystem.

Another critical channel through which public debt can affect FINDEV is credit risk and the specter of sovereign default (Abdel-Halim & Al-Assaf, 2022; Bui, 2018; Kutivadze, 2013; Sağdiç et al., 2021). A government with a history of defaulting on its debt obligations or carrying an unsustainable debt burden can erode investor confidence in the country's financial markets (Bui, 2018; Hauner, 2009). The loss of confidence can lead to a reduction in foreign investment and capital flight, resulting in significant capital outflows (Forson et al., 2017; Ndikumana & Boyce, 2003). This, in turn, not only jeopardizes the stability of the financial sector but can exacerbate broader economic challenges faced by the nation.

Public debt's impact on FINDEV can be further understood by considering its influence on the health of the banking sector (Aimola & Odhiambo, 2021; Jiménez-Sotelo, 2023). Banks that hold a substantial portion of government debt can become highly exposed to sovereign risk (Abdel-Halim & Al-Assaf, 2022). If the government defaults or experiences financial distress, these banks may face severe losses, potentially leading to banking crises (Iddrisu & Alagidede, 2020). Such crises can undermine depositor confidence and erode trust in the financial system, impeding its development and overall stability (Abdel-Halim & Al-Assaf, 2022; Iddrisu & Alagidede, 2020). Thus, maintaining a sound and resilient banking sector is pivotal for fostering financial market development.

The composition of government debt plays a pivotal role in shaping its impact on FINDEV (Aimola & Odhiambo, 2021). Governments that predominantly issue short-term debt instruments create a situation marked by frequent debt rollovers (Gomez-Gonzalez, 2021; Hauner, 2009; Kutivadze,

2013). This exposes the financial system to considerable refinancing risks. Sudden liquidity shortages or rollover difficulties can trigger financial instability and contagion, making the financial sector more susceptible to crises (Gomez-Gonzalez, 2021; Ndikumana & Boyce, 2003; Neaime, 2015). Governments also issue long-term debt with extended maturities to contribute to a more stable financial environment. Reduced refinancing risks associated with long-term debt issuance promote the sustainability and resilience of the financial sector, facilitating its growth and development.

In conclusion, the intricate relationship between public debt and FINDEV is characterized by a complex interplay of transmission mechanisms. These mechanisms include the crowding out effect, interest rate volatility, credit risk, banking sector health, and government debt composition. It is imperative for policymakers to carefully consider these dynamics when managing public debt. Prudent debt management, combined with thoughtful fiscal and monetary policies, is crucial to ensuring that the financial sector remains robust, stable, and conducive to economic growth. Balancing fiscal sustainability with the vitality of financial markets is essential for long-term economic prosperity.

Responsiveness of commercial banks to Monetary Policy

The responsiveness of commercial banks to monetary policy represents a pivotal aspect of contemporary economic management. Monetary policy, executed primarily by central banks worldwide, plays a fundamental role in regulating economic growth, controlling inflation, and promoting financial stability (Benigno & Paciello, 2014; Bonchi, 2023; Ikeda, 2022). The interplay between central banks and commercial banks is crucial to understanding how

monetary policy influences broader economic conditions (Banu & Vepa, 2019; Richter & Teigen, 1982; Vuchelen, 1980).

A cornerstone of monetary policy is the manipulation of interest rates, particularly the policy interest rate set by the central bank (Akosah et al., 2020b; Dale & Haldane, 1995; Kumiarso et al., 2002). Commercial banks closely monitor this rate, as it directly impacts their cost of borrowing money(Nguyen & Nguyen, 2021; Nguyen et al., 2022; Richter & Teigen, 1982). When a central bank adopts an expansionary policy by lowering interest rates, commercial banks, in turn, tend to reduce the interest rates they offer on loans and deposits (Fang & Jiang, 2016; Gray, 1963; Li & Wang, 2012). Conversely, in a contractionary policy environment, where rates rise, commercial banks often respond by increasing their lending rates (Farajnezhad & Suresh, 2019; Nguyen et al., 2021). This mechanism of interest rate transmission serves as a vital channel through which monetary policy influences the economy (Dale & Haldane, 1995; Kumiarso et al., 2002).

When a central bank decreases its policy interest rate, commercial banks typically follow suit by lowering their lending and deposit rates (Fang & Jiang, 2016; Gray, 1963; Li & Wang, 2012; Rudolph, 1978). This encourages borrowing and spending among consumers and businesses, thereby stimulating economic activity (Farajnezhad & Suresh, 2019; Mukhtar & Younas, 2019; Rudolph, 1978). Conversely, during periods of interest rate hikes, commercial banks raise their lending rates, making borrowing more expensive and slowing down economic activity (Dupor, 2002; Geromichalos & Herrenbrueck, 2016; Mukhtar & Younas, 2019).

Lower interest rates tend to reduce the returns on savings accounts and fixed-income investments, such as bonds (Boehl, 2022; Filardo & Siklos, 2016; Geromichalos et al., 2007; Nguyen et al., 2021). This can influence consumers to shift their savings towards riskier assets like stocks or real estate. Additionally, businesses may find it more attractive to invest in expansion projects or capital improvements when borrowing costs are lower, thus boosting overall investment in the economy (Mukhtar & Younas, 2019; Richter & Teigen, 1982).

Commercial banks are central to the credit creation process in the economy (Boehl, 2022; Mukhtar & Younas, 2019; Rudolph, 1978). They act as intermediaries between savers and borrowers, channeling funds from depositors to borrowers in the form of loans (Aharony et al., 1986; Fang & Jiang, 2016; Nguyen & Nguyen, 2021). Therefore, the responsiveness of commercial banks to monetary policy can significantly influence credit conditions (Fang & Jiang, 2016; Gray, 1963). In response to an expansionary policy, commercial banks are more inclined to expand credit, offering loans to businesses and consumers at lower interest rates (Nguyen et al., 2021). This can stimulate borrowing, leading to increased investment and economic activity. Conversely, during a contractionary phase, banks may become more conservative in lending, potentially dampening economic growth.

During periods of easy monetary policy, banks may relax their lending standards to attract a larger pool of borrowers (Gray, 1963; Li & Wang, 2012). However, this can increase the risk of lending to suboptimal borrowers and potentially lead to a rise in non-performing loans, which could threaten the stability of the banking sector. Lower interest rates can encourage consumers to

take on more debt, including mortgages and consumer loans, which can boost consumption (Banu & Vepa, 2019). However, excessive consumer debt can also create financial vulnerabilities.

Commercial banks' profitability is inherently tied to the net interest margin the difference between interest earned on loans and interest paid on deposits (Fang et al., 2018). When central banks lower interest rates, banks may experience a squeeze on their net interest margin, potentially affecting their profitability. To counter this, banks might seek alternative ways to generate income or engage in higher-risk lending practices. Consequently, the profitability of the banking sector can be both a driver and a casualty of monetary policy (Nguyen et al., 2022).

In response to narrowing net interest margins, banks may diversify their income streams by engaging in fee-based services, investment banking activities, or expanding into new markets to maintain profitability (Farajnezhad & Suresh, 2019; Gray, 1963; Rudolph, 1978). In search of higher yields, banks may take on additional risks by investing in riskier assets or extending credit to borrowers with lower credit quality, potentially exposing themselves to increased credit and market risk (Nguyen, et al., 2018).

The changing interest rate environment resulting from monetary policy decisions has implications for banks' risk management strategies (Brei et al., 2020; Kusi et al., 2016). In a low-interest-rate setting, banks may be compelled to take on more risk to maintain profitability. Conversely, when rates rise, they may adopt a more risk-averse approach. Furthermore, monetary policy influences asset prices, including stocks and bonds. Commercial banks often

hold sizable investment portfolios, and fluctuations in asset prices can have direct consequences for their financial health.

In a low-interest-rate environment, banks may seek higher returns by investing in riskier assets, such as corporate bonds or stocks (Amidu, 2006; Miho et al., 2022). However, this increased exposure to market risk can lead to significant losses during market downturns. Changes in interest rates can affect the prices of existing bonds in a bank's portfolio. When interest rates rise, the value of existing bonds falls, potentially leading to capital losses for banks holding these securities.

The responsiveness of commercial banks to monetary policy has broader implications for financial stability. Excessive credit expansion driven by low-interest rates can lead to the formation of asset bubbles, posing systemic risks to the financial system (Mukhtar & Younas, 2019; Nguyen et al., 2021). The global financial crisis of 2008 serves as a stark reminder of the consequences of an overheated financial sector. Central banks must closely monitor the risks associated with commercial banks' responsiveness to policy measures to ensure the overall stability of the banking system.

To mitigate systemic risks arising from excessive bank lending, central banks and regulatory authorities may implement macroprudential policies, such as stricter capital adequacy requirements and loan-to-value limits on mortgage loans (Amidu, 2006; Basile & Joyce, 2001; Ghazali & A. Rahman, 2020). Banks are often subject to stress tests to assess their resilience to adverse economic scenarios, including changes in interest rates. These tests help identify vulnerabilities within the banking system and inform policymakers on necessary actions to maintain financial stability.

In conclusion, through interest rate transmission, credit supply and demand dynamics, profitability considerations, risk management strategies, and impacts on asset prices, commercial banks play a pivotal role in transmitting and amplifying the effects of monetary policy decisions.

Empirical Review

This section presents empirical works on relationship among FINDEV, public debt dynamics, commercial banks' responsiveness and monetary policy effectiveness that emerged over the years.

Monetary Policy and Financial Development

The monetary policy is used to control the overall money supply and other financial conditions in an economy. In the event of fluctuations in an economy's financial resources, the government through the central bank may regulate the allocation of debt between the public sector and the private sector which may impact the FINDEV (Kusairi et al., 2019). Mostly, the theory behind monetary policy is on the floatation exchange rates that affects the domestic currencies – appreciation and depreciation of the currency (Alexandre & Bação, 2005; Benigno & Paciello, 2014; Walsh, 1982). The fluctuations in the monetary policy might affect the bank lending rate and interest rates which may influence the level of FINDEV (Abdel-Halim & Al-Assaf, 2022).

The adjustment of banks' asset holdings is one of the major paths of the impact of monetary policy on the economy which may affect the credit conditions in the economy and may affect the FINDEV of the economy (Rudolph, 1978). The degree of effect between FINDEV and monetary policy in an economy has been explored and the effectiveness of the monetary policy has been found to depend on the condition of the financial system which is going

to lead to asymmetry in the findings from literature (Carranza et al., 2010; Ma & Lin, 2016; Mishra et al., 2012).

For one, in Africa, Effiong et al. (2020) conducted a study in Africa and found that FINDEV influences the effectiveness of monetary policy outputs. In their study, they applied a standard panel data model and macroeconomic generalized method of moments (GMM) model for annual data sampled from 1990 to 2015 for 39 African countries. In Africa, they discovered a limited correlation between Africa's FINDEV and the success of monetary policy. (Effiong et al., 2020).

An earlier study by Mishra and Montiel (2013) found that at best, monetary policies in sub-Saharan Africa is weak because of the level of market integration and financial structural imperfections. Another study conducted in Africa (53 sampled African countries) for the period 1985 to 2010, adopting the treatment effect and the two-step method panel probit method techniques showed that there is a negative impact from banks' crises (which they tend to mitigate using monetary policy), on financial liberalisation and development (Batuo & Mlambo, 2012).

Sena et al. (2021) investigated the influence of FINDEV on the effectiveness of monetary policy using autoregressive distributed lag approach. The data was sampled from 1980 to 2016 where global FINDEV (built on indices indices) was sampled as a proxy for FINDEV. The result showed that in Ghana, FINDEV strengthens the effectiveness of monetary policy. This is contrary to studies by Effiong et al. (2020); Mishra and Montiel (2013) and Batuo and Mlambo (2012) who conducted similar studies in developing economies – Africa and sub-Saharan Africa.

To examine the relationship between monetary policy and FINDEV for 37 industrialized and developing nations between 1985 and 1998, Krause and Rioja (2006) used the GMM estimate technique. The analysis showed that FINDEV (proxied on private credit, liquid liabilities, and financial aggregate index) contributes efficiently to the monetary policy in economies that have developed financial markets as opposed to those that do not have developed markets (Krause & Rioja, 2006).

Fiador (2016) used the autoregressive distributed lag (ARDL) technique to analyze the relationship between monetary policy and FINDEV for three Anglophone West African nations: Ghana, Gambia, and Nigeria, spanning the years 1975 to 2011. The analysis showed that the countries under investigation's monetary policy transmission was ineffectual. The outcome demonstrated that the three nations' pass-through interest rate systems differ significantly from one another. Nigeria displayed an overshooting of lending rates in response to monetary policy adjustments, whereas Ghana and the Gambia demonstrated signs of undershooting.

Principal component analysis was employed by Angelopoulou et al. (2014) to examine the relationship between monetary policy and FINDEV for the European Union Area between 2003 and 2011. The Financial Condition Index (FCI) was employed as a stand-in for FINDEV, and the interest rate, interest rate spread, and credit quantity were utilized to index monetary policy. According to the investigation, the effects of the financial condition index varied throughout the European Union, especially during the 2007–2008 global financial crisis.

Ma and Lin (2016) conducted a research on the relationship between FINDEV and the effectiveness of monetary policy using panel quarterly data for 41 economies from 2005 to 2011. For the analysis, they used fixed effect, random effect, and pooled least squares estimation techniques. The findings demonstrated that monetary policy has a considerable impact on output and inflation, but that it is inversely connected with FINDEV. They found that when the financial system gets better, monetary policy becomes less effective.

Also, Apanisile and Osinubi (2020) used a dynamic stochastic general equilibrium model based on the Bayesian estimation approach and monthly data from January 2004 to April 2016. The results showed that FINDEV has a positive effect on monetary policy transmission in an economy as it is the most active channel to stabilise prices. Vuchelen (1980) showed that the central bank imposes policies on the commercial banks to regulate their responsiveness. Some of these impositions include loan ceiling and co-efficient (rate) for the loans and would ultimately regulate the level of government credit. The ceiling on the loan would determine how much loan is available to the private sector and at what rate the loan should be granted for. Thus, through monetary policy, the commercial banks are able to contribute to the FINDEV of an economy.

Also, Abdul Karim et al. (2021) investigated the relationship between FINDEV and monetary policy effectiveness in ASEAN-3 countries (that is Malaysia, Philippines and Singapore) using an autoregressive distributed lagged model. Their findings revealed that the level of monetary policy effectiveness differs across countries based on the role of FINDEV. They further elaborated that though Malaysia and Singapore are developed, the level of effectiveness of monetary policy is reduced in Malaysia (negative relationship) but more

effective in Singapore. Also, in the Philippines, the main results showed that the effect of FINDEV depends on the variable that is used to measure monetary policy.

Basa et al. (2019) also explored the relationship between FINDEV (proxied as liquid liabilities and stock market capitalisation) and the effectiveness of monetary policy (gross fixed capital formation) in Malaysia. They adopted the structural vector autoregression was used for generating the indexes and analysed by an autoregressive distributed lag model is used. The results showed a negative significance between both variables indicating that a more developed financial sector hinders the effectiveness of monetary policy just as in Abdul Karim et al. (2021).

Jiang et al. (2022) theoretically showed that development of digital finance (financial development) could increase money supply (monetary policy) to some degree. Because emerging economies ultimately appreciate the effectiveness of monetary policy when there is economic growth, Jiang et al. conducted a study in China, a representative of emerging markets found that FINDEV and monetary policy have a positive relationship. Carranza et al. (2010) also examined the level of FINDEV with the effectiveness of monetary policy. Their analysis was based on a sample panel estimation where Carranza et al. statistically proved that there is a significant relationship between FINDEV and monetary policy.

Seth and Kalyanaraman (2017) also looked at the effect of FINDEV on the output of banks in terms of their liquidity by conducting a cross-country analysis of 119 countries from 1997 to 2014. In addition, the study sought to explore if monetary policy is more effective when there is an improved level of

FINDEV. Their GMM analysis showed that monetary policy is more effective in economies with higher levels of FINDEV as opposed to economies with lower levels. The level of FINDEV in an economy also boosts the level of bank outputs and liquidity.

Fang et al. (2018) reported that monetary policy can negatively affect the lending capacity of commercial banks in China using data from 2011 to 2016. This is because, when the lending rate is raised, private sector finds it expensive to extend their credit line therefore reducing bank loans. Also, their quantile regression analysis showed that commercial banks are more responsive to monetary policies when they can control how to fix the interest rates on investments and loans.

Ibrahim (2020) examined the redistributive effect of monetary policy on the FINDEV of developing countries. The results from 54 developing countries from 2000 to 2017 the panel vector autoregression model showed that the improvements in information and financial efficiency would lessen the negative impacts of contractionary monetary policy on income distribution.

Ahiadorme (2022) investigated the distributional channel of monetary policies and FINDEV from 2000-2017 for 32 sub-Saharan economies using a vector autoregressive model and the dynamic panel data model (GMM). The findings showed that the financial sector has an important role to play in reducing the level of financial inequalities by strategically using dis-equalising approaches of the monetary policy that the central banks set. Practically, the effectiveness of the monetary policy set by the central bank would be more effective if there is little change in the policy so that there can be desired outputs for FINDEV.

A study conducted by Acheampong (2007) scrutinized Ghana's financial sector, employing the McKinnon-Shaw framework. This examination explored the interplay between real interest rates and crucial economic facets, including savings, investment, and economic growth. Utilizing the VAR methodology and quarterly data spanning from 1988 to 2004, this research uncovered significant relationships between real interest rates and savings, real interest rates and investment, and investment and economic growth. Notably, it highlighted the dynamic interplay between real interest rates, savings, and economic development, shedding light on the intricate financial landscape in Ghana.

Takyi and Obeng (2013) embarked on an investigation into the determinants of FINDEV in Ghana, spanning from 1988 to 2010. Employing the Autoregressive Distributed Lag (ARDL) approach, their study unearthed a distinctive cointegration relationship between FINDEV and a constellation of factors, including inflation, trade openness, per capita income, government borrowing, and reserve requirements. The research underscored the pivotal roles played by per capita income and trade openness as significant determinants of FINDEV in Ghana. Furthermore, it shed light on the adverse impact of inflation, reserve requirements, and interest rates on FINDEV, both in the short and long run.

Rajan and Zingales (2003) posited that capital flows, coupled with unrestricted trade, can act as catalysts for industrial and FINDEV. This hypothesis revolved around the idea that increased trade and financial openness reduce the government's influence in the financial sector, leading to financial incumbents seeking funding from open markets for various projects. This shift

can stimulate FINDEV as incumbents seize new opportunities spawned by trade and financial openness.

Baltagi et al. (2007) delved into the nexus of financial openness, trade openness, economic institutions, and FINDEV. Their study, employing annual data and panel estimation techniques, revealed that countries previously least open to international trade and capital flows would experience greater benefits upon opening their trade or capital accounts. This emphasized the profound role of financial and trade openness, intertwined with economic institutions, in shaping FINDEV. Interestingly, the study indicated that opening both trade and capital accounts yielded the most significant advantages, although the most open countries reaped fewer benefits.

Quartey (2008) delved into the interplay between financial sector development and poverty reduction in Ghana, spanning from 1970 to 2001. Unveiling a long-run co-integration relationship between these variables, the study illuminated the nuanced relationship between financial sector development and poverty reduction. While financial sector development was found not to granger-cause savings mobilization in Ghana, it contributed to a reduction in poverty levels, albeit with statistical insignificance. The research highlighted the challenges in channeling savings into pro-poor sectors, citing issues such as high default rates, collateral absence, inadequate business proposals, and government deficit financing.

Chinn and Ito (2006) explored the ramifications of capital account liberalization on stock market development across 108 countries. Their findings underscored the significance of this liberalization, contingent upon the level of development in legal systems and institutions. Furthermore, the study

highlighted the dependency of FINDEV on the openness of the capital account, a relationship further modulated by the state of legal development.

Krause et al. (2006) examined the relationship between effective monetary policy implementation and FINDEV in 37 countries between 1985 and 1998 using the generalized method of moments (GMM) estimating approach. With the aid of metrics including private credit, liquid liabilities, and a financial aggregate index, the study demonstrated the critical function that established financial markets play in enabling successful monetary policy outcomes.

The relationship between financial innovation and monetary policy was highlighted by Safdar and Khanm (2013), who examined the interest rate channel of monetary policy transmission in Pakistan. Their results brought to light the complex interplay of output, FINDEV, and the efficacy of monetary policy.

Akinsola and Odhiambo (2017) probed the impacts of FINDEV on monetary policy across Africa from 1980 to 2016. Employing dynamic panel data analysis and using measures of financial sector development, their study revealed a positive correlation between financial deepening and monetary policy, albeit with a significant negative influence from banking crises.

In recent years, a few scholars have directed their focus towards understanding the transmission of policy rates in Ghana. Abradu-Otoo et al. (2003) scrutinized the monetary transmission mechanism in Ghana, identifying the exchange rate channel as a principal medium through which monetary policy influenced inflation and output.

Quartey (2008) delved into the finance-growth causal link in Ghana, revealing that economic growth fostered financial sector enhancement. While growth of broad money was utilized as a measure of FINDEV, the study illustrated the intricate relationship between finance and economic performance.

Public Debt and Financial Development

The public debt and the level of FINDEV sharp the economic position of economies. The level of government debt and the efficiency and stability of its financial markets and economy influences the economic growth of the government. The financial system is the dominant system that is responsible for effectively transforming the economic position of any country. Yet, the level of FINDEV becomes more critical in the event of a highly challenging environment that calls for the government to go into debt (either high or low) (Chinn & Ito, 2006; De la Torre et al., 2013; Fry, 1978; Ha et al., 2022; Karwowski, 2022). According to literature, there is a clear unstable and unsustainable public debt which has ramifications that go beyond economic and fiscal stability consequently leading financial instability (Abbas et al., 2022; Aimola & Odhiambo, 2021; Gomez-Gonzalez, 2021; Hauner, 2009; Ismihan & Ozkan, 2012; Kutivadze, 2013; Neaime, 2015; Pedersoli & Presbitero, 2023).

Technically, domestic lenders in banks are the major source of public debt through risk free investment avenues and issued bonds. Thus, if banks continue to give the government avenues to increase the level of public debt, this could lead to crowding-out effect and reduce the level of credit to private sector and this stifle the contribution of the public sector to FINDEV (Nguyen et al., 2020; Hauner, 2009). In another view, the banks would prefer to grant the

credit line of the government because they would prefer lower credit risk as opposed to the high likelihood of credit risk by the private sector because of the high borrowing costs – that captures their likelihood of default (Abbas et al., 2022; Bui, 2018; Chung-Yee et al., 2020; Gomez-Gonzalez, 2021; Kutivadze, 2013). Along these lines, there has been a number of studies that have explored the relationship between public debt and FINDEV.

Abbas et al. (2022) examined the impact of public debt on FINDEV and reported a that public debt has a negative impact on FINDEV. However, if public debt is treated as a function of institutional quality, the relationship turns negative. Imperatively, public debt has an adverse effect on the FINDEV of economies. Their findings are generalisable to 79 countries over the data period of 1996 to 2015 using Fixed Effect and system GMM estimators. Also, the FINDEV was indexed on three variables: domestic credit to private sector; domestic credit to private sector by banks and broad money while the independent variable was captured as public debt.

Another study that captured public debt as an institutional function is Kutivadze (2011). The findings of this study confirmed that there is a positive relationship between FINDEV and public debt which influences the macro stability of the respective economies but has a complex relationship with the institutional framework of monetary policy. Conclusively, over the time span that these two studies were conducted, it is conclusive that there is a positive relationship between FINDEV and public debt (when it is treated as an institutional function).

Chung-Yee et al. (2020) investigated the asymmetric effect of public debt on FINDEV in Malaysia using time-series data from 1980 to 2015 and

employed the non-linear autoregressive distributed lags framework. the motivation for this asymmetric analysis was on the preamble that the economic conditions are not linear thus, an asymmetric analysis would provide practical implications for the results in both the short- and long-term. Indeed, their analysis showed the existence of asymmetry effects with higher debt levels discouraging any improved levels in FINDEV. Abdel-Halim and Al-Assaf (2022) investigated the role of public debt in the Jordan developing economy market. Using annual data from thirteen banks from 2008 to 2018 analyses by the fixed effect and bias correction fixed effect to control for bank size, bank risk, bank capitalisation.

Just as Abbas et al. (2022) and Kutivadze (2011) who had treated public debt as an institutional function, Abdel-Halim and Al-Assaf (2020) found that public debt and FINDEV have a positive relation. As such, when public debt is increasing, FINDEV increases – this can be generalised to developed and developing economies pending the conformity in the results. Despite the positive relationship, it is worthy to note that huge levels of public debt can be harmful for FINDEV and the growth of an economy (Hauner, 2009). Hauner (2009) found that public debt plays a negative role with FINDEV in their study that was conducted on a country- and banking-level analysis. They used three indicators to measure FINDEV (liquid liabilities of the banking sector; total bank credit; and bank credit to the private sector – in all cases, relative to GDP) and public debt. Their argument for the negative relationship is on the notion that large public debt granted by respective banks could reduce bank efficiency and reduce the level of financial growth stiffening development.

Just as Chung-Yee et al. (2020), Hauner (2009) had earlier found a non-linear relationship where FINDEV is seemingly improved through public debt. Another of such non-linear effect of total domestic public sector debt to FINDEV is from Bui (2018). Using data from 22 economies in the Asia-Pacific region Bui (2018) reported a negative non-linear relationship between FINDEV (measured by domestic public sector debt) and public debt when data is analysed by the panel smooth transition regression model. Bui further adds that the level of financial freedom contributes to the magnitude of relationship between FINDEV and public debt as low(high) financial integration between economies lead to negative(positive) relationship between both variables.

In sub-Saharan Africa, Benayed and Gabsi (2019) examined the non-linear effect of domestic public debt on FINDEV sampling 20 low-income countries using data from 2000-2010. Their results revealed an inverted-U relationship between domestic public debt and bank credit to private sector. Possibly, Benayed and Gabsi (2019) argue that high public debt is associated with high economic uncertainty and instability which may shake the development of the financial institutions and largely the economy. This spillover effect has been explored by Pedersoli and Presbitero (2023). They explored whether good public debt management could have spill over effects on the private sector. They found that in developing countries, there is a positive spillover effect from effective public debt management to the contribution of private capital inflows (financial development) which would largely contribute to deepening FINDEV.

İlgün (2016) investigates the long-term correlation between domestic public debt and FINDEV in 18 rising economies between 1987 and 2013. In

order to account for heterogeneity and cross-section dependence, the study employed panel cointegration analysis and the second-generation panel unit root test. The study's findings imply that government borrowing from local banks has a long-term detrimental impact on FINDEV, İlgün (2016) acknowledges that the direction of the effect of public debt may be ambiguous yet, theoretically, the size and the compositions of the government debt has severe direct and indirect effect on the financial sector. In Turkey, using country-specific data from 2002 to 2012, Altaylıgil and Akkay (2013) adopted regression analysis and reported a negative relationship between public debt (measured as domestic debt to GDP) and FINDEV (measured as financial aggregate). Implicitly, any increase in public debt would lead to a decrease in FINDEV.

Altaylıgil and Akkay (2013) firmly asserted that their results cannot be generalised because of the different fundamentals in economies. Yet, (Kipyego et al., 2022) also reported a negative relationship between public debt and FINDEV in Kenya using data from 1964 to 2019. Mencinger et al. (2014) used panel data from 25 sovereign European Union state members and employed a panel estimation on a generalised economic growth model and augmented the model with public debt. The results showed that there is a significant non-linear impact of public debt on annual GDP per capita growth rates. Kipyego used the autoregressive distributed lag for the analysis and found that irrespective of the market condition of the Kenyan economy – short- or long-term –, the relationship is dominantly a negative one. To analyse the long-term con-integration relationship between FINDEV and public debt, Kusairi et al. (2019)

found that an increase in public debt does not increase FINDEV (private consumption).

Olayungbo and Quadri (2019) delve into the relationship between remittances, FINDEV, and economic growth in sub-Saharan African countries. Their findings reveal positive effects of remittances and FINDEV on economic growth. However, they identify FINDEV as a substitute in the remittances-growth relationship.

Ismihan and Ozkan (2012) have shown that in countries where public dent makes a large share of total bank lending, there is a high chance of harm and unfavourable implications to the FINDEV of such an economy. Using a dynamic panel threshold regression technique, (Law et al., 2021) found a negative impact on economic growth (measured as financial development) from public debt. Law et al. further explained that this level of negative results is dependent on the level of public debt – as its more significant at high levels of public debt as opposed to low levels of public debt with low negative significance. Peprah et al. (2019) also noted that FINDEV can drag the level of economic growth due to the levels of public debts in Ghana using a dynamic heterogeneous autoregressive distributed lag model using annual macrodata from 1984 to 2015.

Sobiech (2019) widens the scope to 54 developing countries and provides evidence for the negative impact of remittances on economic growth. The study emphasizes the importance of financial sector development for the remittance-growth relationship.

Fromentin (2017) extends the analysis to emerging and developing countries, revealing a positive long-term relationship between remittances and

FINDEV, coexisting with a short-term positive effect. The study highlights the temporal dynamics of these relationships. Chowdhury (2016) investigates the effects of remittances and FINDEV on economic growth across top remittance recipient developing countries. Remittances are found to significantly promote economic growth, while the impact of FINDEV varies. Bhattacharya et al. (2018) explore the role of incoming remittances on the FINDEV of economies with high remittance inflows. They underscore the need for strengthened institutional frameworks to enhance FINDEV through increased remittance inflows.

The empirical studies reviewed highlight the intricate relationship between public debt and FINDEV. The relationship between public debt and FINDEV is complex and context-dependent. While some studies suggest a negative impact, others find non-linear relationships and even positive effects in the public debt-FINDEV relationship. The findings emphasise the importance of considering various factors, including institutional quality and debt composition, when analysing this relationship. Achieving a sustainable debt trajectory while fostering a well-functioning financial system is paramount for long-term economic growth and stability.

Responsiveness of Commercial Banks to Monetary Policy

Commercial banks' lending rates in any economy have far-reaching implications beyond their role in facilitating monetary policy implementation. They serve as critical determinants for various economic decisions, particularly those related to investments. Monetary policies are set by the central banks of each economy to control the overall money supply and other financial conditions. Through the commercial banks, the central bank is able to create

economic growth, reduce unemployment, and stabilise the price levels through lending rates and interest rates. Based on the level of the economic situation of a country,

According to the economic situation, the government or the central bank of a country can apply instruments of monetary policy to control the money supply and thus realize the objectives of monetary policy. In most countries, commercial banks are an important transmission medium for controlling money supply in the economy; thus, the effectiveness of monetary policy lies heavily on the responsiveness of commercial banks. As to the role of commercial banks, these institutions derive their interest income from the spread between the lending rate charged to borrowers and the cost of funds, which is affected by monetary policy actions. Thus, how responsive they are to the changing monetary policies would show the policies' effectiveness

Miho et al. (2022) explored the asymmetric effects of monetary policies on the lending channels of commercial banks in Iraq using monthly data from 2005 to 2019 adopting the non-linear autoregressive distributed lag. The following variables were used as proxies for monetary policy: interest rate, cash reserve requirement, and broad money supply and banking credit to quote the lending rate for commercial banks. The results revealed a non-linear link between monetary policy and bank credit. In addition, the Bound and Wald tests showed the long and short-term asymmetric impacts of monetary policy on the credit of Iraqi banks. Fang and Jiang (2016) explored the extent of the increasing joint-stock reform of commercial banks enhance the effectiveness of monetary policy –expansionary or contractionary monetary policy in China. They adopted the traditional quantity of money to explore the responsiveness of the

commercial banks and found that the level of effectiveness of a monetary policy is dependent on how the commercial banks regulate their interest and lending rates. Just as much, Krause and Rioja (2006) asserted that the central bank can guarantee a stability financial system as long as the financial sector intermediaries – commercial banks – are willing to support the monetary policies.

Farajnezhad (2019) investigated the commercial banks in Malaysia to explore the significance of the policy transmission mechanism using annual panel data and the random and fixed effect and ordinary least square method. Their analysis showed that the monetary policy would affect the assets and liabilities. Dang (2021) examined the effects of asymmetric monetary policies on liquidity production in Vietnamese commercial banks. They used the GMM approach, gathered data from 30 Vietnamese commercial banks from 2008 to 2018. The results indicated that Vietnam's monetary policies were not adequately enforced, which led to a decline in the performance of commercial banks and an increase in the country's liquidity levels. Further, Dang showed that the non-autoregressive distributed lag approach to analysing the effects of monetary policies on commercial banks' credit provides more accurate results than symmetric models such as autoregressive distributed lag approach. This is because the conditions in the markets are not linear.

In an earlier study, Gray (1963) examined how the monetary policies set can cause structural challenges within the commercial banking system. Commercial banks' response to central bank monetary policy is largely influenced by the manner in which these policies affect their profit opportunities. If the banking system is to act as an effective vehicle for monetary

policy, it should pass on to potential borrowers both the availability and cost effects of changes induced into the monetary situation by the central bank. In Nigeria, Akanbi & Ajagbe (2012a) investigated the impact of monetary policy on commercial banks (using data on three banks). The data was collected from 1992 to 1999 and analysed on regression models. The results showed that monetary policy that seeks to regulate the interest rate of commercial banks leads to decrease in banks' lending rates. The effectiveness of the interest rate by the Central bank is however dependent on how the commercial banks adjust the rate to suit their interest income needs.

Bangura (2011) explored the adjustments in interest rates by the commercial banks to suit the rates they set on their discount investments, treasury bill, deposits and lending rates. Using monthly data from 1989 to 2009 for Gambia, Nigeria and Sierra Leone and 2000 to 2009 for Ghana, Bangura adopted a cointegration technique and asymmetric error correction model for the short- and long-run analysis. The study showed that, the channel for regulating interest rates by the commercial banks boosts the effectiveness of the interest rate or monetary policy because banks are quick to shift the burden from the central bank to the customers through the various rate avenues. Thus, the commercial banks respond to the interest rate policy by adjusting their retail interest rates.

Harun et al., (2005) investigated whether the stock price reactions of commercial banks to monetary policy actions are dependent on the state of the economy using data from June 1989 to December 2000 using multiple regression models. The results indicate that monetary policy actions have asymmetric effects on the returns of commercial banks across different

monetary policy and business environments. The asymmetric effects can primarily be attributed to the asymmetric effects of monetary policy on discount rates across different monetary and economic conditions.

Vera (2012) explored the response of commercial banks' credit line to monetary policy shocks in US using monthly data from 1959 to 2007 adopting a vector autoregressive model. The results showed that commercial banks' credit line (or bank loans) is not responsive to monetary shocks in the US. Nyong (1996) explored the role of commercial banks (in terms of bank size – large or small) in the transmission of monetary policy in Nigeria and found that large banks are consistent with financial intermediation theory while small banks are consistent with the deposit insurance theory to provide value to customers. This means that large size commercial banks are more responsive to monetary policy in Nigeria than small sized commercial banks using cross-sectional data over the period of 1982 to 1990. The model used for the analysis of the 21 commercial banks is a two-stage least square estimation approach.

Ayodele (2014) examined the effect on monetary policy on commercial bank lending rate in Nigeria from 1988 to 2008. The data sampled were exchange rate and interest rate (monetary policy proxies) and liquidity ratio, money supply and loans and advances from the commercial bank in Nigeria and analysed using the vector error correction mechanism of ordinary least square model. Conclusively, Ayodele found that commercial banks react negatively to the influence of exchange rate and interest rate significantly though there is a long-run relation. Also, Ayodele reports that monetary policy is not effective to stimulate commercial loans and advances.

Taking Ghana as a case study, Asamoah and Adu (2016) delved into the empirical analysis of the drivers behind banks' lending rates in the country, utilizing annual time series data spanning from 1970 to 2013. Their research unearthed significant relationships between lending rates and various factors. Notably, lending rates exhibited a positive correlation with the monetary policy rate set by the Bank of Ghana and exchange rates in both the short and long run. Conversely, the study revealed a negative association between lending rates and real GDP, inflation rates, and fiscal deficits in the long term. Consequently, the study highlighted the substantial influence of the Bank of Ghana's monetary policy and exchange rates on banks' lending rates within the Ghanaian context.

The study conducted by Coetzee and Genukile (2020), focused on South Africa, where they investigated the short and long-term drivers of lending behavior among banks. Their research employed an autoregressive distributed lag model applied to annual time-series data spanning from 1994 to 2016. The findings of this study pointed to the volume of deposits and bank size as the primary determinants of lending behavior in the short term. However, in the long run, GDP emerged as the sole factor driving lending behavior in South Africa. This underscores the importance of examining the trends and patterns of lending rates, alongside the factors that influence them, to inform effective policymaking.

Feyen and Zuccardi Huertas (2020) expanded the scope by analyzing the trends and patterns of nominal lending rates and lending deposit interest rates across 140 emerging markets and developing economies. Their research uncovered a reduction in nominal lending rates and spreads from 2003 to 2007, accompanied by regional variations. Furthermore, the study highlighted the

influence of higher interest rates and lending rates in less economically and financially developed countries, which were driven by high spreads rather than deposit interest rates. Regression results suggested that factors such as public debt, policy interest rates, non-performing loans, non-interest rates, inflation, and the time needed to resolve insolvency (business environment) significantly affected nominal lending rates. Over a ten-year period from 2007 to 2017, changes in interest rates, public debt, non-performing loans, and other variables exhibited region-specific variations, emphasizing the need for nuanced analyses.

Mbowe et al. (2020) focused their research on Tanzania, aiming to identify the major determinants and their relative importance in driving banks' lending rates. They employed a combination of interest rate decompositions and econometric estimations, utilizing data from banks' annual balance sheets. Results from their decomposition analysis pointed to non-performing loans, costs of funds (deposit interest rates), and operating costs as the primary influencers of lending rates in Tanzania. Econometric estimations reinforced the significance of these factors, ranking them in relative importance. Inflation emerged as the most influential driver, with a positive impact of 0.432, followed by operating costs (0.261), and the cost of funds (0.255). Conversely, bank size exerted a negative impact with a magnitude of 0.288. This study emphasized the need for enhancing operational efficiency to reduce operating costs and subsequently lower lending rates in Tanzania.

Furthermore, the impact of monetary policy on banks' lending rates has been a subject of interest, with varying outcomes across different countries. Sengonul and Thorbecke (2005) delved into the case of Turkey, investigating

the effects of bank-level macroeconomics on lending rates using data sourced from the Banking Association of Turkey and the Central Bank of the Republic of Turkey for the period 1997 to 2001. Employing Kashyap and Stein's approach, their findings revealed that contractionary monetary policy reduced lending rates for banks with limited liquid balance sheets. This implied that such policies could potentially decrease the supply of bank loans in Turkey, particularly during balance of payment crises when interest rates rose.

Olokoyo (2011) conducted a study in Nigeria, employing Ordinary Least Squared (OLS) and Vector Error Correction Model (VECM) on annual data spanning from 1980 to 2005. The objective was to examine the long-term relationship between Nigerian banks' lending behavior and various macroeconomic factors. The study identified a unique long-term relationship between lending behavior and factors such as interest rates, investment portfolios, and deposit volume.

Similarly, Djiogap and Ngomsi (2012) explored the effect of macroeconomic factors on banks' lending behavior within the Central Africa Economic and Monetary Community. Their study, based on annual time-series data from 2001 to 2010, revealed that factors such as banks' capital-to-asset ratio, size, and GDP growth had positive and statistically significant effects on long-term business loans.

Matemilola et al. (2015) contributed to the literature by utilizing momentum threshold autoregressive and asymmetric error correction models to analyze the responsiveness of lending rates to changes in the South African money market. Their findings indicated that South African commercial banks adjusted lending rates downward in response to falling money market rates.

However, lending rates appeared to be relatively inflexible in an upward direction, reflecting customer reactions to rate changes.

Interest rate spreads also bear significant implications for the economy and are notably influenced by competition among financial institutions and the presence of scale-related inefficiencies in the financial system. Manamba (2014) examined interest rate spreads in Tanzania using quarterly data from 1986 to 2013. His analysis, which included cointegration tests, revealed that interest rate spreads decreased in the absence of competition among financial institutions and increased due to diseconomies of scale in the financial system.

Despite the breadth of studies examining various facets of lending rates, some critical aspects have remained relatively unexplored in the literature. Notably, there is a gap in understanding the drivers to which lending rates are most responsive, the degree of responsiveness, and the impact of shocks in monetary policy on lending rates. While numerous drivers have been identified, this study seeks to shed light on the drivers that exert the most substantial influence on lending rates and determine the degree of responsiveness, thereby providing essential insights for policymakers. Furthermore, examining how shocks in monetary policy affect lending rates remains an understudied area, despite the potential significance of such shocks on lending behavior. Closing these research gaps will contribute to a more comprehensive understanding of lending rate dynamics and their responsiveness to various factors, including monetary policy shocks.

Gaps Identified

In the empirical review across three distinct objectives of the study, several critical gaps in the existing literature have come to light, underlining the

significance of a comprehensive and nuanced investigation into various facets of Ghana's financial landscape.

Objective 1: Financial Development on Monetary Policy Effectiveness in Ghana

Within the realm of assessing the impact of FINDEV on the effectiveness of monetary policy in Ghana, several gaps demand attention. Firstly, the literature has been notably limited in its scope concerning Ghana. While there have been some research efforts in this domain, they remain relatively scarce compared to other regions (Alnaa & Matey, 2022; Najimu, 2019; Ofori & Obeng, 2023; Quartey, 2008; Sena et al., 2021, 2021a; Takyi & Obeng, 2013; Tweneboah et al., 2019; Ziorklui & Barbee, 2003). Therefore, this study aims to bridge this gap by concentrating on the Ghanaian experience, providing insights tailored to the country's FINDEV level.

Most estimation techniques employed in previous studies are limited in assessing monetary policy transmission mechanism. As such, employing SVAR analysis is pivotal in the study examining the impact of FINDEV on the effectiveness of monetary policy in Ghana. SVAR's significance lies in its ability to disentangle causality, identify shocks, and quantify the dynamics within the economic system. This analysis is particularly valuable in assessing whether changes in FINDEV led to shifts in macroeconomic variables or vice versa, a critical insight for policymakers.

Additionally, SVAR accommodates the examination of lagged effects, allowing researchers to comprehend how FINDEV changes may exert delayed or prolonged influences (Hu et al., 2018; Ilyas et al., 2022; Leu, 2011). Furthermore, SVAR facilitates counterfactual experiments, aiding in the

evaluation of the importance of FINDEV in shaping economic outcomes. In a multifaceted context like Ghana, where monetary policy and FINDEV are interconnected, SVAR offers a robust framework for assessing policy coordination and alignment. Overall, SVAR's data-driven approach empowers this study to provide empirical, dynamic, and policy-relevant insights into the intricate relationship between FINDEV and monetary policy in Ghana.

Finally, analyzing the interaction between FINDEV and monetary policy rate shocks in Ghana is crucial for policymakers and researchers alike yet there is limited and scanty empirical analysis on this problem. This study aims to provide insights into how changes in FINDEV and monetary policy rates jointly affect macroeconomic variables, including output gaps and inflation. Such analysis holds significant policy implications, helping Ghanaian policymakers design more effective strategies to manage inflation, promote economic growth, and enhance macroeconomic stability. Furthermore, it offers valuable insights into investment patterns, risk management, and the potential impact of global financial dynamics on Ghana's economy.

Objective 2: Impact of Public Debt on Financial Development in Ghana

In the context of examining the impact of public debt on FINDEV in Ghana, there are several noteworthy gaps that emphasize the necessity of employing a linear ARDL (Auto Regressive Distributed Lag) modeling approach. One of the primary gaps in the existing literature is the lack of Ghana-specific analysis. Previous research predominantly focuses on the global or generalized relationship between public debt and FINDEV, neglecting the nuances of the Ghanaian context (Abbas et al., 2022; Benayed & Gabsi, 2019; Chung-Yee et al., 2020; Hauner, 2009; İlgün, 2016; Ismihan & Ozkan, 2012;

Jiménez-Sotelo, 2023; Kipyego et al., 2022; Kusairi et al., 2019; Kutivadze, 2013; Ndikumana & Boyce, 2003; Pedersoli & Presbitero, 2023; Sağdiç et al., 2021). Therefore, conducting an in-depth, context-specific analysis becomes imperative to discern how public debt precisely influences FINDEV within the Ghanaian financial landscape.

Moreover, another critical gap pertains to the inadequate disaggregation of public debt. Previous studies often treat public debt as a monolithic entity without distinguishing between its domestic and private components. However, these two facets of public debt might exert varying impacts on FINDEV (Benayed & Gabsi, 2019; Jiménez-Sotelo, 2023; Moazzam, 2023; Sağdiç et al., 2021). Thus, the meticulous separation of public debt into domestic and private categories becomes crucial to gain a more nuanced understanding of how each component influences the financial sector in Ghana.

Furthermore, dominance analysis, a methodological approach that ranks variables based on their effect on FINDEV, presents another gap-filling opportunity (Budescu, 1993; Luchman, 2021; Nanivazo, 2015; Rady et al., 2020; Rød & Van Der Meer, 2007; Rød & van der Meer, 2009). While some studies have investigated various variables' relationships with FINDEV, they may not have determined which factors hold the most substantial influence. Dominance analysis can provide valuable insights into the relative importance of these variables and help identify which ones exert the most significant impact.

Objective 3: Responsiveness of Commercial Banks to the Monetary Policy Rate in Ghana

In the empirical review concerning the responsiveness of commercial banks to the monetary policy rate (MPR) in Ghana, several critical gaps in the existing literature come to light, underlining the need for a comprehensive and multi-method approach to research.

Firstly, a significant gap emerges in terms of the limited focus on Ghana in previous studies. While research in this area has explored global contexts and examined other countries, there remains a paucity of dedicated research on Ghana. This gap underscores the necessity of specific and context-relevant investigations to comprehend the intricacies of the Ghanaian financial landscape thoroughly.

Additionally, there is a gap in methodological diversity. Many prior investigations have heavily relied on econometric models to explore the relationship between monetary policy and lending rates (Akanbi & Ajagbe, 2012; Ayodele, 2014; Bangura, 2011; Glindro et al., 2015; Gray, 1963; Harun et al., 2005; Li & Wang, 2012; Nguyen & Nguyen, 2021; Njiru, 2014; Olokoyo, 2011; Ray, 2008). However, the inclusion of interviews with bank managers provides a qualitative perspective that complements quantitative findings. This mixed-method approach holds the potential to uncover nuanced insights into the decision-making processes of banks and their responses to monetary policy.

Additionally, there is a need for a comprehensive framework that bridges quantitative analyses with qualitative interviews. Such a framework would enable researchers to triangulate their findings, resulting in a more robust

understanding of how commercial banks in Ghana respond to changes in the MPR and financial sector dynamics.

In conclusion, these identified gaps underscore the importance of conducting dedicated research on Ghana, adopting a mixed-method approach, integrating quantitative and qualitative findings, and providing practical policy implications. Such research endeavors would contribute to a more comprehensive understanding of how commercial banks in Ghana respond to monetary policy changes and financial sector developments, thereby benefiting the nation's economic stability and growth.

Conceptual Framework

The review of both theoretical and empirical literature reveals that there is no single theory providing a straightforward relationship among FINDEV, public debt dynamics, commercial banks' responsiveness and monetary policy effectiveness in Ghana. Monetary policy is a powerful tool employed by central banks to influence macroeconomic variables such as inflation, economic growth, and exchange rates. In Ghana, as in many other economies, the effectiveness of monetary policy depends on the transmission mechanism through which policy rate changes influence various aspects of the economy (Amidu, 2006; Iddrisu & Alagidede, 2022; Mensah et al., 2018; Sena et al., 2021, 2021a; Sowa & Abradu-Otoo, 2009). The Figure 3 shows the transmission of monetary policy to solve output and inflation gap.

The market rate channel is one of the primary avenues through which monetary policy rate changes affect the economy (Brownbridge, 1995; Cantah & Ahiakpor, 2017; Wiafe et al., 2022). When the central bank adjusts its policy rate, commercial banks follow suit by altering their lending and deposit rates

(Amidu, 2006). The efficiency of this channel hinges on the level of FINDEV. In a well-developed financial system, interest rate adjustments are swift and effective, allowing borrowers and savers to respond promptly to rate changes (Feyen & Zuccardi Huertas, 2020; Olokoyo, 2011).

Changes in the monetary policy rate can also reverberate through asset prices (Alexandre & Bação, 2005; Arango, 2019; Carlstrom & Fuerst, 2007; Furlanetto, 2011; Holz, 2007; Malik et al., 2023; Svensson, 1989). In economies like Ghana, where financial markets may be less sophisticated, asset prices can be particularly sensitive to interest rate shifts. Higher rates may dampen demand for assets like real estate and stocks, impacting consumer and business wealth. The role of FINDEV becomes evident here, as a mature financial system can provide a more nuanced response to changes in interest rates (Airaudo et al., 2015; Galí, 2014; Geromichalos et al., 2007; Saman & Szeles, 2020).

Businesses often base their investment decisions on expectations about future economic conditions (Coibion et al., 2018; Lahiri & Lee, 1979; Pitchford, 1981). The monetary policy rate is a critical factor influencing these expectations. In Ghana, the responsiveness of commercial banks to monetary policy is essential. Quick adjustments in lending rates can encourage businesses to invest when rates are low, thereby stimulating economic growth.

Exchange rates play a vital role in the transmission of monetary policy (Chadha et al., 2004; De Grauwe & Grimaldi, 2001). In Ghana, as in many emerging economies, changes in interest rates can impact the exchange rate. When rates rise, attracting foreign capital, the local currency may appreciate, affecting net exports. FINDEV plays a role here by helping to manage capital

flows and mitigate sharp currency fluctuations (Mohammed et al., 2021; Taylor & Sarno, 2004).

The cost of borrowing for households and businesses is influenced by changes in the monetary policy rate (Forson et al., 2017; Ziorklui & Barbee, 2003). In Ghana, if commercial banks are responsive to rate adjustments, the impact on domestic demand can be more immediate and effective (Gray, 1963; Olokoyo, 2011). The role of FINDEV in ensuring the responsiveness of banks is pivotal.

The combined effect of changes in domestic and external demand, influenced by monetary policy rate adjustments, has significant implications for the output gap and the inflationary gap (Priya & Sharma, 2023; Rezende, 2015; Wang, 2023). FINDEV enhances the efficiency of this transmission process by ensuring that credit flows smoothly to productive sectors, helping to reduce output gaps and keep inflation in check.

In Ghana, the effectiveness of monetary policy is intricately linked to its transmission mechanism, which involves various channels influenced by FINDEV, public debt dynamics, and commercial banks' responsiveness. A well-developed financial system ensures that interest rate adjustments have their desired effects on market rates, asset prices, business expectations, and ultimately, on the macroeconomic variables that central banks aim to control. Understanding these dynamics is crucial for policymakers seeking to achieve stability and sustainable economic growth in Ghana.

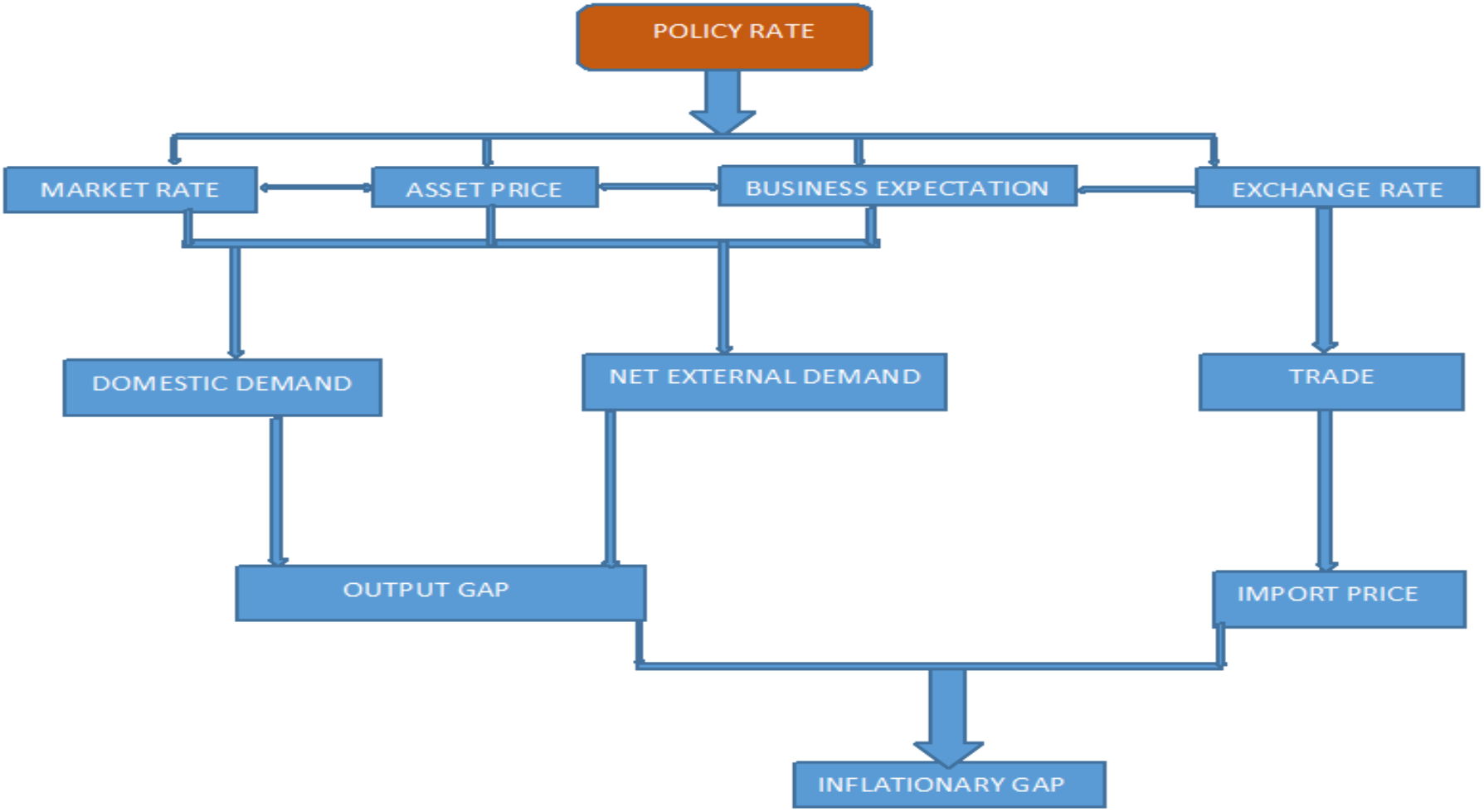


Figure 3: Transmission Channel of Monetary Policy

Source: Auther's construct

Chapter Summary

The chapter was divided into four sections; theoretical review, review of concepts, empirical review and conceptual framework, which were duly reviewed according to the study's objectives. The theories adopted in the study are Monetary Policy transmission channels related to the Banking Sector such as, credit channel of monetary policy transmission. The study also elaborates on McKinnon and Shaw Hypothesis and Lazy banks and Safe asset Hypothesis.

The conceptual review was covered under thematic headings; financial sector, financial policy regimes in Ghana, FINDEV, public debt and monetary policy. The theoretical and empirical review indicated the connection between economic growth, commercial banks responsiveness and monetary policy effectiveness. The chapter discusses various transmission mechanisms how monetary policy influences the broader economy. These include interest rate adjustments, inflationary expectations, and the influence on aggregate demand, prices, and exchange rates.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter discusses the methods and procedures used to undertake the study. It uses particularly the mixed method approach to deal with the analysis issues identified. The chapter therefore spells out the research design and philosophy underpinning the study based on each research objective. In particular, the chapter provides a thorough explanation of the empirical and theoretical formulation of the models used in the study. The study investigates financial development and its influence on monetary policy effectiveness using Structural VAR (SVAR) approach. Also, the link between financial sector development and total debt (external and domestic), trade openness, real effective exchange rate, inflation, GDP growth rate as well as remittance are explored with ARDL. Finally, the mixed method part of the work is explored to find out the responsiveness of commercial banks to monetary policy rate in order to complement the role of financial development in making monetary policy effective. The studies' datasets are also described after the models' empirical specification. The final section describes the method used to gather and analyze data for the qualitative study on Ghana's commercial banks' responsiveness to the monetary policy rate.

Research Philosophy, Approach and Design

The study adopts the mixed-methods approach, drawing from both positivist and interpretivist philosophies as foundational frameworks (Bresz et al., 2017; Creswell & Creswell, 2018; Hausman, 2015; Tamminen & Poucher, 2020). The adoption of these philosophical stances serves to comprehensively

address multifaceted research objectives. Positivism, aligned with the new consensus view of monetary policy (New Wicksellian Connection), forms the basis for the quantitative aspects of this research (Hughes & Hoffmann, 2018). Positivist philosophy, as expounded in literature, rests upon the assumption that patterns, generalizations, methodologies, and cause-and-effect relationships are applicable not only to natural sciences but also to the social sciences (Aliyu et al., 2014; Jackson & Dolan, 2021; Thorpe & Holt, 2015). It posits that scientific methods can be effectively applied to study the objects of social sciences, primarily people, leading to the generation of generalizations akin to those in the natural sciences.

The positivist perspective underscores the existence of an objective reality beyond personal experiences, characterized by distinct cause-and-effect associations (Thorpe & Holt, 2015). In adopting a positivist stance, researchers aim to maintain a distant, neutral, non-interactive position to objectively analyze data, enabling value-free interpretations (Tamminen & Poucher, 2020). Analytical interpretations of quantifiable data are favored by positivists. Consequently, the quantitative approach is aptly suited for investigating research objectives one and two, and it aligns with the positivist philosophy.

Moreover, this study embraces an explanatory research design within the quantitative paradigm for the research objectives one and two (Creswell & Creswell, 2018). The explanatory design facilitates the identification and exploration of cause-and-effect relationships' nature and magnitude. It is particularly suitable for examining the impacts of specific changes on existing processes, aligning with the overarching research objectives.

Conversely, the mixed method approach is also integrated into the research methodology to offer a profound understanding of the economic phenomena under investigation by research objective three (Bresz et al., 2017; Creswell, 2015; Tamminen & Poucher, 2020). Drawing inspiration from interpretivist philosophy, the third objective facet of the study seeks to delve into the perspectives, opinions, experiences, and meanings attributed by manager of commercial banks on the responsiveness of commercial banks to MPR. According to Tamminen and Poucher (2020), the interpretivist paradigm places significant emphasis on contextual analysis to draw reliable inferences. It operates on the premise that knowledge and meaning are products of interpretation, thereby rejecting the existence of objective knowledge independent of human cognition. Interpretivists contend that reality can only be apprehended through social constructs such as language, consciousness, and shared meanings (Hausman, 2015; Lee & Cronin, 2016). The interpretive paradigm revolves around observation and interpretation, whereby observation involves collecting information about events, and interpretation entails extracting meaning from this information by making inferences or assessing its alignment with abstract patterns (Tamminen & Poucher, 2020).

This interpretive approach is particularly relevant to the third research objective, which delves into the perceptions of experts regarding the responsiveness of commercial banks to monetary policy in Ghana. Interpretivism shines as it enables the exploration of the world through the individual viewpoints of experts, chiefly via qualitative data collection methods like interviews (Lee & Cronin, 2016; Saunders et al., 2015). These qualitative

investigations aim to shed light on the subjective interpretations and experiences of the experts, enriching the overall research endeavor.

Thus, in summary, the study adopts quantitative approach based on the positivist philosophy for objectives one and two and interpretivist philosophy for objective three. Also, explanatory design is adopted because it is effectively incorporated into a mixed-methods research approach to enhance the depth and breadth of inquiry, making it a valuable tool as the study seeks to gain comprehensive insights based on the research objectives.

Financial Development and the Effectiveness of Monetary Policy

The first objective of the study seeks to examine the role of financial development in the effectiveness of monetary policy in Ghana. The objective follows the positive paradigm, quantitative and explanatory research. The theoretical and empirical models are specified in the subsequent sections. The data analysis techniques and the data sources are also explained.

Theoretical Model

The theoretical framework employed for examining the relationship among FINDEV, and monetary policy effectiveness in Ghana draws from the New Keynesian macroeconomic model (Carranza et al., 2010; Effiong et al., 2020; Krause et al., 2006; Leu, 2011; Ma, 2018; Ma & Lin, 2016). This modern macroeconomic school of thought endeavors to establish microeconomic foundations for Keynesian economics and was, in part, developed as a response to criticisms of Keynesian macroeconomics, particularly from proponents of new classical macroeconomics (Farmer & Nicolò, 2018; Lai, 2017; Michie, 2018; Razin & Yuen, 2002; Scheufele, 2010). Within this theoretical framework, economic agents are characterized as rational and forward-looking,

aligning with the principles of contemporary economic analysis. The specific models utilized in this study encompass the (investment-savings) IS equation, the (aggregate supply) AS equation, uncovered interest rate parity, and a monetary rule.

IS Equation

The IS equation serves as a fundamental component of the analytical framework (Cantah, 2018; Fischer, 2008; Kara & Nelson, 2004; Rogoff, 1999; Serrano & Summa, 2015). It is employed to delineate the output gap within the context of a small open economy. This revised IS curve, akin to the Mundell-type, forms the basis for understanding the output gap (Rogoff, 1999; Serrano & Summa, 2015). Consequently, it represents the optimization problem of households operating within an open economy framework. For a comprehensive exploration of the aggregate demand specification, one can refer to McCallum and Nelson (2004) and McCalluma and Nelson (1999). Accordingly, IS equation can be modelled as

$$X_t = \alpha + \alpha_1 X_{t+1} - \alpha_2(R_t - \pi_{t+1}) + \alpha_3(\&_t + P_t - P_t^*) + e_t^x \qquad (1)$$

In the presented equation (1), various factors influence the output gap X_t within the economy. These factors include the nominal short-term interest rate (R_t), the inflation rate π_t, the exchange rate ($\&_t$) expressed as the domestic currency cost of one unit of foreign currency, the general price level (P_t), foreign variables (general price level of the foreign country) denoted with an asterisk P_t^*, and parameters represented by α. Each parameter captures the specific impact of these variables on the current output gap (Leu, 2011).

Equation (1) essentially illustrates the aggregate demand side of an open economy, with e_t^x interpreted as an aggregate demand shock. According to this

model, the current level of output is intricately linked to the expected output in the future. Furthermore, the equation (1) suggests that the real interest rate $(R_t - \pi_{t+1})$ exerts a negative influence on the present output level, reflecting the concept of intertemporal substitution of consumption. In addition, an increase in the value of the real exchange rate $(\&_t + P_t - P_t^*)$ is anticipated to elevate the current output, primarily through the expenditure-switching effect.

Aggregate Supply Equation

The New Keynesian Phillips curve, based on Calvo (1983) staggered nominal price setting model with an exogenous aggregate supply shock (e_t^{π}), can be expressed as follows:

$$\pi_t = \emptyset_1\pi_{t-1} + \emptyset_2 X_t + \emptyset_3 X_{t-1} + \emptyset_4(\&_t - P_t + P_t^*) + \emptyset_5(\&_{t-1} + P_{t-1}^* - P_t) + e_t^{\pi} \quad (2)$$

In equation (2), inflation is influenced by past inflation rates, the current output gap, and the real exchange rate. This implies that a decrease in the domestic currency's value relative to the foreign currency contributes to an increase in inflation. Thus, the output gap X_t within the economy. These factors include the inflation rate π_t, the exchange rate $(\&_t)$ expressed as the domestic currency cost of one unit of foreign currency, the general price level (P_t), foreign variables (general price level of the foreign country) denoted with an asterisk P_t^*, and parameters represented by $\emptyset$.

Uncovered Interest Parity

In most open economy macroeconomic models, the uncovered interest parity plays a fundamental role in describing the behaviour of the nominal exchange rate (Liao, 2020; Taylor & Sarno, 2004). The equation governing uncovered interest parity is expressed as:

$$\&_t = \&_{t+1} - (R_t - R_t^*) + e_t^{\&} \quad (3)$$

In equation (3), R_t represents the domestic interest rate, while R_t^* represents the foreign interest rate. The error term $e^{\&}$ accounts for temporary deviations from the interest parity condition. This formulation of uncovered interest rate parity aligns with the works of (McCallum, 1994).

Monetary Policy Rule

Additionally, the model incorporates a forward-looking monetary policy rule, as shown below:

$$R_t = \lambda_1 R_{t-1} + \lambda_2 X_t + \lambda_3 \pi_t + \lambda_4 \&_t + e_t^R \quad (4)$$

In equation (4), $\&_t$ represents the exchange rate, while λ denotes parameters, and e_t^R represents shocks to monetary policy. According to equation (4), the central bank is assumed to respond to changes in targeted inflation, the exchange rate, and the output gap by adjusting interest rates to some extent. The study posits that the effectiveness of monetary policy rate transmission through interest rates is contingent upon the structure and functioning of the financial system, emphasizing the role of FINDEV as a conduit through which monetary policy can effectively transmit.

Transmission Channels

The impact of monetary policy shocks on key macroeconomic variables, such as inflation and output, operates through various channels. The transmission process in an economy typically begins with the discretionary actions of monetary authorities and their influence on financial aggregates like money and interest rates. The subsequent stage involves the connection between changes in financial variables, aggregate demand, and prices (Robinson 1964).

Initially, monetary policy changes are communicated through the financial markets, partly due to lower information and transaction costs.

Empirical Model Specification

Structural VAR (SVAR)

The SVAR approach has been developed over the last decade to interpret business cycle variabilities and to aid in identifying the effects of different economic policies (Hu et al., 2018; Ilyas et al., 2022; Soliman et al., 2023). It is an advancement and development in the traditional theoretic VAR approach in that it reconciles economic theory with time-series analysis to determine the different response of economic variables to various disturbances. The core benefit of SVAR analysis is that the relevant restrictions on the estimated reduced form model, required for identification of the given structural model, can be provided by economic theory (Ilyas et al., 2022; Leu, 2011). These restrictions can be either contemporaneous or long-run in nature contingent upon whether the underlying disturbances are considered to be temporary or permanent in nature. Once the identification is achieved, it is possible to recover from the structural shocks. Impulse response and variance decomposition functions can then be generated from the shock to assess the dynamic impacts on different economic variables (Deng et al., 2023). It is also used to provide checks on the theory by testing whether the shock imposed affect a restricted economic variable. In other words, SVAR makes it possible to investigate the net effect of an unexpected changes in one variable on other variables in the model (Soliman et al., 2023).

Furthermore, SVAR is seen to have power over a reduce form model with respect to the interpretation of whether the variations are as a result of

differences in structural shocks in the transmission mechanism of economy. Policy makers prefer to use SVAR models to reduce model form because they are able to test the response of a given targeted variable to a relevant shock easily. Studies from (Apanisile, 2021; Bangara, 2019; Ca' Zorzi et al., 2017; Hur, 2017; Rapa, 2016; Takyi & Leon-Gonzalez, 2020; Zhao et al., 2022) supported the use of structural models that are developed from micro foundations as general equilibrium models. Cantah (2018) proposed that SVAR models are not only consistent but they also provide valid results, particularly in the case of a small open economy.

Irrespective of the fact that dynamic stochastic general equilibrium (DSGE) model was used to overcome the Lucas critique, DSGE model has some challenges (Apanisile & Osinubi, 2020; Ca' Zorzi et al., 2017; Hur, 2017). DSGE models at some point not able to match some aspects of macroeconomic variables' observed behaviour (Cantah, 2018; C. Chen et al., 2017; Wiafe et al., 2022). The optimizing agent's framework implies that Ricardian equivalence typically holds, which is clearly at odds with the empirical evidence (Slanicay, 2016). A unique feature of DSGE models is the assumption that structural parameters do not respond to policy changes. At least some of the parameters may depend on the economic policy.

Again, according to prior studies it does not make sense to check the micro foundation models to see the detail dynamic behaviours of the real variables and the variables used as a proxy that constitute the data. By defining a SVAR and imposing certain identification constraints, an alternate method to DSGE modelling can be used to derive some structural inferences (Cantah, 2018; Wiafe et al., 2022). Awad & Eid (2017), stated that SVAR provides an

avenue through which econometricians can pin down the effects of monetary policy shocks and trace their expected impact on various macroeconomic variables. SVAR is well accepted by many as one of the means to empirically test theoretical models with real data. It is argued that SVAR avoids incredible restrictions in single equations and strict restrictions in DSGE models (Cantah, 2018; Ilyas et al., 2022; Leu, 2011)

The study therefore makes use of SVAR model and uses the conventional New Keynesian framework to examine how a sudden change in FINDEV affect the macroeconomic implications of monetary policy's efficacy.

Model Specification

The variables in the study are analyzed using the SVAR methodology by imposing appropriate restrictions on the dynamic relationships of the variables. The non-recursive identification in SVAR models relies on economic theory to impose restrictions on the contemporaneous causal relationship of the variables instead of relying on the pure ordering of the variables. The VAR framework is an important tool in identifying the dynamic impact of a shock on a variable of interest. The study augments the equation (1) through to equation (4) and specify SVAR framework with the general representation below as proposed by Kilian (2011).

$$AY_t = B + \mathrm{q(L)Y}_{t-j} + \mathrm{C}\, e_t^y \qquad (5)$$

The (Y_t) in the equation (5) above is a vector that represents endogenous variables which consist of output gap, FINDEV, inflation, trade openness, real effective Exchange rate and monetary policy rate. The B is constant and also represent the linear term. The $q(L)$ is polynomial matrix in the lag operator L while A is the contemporaneous coefficients among the endogenous variables**,**

and C**,** is the contemporaneous impact matrix of vector of orthogonalised error terms e_t^y (which also captures structural shocks in the Ghanaian economy) (Leu, 2011).

The structural equation (5) cannot be estimated directly because of the correlation between the variables and the error terms. The information in the system can be recovered by estimating reduced form equations that can actually be estimated. This is achieved by pre-multiplying equation (1) by A^{-1} to obtain the following reduced form equation:

$$A^{-1}AY_t = A^{-1}B + A^{-1}\,\mathrm{q(L)Y}_{t-j} + A^{-1}\mathrm{C}\,e_t^y \qquad (6)$$

These will imply that

$$Y_t = \lambda + \&(\mathrm{L})\mathrm{Y}_{t-j} + \phi^y \qquad (7)$$

$A^{-1}B = \lambda,\ A^{-1}\,\mathrm{q} = \&,$ and $A^{-1}\mathrm{C}e_t^y = \phi_t^y$

is the reduction form residual vector, which may be contemporaneously correlated across equations but is assumed to be white noise and serially uncorrelated with all right-side variables as well as their own lag values. Restrictions on the parameters of matrices in equation (7) isolate the structural economic shocks from the estimated reduced form residuals given the estimations of the reduced form VAR. (8):

$$A\phi_t = Ce_t^y \qquad (8)$$

which is derive from equation (7). The orthogonality assumption of the structural innovations i.e. $E\ (e_{t,}e_t^i) = 1,$

Identification

A number of restrictions are imposed on the structural parameters of the endogenous variables in order to effectively identify the underlying structural shocks in a SVAR Model (Leu, 2011). Assuming that matrix *A* and *B* are non-

singular matrices, the identifying restrictions are put on both matrices. For the purpose of this study the recursive identification is used. In the recursive identification the study uses a recursive order of the variables in the VAR system. This is whereby we restrict matrix A to a lower triangular matrix with zero above the diagonal line (Hu et al., 2018; Ilyas et al., 2022). Mostly, the emphasis is the order in which variables appear in the system with low frequency placed above the high frequency variable (Wiafe et al., 2022). Recursive identification requires that enough restrictions are placed on A for exact identification. The restrictions placed on matrix A and B are indicated in equation (9) below.

Matrix 1

$$AY_t = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 & 0 \\ a_{41} & a_{42} & a_{43} & 1 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 \end{bmatrix} \times \begin{bmatrix} REER_t \\ TRDOPEN_t \\ FINDEV_t \\ OUTGAP_t \\ INF_t \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} e_t^{REER} \\ e_t^{TRDOPEN} \\ e_t^{FINDEV} \\ e_t^{OUTGAP} \\ e_f^{INF} \end{bmatrix} \quad \ldots (9)$$

$$C = \begin{bmatrix} C_{11} & 0 & 0 & 0 & 0 \\ 0 & C_{22} & 0 & 0 & 0 \\ 0 & 0 & C_{33} & 0 & 0 \\ 0 & 0 & 0 & C_{44} & 0 \\ 0 & 0 & 0 & 0 & C_{55} \end{bmatrix} \quad e_t = \begin{bmatrix} e_t^{REER} \\ e_t^{TRDOPEN} \\ e_t^{FINDEV} \\ e_t^{OUTGAP} \\ e_f^{INF} \end{bmatrix}$$

Matrix 2

$$AY_t = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 & 0 \\ a_{41} & a_{42} & a_{43} & 1 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 \end{bmatrix} \times \begin{bmatrix} REER_t \\ TRDOPEN_t \\ MPR_t \\ OUTGAP_t \\ INF_t \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} e_t^{REER} \\ e_t^{TRDOPEN} \\ e_t^{MPR} \\ e_t^{OUTGAP} \\ e_f^{INF} \end{bmatrix} \quad \ldots(10)$$

$$C = \begin{bmatrix} C_{11} & 0 & 0 & 0 & 0 \\ 0 & C_{22} & 0 & 0 & 0 \\ 0 & 0 & C_{33} & 0 & 0 \\ 0 & 0 & 0 & C_{44} & 0 \\ 0 & 0 & 0 & 0 & C_{55} \end{bmatrix} \quad e_t = \begin{bmatrix} e_t^{REER} \\ e_t^{TRDOPEN} \\ e_t^{MPR} \\ e_t^{OUTGAP} \\ e_f^{INF} \end{bmatrix}$$

Matrix 3

$$AY_t = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 & 0 \\ a_{41} & a_{42} & a_{43} & 1 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 \end{bmatrix} \times \begin{bmatrix} REER_t \\ TRDOPEN_t \\ FINDEV * MPR_t \\ OUTGAP_t \\ INF_t \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} e_t^{REER} \\ e_t^{TRDOPEN} \\ e_t^{FINDEV*MPR} \\ e_t^{OUTGAP} \\ e_f^{INF} \end{bmatrix} \quad ...(11)$$

$$C = \begin{bmatrix} C_{11} & 0 & 0 & 0 & 0 \\ 0 & C_{22} & 0 & 0 & 0 \\ 0 & 0 & C_{33} & 0 & 0 \\ 0 & 0 & 0 & C_{44} & 0 \\ 0 & 0 & 0 & 0 & C_{55} \end{bmatrix} \quad e_t = \begin{bmatrix} e_t^{REER} \\ e_t^{TRDOPEN} \\ e_t^{FINDEV*MPR} \\ e_t^{OUTGAP} \\ e_f^{INF} \end{bmatrix}$$

The a_{ij} and c_{ij} which are none zero coefficient of matrixes (1, 2 and 3) A and B respectively showing that any residual j in matrices ϕ_t and e_t, and in that order has an instantaneous impact on variable i. Five variables in the matrix (1), (2) and (3) with Matrix (3) having an interacted term between financial development and monetary policy. These variables are $REER_t$ (real effective exchange rate), $TRDOPEN_t$ (trade openness), $FINDEV_t$ (financial development) $OUTGAP_t$ (output gap) INF_t (inflation rate), MPR_t (monetary policy rate) and $FINDEV * MPR_t$ (interaction between financial development and monetary policy rate). Output gap and inflation rate enters the SVAR as a

policy goal, whiles monetary policy, financial development rate as well as interaction term between financial development and monetary policy rate are seen as operating targets. The remaining variables, trade openness and real effective exchange rate were considered as intermediate target.

The first two equations suggest that trade openness and exchange rate are slow in responding to shocks to monetary policy variable in the economy. This structure is based on the observation that a lot of real economic activities may respond only with a lag to monetary policy variables because of inherent inertia and planning delays (Abdul Karim et al., 2021; Basa et al., 2019; Chen et al., 2015; Effiong et al., 2020; Ma & Lin, 2016). From the equation (9), Devereux and Connolly (1996) found that import taxes appreciate the real effective exchange rate in a sample of Latin American countries. This complements the hypothesis that liberalization of trade brings about depreciation of the real effective exchange rate. FINDEV affects real effective exchange rate.

Financial development is postulated to be contemporaneously affected by trade openness and exchange rate (Cole & Shaw, 1974; Demetriades & Rousseau, 2010; Dogan & Seker, 2016; Farhani & Ozturk, 2015; Nasrullah et al., 2023; Ozatac et al., 2017; Qamruzzaman & Jianguo, 2020). The high degree of financial sector development could dampen the real economic costs of exchange rate volatility. This implies that the degree of financial sector development could provide more effective ways of transferring risks arising from exchange rate volatility (Demetriades & Rousseau, 2010; Minea & Villieu, 2010). Merton and Bodie (1995) emphasize that one of the main functions of a financial system is to facilitate the trading, hedging, diversifying and pooling of

risk. As a result, a well-developed financial market may reduce the effect of exchange rate volatility on exports. In effect, when the financial sector is well developed, it has a tendency of reducing the effect of exchange rate volatility on export. However, in this study, financial sector development is seen to be influenced by trade openness and exchange rate.

Abdul Karim et al. (2021) study investigates the relationship between FINDEV and monetary policy effectiveness in ASEAN-3 countries (Singapore, Malaysia, and the Philippines). It finds that the role of FINDEV varies across countries. In Malaysia, a more developed financial system reduces MPE on output, while in Singapore, it tends to increase it. In the Philippines, the impact of FINDEV on MPE depends on the policy variable used (interest rates or money supply).

Nguyen et al. (2022) examined the impact of financial development on the bank lending channel of monetary policy transmission in an emerging market (Vietnam). They found that FINDEV weakens the bank lending channel, with heterogeneous effects on different banks. Krupkina et al. (2015) also found that financial indicators (e.g. credit to GDP ratio, broad measure of money to GDP ratio, stock market capitalization) matter for output gap. In this study it is assumed that FINDEV has a positive impact on output gap. A number of studies has been carried out empirically on FINDEV and monetary policy (Abdul Karim et al., 2021; Akinsola & Odhiambo, 2017; Basa et al., 2019; Oanh et al., 2023; Sena et al., 2021; Xu et al., 2023).

There is a positive effect of trade openness on economic growth in Cote d'Ivoire over the period 1965 and 2014 using the Autoregressive Distributed Lag bounds test to cointegration (Keho, 2017). According Xu et al. (2023)

divide FINDEV into marketization effects (ME) and scale effects (SE). ME is found to reduce financial frictions, while SE does not. In the case of China, they find that FINDEV improves the overall effect of monetary policy. ME and SE have different impacts on the interest rate channel and the credit channel, and the total effect of monetary policy combines these two channels. Considering the demand side of the Ghanaian economy as captured in the equation (9), the output gap in the equation react to changes in exchange rate, FINDEV and other variable so far as the study is concerned (Ahiakpor et al., 2019; Amidu, 2006; Iddrisu & Alagidede, 2022; Mensah et al., 2018; Sena et al., 2021).

Again, short term interest rate as is expected to have negative influence on the IS curve as indicated in equation (1). According to the study all other innovations that affect output in the Ghanaian economy, that is, interest rate as well as FINDEV and exchange rate would be referred to as output gap shock. The fifth row of equation (9) captures the supply side of the Ghanaian economy. From the equation, inflation, is influenced by changes in exchange rate, interest rate and the output gap.

Lastly, the central bank's reaction function is shown in equation 10's third row. Here, it was assumed that the Bank of Ghana would respond to all lags and contemporaneous shocks to output, inflation, currency rates, and shifts in the economy's degree of FINDEV. The study went further to interact financial development with monetary policy rate.

The interest rate that commercial banks pay the Bank of Ghana when they borrow money, or MPR, influences other interest rates in the Ghanaian economy. Depending on how big the economy is, changes to the MPR typically have an impact on the state of the economy both domestically and

internationally as well as future prospects. In the SVAR, monetary policy shocks are identified as changes in MPR. In the style of Taylor's rule, central bank reacts to changes in inflation, output gap and other economic variables by using policy rate (Cantah, 2018; Cantah et al., 2023; Cantah & Ahiakpor, 2017).

Data Collection and Sources

Data used in this study was obtained from various sources. The dataset was mainly obtained from secondary sources. The secondary dataset used for the study was monthly time series. Financial development data was obtained from IMF data base from 2002 to 2020. Real effective exchange rate was sourced from World Bank from global economic monitor. Monetary policy rate and inflation rate were obtained from Bank of Ghana database.

In terms of trade openness, monthly export data was also sourced from IMF direction of trade statistics in the IMF database, whiles the GDP was also annual series from WDI was which extrapolated into monthly. The dataset apart from FINDEV and GDP that were yearly series, all the others were monthly series with the start date being January 2002 to December 2020. This implies that FINDEV data was converted from yearly to monthly data. The sample period was influenced since Ghana switched its monetary policy regime from monetary targeting to inflation targeting in the year 2002 and till date.

To obtain monthly output gap data, the extrapolated monthly GDP data was used. The dataset was then transformed into output gap using Hodrick-Prescott (HP) filter ($\lambda = 14400$ as recommended for monthly series) to obtain a time varying trend.

Government Debt and Financial Development

The second objective of the study was to assess the determinants of financial development with specific focus on total debt also known as public debt which was later disaggregated into domestic and external debt for policy purposes. The objective of the study also follows the positivist, quantitative and explanatory research. The theoretical and empirical model for the objective is explained in the subsequent section. Also, the objective was achieved using ARDL which is also explained later.

Theoretical Model

Theoretically, financial development is predicted to have a positive relationship with real income and the real interest rate, and this is based on McKinnon-Shaw type models and the endogenous growth literature (Bilquess et al., 2011). On the basis of those theoretical expositions, a financial development association can be specified as: $FINDEV = f\ (GDPGRTH, MPR)$ where $FINDEV$ is financial development, $GDPGRTH$ is the GDP growth (indicator for real income) and MPR is the monetary policy rate (Baltagi et al., 2007; Cole & Shaw, 1974; Ghossoub & Reed, 2017; Ha et al., 2022; Quartey, 2008).

Prior studies have also posited that inflation and trade openness is seen to have an impact on financial development and have also received attention in the literature (Alnaa & Matey, 2022; Ayadi et al., 2015; Basa et al., 2019; Fiador et al., 2022; Krinichansky, 2015; Najimu, 2019; Ofori & Obeng, 2023; Takyi & Obeng, 2013; Wai & Wong, 1982). Therefore, in this study, the above equation is extended to include inflation, remittances, total debt and trade openness in order to examine the possible separate influence of these variables on financial

development (Abbas et al., 2022; Adu-Darko & Aidoo, 2022; Hauner, 2009; Ismihan & Ozkan, 2012; Kutivadze, 2013; Ndikumana & Boyce, 2003; Pedersoli & Presbitero, 2023; Peprah et al., 2019; Sobiech, 2019). The financial development equation that will be estimated in this study is adapted and specified as follows:

$$FINDEV = f(GDPGRTH, TRDOPEN, REER, INFL, TOT\_DEBT, REMIT)$$

Empirical Model Specification

Based on the theoretical model above, the empirical models to be estimated are given as:

$$FINDEV_t = \beta_0 + \beta_1 INF_t + \beta_2 TOT\_DEBT + \beta_3 \text{GDPGRTH}_t + \beta_4 MPR_t + \beta_5 TRDOPEN_t + \beta_6 REER + \beta_7 \text{REMIT}_t + \varepsilon_t \quad (13)$$

Where $FINDEV$ represents financial development, $REER$ is the real effective exchange rate, MPR represent Monetary Policy rate, INF represent inflation, GDPGRTH is the Gross Domestic Growth, TOT_DEBT_t represent total government Debt, $TRDOPEN$ represent trade openness and $REMIT$ represent remittances.

The study also disaggregated public debt into domestic debt and external debt. Domestic debt and external debt have distinct effects on domestic financial markets (Altayligil & Akkay, 2013; Assibey-Yeboah et al., 2016). Domestic debt is issued and held within the country, primarily affecting domestic financial institutions, interest rates, and liquidity conditions. External debt, on the other hand, involves borrowing from foreign creditors and can lead to currency risk and exposure to international financial markets. External debt introduces

currency risk, as it needs to be repaid in foreign currencies (Assibey-Yeboah et al., 2016). This exposes the country to exchange rate fluctuations, which can affect financial stability (Aimola & Odhiambo, 2021; Godswill et al., 2018). An increase in external debt may lead to currency depreciation, potentially impacting the balance sheets of financial institutions and affecting their lending capacity (Klobodu & Adams, 2016). Disaggregating debt allows for the examination of these dynamics and their implications for financial development.

Disaggregating debt helps in understanding how each type of debt affects the credit channel. Domestic debt may crowd out private sector borrowing by raising interest rates, potentially limiting access to credit for businesses and households (Jiménez-Sotelo, 2023; Sağdiç et al., 2021). External debt may have similar or different effects on the credit channel, depending on how it impacts exchange rates and investor confidence.

Different types of public debt may require different policy responses. For example, if external debt is increasing rapidly and causing currency depreciation, policymakers may need to implement measures to stabilize exchange rates. If domestic debt is crowding out private investment, fiscal or monetary policies may need to be adjusted to encourage private sector lending. Disaggregating debt helps policymakers make more targeted and effective policy decisions.

In summary, disaggregating public debt into domestic and external components allows for a more nuanced analysis of the impact of debt on financial development. Each type of debt has distinct implications for domestic financial markets, interest rates, currency risk, and the credit channel.

Understanding these dynamics is essential for policymakers, therefore equation 13 is restated as:

$$FINDEV_t = \beta_0 + \beta_1 INF_t + \beta_2 DOM\_DEBT_t + \beta_3 EXT\_DEBT_t + \beta_4 \text{GDPGRTH}_t + \beta_5 MPR_t + \beta_6 TRDOPEN_t + \beta_7 REER + \beta_8 \text{REMIT}_t + \varepsilon_t \quad (14)$$

All abbreviation remains the same. Nonetheless, DOM_DEBT represents domestic debt and EXT_DEBT represent external debt.

Measurement and Justification of Variables

In studying the determinants of financial developments in Ghana, the study made use of monthly data over the period 2002 to 2020; there are a total of nine variables. The variables are financial development, real effective exchange rate, remittances, inflation, GDP growth, trade openness, total government debt, external debt and domestic debt.

Dependent Variable

Financial Development (FINDEV)

The endogenous variable in this study is financial development. It is an index constructed with the use of a standard three-step approach to reducing multidimensional data into one summary index. The step includes the normalisation of the variables, aggregation of the normalized variables into the sub-indices representing a particular functional dimension, and finally, aggregation of the sub-indices into the final index. This procedure used follows the OECD Handbook on Constructing Composite Indicators (OECD, 2008), which is a better reference for methodological suggestions. A number of constructing composite indices that rank country performance does exist. Some of them are the various financial inclusion indices (Tuesta et al., 2015; Aduda,

2012; Mialou & Amidzic, 2017; Mohan, 2006; Oanh et al., 2023; Pang et al., 2022), the IMF Financial Stress Index (Cardarelli et al., 2009; Fu et al., 2022; Wang et al., 2023) and the United Nations Development Programme well-being indices, for instance, the Gender-Inequality Index, Multidimensional Poverty Index, Gender Development Index, and Human Development Index (UNDP, 2014).

This index is Constructed using a list of six indicators for the measurement of how accessible, deep and efficient the financial markets and financial institutions are. The sub-indices used include Financial Institutions Depth (FID), Financial Institutions Access (FIA), Financial Institutions Efficiency (FIE), Financial Markets Depth (FMD), Financial Markets Access (FMA), and Financial Markets Efficiency (FME). Financial Institutions (FI) and Financial Markets (FM) which measure how the overall financial institutions and financial markets are, are derived from the aggregation of the six sub-indices. Lastly, the financial institutions and financial markets are then aggregated into the general measure of financial development which is the FD index. The observations for this index range from 0 to 1. This implies that the higher the figure (a figure approaching 1, for instance, 0.8 or 0.9), the higher the level of financial development.

Independent Variables

The study has a variety of exogenous variables. They include inflation rate which is proxy by consumers' price index, government total debt, domestic debt, external debts, GDP growth, real effective exchange rate, trade openness, and monetary policy rate (serving as a proxy for interest rate).

GDP growth

The GDP growth rate measures how fast the economy is growing. It does this by comparing one-quarter of the country's gross domestic product to the previous quarter**.** It is expected that countries with high GDP growth experience progress in the development of their financial sector. This argument is supported by empirical studies such as (Adabor & Buabeng, 2021; Adams et al., 2017; Adu-Darko & Aidoo, 2022; Ho & Iyke, 2020; Iyke & Ho, 2019; Klobodu & Adams, 2016; Kyereme, 2010; Obeng-Amponsah & Owusu, 2023; Osei-Assibey & Asenso, 2015; Sena et al., 2021; Sylvester et al., 2023; Zayed et al., 2018)**.**

External Debt

This is the portion of the national debt that was obtained through borrowing from foreign lenders, such as governments, commercial banks, and international financial institutions. In this study, external debt was used as a proxy for government borrowing and it plays an important role in the development of a country's financial sector. Empirical works have suggested that too much dependence on government borrowing can adversely affect development in the private sector (Akosah, 2015; Amoako-Tuffour, 1999; Assibey-Yeboah et al., 2016; Ersoy, 2011; Klobodu & Adams, 2016; Shahe Emran & Farazi, 2011; Takyi & Obeng, 2013). Moreover, rising debt servicing could result in an increase in the government's interest costs and budget deficit. The amount of external debt is used to gauge macroeconomic success at the private investment level.

Domestic Debt

Domestic debt is the money that a government owes to domestic lenders such as commercial banks, private individuals, and other institutions as a result of loans and or negative balance of trade. The presence of large domestic debt burdens constitutes another source of uncertainty in the macroeconomic environment. A high domestic debt signifies that part of the future returns on any investment must be used to service the existing stock of debt. A higher internal debt level could be an indicator of over-indebtedness of internal credit for investment financing, signalling the lack of viability and sustainability of macroeconomic policies in the long term, and most likely negatively impacting investors' expectations due to the increase in the degree of uncertainty on future policies (Altayligil & Akkay, 2013; Gomez-Gonzalez, 2021; Jiménez-Sotelo, 2023; Pedersoli & Presbitero, 2023; Sağdiç et al., 2021).

Total Debt

Total public debt refers to all of the national debt which Ghana owes to its various creditors and other agencies (Hauner, 2009; Kutivadze, 2013; Neaime, 2015). It is made up of both internal and external debts of a country or government. This amount grows in years where there are deficits as the government spends more funds than it receives in taxes. It is expected that as the total debt stock of a country increases, it results in an increase in interest payment on loans and as consequence a rise in the deficit of a country. This has an adverse effect on the financial development of a country. Empirical works such as (Aimola & Odhiambo, 2021; Hauner, 2009; Ismihan & Ozkan, 2012; Kutivadze, 2013; Ndikumana & Boyce, 2003; Pedersoli & Presbitero, 2023;

Shahe Emran & Farazi, 2011) support the argument that stable government debt serves as a backbone for further development of financial markets;

Remittances

Remittances are the second largest source of external finance after foreign direct investment in developing economies (Adu-Darko & Aidoo, 2022; Peprah et al., 2019; Sobiech, 2019). As a country receives more capital inflow in the form of remittances from relatives abroad or in the form of FDI, it would boost economic activities in the country, which would translate into the growth and development of the financial sector. Empirical studies found that an increase in the inflow of remittances enhances financial development across countries (Apanisile, 2021; Bhattacharya et al., 2018; Chowdhury, 2016; Fromentin, 2017; Hamma, 2017; Olayungbo & Quadri, 2019; Sobiech, 2019). On these premises, it is expected that remittances would have a positive effect on the financial development of Ghana.

Monetary Policy Rate

Monetary policy rate as a combination of measures designed to regulate the value, cost and supply of money in an economy in consonance with the expected level of economic activity (Folawewo and Osinubi, 2006). It is a macroeconomic variable which is used to banking activities so as to have influence on inflation and out gap.

Real interest rate is used as a proxy for monetary policy rate in the study. This is a crucial consideration in any private sector investment choice. This is the interest rate after inflation, either predicted or actual, has been considered.(Gentle et al., 2005; Taylor & Sarno, 2004). Neo-Classical economists typically took the real interest rate into account when calculating the

user cost of capital. It is anticipated that the real interest rate will have a detrimental impact on financial development. According to Kaputo (2011), real interest rates have a long-term detrimental impact on private investment. Because borrowing investment funds is less expensive when interest rates are lower, private economic agents will be more inclined to engage in investment activities. On the other hand, the real interest rate and private investment have a positive relationship, under the McKinnon-Shaw complementarity theory. The monetary policy rate is used as a proxy for the real interest rate. In this study, the real interest rate is expected to be negatively related to development in the financial sector.

Real Effective Exchange Rate

The nominal effective rate index, which compares a currency's value to a weighted average of many foreign currencies, is divided by a price deflator or cost index to get the real effective exchange rate. (Hall, 2004; De Brouwer & Kawai, 2004; Svensson, 1989; Umar & Dahalan, 2017). A decrease in the REER (depreciation of the local currency) is expected to lead to an increase in financial development. This is true for a country like Ghana whose financial system is dominated by foreign-owned banks. This explains that when the value of the local currency (the Ghana cedis) reduces, foreigners are able to establish their financial institutions or improve their systems (with a relatively small amount of foreign currency) with the foreign currency at their disposal. An increase in the REER (appreciation of the local currency) is expected to reduce financial development (for financial institutions that are owned by foreigners) however, improves financial development for locally owned financial institutions.

Trade openness

The degree to which citizens and foreigners can conduct trade without incurring artificial expenses (costs imposed by the government), delays, or uncertainty is known as trade openness. Generally speaking, this is computed as export + import divided by GDP. The traditional approach to measuring trade openness, however, has come under fire for being a one-dimensional measure that only considers a nation's trading performance in relation to its domestic economy. The degree of trade barriers, the size of the economy, technology, and potential consequences of resource endowment are other vulnerabilities. (Ahiakpor et al., 2019; Bilquess et al., 2011; Demetriades & Rousseau, 2010; Eijffinger & Qian, 2016; Furuoka et al., 2020; Qamruzzaman & Karim, 2020). Thus, as proposed and used by Squalli and Wilson, this study will use the Composite Trade Intensity (CTI), which measures trade openness by combining Trade Intensity (TI) and Relative World Trade Intensity (RWTI) (2006). The CTI index was developed by Squalli and Wilson and combines TI and RWTI in the following way.:

$$CTI = \frac{1}{X}[TI \times RWTI] \tag{15}$$

$$CTI = \frac{1}{\bar{X}}\left[\frac{(X+M)_i}{GDP_i} \times \frac{(X+M)_i}{\sum_{j=1}^{n}(X+M)_j}\right] \tag{16}$$

$$\bar{X} = \frac{1}{n} \text{and} \sum_{j=1}^{n}(X+M)_j = 2(X+M)_j \tag{17}$$

$$CTI = \frac{n[(X+M)_i \times (X+M)_i]}{GDP_i 2(X+M)_i} \tag{18}$$

$$CTI = \frac{(X+M)_i{}^2}{GDP_i 2(X+M)_i} \tag{19}$$

$$CTI = \frac{(X + M)_i}{2(GDP_i)} \quad (20)$$

where CTI is the Composite Trade Intensity, $X\text{-}i.$ is the study's country of interest's exports, $M\text{-}i.$ is its country of interest's imports, $GDP\text{-}i.$ is the country of interest's gross domestic product, and n is the sample of nations taken into account. Since this study is country-specific, n equals one.

The disadvantage of the traditional approach is mitigated by the use of the new measure (CTI), which measures both trade openness (TI) and relative world trade intensity (RWTI). According to Demetriades and Rousseau (2010), trade openness discourages private investment since it increases the likelihood of a net flow of money out of the economy. Open trade allows home nations to access global markets and creates the ideal environment for foreign investors to enter these nations.

Inflation rate

It is the persistence and sustained rise in the general price levels of goods and services over a period of time (Asiedu et al., 2021; Nchor & Darkwah, 2015; Nkegbe & Mumin, 2014; Nortey et al., 2015; Sakyi et al., 2017). A high level of inflation negatively affects domestic investment activity by increasing the riskiness of longer-term investment projects hence impacting the financial sector negatively. Investors prefer to invest in more stable economies with less degree of instability. The higher inflation rate is also more likely to deter FDI inflows (which is likely to positively affect the financial system positively). In this study the inflation is measured by Consumer price index (CPI). Inflation is expected to relate negatively to financial development.

Sources of Data

Data employed for the study were derived from different sources. Data on the real effective exchange rate, inflation, GDP growth, trade openness and government borrowing were sourced from the World Bank's World Development Indicators (WDI). Trade openness however was computed by the researcher using values of export, imports and gross domestic product. The financial development data and remittances were also sourced from the International Monetary Fund (IMF). The study uses monthly data from 2002 to 2020.

Estimation Techniques

There are a few steps that must be followed in the times series modelling process to be able to identify the regression model that needs to be estimated in order to meet the study's objectives. Here are a few of the steps.

Unit Roots Test

To check if each variable in the model is stationary, the unit root test is utilized (Gujarati & Porter, 2009; Luintel, 2001). Regression with non-stationary time series results in erroneous regression since time series data are likely to be non-stationary in the level forms. While the variables show a strong and statistically significant link when, in reality, there is little to no relationship, this is known as spurious regression. When the variance and mean of a time series remain constant across time and the covariance varies solely on the time interval between two periods rather than the precise moment the covariance is computed, the time series is said to be stationary (Kwiatkowski et al., 1992; Phillips & Perron, 1988). The series has no unit root if it is stationary. We use the Augmented Dickey-Fully (ADF) test to prevent misleading estimated

coefficients (Fuller, 1976). The following equation needs to be approximated using the ADF.

$$\Delta X_t = \beta + \delta_t + \rho X_{t-1} + \sum_{i=1}^{\rho} \theta_i \Delta X_{t-1} + \epsilon_t \quad (21)$$

Where ϵ_t is a pure white noise error term, and Δ is the first difference operator, X_t denoting the series at time t, ρ δ are the parameters to be estimated.

The null and the Alternative hypothesis for the test is given by:

$H_o: \rho = 0$ Has unit root

$H_1: \rho < 0$ Has no unit root

Since the series has a unit root, we can conclude that it is non-stationary and fail to reject the null hypothesis if the t statistics is not more negative than the critical values. Otherwise, the series is stationary.(Fuller, 1976).

Choice of Estimation Technique

To achieve the objectives, the study adopted the bounds testing approach to co-integration in the ARDL framework and employs the dominance analysis technique to ascertain the relative importance of the predictors to the dependent variable (Ali et al., 2017; Pesaran et al., 2001; Yakubu, 2020). The reasons for employing ARDL are outlined as follows.

Autoregressive Distributed Lag (ARDL) Approach to cointegration

Certain co-integration techniques, like the one described by Engel and Granger (1987), have drawn criticism for their incapacity to evaluate a hypothesis pertaining to the estimated coefficients in long-term relationships and for introducing small sample bias through the exclusion of short-term dynamics. Although the Phillips and Hansen (1990) approach addresses these shortcomings, its process necessitates that all of the model's variables be

integrated of order one, or I (1). Nevertheless, there are a few benefits that the ARDL process provides over conventional methods.

Firstly, the ARDL cointegration procedure is relatively more efficient in small sample data sizes as is the case in this study (Frimpong & Marbuah, 2010; Pesaran et al., 2001; Qamruzzaman & Karim, 2020; Udoh et al., 2021). This study covers the period 2002 to 2016 inclusive. Thus, the total observation for the study is 180 which is relatively small.

Second, in contrast to other methods like the Johansen approach, the ARDL procedure does not necessitate pretesting the variables included in the model to determine their order of cointegration. (Olorogun, 2021; Udoh et al., 2021). It is applicable irrespective of whether the variables in the model are I (0), I (1), or mutually cointegrated (Pesaran et al., 2001). However, when the variables are integrated of order two, or I (2), the process will fail. Additionally, the ARDL method can make it easier to assess both short- and long-term partnerships at the same time.

The study used a combination of I (0) and I (1) variables hence the appropriate procedure is the ARDL approach. The general autoregressive (AR) model of order p, in Z_t:

$$Z_t = \alpha_0 + \beta_t + \sum_{i=1}^{p} \emptyset_i \, Y_{t-1} + \varepsilon_t \qquad t = 1, 2, \dots, T$$

With α_0 representing $(k + 1) - a$ vector of intercept (drift), and β_t denoting $(k + 1) - a$ vector of trend coefficients.

Cointegration Test

The cointegration analysis allows us to check for the long-run relationship among the variables included in the model (Davidson et al., 1993; Phylaktis, 1992; Taylor, 1988; Ziramba, 2010). If there is a consistent trend or a well-established long-term relationship between the series, they are cointegrated. In other words, if we take two non-stationary time series, X and Y, we should anticipate that a linear combination of the two variables will likewise be non-stationary. Utilizing the initial differenced data is essential to avoiding the non-stationarity issue. There are various approaches that can be used to perform the cointegration test. The most widely used methods are the residual-based Engle-Granger (1987) test, the maximum likelihood-based Johansen-Juselius (1990) test, and the Johansen-Juselius (1990) test (1995). (Engle & Granger, 2015; Johansen & Juselius, 1990). Many researchers continue to use this methodology because they claim it is the most accurate way to apply for series integrated of order one, or I (1), and it typically requires larger observation variables. Nevertheless, we will not be able to use the Johansen-Juselius test due to the quantity of observations used in the study. The limits test approach was utilized in the study to investigate the existence of a long-term link between the variables.

Bounds Testing Procedure

Compared to previous cointegration techniques, this bound testing strategy has certain statistical advantages (Pesaran & Shin, 1998). There is the need to pre-test the series in order to ascertain the order of integration to see if the series is not I (2) variable to confirm that the variable do not contain I(2) variables. It can also be used with small samples. In order to test for the presence

of a long-run link among the variables, the ARDL bounds testing approach estimates equation (22) using ordinary least squares (OLS). F-test is then performed to determine the joint significance of the coefficients of the lagged levels of the variables. This is done by restricting the coefficients of the lag values to zero. That is specified as:

$$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$$

$$H_1 = \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0$$

When the independent variables are I(d) ($where\ 0 \leq d \leq 1$), there are two asymptotic critical values bounds that offer a test for cointegration: a lower value assuming the regressors are I (0) and an upper value assuming purely I (1) regressors. In the event that the F-statistic is greater than the upper critical value, the null hypothesis—that there is no long-run relationship—can be rejected regardless of the time series' orders of integration. Conversely, the null hypothesis cannot be ruled out if the F-statistic is less than the lower critical value. Lastly, the outcome is uncertain and depends on whether the underlying variables are I (0) or I if the statistic lies between the lower and higher critical values (1). This means that the variable being studied must have its unit root tested.(Frimpong & Marbuah, 2010; Paweenawat & Plyngam, 2017; Shrestha & Chowdhury, 2005). However, given that Pesaran's critical values are based on a simulated large sample size, this study will use the critical values developed by (Kumar Narayan, 2004) since it is more appropriate for small samples.

Once the existence of long run relationship among the variables in the model is established, the ARDL methodology estimates the number $(m + 1)^{k+1}$ of the regressors. Where m the maximum number of lags and k is the number of the variable in the equation (Pesaran & Pesaran, 1997). The

orders of lags of the ARDL models are selected using, either, Schawrtz-Bayesian Criteria, Akaike's Information Criteria, the R^2 criteria or the Hannan and Quinn criteria. The SBC uses the smallest possible lag length and is considered as most parsimonious model whereas the AIC chooses the maximum necessary lag length (Shrestha & Chowdhury, 2005).

In the next stage of the ARDL bounds approach, once cointegration is established in the conditional ARDL $(p, q1, q2, q3, q4, q5, q6, q7)$, the long-run model of an expression of the relationship between financial development and the other explanatory variables which are seen as the determinant is expressed in an ARDL model in equation (22 to 24). In equation (23), EXT_DEBT in the model represents external borrowing by the government while DOM_DEBT represent domestic borrowing. In equation (22) ARDL model consist of TOT_DEBT which is the total government borrowing. The domestic and external borrowing by government is also found in equation (23) in the single ARDL model.

$$\begin{aligned}\Delta FINDEV_t = {} & \varphi_0 + \emptyset FINDEV_{t-1} + \alpha_1 INF_{t-1} + \alpha_2 TOT\_DEBT_{t-1} \\ & + \alpha_3 \mathrm{GDPGRTH} + \alpha_4 MPR_{t-1} + \alpha_5 TRDOPEN_{t-1} \\ & + \alpha_6 REER_{t-1} + \alpha_7 \mathrm{REMIT}_{\boldsymbol{t-1}} + \sum_{i=1}^{\rho} \beta_1 FINDEV_{t-1} \\ & + \sum_{i=1}^{\rho} \beta_2 \Delta INF_{t-1} + \sum_{i=1}^{\rho} \beta_3 \Delta \mathrm{TOT\_DEBT}_{t-1} \\ & + \sum_{i=1}^{\rho} \beta_4 \Delta G\mathrm{DPGRTH}_{\boldsymbol{t-1}} + \sum_{i=1}^{\rho} \beta_5 \Delta MPR_{t-1} \\ & + \sum_{i=1}^{\rho} \beta_6 \Delta TRDOPEN_{t-1} + \sum_{i=1}^{\rho} \beta_7 \Delta REER_{t-1} \\ & + \sum_{i=1}^{\rho} \beta_8 \Delta \mathrm{REMIT}_{t-1} + \varepsilon_t \end{aligned} \quad (22)$$

$$\begin{aligned}\Delta FINDEV_t = {} & \varphi_0 + \emptyset FINDEV_{t-1} + \alpha_1 INF_{t-1} + \alpha_2 \text{DOM\_DEBT}_{\boldsymbol{t-1}} \\ & + \alpha_3 \text{EXT\_DEBT}_{\boldsymbol{t-1}} + \alpha_4 \text{GDPGRTH} + \alpha_5 MPR_{t-1} \\ & + \alpha_6 TRDOPEN_{t-1} + \alpha_7 REER_{t-1} + \alpha_8 \text{REMIT}_{\boldsymbol{t-1}} \\ & + \sum_{i=1}^{\rho} \beta_1 FINDEV_{t-1} + \sum_{i=1}^{\rho} \beta_2 \Delta INF_{t-1} \\ & + \sum_{i=1}^{\rho} \beta_3 \Delta \text{DOM\_DEBT}_{t-1} \\ & + \sum_{i=1}^{\rho} \beta_4 \Delta \text{EXT\_DEBT}_{t-1} \\ & + \sum_{i=1}^{\rho} \beta_5 \Delta \text{GDPGRTH}_{t-1} + \sum_{i=1}^{\rho} \beta_6 \Delta MPR_{t-1} \\ & + \sum_{i=1}^{\rho} \beta_7 \Delta TRDOPEN_{t-1} + \sum_{i=1}^{\rho} \beta_8 \Delta REER_{t-1} \\ & + \sum_{i=1}^{\rho} \beta_9 \Delta \text{REMIT}_{\boldsymbol{t-1}} + \varepsilon_t \end{aligned} \quad (23)$$

This is followed by the estimation of the short-run parameters of the variables with the error correction representation of the ARDL model. The speed of adjustment is determined by the application of the error correction model. The unrestricted ARDL error correction representation is estimated when there exists a long-run relationship accordingly as:

$$\Delta FINDEV_t = \varphi_0 + \sum_{i=1}^{\rho} \beta_1 FINDEV_{t-1} + \sum_{i=1}^{\rho} \beta_2 \Delta INF_{t-1} + \sum_{i=1}^{\rho} \beta_3 \Delta \text{TOT\_DEBT}_{\boldsymbol{t-1}} + \sum_{i=1}^{\rho} \beta_4 \Delta \text{GDPGRTH}_{\boldsymbol{t-1}} + \sum_{i=1}^{\rho} \beta_5 \Delta MPR_{t-1} + \sum_{i=1}^{\rho} \beta_6 \Delta TRDOPEN_{t-1} + \sum_{i=1}^{\rho} \beta_7 \Delta REER_{t-1} + \sum_{i=1}^{\rho} \beta_8 \Delta \text{REMIT}_{\boldsymbol{t-1}} + \gamma ECT_{t-1} + v_t \quad (24)$$

$$\Delta FINDEV_t = \varphi_0 + \sum_{i=1}^{\rho} \beta_1 FINDEV_{t-1} + \sum_{i=1}^{\rho} \beta_2 \Delta INF_{t-1} + \sum_{i=1}^{\rho} \beta_3 \Delta \text{DOM\_DEBT}_{\boldsymbol{t-1}} + \sum_{i=1}^{\rho} \beta_4 \Delta \text{EXT\_DEBT}_{\boldsymbol{t-1}} + \sum_{i=1}^{\rho} \beta_5 \Delta \text{GDPGRTH}_{\boldsymbol{t-1}} + \sum_{i=1}^{\rho} \beta_6 \Delta MPR_{t-1} + \sum_{i=1}^{\rho} \beta_7 \Delta TRDOPEN_{t-1} + \sum_{i=1}^{\rho} \beta_8 \Delta REER_{t-1} + \sum_{i=1}^{\rho} \beta_9 \Delta \text{REMIT}_{\boldsymbol{t-1}} + \gamma ECT_{t-1} + v_t \quad (25)$$

Where the short-run dynamics are the coefficients, while γ is the speed of adjustment to long-run equilibrium following a shock to the system and ECT_{t-1} is the error-correction term, the residuals from the cointegration equation lagged one period is respectively given by:

$$ECT_t = FINDEV_t - \varphi_0 - \sum_{i=1}^{\rho} \beta_1 FINDEV_{t-1} - \sum_{i=1}^{\rho} \beta_2 \Delta INF_{t-1} - \sum_{i=1}^{\rho} \beta_3 \Delta \mathrm{TOT}_{\mathrm{DEBT}_{t-1}} - \sum_{i=1}^{\rho} \beta_4 \Delta \mathrm{GDPGRTH}_{t-1} - \sum_{i=1}^{\rho} \beta_5 \Delta MPR_{t-1} - \sum_{i=1}^{\rho} \beta_6 \Delta TRDOPEN_{t-1} - \sum_{i=1}^{\rho} \beta_7 \Delta REER_{t-1} - \sum_{i=1}^{\rho} \beta_8 \Delta \mathrm{REMIT}_{\boldsymbol{t-1}} \quad (26)$$

$$ECT_t = FINDEV_t - \varphi_0 - \sum_{i=1}^{\rho} \beta_1 FINDEV_{t-1} - \sum_{i=1}^{\rho} \beta_2 \Delta INF_{t-1} - \sum_{i=1}^{\rho} \beta_3 \Delta \mathrm{DOM\_DEBT}_{\boldsymbol{t-1}} - \sum_{i=1}^{\rho} \beta_4 \Delta \mathrm{EXT\_DEBT}_{\boldsymbol{t-1}} - \sum_{i=1}^{\rho} \beta_5 \Delta \mathrm{GDPGRTH}_{t-1} - \sum_{i=1}^{\rho} \beta_6 \Delta MPR_{t-1} - \sum_{i=1}^{\rho} \beta_7 \Delta TRDOPEN_{t-1} - \sum_{i=1}^{\rho} \beta_8 \Delta REER_{t-1} - \sum_{i=1}^{\rho} \beta_9 \Delta \mathrm{REMIT}_{\boldsymbol{t-1}} \quad (27)$$

Once the variables are cointegrated, their dynamic relationship can be specified by an error correction representation as argued by Engle and Granger (1987) in which an error correction term (ECT) computed from the long-run equation must be incorporated in order to capture both the short-run and long-run relationships. The error correction term indicates the speed of adjustment to long-run equilibrium in the dynamic model. In other words, the magnitude of the ECT shows how quickly the variables converge to equilibrium when they are disturbed. The ECT is expected to be statistically significant with a negative sign. The negative sign indicates that any shock that occurs in the short run will be corrected in the long-run. The larger the coefficients of the error correction term in absolute terms, the faster the convergence to equilibrium.

To ascertain the appropriateness of the ARDL model, diagnostic and stability tests are conducted. The diagnostic test examines the serial correlation, functional form and heteroskedasticity associated with the selected model (Breusch, 1978; Breusch & Pagan, 1979; Jarque & Bera, 1980; Royston, 1982; White, 1980). It is important to conduct a stability test as opined by Pesaran and Pesaran (1997) suggested we employed the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) to test the stability of the parameters. The CUSUM and CUSUMSQ statistics are updated recursively and plotted against the breakpoints. The null hypothesis of stable coefficients in a given regression cannot be rejected if the plots of the CUSUM and CUSUMSQ statistics stay within the critical bounds of the five percent significance level.

Dominance Analysis

Budescu (1993) developed a clear and intuitive definition of importance in regression models, that states that a predictor's importance reflects its contribution to the prediction of the criterion and that one predictor is 'more important than another if it contributes more to the prediction of the criterion than does its competitor at a given level of analysis. Dominance analysis is a procedure for determining independent variable relative importance in a statistical model, (Luchman, 2021). In other work dominance analysis is a method developed to evaluate the importance of each predictor in the selected regression model: "one predictor is 'more important than another' if it contributes more to the prediction of the criterion than does its competitor at a given level of analysis." (Budescu &Azen, 2004).

In order to identify the relative importance of independent variables that determined the dependent variable, dominant analysis was used. Budescu

(1993) detailed the procedure for conducting a dominance analysis. Dominance analysis produces general dominance weights that are computed by finding the average of a given predictor's incremental validity across all possible sub-models that involve that predictor (Luchman, 2021; Luo & Azen, 2013; Tessema & Geda, 2023; Thomson, 1989). The incremental validity of predictor *i* in a sub-model is defined by:

$$\Delta R^2_{in} = r^2_{y.xixh} - r^2_{y.xh} \quad (30)$$

Where X and Y in the equation represent independent and dependent variables respectively while xh represents one unique subset of k predictors in the sub-model and x_i represents the $(k + 1)th$ variable added to the sub-model. The average incremental validity for predictor x_i contained in all sub-models of size k is

$$C^k_{xi} = \sum^{p-1}_{k=1} {}^{k}\Delta R^2_{ih} \; / \; {}^{p-1}_{k} \quad (31)$$

where ΔR^2_{ih} is as defined in equation 32, *h* is one unique subset of *k* predictors, and $\binom{p-1}{k}$ is the combination function equal to $p!/[k!(p-1-k)!]$, which is the number of subsets of size *k* that can be formed from $(p-1)$ predictors.

$$C_x = \sum^{p-1}_{k=1} {}^{k} C^{(k)}_{xi} / (p-1) \quad (32)$$

General dominance weights have two main inviting properties: One, each general dominance weight is the average contribution of a predictor to a criterion, both on its own and when taking all other predictors in the model into account. Second, general dominance weights across predictors always sum to the overall model R^2

Financial Development and Responsiveness of Commercial Banks to Monetary Policy rate

Introduction

This section discusses the mixed method procedure for analysing the responsiveness of commercial banks to the monetary policy rate and the role plaid by the level of financial development of these commercial banks in Ghana. According to Bryman (2007) the variables are referred to as the building blocks of theory. Monetary policy decisions are transmitted to the real economy by financial institutions through interest rate, credit, wealth, balance sheet and exchange rate channels (Brissimis & Delis, 2022; Dabla-Norris & Floerkemeier, 2006; Misati, et al., 2010; Mishkin, 1996; Nguyen, et al., 2018; Peek & Rosengren, 1995; Saman & Szeles, 2020; Seth & Kalyanaraman, 2017; Warjiyo, et al., 2002; Xu et al., 2023). All these channels take some time to affect the real economy through commercial banks and other financial institutions. For commercial banks to respond to policy rates effectively, the level at which the sector (commercial banks) has developed and other factors play an important role (Farajnezhad & Suresh, 2019; Gray, 1963; Kwashie et al., 2022; Li & Wang, 2012; Miho et al., 2022; Nguyen & Nguyen, 2021; Olokoyo, 2011).

The study employed ARDL technique as a preliminary test to confirm quantitatively the responsiveness of Banks to MPR before interviewing the heads of worker at the risk department of commercial banks. Firstly, the ARDL cointegration procedure is relatively more efficient in small sample data (Davidson et al., 1993; Johansen & Juselius, 1990; Pesaran et al., 2001). This study covers monthly period 2015M01 2020M12 inclusive sizes as is the case

in this study. Thus, the total observation for the study is relatively small but does not affect the validity of the results (Frimpong & Marbuah, 2010; Olorogun, 2021). This is because the ARDL results were used as preliminary test for the qualitative study so the researcher did not want to include a very long time series dataset where the respondents of the interviews were not even around.

The utilization of the ARDL model in this analysis offers several advantages. Firstly, it assists in determining whether a series is integrated of order one (I(1)) or order zero (I(0)), or even mutually cointegrated. This attribute enhances the robustness of the results. Additionally, the ARDL model provides consistent long-run coefficients, offering valuable insights into both long-term and short-term relationships within the data. One notable feature of the ARDL model is its ability to Construct a dynamic Error Correction Model (ECM) that combines short-term dynamics with the long-run equilibrium (Ali et al., 2022; Olayungbo & Quadri, 2019). This feature is particularly advantageous for understanding how variables respond to shocks and deviations from their equilibrium levels.

Moreover, the ARDL model presents several advantages over alternative methods, such as the Johansen Cointegration approach. Notably, it circumvents issues related to including a large number of dependent and independent variables in the analysis (Ewodo-Amougou et al., 2023; Itoo & Ali, 2023; Olayungbo & Quadri, 2019). Endogeneity concerns are effectively addressed in the ARDL model, provided there is no residual correlation. The model also possesses the ability to distinguish between endogenous and exogenous variables, even when the explanatory variables are exogenous themselves.

In practice, the ARDL approach employs Ordinary Least Squares (OLS) to examine the long-run relationships among the variables. This is accomplished through F-tests, assessing the joint significance of lagged variable coefficients within the model. For instance, the analysis entails regressing a specific variable on others in the model thus the study regressed Average Commercial Banks Lending Rate (%): (ACBL) on variables such as Monetary Policy Rate (%): (MPR), Private Sector Credit (In Million Ghana Cedis): (PSC), Non-Performing Loans (%): (NPL), Core Inflation (Adjusted for Energy & Utility) (%) Yearly Change: (INF), Total value of mobile money (MOMO) transactions for the month (GH¢'million), Financial Development Index: (FINDEV) and Exchange Rate (Ghana Cedis to Dollar): (REER. This process is repeated for all variables, equalling the total number of regressions to the number of variables employed in the model. The variables were sourced from Bank of Ghana Database.

Given the combination of both I(0) and I(1) variables in this study, the ARDL procedure is the most suitable analytical approach (Olorogun, 2021; Udoh et al., 2021). Its advantages, including its ability to handle various types of variables and address endogeneity and serial correlation issues, make it a robust choice for the research analysis. Detailed methodology of the ARDL specification (just used in objective two) has been left out because it is regarded as a preliminary analysis for this objective which follows the mixed method approach.

Causality Test

When variables are cointegrated, then there may exist unidirectional, bi-directional relationships. If variables are not cointegrated, it implies one does

not affect the other. In other to determine the direction of such relationships Granger (1969) developed a causality test methodology. In the Granger-sense X is a cause of Y if it is useful in forecasting Y? In this framework "useful" means that X is able to increase the accuracy of the prediction of Y with respect to a forecast, considering only past values of Y. Granger causality is a powerful econometric tool that is used to test the direction of causality that one might think otherwise. The most common implication here is that if non-stationary series are cointegrated, then one of the series must granger cause the other (Gujarati & Porter, 2009). Granger causality is conducted in other to examine the direction of causality in a given cointegrated vector as the model shows.

$$\Delta Y_t = \varphi_0 + \sum_{i=1}^{\rho} \beta_1 \Delta Y_{t-i} + \sum_{i=0}^{\rho} \emptyset_1 \Delta X_{t-1} + \forall_1 ECT_{t-1} + \varepsilon_t \quad (28)$$

$$\Delta X_t = \varphi_0 + \sum_{i=1}^{\rho} \beta_2 \Delta X_{t-i} + \sum_{i=0}^{\rho} \emptyset_2 \Delta Y_{t-1} + \forall_2 ECT_{t-1} + u_t \quad (29)$$

From the above, ΔY_t and ΔX_t represent the non-stationary dependent and independent variable while ECT is the error correction term. $\forall_i$ also is the speed of adjustment for the two models. ρ and $t-1$ are the optimal lag order and lag values respectively. The error correction term in the model will not appear if the series is not cointegrated. To examine whether the independent variable X in the equation (29) Granger causes the dependent variable Y, the joint significance of the lagged dynamic term is examined by testing the null hypothesis that:

$$H_0 = \emptyset_1 = 0$$

The above implies that the explanatory variable (X) does not granger cause the dependent variable (Y) against the alternative hypothesis that:

$$H_1 = \emptyset_1 \neq 0$$

Implying that the explanatory variable (X) granger causes the dependent variable (Y).

From the equation (29), to find out whether the dependent variable (Y) Granger causes the explanatory variable (X) we, therefore, examine the significance of the lagged dynamic term by testing also the null hypothesis:

$$H_0 = \emptyset_2 = 0$$

Against the alternative hypothesis:

$$H_1 = \emptyset_2 \neq 0$$

Implying that the dependent variable (Y) granger causes the independent variable (X).

In granger causality testing, four possibilities exist when standard F-test or Wald statistic is used. These involve the rejection of the null hypothesis at the same time means unidirectional causality running from X to Y. Secondly, a rejection of the null hypothesis but at the same time failing to reject the null hypothesis also implies unidirectional causality running from Y to X. The third possibility is a simultaneous failure to reject the two null hypotheses indicates independence or no causality between the variable of interest. Finally, another possibility is a simultaneous rejection of the two null hypotheses which means that there is bi-directional causality.

Qualitative Analysis

Population, Sample and Sampling Procedure

The population of interest in this study was employees in the twenty-three commercial Banks operating in Ghana and that holds respective offices. The study was conducted at the headquarters of the banks in Accra. The target respondents in the banks are the heads of departments responsible for

responding to monetary policy rates in their respective banks in Ghana. Purposive sampling technique was used to select eight commercial banks from these twenty-three (23) banks and this is in accordance with Lee et al., (2002) who suggest that studies that use more than one method require fewer participants, as do studies that use multiple (very in-depth) interviews with the same participant. Again, Creswell in 1998 suggested a sample size ranging between 5 to 25 when an in-depth interview is involved whiles Morse in 1994 stated the minimum sample size of six. The method used to select these respondents from the eight commercial banks selected was based on Creswell (2015) and Rahi, (2017) that the sampling method used in selecting should be purposive to help provide an in-depth understanding of the problem. This helped to select participants who are very rich in the information required for the study. From the eight banks selected, one respondent each was selected from the banks making a total of 8 respondents. These eight banks were selected base on their performance among the 23 Commercial Banks in Ghana base on the percentage of their asset.

In fact, that there is no ideal sample size for a qualitative study especially when the method used is purposive (Bresz et al., 2017; Creswell, 2015; Creswell & Creswell, 2018). Creswell (2015) suggested that the sample size depends on the qualitative design being used. Rahi (2017) on the other hand, emphasised a careful selection of a small number of participants who have in-depth information for qualitative inquiry. The respondents selected for the research made available a fair representation of stakeholders regarding the expert views on the performance of the central bank on the conduct of monetary policy in Ghana in order to make the information provided for the qualitative study rich.

Data Collection Method and Instrumentation

An in-depth interview was used to bring about the ideas and opinions of the experts with respect to the conduct of commercial banks' responsiveness to the monetary policy rate in Ghana. An in-depth interview is used because of the need to know more from the experts on the subjects related to the conduct of the responsiveness of commercial banks to the monetary policy rate in Ghana (Mugenda & Mugenda, 2019). An in-depth interview provides more thorough and well-informed information paralleled to other qualitative data collection instruments in a more relaxed atmosphere.

More opportunities are provided to ask follow-up questions in order to investigate further for additional information. A voice recorder and interview guide were used to conduct the interview. The use of an interview guide allows the interviewer to engage the interviewees regarding the issues related to the topic under research within a predetermined framework and time (Leedy & Ormrod, 2018; Rahi, 2017). The interview guide was divided into three sections meant to address particular issues. Sections "A" consist of questions relating to the profile of the respondents and B comprise questions directed to solicit respondents' views on commercial banks' responsiveness to the monetary policy rate. Finally, section "C" also addresses questions on channels of monetary policy transmission and how financial development plays a mediating role in affecting the prompt transmission of the monetary policy rate. The participants were engaged to respond to a twenty-item question (Appendix).

Data Collection Procedure

To fine-tune the interview guide for final editing, the researcher pre-tested with questions. The instrument was pre-tested with Bondzei (PhD), a

Senior lecturer at the University of Cape (School of Economics) because of his knowledge in monetary economics and financial sector on 20th May 2022. Before the collection of actual data, all the participants were pre-informed and fixed appointment dates differently for the in-depth interview. The interview began on 20th June 2022 and ended on 20th March 2023. Each interviewee was engaged for an average of 45 minutes. Permission was sought from the participants to record the in-depth interviews using a digital voice recorder and sometime too recording during phone calls. For the sake of strict adherence to the rules of the in-depth interviews, the researcher conducted the interview personally.

Validity of Research Instrument

The property of a proposition or measure's validity is how closely it adheres to accepted knowledge or the truth (Atmowardoyo, 2018; Leedy & Ormrod, 2018). When the results of an attitude scale match those of other measures of attitude possession, the scale is deemed legitimate. Therefore, an instrument's validity refers to how well it can measure what it should measure. As a result, it describes the degree to which an instrument accurately poses the proper questions (Bresz et al., 2017; Bryman, 2007; Creswell, 2015). Validity, according to Mugenda & Mugenda (2003), is the significance and correctness of conclusions drawn from research findings.

There were two methods used to assess the instrument's content validity. The researcher first spoke with the department of economics lecturer (Dr Bondzie) and supervisors about the items in the instrument (Bryman, 2007; Creswell & Creswell, 2018). It is expected of these individuals to check or cross check whether each item in the questionnaire measures what it is intended to

measure. Suggestions, explanations, and other input are included in the advice. Secondly, through piloting, where subject responses are compared to the study goals, the content validity of the instrument was established (Creswell, 2015; Mugenda & Mugenda, 2019). This also gives a reason as to why the content was used. For a research instrument to be considered valid, the content selected and included in the questionnaire must be relevant to the variable being investigated (Bresz et al., 2017; Bryman, 2007; Creswell, 2015; Mugenda & Mugenda, 2019).

Reliability of the Instrument

Measurement consistency is known as reliability. Using uniform testing processes, assessing a wide sample of persons, and putting a large number of related items on a measure all boost reliability (Creswell, 2015). The internal consistency of the data gathered is determined by reliability. This guarantees that specific internal consistent patterns exist in the data. When no pattern is found in the responses, this indicates that probably the test is too difficult and as a result, the respondents just guess the answers randomly. The reliability of the research instrument was enhanced through a pilot study that was done in other banks and lecturers, other than those used in this study, selecting a pilot group of five respondents in all (Bresz et al., 2017; Mugenda & Mugenda, 2019). The respondents were conveniently selected since statistical conditions are not necessary for the pilot study (Alfahl et al., 2017; Wenger, 1991). The pilot data was not included in the actual study. The pilot study allowed for pre-testing of the research instrument to ascertain the reliability of the study as noted earlier. The Cronbach Alpha coefficient (α) was used to gauge the dependability

estimate. According to Nunnally (1978), research instruments should have a dependability of at least 0.70.

Data Analysis and Presentation

The researcher made use of the thematic framework for qualitative data analysis. This involves a comprehensive examination of the data set to check repeated patterns of meaning or themes (Bresz et al., 2017; Bryman, 2007; Creswell, 2015; Creswell & Creswell, 2018; Mugenda & Mugenda, 2019; Tan & Cao, 2022). The recorded voice of the participants was transcribed and edited and then the transcripts were imported into Nvivo 11 for windows for analysis. Finally, codes were generated and organised into categories for analysis.

Chapter Summary

This chapter focused on the research methods employed to achieve the studies objectives. The first and second objectives of the study follow a positivist, quantitative and explanatory research whereas the last objective followed an interpretivist philosophy and mixed method research. SVAR and ARDL was employed for the first and second objective respectively while ARDL and thematic framework for in-depth interview were used for the third objective. The sources of data used were clearly stated for each objective. Reliability and validity of data collection instrument and results are explained.

CHAPTER FOUR

FINANCIAL DEVELOPMENT AND MONETARY POLICY EFFECTIVENESS IN GHANA

Introduction

The aim of the study is to examine the relationship among financial development, public debt dynamics, commercial banks' responsiveness and monetary policy effectiveness in Ghana. This chapter specifically examines the role of financial development in the effectiveness of monetary policy in Ghana. This chapter is divided into two parts. The first part contains descriptive statistics of the variables used for the study and the stationarity properties of all the variables involved are also checked. The second part is dedicated to the discussion of the results of the SVAR regarding the impact of FINDEV on the effectiveness of monetary policy in Ghana by considering the following variables: monetary policy rate, financial development index, real effective exchange rate, output gap, trade openness, financial market, financial institution, and inflation rate. The chapter further explores how monetary policy can effectively reduce the inflation rate and output gap and other macroeconomic variables in Ghana.

Descriptive Statistics

Table 1 presents the descriptive statistics of the variables employed in the study. The descriptive statistics presented in Table 1 offer valuable insights into the key variables under consideration in the study. These statistics provide a snapshot of the central tendencies, variability, skewness, kurtosis, and other characteristics of the data.

Table 1: Descriptive Statistics

	FINDEV	REER	OUTGAP	MPR	TRDOPEN	INF
Mean	0.122561	88.66844	-70.80165	18.04670	0.235723	14.16797
Maximum	0.177344	113.1575	0.242968	27.50000	0.328361	33.60000
Minimum	0.090684	57.53042	-107.1098	12.50000	0.168967	5.530000
Std. Dev.	0.026159	13.33279	37.93418	4.295957	0.043447	5.476479
Skewness	1.064230	0.015217	1.226827	0.701061	0.596593	1.462718
Kurtosis	2.613090	1.986909	2.744553	2.324691	2.411349	5.845889
Jarque-Bera	44.26542	9.716344	57.56032	22.90799	16.74318	157.5499
Probability	0.000000	0.007765	0.000000	0.000011	0.000231	0.000000
Observations	227	227	227	227	227	227

Note: Financial Development (FINDEV); Real Effective Exchange Rate (REER); Output Gap (OUTGAP); Monetary Policy Rate (MPR); Trade Openness (TRDOPEN); Inflation (INF); Standard Deviation (Std. Dev.)

Source: Author's Computation (2023)

The descriptive statistics presented in Table 1 offer valuable insights into the key variables under consideration in this study. The mean values of the variables provide a central measure for each of them. Notably, the Real Effective Exchange Rate (REER) exhibits a mean value of approximately 88.67, suggesting a relatively stable exchange rate environment on average with the study period. Meanwhile, the Trade Openness (TRDOPEN) variable has a mean of about 0.236, indicating that, on average, countries tend to have moderately open trade policies. This is in line with the proposition of Ahiakpor et al. (2019) on how open the Ghanaian economy is.

Financial Development (FINDEV), a crucial aspect of economic growth, shows a mean value of approximately 0.123. This suggests that Ghana exhibit a moderately low level of financial development. The Output Gap (OUTGAP) refers to the difference between an economy's actual level of output (real GDP) and its potential or trend level of output. The average value of -70.80165, indicating a negative output gap occurs in Ghana. Thus, the actual level of economic output falls below the potential or trend level. In this case, the economy is operating below its full capacity, potentially leading to unemployment and underutilization of resources (Valogo et al., 2023).

Inflation (INF) is an essential economic indicator, and the mean value of around 14.16797 inflation in the country of study (Ghana) indicates a moderate level of inflation, on average, across the country in the dataset. Similarly, the Monetary Policy Rate (MPR) shows a mean value of approximately 18.04670, reflecting the average interest rate set by central banks in these economies.

The minimum and maximum values for each variable provide insights into the range of variation. For instance, the REER ranges from a minimum of approximately 57.53042 to a maximum of 113.1575, highlighting significant variability in exchange rates across the study period. Similarly, TRDOPEN exhibits a wide range from 0.168967 to 0.328361, indicating diverse trade policies among the countries.

Standard deviations reflect the degree of dispersion or variability in the data. Thus, the REER has a standard deviation of around 13.33279, indicating that exchange rates can vary considerably from the mean. Skewness and kurtosis provide insights into the shape of the distributions (Royston, 1982). Negative skewness in some variables, like REER, suggests a longer left tail, potentially indicating instances of extreme depreciation. High kurtosis values in several variables, such as TRDOPEN and INF imply the presence of outliers or fat tails in their distributions, which could be indicative of non-normality.

The Jarque-Bera test and associated probabilities are statistical assessments of normality (Jarque & Bera, 1980). For instance, the low p-values for variables like TRDOPEN suggest that these variables are not normally distributed.

These descriptive statistics offer a comprehensive overview of the dataset, shedding light on the central tendencies, variability, and distributional characteristics of the variables under investigation. These insights serve as a foundation for more in-depth analyses and model development in this study.

Stationarity Test

Time series data, which involve the observation of a variable over time, often exhibit a characteristic known as non-stationarity (Rhif et al., 2019;

Russell, 2011; Russell & Banerjee, 2008). Nonstationary time series data can pose challenges in statistical analysis and regression modeling, as they may lead to spurious regression results. Several seminal studies, including Fuller (1976), Kwiatkowski et al. (1992), and Phillips & Perron (1988), have highlighted the issues associated with nonstationary time series.

Non-stationarity essentially means that the statistical properties of the data, such as the mean, variance, and autocovariance, are not constant over time. In practical terms, this implies that the data's behavior can change, making it challenging to draw meaningful conclusions from the raw data.

In reality, most time series data are nonstationary due to various factors, including the underlying data-generating processes and potential subjectivity in data collection (Fuller, 1976; Kwiatkowski et al., 1992; Phillips & Perron, 1988). This non-stationarity can complicate statistical analyses, particularly when attempting to establish relationships between variables through regression.

Some widely used methods employed to determine stationarity are the Augmented Dickey-Fuller (ADF) test, Phillips-Perron (PP) tests, Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test. These tests help assess whether a time series is stationary around a constant mean or has a unit root, which would imply non-stationarity. The key insight is that stationarity is a prerequisite for conducting reliable regression analyses, as spurious relationships can arise when nonstationary series are regressed against each other.

Table 2: Unit Root Test

	PP		ADF		KPSS	
	Level	First Difference	Level	First Difference	Level	First Difference
INF	-2.9052**	-13.8321***	-2.9529**	-4.6157***	0.5624**	0.0466
FINDEV	-0.1312	-14.2816***	-0.0014	-14.245***	1.5722***	0.1383
MPR	-2.1769	-15.9896***	-2.1145	-4.9846***	0.2151	0.2048
OUTGAP	-1.71	-26.4427***	-1.7575	-25.7633***	1.2304***	0.4974
REER	-1.1893	-14.5089**	-1.058	-14.484***	1.3215***	0.0773
TRDOPEN	-1.836	-3.4346**	-2.8257	-3.37**	0.2666	0.0975

Notes: (*) Significant at the 10%; (**) Significant at the 5%; and (***) Significant at the 1%. Probability of ADF and PP are based on MacKinnon (1996) one-sided p-values and Probability of KPSS are on Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1). Lag Length are based on AIC. Inflation (INF); Financial Development (FINDEV); Monetary Policy Rate (MPR); Output Gap (OUTGAP); Real Effective Exchange Rate (REER); Trade Openness (TRDOPEN)

Source: Author's Computation (2023)

Table 2 contains the results of various unit root tests, namely the ADF, PP, and KPSS tests, for the study's variables in levels and their first differences (Fuller, 1976; Kwiatkowski et al., 1992; Phillips & Perron, 1988).

INF in both levels and first differences, the ADF and PP tests show significant results at the 5% level and 1% respectively, indicating that inflation is stationary. The KPSS test in levels suggests that inflation is non-significant (not stationary), while in first differences, it is significant. In summary, inflation appears to be stationary in first differences, which is a common characteristic for economic time series data. The ADF and PP tests for FINDEV, whether in levels or first differences, are all highly significant at the 1% level. These results suggest that FINDEV is stationary.

The ADF and PP tests under MPR show significant results at the 1% level in first differences, indicating stationarity. The KPSS test is not significant in both levels and first differences. Thus, the monetary policy rate appears to be stationary in first differences. OUTGAP shows ADF and PP tests in levels and first differences, as well as the KPSS test in levels and first differences, all yield highly significant results at the 1% level. This implies that the output gap is likely stationary. It is also worth noting that the KPSS test indicates stationarity in first differences.

ADF and PP tests are not significant at the 5% level in levels, but they become significant at the 1% level in first differences, indicating stationarity in first differences. The KPSS test suggests that REER is stationary at levels not first differences. Finally, TRDOPEN on ADF and PP tests are not significant at the 5% level in levels, while they are significant in first differences, implying

stationarity. The KPSS test suggests stationarity in levels and in first differences.

The choice of these tests for stationarity were significant because they complement each other like the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) tests in certain situations as well as Kwiatkowski-Phillips-Schmidt-Shin (Fuller, 1976; Kwiatkowski et al., 1992; Phillips & Perron, 1988). In summary, recognizing that the variables were stationary at first difference, the study used the logged differenced of the variables to ensure reliability of study's findings.

Analysis of Empirical Results

The SVAR results presenting the response of inflation rate, exchange rate, trade openness and output gap on FINDEV and monetary policy rate shock is provided in this section. The study examines the role of FINDEV in the effectiveness of monetary policy in Ghana using SVAR estimation technique. Various shocks such as FINDEV, monetary policy rate and interacted variable from financial development and monetary policy rate are applied to other macroeconomic variables in Ghana to see how specifically the output gap and inflation will respond.

The paper first examines how the financial development shock affects macroeconomic indicators. Next, the shock to macroeconomic variables from monetary policy. Analysis of how financial development and monetary policy rate shocks interact with macroeconomic variables in Ghana comes next.

Financial Development Shocks and Macroeconomic Variables

Pre-Estimation Test

Lag length for the study employed several key criteria commonly used in time series analysis (see Table 3). These criteria, namely the Log-Likelihood (LogL), Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Criterion (SC), Hannan-Quinn Criterion (HQ), played a pivotal role in guiding our selection process (Baranowski et al., 2019; Bertrand et al., 1988; Fryzlewicz, 2014; Hannan & Quinn, 1979; Harville, 1974; Quinn, 1980). The primary goal was to identify the lag order that would yield the most suitable model for SVAR analysis.

A comprehensive analysis of these criteria led the study to a consensus: the optimal lag length for the study is one, denoted as 'p = 1.' This choice was grounded in the favorable outcomes across these criteria, collectively pointing towards lag 1 as the most appropriate choice. FPE serves as a crucial indicator of a model's predictive performance. Lower FPE values imply superior predictive accuracy. Thus, the declining trend in FPE values as the lag order increased clearly indicated that lag 1 was a strong candidate, offering enhanced predictive power.

AIC seeks to strike a balance between model fit and complexity, penalizing overly complex models. The consistent decrease in AIC values with increasing lag order strongly suggested that lag 1 was a favorable choice in terms of model fit. Similar to AIC, SIC discourages excessive model complexity. The decreasing SIC values as we considered higher lag orders mirrored the trend seen in AIC, affirming the appeal of lag 1 from the standpoint of model fitting. HQ, like AIC and SIC, emphasizes the importance of a

parsimonious yet accurate model. Its decreasing value with increasing lag order underscored the credibility of selecting lag 1.

Table 3: VAR Lag Order Selection Criteria for Financial Development Shocks and Macroeconomic Variables

Lag	LogL	LR	FPE	AIC	SC	HQ
0	3181.1560	NA	9.00e-21	-29.1299	-29.0367	-29.0923
1	3593.475	798.1599*	2.85e-22*	-32.5823*	-31.9302*	-32.31897*
2	3604.9888	21.6532	3.57e-22	-32.358	-31.1467	-31.8685
3	3629.2476	44.2889	3.98e-22	-32.25	-30.4801	-31.5351
4	3643.3365	24.9465	4.89e-22	-32.049	-29.7202	-31.1083
5	3653.7892	17.9326	6.21e-22	-31.8146	-28.9269	-30.6482
6	3674.2860	34.0359	7.22e-22	-31.6724	-28.2257	-30.2802
7	3693.2194	30.3978	8.54e-22	-31.5158	-27.5103	-29.8979
8	3710.7310	27.1510	1.03e-21	-31.3461	-26.7817	-29.5025

Note: *Log-Likelihood (LogL), Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Criterion (SC), Hannan-Quinn Criterion (HQ)*

Source: Author's Computation (2023)

Furthermore, the decision to opt for lag 1 was validated by the Lagrange-Multiplier test (see Table 4), which assessed autocorrelation within the chosen lag order (Breusch, 1978; Breusch & Pagan, 1979). The test revealed that the null hypothesis of no autocorrelation was not rejected. This outcome holds significant implications—it signifies that the VAR model, within which the SVAR model is derived, satisfies the stability conditions.

Table 4: VAR Residual Serial Correlation for Financial Development Shocks and Macroeconomic Variables

Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	19.5584	36	0.9883	0.539	(36, 911.8)	0.9883
2	20.2597	36	0.984	0.5585	(36, 911.8)	0.9840
Null hypothesis: No serial correlation at lags 1 to h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	19.5584	36	0.9884	0.539	(36, 911.8)	0.9883
2	50.6082	72	0.9739	0.6966	(72, 1099.4)	0.9739

*Note: *Edgeworth expansion corrected likelihood ratio statistic.*

Source: Author's Computation (2023)

Moreover, in Figure 4, the graph displays eigenvalues extracted from the reduced form VAR. Notably, all eigenvalues are situated within the unit circle, indicating that the VAR utilized to Construct the SVAR adheres to stability conditions. This is a significant finding in ensuring the reliability and robustness of the SVAR model.

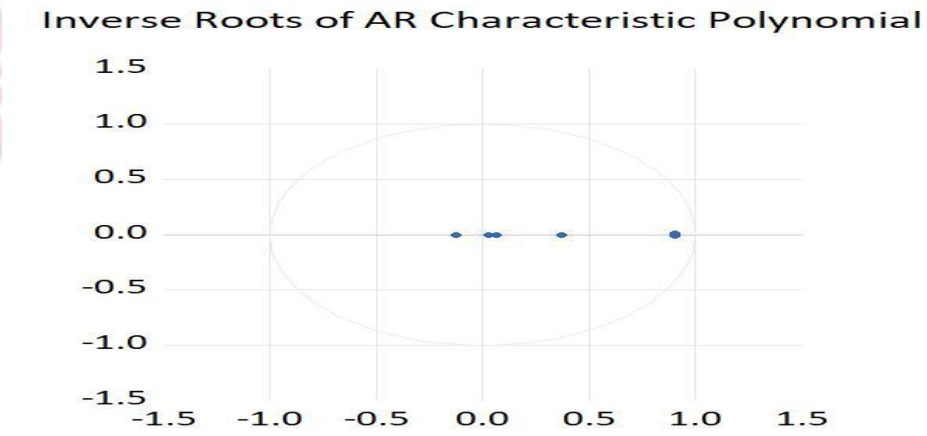


Figure 4: Plots of eigenvalues from the reduced form VAR

Source: Author's Construct (2023)

Thus, the rigorous analysis of various lag order selection criteria, alongside the Lagrange-Multiplier test and Figure 4 consistently pointed to a lag order of four as the most suitable choice for the study. This selection ensures that the SVAR model is grounded in stable and reliable statistical foundations, providing the study with confidence in the analytical results and their implications.

Analysis of SVAR for Financial Development Shocks and Macroeconomic Variables

Figure 5 presents results of the impulse response function from the shocks to financial development in Ghana. It presents the response of exchange rate, output gap, trade openness and inflation rate to financial development shock. The study found that a shock to financial development has an effect on inflation rate, exchange rate, trade openness and output gap during the study period from 2002 to 2020 in Ghana. The effect of the financial development shock is followed by a decrease in the output gap is due to the importance of FINDEV. Though the output gap becomes stable after the second month, it is largely insignificant. The response of the output gap to financial development is interesting. An increase in financial development initially leads to a decrease in the output gap. This could be due to the progressing development financial system in Ghana in facilitating investment and economic growth. As a result, economic output may improve, leading to a narrowing of the output gap (Ghazali & A. Rahman, 2020; Iheonu et al., 2020; Nguyen et al., 2022). However, it's noted that this effect becomes largely insignificant after the second month. This may suggest that while there is an initial positive impact, other factors also affect the output gap in the longer run.

When the financial sector is developed to some extent, it smoothens economic activities hence its impact on output growth through development in the credit channel and exchange rate channel (Abbate & Thaler, 2019; Farajnezhad & Suresh, 2019; Koch, 2011). Financial development increases access to financial services by firms and individuals which in turn also increase access to credit facilities and hence increase in total productivity of a given economy (Alnaa & Matey, 2022; Chowdhury, 2016; Cole & Shaw, 1974; Ha et al., 2022; Peprah et al., 2019).

A positive shock to FINDEV initially leads to an increase in the inflation rate. This could be due to the fact that improved financial development often encourages increased economic activities, investments, and borrowing. As a result, an initial boost in financial development might lead to higher demand and subsequently upward pressure on prices (inflation). Over time, however, the effect on inflation diminishes, indicating that the initial impact is temporary. Inflation is known from prior studies to have a significant relationship with financial development (Almalki & Batayneh, 2015; Bittencourt et al., 2014; Dar & Nain, 2023; Ehigiamusoe et al., 2022; Rousseau & Yilmazkuday, 2009).

Similarly, a positive financial development shock leads to an initial increase in the exchange rate. This might occur because a more developed financial system can attract foreign investments and promote currency stability. In this context, the exchange rate appreciates. However, as with inflation, this effect becomes less significant as time progresses, suggesting that the exchange rate stabilizes after an initial fluctuation (Dabachi et al., 2022; Sehrawat & Giri, 2015).

The study found that the effect of financial development shocks on trade openness is insignificant. This result implies that changes in financial development within the given period do not significantly impact on the degree of trade openness. It could be that other factors, such as government policies or global economic conditions, play a more dominant role in influencing trade openness. The findings are inconsistent with Qamruzzaman and Jianguo (2020) who found that financial development significantly influence trade openness but it is in line to Demetriades and Rousseau (2010) who also postulated that there is no significant relationship between trade openness and financial development.

Overall, these findings suggest that financial development indeed has a noticeable influence on various macroeconomic variables in Ghana, but the magnitude and duration of these effects can vary. Cecchetti and Kharroubi (2013) studied how financial development affects growth at both the country and industry levels. Based on a sample of developed and emerging economies, they found that the level of financial development is good only up to a point, after which it becomes a drag on growth.

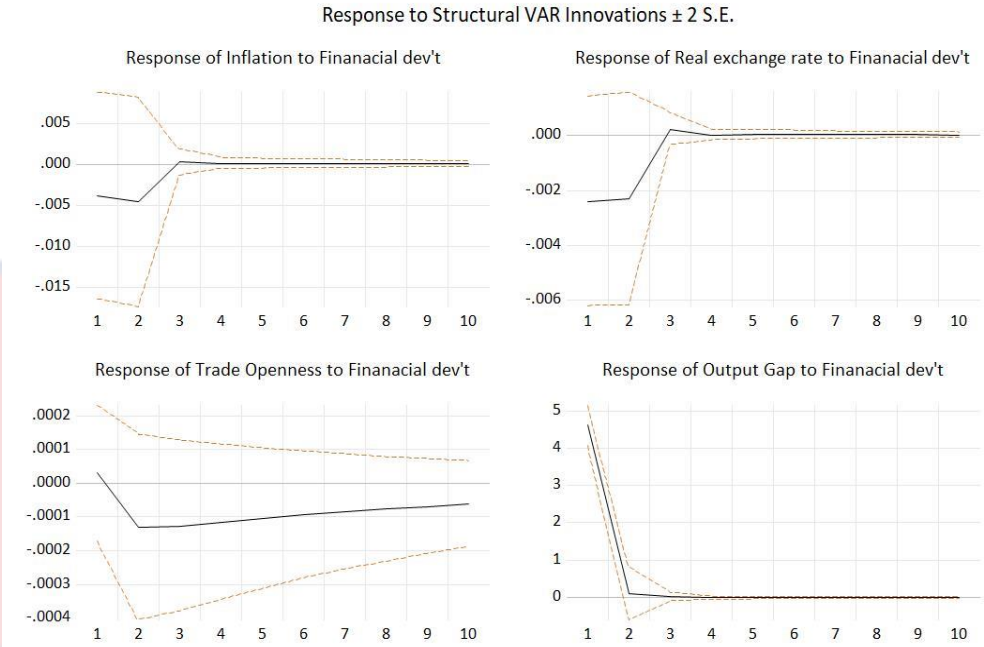


Figure 5: Response of Macroeconomic variables to financial development shock

Source: Author's Construct (2023)

Monetary Policy Rate Shocks on Macroeconomic Variables in Ghana.

Pre-Estimation Diagnostic Test

Table 5 provides the results of various lag order selection criteria used to determine the appropriate lag order for the SVAR model on monetary policy rate shock on macroeconomic variables in Ghana. The results show that lag order selected by LR test is 6, indicating the potential for more complex models. FPE measures the accuracy of future predictions. A lag order of 2 has the lowest FPE. AIC, SIC and HQ suggest a lag order of 2. In this case, the AIC, SC, and HQ all agree on a lag order of 2 as the most suitable. The final choice of lag order should consider the trade-offs between model complexity and goodness of fit, hence a lag order of 2 is appropriate for this analysis.

Table 5: VAR Lag Order Selection Criteria Monetary Policy Rate Shocks on Macroeconomic Variables in Ghana

Lag	LogL	LR	FPE	AIC	SC	HQ
0	899.3480	NA	1.62e-12	-12.9615	-12.8555	-12.9185
1	1044.66235	277.9927	2.83e-13	-14.7053	-14.0689*	-14.4467
2	1099.0672	100.137	1.85e-13*	-15.1314*	-13.9648	-14.6573*
3	1107.6996	15.2629	2.35e-13	-14.8942	-13.1972	-14.2046
4	1123.0772	26.0752	2.72e-13	-14.7547	-12.5279	-13.8496
5	1128.5052	8.81063	3.65e-13	-14.4710	-11.7135	-13.3505
6	1153.467	38.7089*	3.72e-13	-14.4705	-11.1829	-13.1344
7	1168.1139	21.6519	4.42e-13	-14.3204	-10.5023	-12.7689
8	1182.8368	20.6975	5.29e-13	-14.1716	-9.8231	-12.4044

* 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

Source: Author's Computation (2023)

The LM test was also employed to assess residual serial correlation (Breusch, 1978; Breusch & Pagan, 1979). The test statistics (LR) range from approximately 15.20 to 18.24, with degrees of freedom (df) at 25. The associated probabilities are relatively high, ranging from 0.832 to 0.937. Overall, the LM tests consistently demonstrate that there is no significant residual serial correlation in the VAR model. In conclusion, the results of the LM tests suggest that the VAR model used in this analysis meets the assumption

of no residual serial correlation, affirming the reliability of the model's estimates and forecasts.

Table 6: VAR Residual Serial Correlation for Monetary Policy Shocks and Macroeconomic Variables

Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	17.4534	25	0.8646	0.6940	(25, 484.4)	0.8648
2	15.2020	25	0.9365	0.6031	(25, 484.4)	0.9366
3	18.2408	25	0.8319	0.7259	(25, 484.4)	0.8321
Null hypothesis: No serial correlation at lags 1 to h						
Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	17.4533	25	0.8647	0.69409	(25, 484.4)	0.8648
2	44.9427	50	0.6760	0.89603	(50, 573.5)	0.67695
3	71.5586	75	0.5912	0.95179	(75, 579.0)	0.59403

*Note: *Edgeworth expansion corrected likelihood ratio statistic.*

Source: Author's Computation (2023)

Moreover, in Figure 6, the eigenvalue plots derived from the reduced-form VAR reveal a noteworthy pattern. Specifically, all eigenvalues are contained within the unit circle. This observation is indicative of the VAR model's compliance with stability conditions.

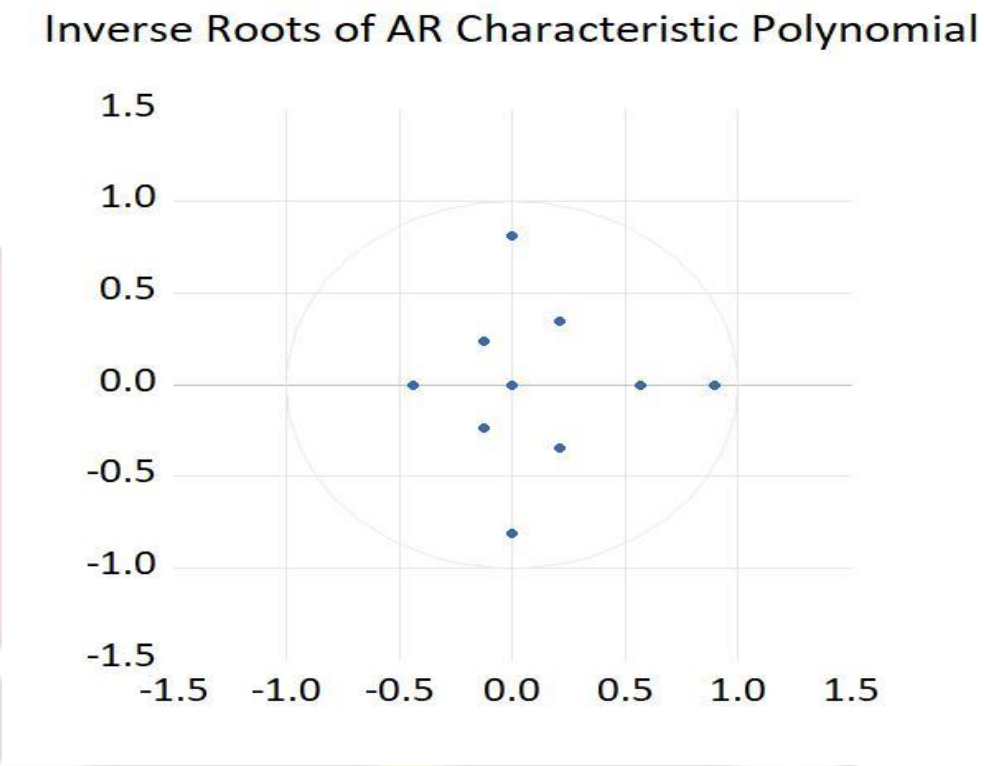


Figure 6: Plots of eigenvalues from the reduced form VAR for monetary policy shocks and macroeconomic variables

Source: Author's Construct (2023)

In conclusion, the pre-estimation tests performed to evaluate the data and model's properties have provided valuable insights. The Lag Order Selection process has contributed to determining the appropriate lag order for the model. Additionally, the Lagrange Multiplier (LM) tests for serial correlation and the examination of eigenvalues in the reduced-form VAR demonstrated the absence of autocorrelation and the model's stability. These positive results suggest that the subsequent estimations and analyses can be conducted with confidence, given the underlying data and model conditions. This comprehensive battery of pre-estimation tests ensures that the model is well-prepared for rigorous and reliable econometric analysis.

Analysis of SVAR for Monetary Policy Shocks and Macroeconomic Variables

The results depicted in Figure 7 illustrate the impulse response functions of monetary policy shocks. In the first three months, a positive shock to the monetary policy rate is found to have a significant influence on the inflation rate. This is in line with standard economic theory. When central banks raise interest rates (a contractionary monetary policy), borrowing becomes more expensive, which can lead to reduced spending and, consequently, a dampening effect on inflation (Bleaney et al., 2020; George, 1994; Ikeda, 2022; Sowa & Abradu-Otoo, 2009). However, this effect diminishes and becomes statistically insignificant beyond the initial three months. This might indicate that other factors or lags in the transmission mechanism of monetary policy start to dominate, and the impact of a single interest rate shock on inflation wanes over time. Fiador (2016) revealed that monetary policy transmission is ineffective in some African countries specifically Ghana, Gambia and Nigeria.

The results suggest that a positive monetary policy shock decreases the exchange rate. This implies that when the central bank raises interest rates, it can attract foreign capital seeking higher returns. This increased demand for the domestic currency can appreciate its value. Nevertheless, the relationship between monetary policy and the exchange rate is found to be statistically insignificant. This lack of significance could be due to various other factors influencing exchange rates, including trade balances, fiscal policies, and global economic conditions, which may overshadow the direct impact of monetary policy changes (Akosah et al., 2020b; Chadha et al., 2004; Lagos, 2011; Obstfeld, 1980; Suriani et al., 2021; Svensson, 1989; Zhang, 2018).

The study reveals that a positive shock to the monetary policy rate has an insignificant impact on the output gap. The output gap represents the difference between actual and potential economic output. The lack of significance suggests that changes in the monetary policy rate do not strongly affect overall economic output in the short term. The results are in contrary with Ma and Lin (2016) who showed that the effect of monetary policy on output and inflation are significant but negatively correlated with financial development. Other factors, such as fiscal policy, consumer and business confidence, and external shocks, may have a more substantial influence on the output gap.

The study indicates that a positive monetary policy shock reduces trade openness significantly in the first two months but becomes insignificant afterward. Trade openness reflects a country's degree of participation in international trade (Ahiakpor et al., 2019). The initial decrease in trade openness could be associated with the appreciation of the domestic currency, which makes exports more expensive and imports cheaper. However, the subsequent insignificance might result from the complex dynamics of trade, including long-term contracts and the adaptability of businesses to exchange rate fluctuations.

This is consistent with the work done by Stephen (2009) on the relationship between changes in monetary policy and the exchange rate in Canada. The work showed a strong and significant negative correlation between the exchange rate and monetary policy by using the DSGE. The insignificant result could be due to the fact that there is always a fluctuation in the exchange rate in Ghana which may be due to the presence of a black market in Forex

trading. This causes a shock to the monetary policy rate to be ineffective with respect to the exchange rate in Ghana.

The impulse response shows that a positive shock to the monetary policy rate insignificantly causes a fall in the output gap in the first two months but later increases significantly by 1.9 % in the fourth month. The output gap thereafter decreases by 1.6 % within the six-month period and become stable from the seven months through to the 24 months.

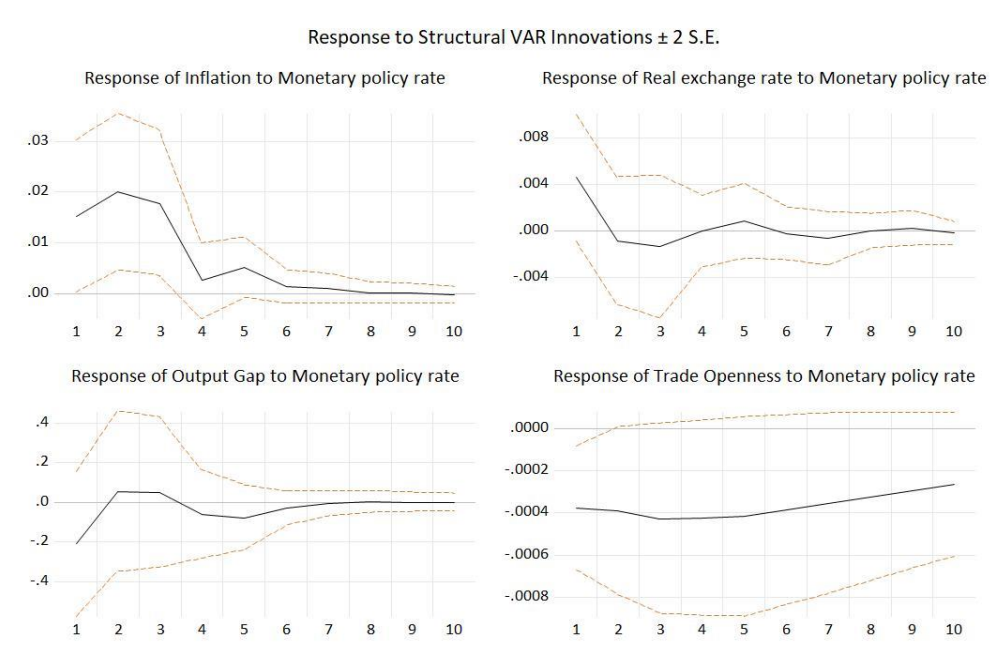


Figure 7: Response of Macroeconomic variables to monetary policy rate shock

Financial Development and Monetary Policy Shock, (Interaction between financial development and monetary policy rate) and Macroeconomic Variables

Pre-Estimation Techniques

Table 7 presents lag order selection criteria for the SVAR model with various endogenous variables. Multiple criteria are employed to determine the optimal lag length for the model. The log likelihood, sequential modified LR test statistic, FPE, and information criteria including AIC, SC, and HQ are

assessed for lag orders ranging from 0 to 8. The results consistently favor a lag order of 2, supported by the lowest values for FPE, AIC, SC, and HQ, indicating this as the optimal choice. This suggests that considering the two previous time periods' values of these variables in the SVAR model strikes a balance between model complexity and goodness of fit, enhancing its suitability for time series analysis.

Table 7: VAR Lag Order Selection Criteria for Interaction between financial development and monetary policy rate Shocks on Macroeconomic Variables in Ghana

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-573.2859	NA	7.99e-06	5.2902	5.3831	5.3278
1	1756.7307	4511.083	6.37e-15	-15.6596	-15.0097	-15.3971
2	2158.2357	755.3427*	2.26e-16*	-18.9976*	-17.791*	-18.5101*
3	2178.0319	36.1574	2.63e-16	-18.8496	-17.0854	-18.1371
4	2203.0028	44.2408	2.92e-16	-18.7489	-16.4276	-17.8114
5	2221.6720	32.0531	3.44e-16	-18.5906	-15.7122	-17.4281
6	2234.1223	20.6936	4.30e-16	-18.3755	-14.9400	-16.9881
7	2250.1591	25.776	5.22e-16	-18.1932	-14.2006	-16.5807
8	2269.2768	29.6804	6.18e-16	-18.0396	-13.4893	-16.2015

* 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

Source: Author's Computation (2023)

Table 8 displays results from the SVAR Residual Serial Correlation LM Tests, evaluating serial correlation in the residuals at different lag lengths for Interaction between financial development and monetary policy rate Shocks on Macroeconomic Variables in Ghana. The first set of tests assesses the null

hypothesis of no serial correlation at a specific lag (h), while the second set explores the hypothesis of no serial correlation at lags from 1 to h. The test statistics are reported alongside degrees of freedom and probabilities (Prob.) for each lag. The results suggest that serial correlation is not significant at lag 1, as indicated by high p-values. However, at lag 3, the p-value becomes smaller, suggesting potential serial correlation, especially when considering multiple lags. The results from the VAR Residual Serial Correlation LM Tests indicate that serial correlation is not significant at lag 2. This means that the residuals from the model do not exhibit a strong pattern of correlation at this lag. The p-value for lag 2 is relatively high, suggesting that the null hypothesis of no serial correlation at this lag cannot be rejected. This is a favourable result because it implies that the model's residuals are relatively independent at lag 2, which is important for reliable parameter estimation.

Table 8: VAR Residual Serial Correlation LM Tests for Interaction between financial development monetary policy rate Shocks on Macroeconomic Variables in Ghana

Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	df	Prob.	Rao F-stat	Df	Prob.
1	35.9836	36	0.4694	1.0005	(36, 885.4)	0.4696
2	28.7067	36	0.8010	0.7949	(36, 885.4)	0.8012
3	50.9876	36	0.0501	1.4296	(36, 885.4)	0.0501
Null hypothesis: No serial correlation at lags 1 to h						
Lag	LRE* stat	df	Prob.	Rao F-stat	Df	Prob.
1	35.9836	36	0.4694	1.0005	(36, 885.4)	0.4696
2	69.9643	72	0.5459	0.9713	(72, 1066.7)	0.5468
3	111.0299	108	0.4014	1.0295	(108, 1090.3)	0.4036

*Note: *Edgeworth expansion corrected likelihood ratio statistic.*

Source: Author's Computation (2023)

Moreover, Figure 8 illustrates the eigenvalue plot derived from the reduced form VAR, where all eigenvalues are situated within the unit circle. This observation signifies that the VAR used to construct the SVAR model adheres to the stability conditions, ensuring reliable results and interpretations.

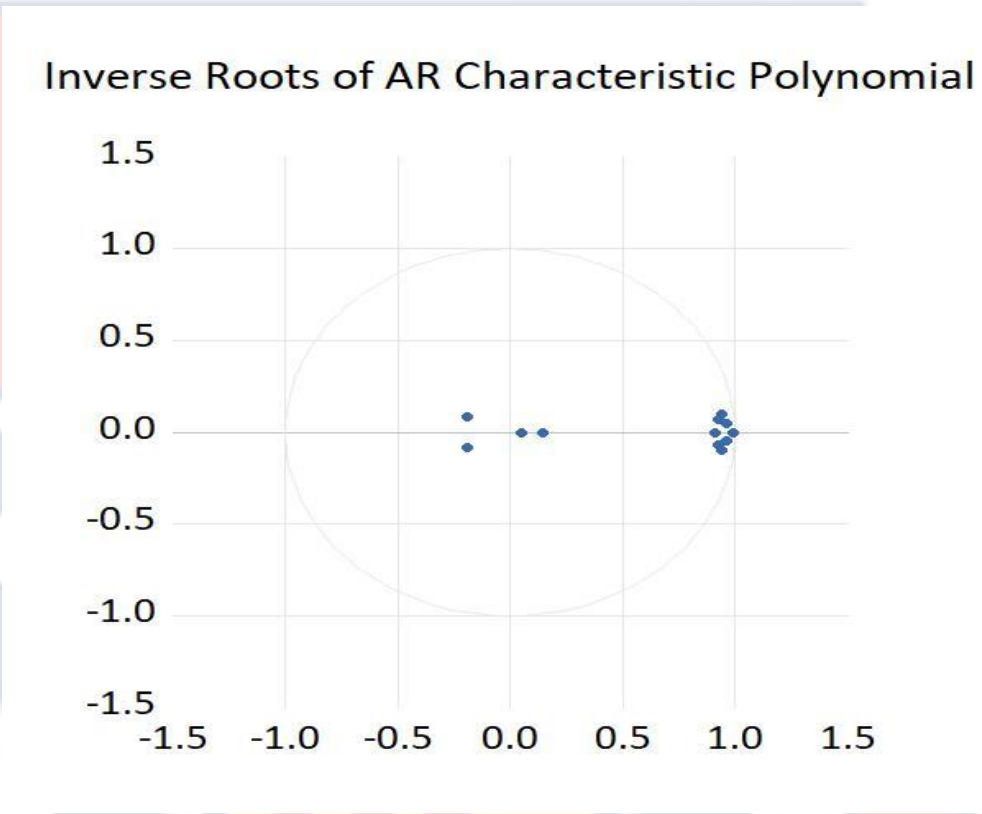


Figure 8: Plots of eigenvalues from the reduced form VAR
Source: Authers own construct

In conclusion, the pre-estimation tests have provided crucial insights into the adequacy and reliability of our chosen modelling approach. The lag selection criteria have helped us determine the optimal lag length for our model, ensuring that the study captures relevant dynamics in the data without overcomplicating the model. The LM tests allowed the study to assess the presence of serial correlation in the residuals, and the results indicate that the model does not exhibit significant serial correlation, thus upholding the validity of the estimated coefficients. Additionally, the eigenvalues derived from the

reduced form VAR have affirmed that the SVAR complies with stability conditions, reinforcing the study's confidence in the forthcoming estimations. These comprehensive pre-estimation tests lay a strong foundation for the robustness and accuracy of our subsequent analysis and interpretation of the SVAR model.

Analysis of SVAR for Financial Development and Monetary Policy Shock, (Interaction between financial development and monetary policy rate) and Macroeconomic Variables

The results presented in Figure 9 suggest that the interaction between financial development and monetary policy plays a role in shaping various economic indicators over time. Thus, the section examined the possible effect of simultaneous shock of both financial development and monetary policy on some key variables. The response of inflation (in the first quadrant of Figure 9), exchange rate (in the second quadrant of Figure 9) and trade openness (in the third quadrant of Figure 9) and output gap (in the fourth quadrant of Figure 9) can be seen in Figure 9.

A simultaneous shock from the interaction between financial development and monetary policy leads to a rapid decrease in inflation during the initial two months, followed by a more gradual decline. This pattern suggests that a coordinated effort to boost financial development and implement appropriate monetary policies can effectively combat inflation. The significance of this relationship underscores the importance of monetary policy in controlling price levels. The results are in with Sena et al. (2021) who showed that in Ghana, financial development strengthens the effectiveness of monetary policy. This is contrary to studies by Effiong et al. (2020); Mishra and Montiel

(2013) and Batuo and Mlambo (2012) who conducted similar studies in developing economies – Africa and sub-Saharan Africa.

After a positive shock from the interaction term between financial development and monetary policy, the output gap initially rises in the first month. This could be attributed to increased economic activity and investment resulting from improved financial development and accommodative monetary policies. However, this effect is short-lived, and the output gap begins to decline after the second month. The significance up to the tenth month indicates that these policies can have a positive impact on the output gap but might not sustain it over the long term. The study results are in contrary to Ahiakpor et al. (2019) who interacted trade openness with monetary policy and found that monetary policy was ineffective in dealing with output gap in Ghana. Similarly, Fiador (2016) posited that monetary policy transmission in West African countries, Ghana, Gambia and Nigeria was ineffective. Nonetheless, the results of this current study have showed that when there is a well-developed financial sector, monetary policy will translate to the economy effectively.

The results show that a positive shock from the interaction between financial development and monetary policy leads to an increase in trade openness. This suggests that when these policies work in tandem, they can stimulate international trade. However, the relationship becomes insignificant after the sixth month, indicating that the impact on trade openness might be temporary. It's important for policymakers to understand the dynamics of this relationship for effective trade policy planning. In line with prior studies Apanisile and Osinubi (2020) showed that financial development has a positive

effect on monetary policy transmission in an economy as it is the most active channel to stabilise prices.

In contrast to the other variables, the interaction between financial development and monetary policy does not show a significant relationship with the exchange rate. This implies that these policies, as studied, do not have a substantial impact on the exchange rate. Although the result is insignificant a positive shock from the interacted variable causes a decrease in the exchange rate. Improved financial development often contributes to the stability and attractiveness of a country's financial markets, attracting foreign investments and capital inflows. This increased demand for the local currency exerts upward pressure on its exchange rate. Conversely, accommodative monetary policies, characterized by lower interest rates, may attract investment in the domestic currency but simultaneously lower relative returns on domestic assets, potentially discouraging foreign capital inflows and exerting downward pressure on the exchange rate. The outcome is the interplay of these forces, which are influenced by various economic factors. The result's statistical insignificance suggests that these dynamics are not strong or consistent enough to provide a definitive conclusion about their impact on exchange rates.

The results imply that the degree of financial sector development is considered important in explaining monetary policy effectiveness as the efficacy of monetary policy crucially depends on the structure and condition of the financial system (Carranza et al., 2010a; Ma & Lin, 2016; Mishra et al., 2012). Also, findings from Abdul Karim et al. (2021) revealed that the level of monetary policy effectiveness differs across countries based on the role of financial development. They further elaborated that though Malaysia and

Singapore are developed, the level of effectiveness of monetary policy is reduced in Malaysia (negative relationship) but more effective in Singapore. Basa et al. (2019) showed a negative significance between financial development (proxied as liquid liabilities and stock market capitalisation) and the effectiveness of monetary policy (gross fixed capital formation) indicating that a more developed financial sector hinders the effectiveness of monetary policy just as in Karim et al. (2020).

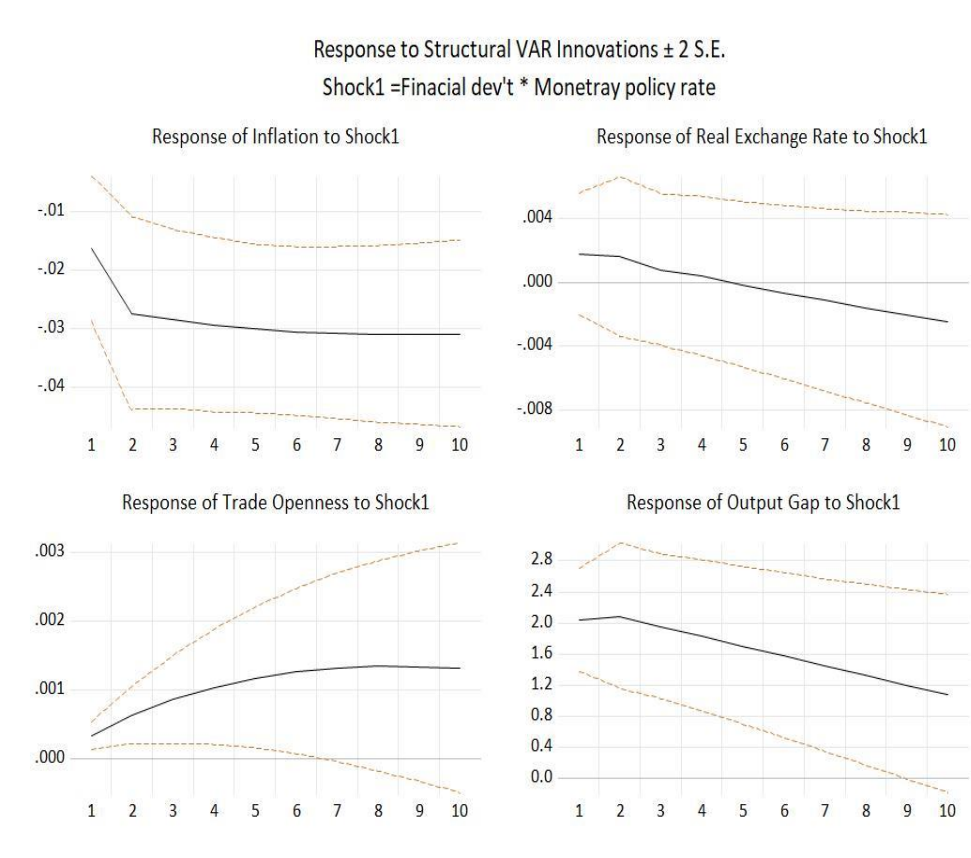


Figure 9: Response of Macroeconomic variables to shocks of interaction between financial development and monetary policy rate

Source: Author's Computation (2023)

Level of financial development in Ghana influences the effectiveness of monetary policy

The results showed that financial development plays a pivotal role in enhancing the effectiveness of monetary policy in various ways, especially

concerning inflation, output gap, and trade openness (Ahiadorme, 2022; Effiong et al., 2020; Ghossoub & Reed, 2017; Ho, 2022; Krause & Rioja, 2006; Ma, 2018; Ma & Lin, 2016; Oyadeyi, 2023; Sena et al., 2021; Seth & Kalyanaraman, 2017). Financial development, particularly the development of a well-functioning banking and financial system, can aid in better controlling inflation (Carranza et al., 2010a; Effiong et al., 2020; Kusairi et al., 2019; Ma & Lin, 2016). As banks and financial institutions become more sophisticated and efficient, they can more effectively channel funds from savers to borrowers (Angelopoulou et al., 2014; Apanisile & Osinubi, 2020; Fiador et al., 2022; Fiador, 2016). This efficient allocation of capital can reduce the liquidity overhang, leading to less pressure on prices. The Quantity Theory of Money suggests that a well-developed financial system can influence the velocity of money and subsequently impact inflation (Dimand, 2013; Ongan et al., 2022; Pinter, 2022; Vatsa & Mixon, 2022). A stable financial system can also help implement inflation-targeting policies more effectively, as central banks can rely on more accurate information and better transmission mechanisms to manage inflation expectations (Abango et al., 2019; Bleaney et al., 2020; Klutse et al., 2022; Ryczkowski, 2021; Tweneboah & Alagidede, 2019; Wasserfallen, 2019).

Financial development can have a substantial impact on the management of the output gap, which is the difference between actual and potential output. A well-developed financial sector allows firms and households to access financing more easily (Cole & Shaw, 1974; Finance, 2003; Fry, 1978; Peprah et al., 2019). When interest rates are lowered to stimulate economic activity, as part of expansionary monetary policy, developed financial markets ensure that

these rate cuts are effectively transmitted to consumers and businesses (Alnaa & Matey, 2022). The Credit Channel Theory suggests that an efficient financial system can improve the transmission of monetary policy through lending, thereby impacting real economic activity (Abbate & Thaler, 2019; Farajnezhad & Suresh, 2019; Koch, 2011). As a result, a well-developed financial sector is a crucial element in implementing monetary policy geared towards reducing the output gap.

Financial development can also enhance the effectiveness of monetary policy concerning trade openness and exchange rates (Bilquess et al., 2011; Dabachi et al., 2022; Demetriades & Rousseau, 2010). In an open economy, monetary policy decisions can influence exchange rates nonetheless the study's results showed that exchange rate insignificantly receive from the interacted term for financial development and monetary policy. A well-developed financial sector can make the exchange rate more responsive to monetary policy actions, as financial markets efficiently process information (Abdul Karim et al., 2021; Basa et al., 2019; Fang & Jiang, 2016; Jiang et al., 2022).

In conclusion, financial development is a critical determinant of how effectively monetary policy can achieve its objectives. The intuitive link between a developed financial sector and monetary policy effectiveness is supported by empirical results from this study. When financial markets are robust and well-functioning, monetary authorities are better equipped to manage inflation, control the output gap, and influence trade openness, ultimately contributing to economic stability and growth.

Chapter Summary

This chapter examine the role of financial development in the effectiveness of monetary policy in Ghana. The data analysis technique employed for this objective is SVAR. The findings demonstrated that the level of financial sector development is thought to be significant in explaining the effectiveness of monetary policy, since the structure and state of the financial system play a critical role in monetary policy's effectiveness. Inflation and output gap receives significant shock from the interaction between financial development and monetary policy rate. However, the exchange rate was not significantly influenced by a shock from interaction between financial development and monetary policy rate.

CHAPTER FIVE

GOVERNMENT DEBT, TRADE OPENNESS, AND FINANCIAL DEVELOPMENT

Introduction

This chapter furnishes the outcomes regarding the impact of public debt, also referred to as total debt, on financial development in Ghana. The presentation commences with a depiction of the variables' descriptive statistics, followed by unit root tests encompassing the Augmented Dickey-Fuller (ADF), Philips Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests to assess the stationarity of these variables. Subsequently, the chapter delves into the bound tests and stability examinations. The study results are unfolded in a two-fold manner. Initially, it treats total debt as a unified entity within the Autoregressive Distributed Lag (ARDL) model. And for the purpose of policy implementations total is then decomposed into its constituents, namely domestic debt and external debt, and employs a distinct ARDL model. Conclusively, a Dominance Analysis is presented, encompassing both the total debt model and the disaggregated total debt model, to elucidate the relative significance of the various independent variables in elucidating shifts in financial development.

Descriptive Statistics

Table 9 presents descriptive statistics for various economic variables employed in for the objective two. The data used spans from the years 2002 to 2020, similar to the period used for the first objective. Nonetheless, the researcher sees it fit to present a different descriptive because of the introduction of some new variables. The Remittances variable represents personal remittances received in current US dollars.

Table 9: Descriptive Statistics

	Mean	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera
REMIT	1.69E+09	4.98E+09	45318341	1.63E+09	0.354168	1.553156	23.35588***
REER	89.36757	113.1575	57.53042	13.28889	-0.08336	2.054378	8.297992**
TRDOPEN	0.237752	0.328361	0.168967	0.043559	0.523614	2.358547	13.57333***
MPR	18.22037	27.50000	12.50000	4.331813	0.624319	2.232973	19.32683***
INF	14.35444	33.60000	5.530000	5.541639	1.404786	5.645024	134.0086***
FINDEV	0.120029	0.175957	0.090684	0.024206	1.278044	3.280206	59.50887***
DOM_DEBT	21.61453	32.91122	7.975026	6.169808	-0.2046	2.116628	8.530043**
EXT_DEBT	19.28554	33.50000	6.713029	8.562500	-0.03806	1.476352	20.94567***
GDPGRTH	6.195626	14.04712	0.513942	2.536815	0.727441	3.927679	26.79540***
TOT_DEBT	40.90002	61.69000	19.45558	11.62636	0.007476	1.712509	14.92070***

Note: Remittances (REMIT); Real Effective Exchange Rate (REER); Trade Openness (TRDOPEN); Monetary Policy Rate (MPR); Inflation rate (INF); Financial Development (FINDEV); Domestic Debt to GDP (DOM_DEBT); External Debt to GDP (EXT_DEBT); GDP Growth (GDPGRTH); Public Debt to GDP (TOT_DEBT)

Source: Author's Computation (2023)

The mean amount received is approximately 1.69 billion US dollars. The data range is substantial, with remittances ranging from a minimum of approximately 45.3 million to a maximum of nearly 4.98 billion US dollars. The standard deviation is relatively high, indicating significant variability in the amount of remittances. This suggests as indicated in prior studies that remittances play a crucial role in Ghana's economy, and their volatility could impact economic stability and growth (Adu-Darko & Aidoo, 2022; Peprah et al., 2019). The mean Real Effective Exchange Rate (REER) value is around 89.37. The REER is an important indicator of a country's international competitiveness (Kyereme, 2010; Nchor & Darkwah, 2015; Saidi et al., 2021; Umoru et al., 2023).

Trade Openness (TRDOPEN) has a mean value is approximately 0.238, indicating that exports play a significant role in Ghana's economy. The low standard deviation suggests relative stability in the trade openness ratio over the period, which can be seen as a positive aspect for Ghana's international trade stability. The mean monetary policy rate (MPR) is around 18.22. This rate reflects the cost of borrowing or the return on savings and plays a vital role in economic activities. The variation, as indicated by the standard deviation, shows fluctuations in monetary policy rates during the period.

The mean inflation rate (INF) is approximately 14.35. Inflation measures how the general price level of goods and services changes over time. As such as moderate standard deviation suggests some stability in the inflation rate. Financial Development (FINDEV) mean value is approximately 0.12, reflecting the level of financial development in Ghana. The low standard deviation indicates relatively stable financial development. GDP Growth

(GDPGRTH) has a mean GDP growth rate of approximately 6.2%, with a median of 5.9%. A positive skewness indicates that there are more observations on the left side of the mean, which suggests that there might be more years with lower GDP growth than with higher growth.

Domestic Debt to GDP **(**DOM_DEBT**)** variable represent the ratio of domestic debt to GDP. The mean value is 21.61, indicating stability in this ratio over the years. It suggests that Ghana has maintained a relatively constant level of domestic debt relative to its GDP. External Debt to GDP **(**EXT_DEBT**),** similar to the previous variable, represents the ratio of external debt to GDP, with a relatively stable ratio. It has a mean of 19.28 with a minimum of 6.71 and 33.5 as maximum. TOT_DEBT which is public debt to GDP ratio has a mean of around 40.9. It's essential for assessing a country's fiscal health, and the standard deviation indicates some variability in this ratio.

Skewness measures the degree and direction of asymmetry in the distribution of data (Royston, 1982). A positive skewness indicates that the data is skewed to the right, with a long tail on the right side. Conversely, a negative skewness suggests a left-skewed distribution, with a long tail on the left side.

In Table 9 variables such as INF and TOT_DEBT exhibit positive skewness. This means that these variables have more observations on the lower end of their respective ranges, and there are occasional extreme values on the higher side. On the other hand, the variable TRDOPEN shows negative skewness, indicating more observations with a higher ratio of trade openness to GDP. This suggests greater stability and fewer extreme values.

Kurtosis measures the "tailedness" of a distribution, indicating whether the data has heavier or lighter tails compared to a normal distribution (Royston, 1982). INF, FINDEV, and GDPGRTH have positive kurtosis. This means that these variables have heavy tails, suggesting a higher likelihood of extreme values. REER shows negative kurtosis, suggesting lighter tails and fewer extreme values. Table 4 provides the Jarque-Bera statistic tests the hypothesis of normality for all the variables used in the study (Jarque & Bera, 1980). For most variables, it indicates normality, as the p-values are very low (not significantly different from a normal distribution).

Unit Root Test

The study employed the Augmented Dickey-Fuller (ADF), Philip Peron (PP) test and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) with constant and trend options to test the stationarity of each variable (see Table 10). The goal is to determine whether or not I (2) variables exist in order to separate real findings from fake outcomes. Because of this, unit root tests were carried out to look at the data's stationarity characteristics prior to using the ARDL approach, even though the ARDL approach employed are not affect by I (1) variables. As a result, the ADF, PP and KPSS test were applied to all the variables in levels and in the first difference in order to formally establish their order of integration.

Table 10 presents the results of unit root tests conducted using three different statistical tests: the ADF test, PP test, and KPSS test, with both constant and trend values. The test statistics are presented for ADF, PP, and KPSS at both the level and first difference, along with the respective p-values in parentheses. The results of ADF and the PP test for unit root with intercept and trend in the model for all the variables are presented in Tables 10. The null

hypothesis is that the series is non-stationary or contains a unit root. The rejection of the null hypothesis is based on the MacKinnon (1996) critical values as well as the probability values for both the ADF and PP.

Table 10: Unit Root Test

	PP Test		ADF Test		KPSS	
	level	First Difference	Level	First Difference	level	First Difference
FINDEV	*-1.6399*	-14.2832***	-1.473	-14.2639***	0.3614***	0.0480
DOM_DEBT	*-1.2069*	-13.9537***	-2.7445	-3.8704**	0.2637***	0.0631
EXT_DEBT	*-3.3421**	-19.504***	-3.2315*	-4.2016***	0.1476**	0.0465
TOT_DEBT	*-1.8612*	-16.6204***	-2.4719	-3.7156**	0.2159**	0.0541
INF	*-2.7388*	-14.8839***	-2.6743	-14.8581***	0.1086	0.0415
MPR	*-2.1212*	-15.9811***	-2.0982	-4.9846***	0.2272***	0.1516
REMIT	*-1.6029*	-6.7662***	-1.9085	-5.4665***	0.1872**	0.0844
REER	*-2.1849*	-16.082***	-2.3162	-9.6312***	0.2314***	0.0562
TRDOPEN	*-1.8685*	-3.4295*	-2.922	-3.3645*	0.1337*	0.0952

Notes: *(*) Significant at 10%; (**) Significant at 5%; and (***) Significant at 1%. Probability of ADF and PP are based on MacKinnon (1996) one-sided p-values and Probability of KPSS are on Kwiatkowski-Phillips-Schmidt-Shin (1992, Table 1). Lag Length are based on AIC. Financial Development (FINDEV); Domestic Debt to GDP (DOM_DEBT); External Debt to GDP (EXT_DEBT); Public Debt to GDP (TOT_DEBT); Inflation rate (INF); Monetary Policy Rate (MPR); Remittances (REMIT); Real Effective Exchange Rate (REER); Trade Openness (TRDOPEN)*

Source: Author's Computation (2023)

In Table 10, all the variables were stationary at first difference having test statistics and p-values that reject the null hypothesis of non-stationarity in their first differences for PP and ADF and p-values not being able to reject the null hypothesis for KPSS (Fuller, 1976; Kwiatkowski et al., 1992; Phillips & Perron, 1988). This means that these variables are likely stationary after differencing and can be used in time series analyses.

It is therefore clear from the unit root results discussed above that all the variables are integrated of order zero, I(0), or order one, I(1). Since the test results have confirmed the absence of I (2) variables, the ARDL methodology is used for estimation (Pesaran et al., 2001).

Empirical Results

The empirical findings of this study are presented in two distinct sections. Initially, the Linear Autoregressive Distributed Lag (ARDL) model is introduced, focusing on the analysis of total debt. Subsequently, another Linear ARDL model is employed to explore the dynamics of disaggregated debt components. In both cases, pre- and post-estimation tests are conducted and reported to ascertain the validity and robustness of the results.

Cointegration analysis for the Total debt Model

It is imperative to examine the presence of a long-term equilibrium relationship among the variables employed in the total debt model using the bounds test for cointegration (see Table 11). From a statistical perspective, a long-term relationship between variables signifies that these variables exhibit a tendency to move together over time, thereby correcting short-term disturbances arising from their long-term trends. The existence of a cointegrating relationship among two or more variables implies the presence of an error correction

mechanism (Davidson et al., 1993). This mechanism entails the utilization of lagged residuals from the cointegrating regression. It serves as a crucial indicator of the speed at which the model adjusts back to equilibrium following an external shock. In this context, it is anticipated that the error correction term will exhibit a significant negative coefficient, reflecting the system's adjustment toward equilibrium (Granger & Yoon, 2002; Shahbaz et al., 2012; Yacour et al., 2022). This analytical approach is particularly pertinent in economic research and modeling.

Table 11: Bounds Test Results for Cointegration for Total Debt

Test Statistic	Value	K
F-Statistic	4.75	7
Critical Value Bounds		
Significance	I(0) Bound	I(1) Bound
10 %	1.92	2.89
5%	2.17	3.21
1%	2.73	3.9

Note: *Critical values are obtained from Narayan (2004); denotes statistical significance at the 5% level and K is the number of regressors.*
Source: Author's Computation (2023)

To determine the long-run relationship, the F-statistics test shows the joint null hypothesis that the coefficients of the lagged levels are zero. In order words, there is no long run relationship between them. Finding the presence or absence of long-term cointegration among the variables is the main purpose of the F-test. The F-statistics are contrasted with Pesaran at a lower and upper critical values (2001). Whereas the upper bound's critical value presupposes that the explanatory variables are integrated of order one, or I(1), the lower bound's

critical value assumes that they are integrated of order zero, or I(0). The FINDEV dependent variable in the ARDL regression yielded the computed F-statistics, which are shown in Table 11.

The joint null hypothesis of lagged level variables (i.e. variable addition test) of the coefficients is zero and is rejected at 5 % significance level as depicted in Table 11. This is because the calculated F-statistics for FLPINV (.) = 4.75 (for Table 11) exceeds the upper bound of the critical value of band (3.9). Therefore, the null hypothesis of no cointegration (i.e. long run relationship) between the dependent variables and the independent variables is rejected. This conforms to previous literature which states that there is a relationship between public debt and financial development (Abbas et al., 2022; Aimola & Odhiambo, 2021; Gomez-Gonzalez, 2021; Hauner, 2009; Ismihan & Ozkan, 2012; Kutivadze, 2013; Neaime, 2015; Pedersoli & Presbitero, 2023). Hence, there is a long-run relationship among the variables employed in the study. The study moved on to assess ARDL results presented in Tables 12.

Total Debt ARDL Model Results

The results from the ARDL estimations are presented in Table 12. The results are presented according to panels in Table 12. Panel A, B and C show long run, short run and ARDL diagnostics respectively.

Table 12: Estimated Coefficients of the Total Debt Model using ARDL

Dependent Variable: FINDEV				
Independent Variable	Coefficient	Std. Err	t-Statistic	P-value
Panel A: Long Run Results				
LOG(TOTAL_DEBT)	0.172090	0.019306	8.913718	0.0000
GDPGRTH	0.009286	0.003926	2.365158	0.0193
MPR	-0.000977	0.002794	-0.349811	0.7270
LOG(REMIT)	-0.143340	0.028123	-5.096974	0.0000
LOG(INF)	-0.044053	0.024269	-1.815183	0.0714
LOG(REER)	0.114717	0.072848	1.574737	0.1173
LOG(TRADOPEN)	-0.145944	0.058739	-2.484638	0.0140
C	-3.680108	0.442184	-8.322580	0.0000
Panel B: Short Run Results				
DLOG(FINDEV(-1))	0.145858	0.071087	2.051831	0.0419
DLOG(FINDEV(-2))	0.143253	0.070924	2.019813	0.0451
DLOG(FINDEV(-3))	0.131867	0.071135	1.853742	0.0657
DLOG(FINDEV(-4))	0.122785	0.070515	1.741259	0.0836
DLOG(TOT_DEBT)	-0.027461	0.010444	-2.629296	0.0094
D(MPR)	-0.000344	0.000884	-0.388752	0.6980
D(MPR(-1))	-0.002386	0.000856	-2.786463	0.0060
D(MPR(-2))	-0.001780	0.000911	-1.954608	0.0524
DLOG(REMIT)	-0.068996	0.020274	-3.403225	0.0008
DUM_1	-0.006110	0.001534	-3.983061	0.0001
ECT(-1)*	-0.085912	0.012818	-6.702389	0.0000
R-squared	0.452871	Mean dependent var		0.001713
Adjusted R-squared	0.419510	S.D. dependent var		0.009016
S.E. of regression	0.006869	Akaike info criterion		-7.062803
Sum squared resid	0.007738	Schwarz criterion		-6.863874
Log likelihood	628.9953	Hannan-Quinn criterion		-6.982112
Durbin-Watson stat	1.979669			
Panel C: LARDL diagnostic			F-statistic	p-value
Breusch-Godfrey Serial Correlation LM Test			0.130855	0.8774
Heteroskedasticity Test: Breusch-Pagan-Godfrey			0.976385	0.4493

Note: Monetary Policy Rate (MPR); Remittances (REMIT); Inflation rate (INF); Real Effective Exchange Rate (REER); Trade Openness (TRDOPEN); Financial Development (FINDEV); Public Debt to GDP (TOT_DEBT) and GDP Growth (GDPGRTH)

Source: Author's Computation (2023)

Results of the Long Run Relationship (Total Debt included)

Table 12 shows the results of the determinants of financial development focusing much on the total debt (the first independent variable). Total debt was estimated to relate positively to financial development. The relationship estimated is also statistically significant at 1 percent. Thus, the findings reveal that all other variables held constant, a percentage increase in total debt leads to a 0.172 percent increase in financial development in Ghana over the period under study. This indicates a strong long-run positive relationship between total debt and financial development in Ghana. This finding is in line with the work of (Abdel-Halim & Al-Assaf, 2022; Kumhof & Tanner, 2013; Kutivadze, 2013) but in contradiction to these studies (Abbas et al., 2022; Chung-Yee et al., 2020; Hauner, 2009).

In addition, Hauner (2008) summarized that a large proportion of public debt absorbed by banks increases their profitability. This is typically illustrated in the lazy bank's hypothesis. According to Mogaka in 2017, the growth of public debt makes the financial market develop but instances where the debt goes beyond a certain amount, it starts having a negative impact on financial market development. The positive relationship between government debt and financial development is explained by crowding in effect which posits that government deficit spending relies mostly on how much the government puts in to increase economic activity (Abbas et al., 2022). An increase in economic activity creates an opportunity for businesses to increase their operations towards profitability. Thus, the private sector crowds in to satisfy increasing consumer needs. This in effect increases financial development.

The positive coefficient suggests that an increase in total debt positively affects financial development. This could be explained by the fact that debt inflows, whether from domestic or external sources, can provide additional capital to the financial sector. This capital infusion can be channelled into various financial activities, leading to the expansion and development of the financial sector. The relationship identified in the study also can be drawn from the financial intermediation theory (Boufateh & Saadaoui, 2021; Isayev et al., 2023; Kumhof & Tanner, 2013). According to this theory, financial intermediaries, such as banks, play a crucial role in allocating funds from savers to borrowers. An increase in total debt can enhance the resources available to these intermediaries, allowing them to provide a wider range of financial services (Pedersoli & Presbitero, 2023). As the financial sector expands, it can better serve the needs of businesses and individuals, leading to improved financial development.

Growth in GDP was estimated to be positive and statistically significant at 5 percent. The results show that all other variables held constant, a percentage increase in GDP growth leads to a 0.93 percent increase in financial development. As the economy grows, a lot of business activities that require the use of money take place. This potentially leads to development in the financial sector since banks and other financial authorities might introduce more lucrative and attractive means of handling finances with the aim of attracting more customers (Asafo-Adjei et al., 2021; Jaiblai & Shenai, 2019; Sehrawat & Giri, 2015).

The monetary policy rate (MPR) had its expected negative sign but was statistically insignificant. This result might imply that the interest rate policy

alone is insufficient to significantly impact financial development. Using the prime rate as a monetary policy signal lowers the response of the rates of lending to the variations in the rates within the money market which also leads to a reduction in how flexible banks perform their financial activities (Ahiadorme, 2022; Bandiera, 2021; Krause & Rioja, 2006; Ma, 2018). Takyi and Obeng (2013) also argued that the high-interest rate charged by the central bank possibly leads to the widening of the spread of the interest rate (thus the difference between the rate of lending and the rate of deposit) of banks. The implication is that the larger banking sector's interest rate spread depresses potential savers because of the low returns found on deposits hence reducing financing for possible borrowers.

Remittances were estimated to be negative and statistically significant at 1 percent. A percentage increase in the remittances leads to a 0.143 percent decrease in financial development in Ghana all other variables held constant. Remittances exhibit a negative and significant coefficient, indicating that higher remittance inflows are associated with lower financial development. Thus, an increase in remittances has the potential of reducing financial development in Ghana over the period under study. This might be counterintuitive but can be explained by the fact that countries with high remittance dependence often have less developed financial sectors since many individuals rely on remittances rather than formal financial services. Remittances in Ghana are mostly for consumption purposes being a detriment to savings. This implies that increase in remittances reduces development in the Ghanaian financial sector. Sobiech (2015) provides evidence for the negative impact of remittances on economic growth. Sobiech's study emphasis the importance of financial sector

development for the remittance-growth relationship. Contrarily Fromentin (2017) revealed a positive long-term relationship between remittances and financial development, coexisting with a short-term positive effect. The study highlights the temporal dynamics of these relationships. Chowdhury (2016) also posited that the impact of Remittances on financial development varies.

Inflation had the expected negative sign and was statistically significant at 10 percent. The results show that all other variables held constant, a percentage increase in inflation, leads to a 0.044 percent decrease in financial development. The value of money reduces with time when inflation is on a rise. This will therefore discourage people from keeping money or financial assets. This is consistent with most of the studies in the literature, for instance, the findings of Takyi and Obeng (2013) and (Bittencourt, 2011) discovered that there exists a negative relationship between inflation and financial development in Brazil. This means that inflation causing macroeconomic instability has a significant adverse influence on financial development in Ghana. Again, theoretically, the result is consistent with McKinnon (1974) theory which explains that price stability is important for intermediation in the financial system and that high rates of inflation deter long-term contracting, moral hazard, and aggravates information asymmetry that hinders financial development.

Real effective exchange rate, in the long run, was estimated not to have any statistically significant effect on financial development in Ghana. Trade openness was estimated to be negative and statistically significant at 5 percent. The findings show that a percentage increase in trade openness leads to about a 0.146 percent decrease in financial development all other variables held constant. Trade openness indicates that more open economies tend to have

lower financial development. This result might be due to the fact that countries with highly open economies may prioritize trade-related activities over financial sector development.

The results are partly in line with the work of (Do & Levchenko, 2004) which suggested that increasing trade openness affects financial development positively or negatively through external finance demand depending on the income levels of the countries. In this context, if the income level of the country is high there is a likelihood of trade openness having a positive impact on financial development. The situation where the financial sectors of the countries have a relatively low-income level is influenced negatively by the increasing trade openness. The work of Baltagi et al. (2009), in testing whether trade openness can explain the pace of financial development, find that trade openness is negatively associated with the degree of financial openness is also in line with this result. In advance, economies' trade openness is likely to have a positive relationship with financial development. This is unlike the case of Ghana (a middle-income country) where the level of financial development is low; this contributes to why trade openness has a negative impact on financial development.

Kim et al. (2012) also examine the relationship between finance, trade, and growth in a group of 63 countries and found that the finance–trade nexus depends on the level of income of the study country. In poorer countries, they reveal the coexistence of the positive impact of finance on trade and the negative impact of trade on finance. This is no exception in the case of Ghana. Most of the work that suggests that trade openness has a positive relationship made use of simple outcome-oriented measure (trade intensity) of trade openness, but this

work made use of the policy-oriented measure. The works that made use of the outcome-oriented measure of openness may miss a critical aspect of openness.

Results of the Short Run Relationshi

Table 12 presents the short-run results in Panel B showing the coefficients of the Error Correction Model (ECM) with a restricted constant and no trend for financial development in Ghana. The findings reveal that in the short run, DLOG (FINDEV (-1)) and the subsequent lagged variables (DLOG (FINDEV (-2)), DLOG (FINDEV (-3)), DLOG (FINDEV (-4)) have positive coefficients. These variables represent the changes in financial development in the previous periods. The positive coefficients indicate that short-term deviations from the long-run equilibrium are corrected in the current period, as shown by the Error Correction Mechanism (ECM). Thus, if financial development was higher than its long-run equilibrium level in the previous periods, it tends to decrease, and vice versa, ensuring convergence to the equilibrium over time. The results suggests that Ghana's financial sector tends to exhibit short-term persistence, meaning that if financial development increased in the recent past, it is likely to continue increasing in the short run. The positive coefficient supports the idea that past improvements in financial development have a lasting impact on the sector's growth. The results are in line with Takyi and Obeng (2013) who posited that lag of financial development of Ghana has a positive relationship with the current.

DLOG(TOT_DEBT) exhibits a negative and significant coefficient, suggesting that an increase in total debt negatively impacts short-term financial development. It implies that high levels of debt might crowd out investments in the financial sector, leading to short-term financial constraints. This could be

attributed to the crowding-out effect, where high levels of debt may lead to less credit available for the private sector, including financial institutions, potentially hampering financial development in the short run. Law et al. (2021) found a negative impact on economic growth (measured as financial development) from public debt. Similarly, Kusairi et al. (2019) found that an increase in public debt does not increase financial development (private consumption). Peprah et al. (2019) also noted that financial development can drag the level of economic growth due to the levels of public debts in Ghana Lastly, Benayed and Gabsi (2020) argue that high public debt is associated with high economic uncertainty and instability which may shake the development of the financial institutions and largely the economy in the short term.

D(MPR), D(MPR(-1)), and D(MPR(-2)) represent changes in the Monetary Policy Rate (MPR) in the current and previous periods. The coefficient for D(MPR) is non-significant, implying that current changes in the interest rate do not have a significant short-term effect on financial development. However, the coefficient for D (MPR (-1)) and D(MPR(-2)) are negative and statistically significant. This implies that a decrease in the monetary policy rate in the previous period is associated with a short-term improvement in financial development, perhaps by reducing borrowing costs and stimulating economic activity. Lower interest rates may encourage borrowing, stimulate investment, and drive economic growth, which positively affects the financial sector. The results are in line with (Najimu, 2019; Takyi & Obeng, 2013) reveal that in the short run interest rate has a negative relationship with financial development.

DLOG(REMIT) has a negative and significant coefficient. The negative and significant coefficient for DLOG(REMIT) suggests that an increase in remittances negatively affects short-term financial development. This may be due to the fact that increased reliance on remittances can reduce the demand for formal financial services in the short run. Also, higher remittances may reduce the need for individuals to access formal financial services, as they have an alternative source of funds (Bhattacharya et al., 2018; Chowdhury, 2016; Sobiech, 2019). As a result, it can lead to a short-term decline in the demand for financial services.

The dummy variable which measures the structural breaks or the crisis in the economy during the study period as expected was estimated to be negative and statistically significant at 1 percent. The financial system was distorted leading to drawbacks in financial development since savings and dealings with the financial systems in the economy were halted. The short run results again revealed that the coefficient of the lagged error term thus ECT (-1) shows the expected negative sign (-0.086) and is statistically significant at 1 percent (Banerjee et al., 1998; Engle & Granger, 1987). The significant error correction term indicates that the disequilibrium caused by previous years shocks converges back to the long-run equilibrium in the current year. The negative and significant coefficient of the error correction term confirms the existence of the co-integration relationship between the dependent variable (Financial development in Ghana) and its independent variables employed in the study**.**

Post-Estimation Test

In Panel C of Table 12, the results reveal a p-value of 0.8774 for the Breusch-Godfrey Serial Correlation LM test, notably exceeding the critical

value of 0.05 (Godfrey, 1978). This finding affirms the absence of autocorrelation in the total debt ARDL model. Furthermore, the heteroscedasticity test produces a p-value of 0.4493 for the ARDL model, surpassing the critical value of 0.05, thus indicating homoscedasticity in the model (Breusch & Pagan, 1979). Additionally, Figure 10, depicting the CUSUM and CUSUMSQ plots for the estimated ARDL model, corroborate the absence of structural breaks in the model.

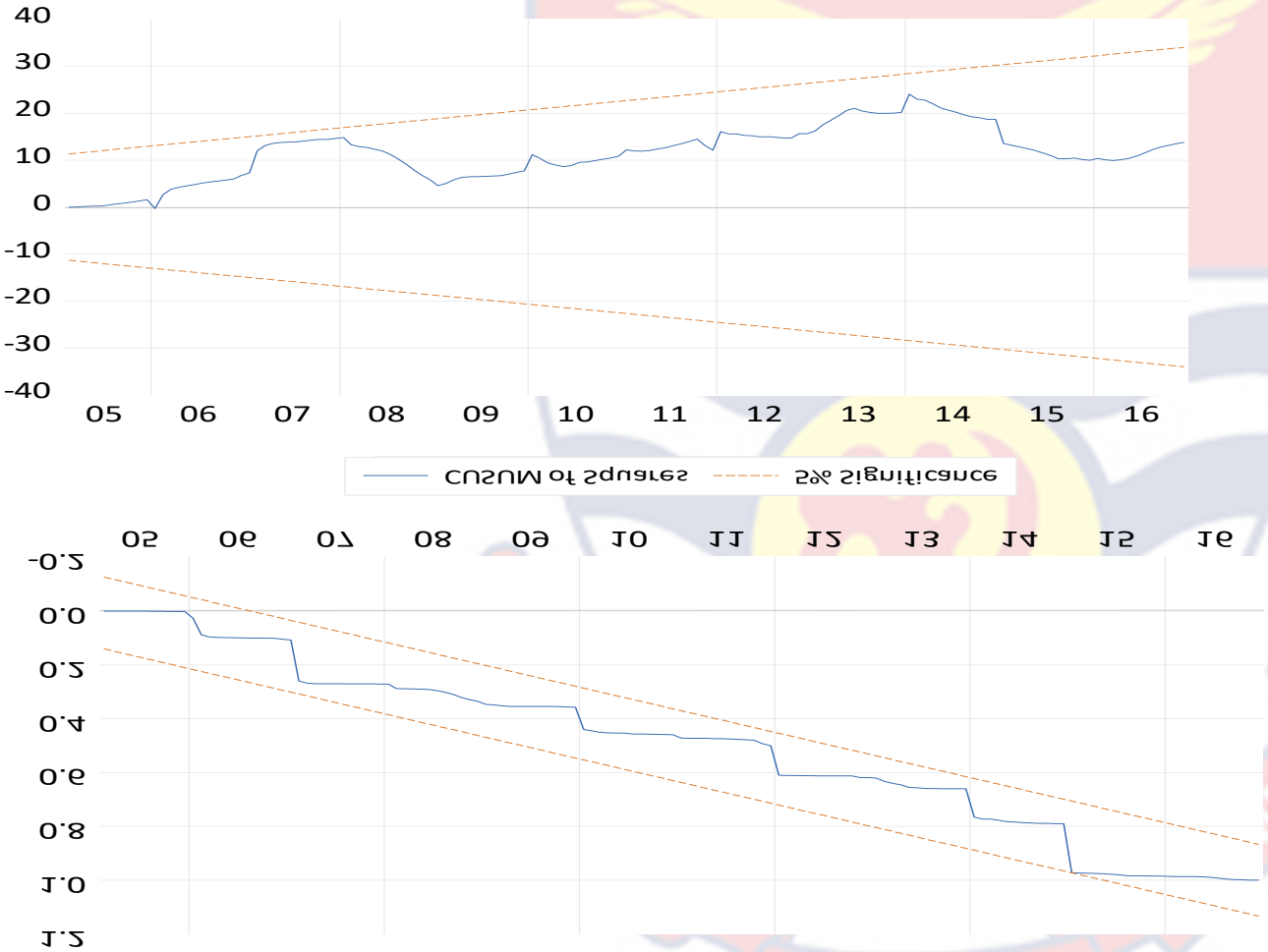


Figure 10: Stability Test

Source: Author's Construct (2023)

ARDL results for Total debt disaggregated into Domestic and External Debt

This section discusses the results of the ARDL for the total debt which was disaggregated into domestic and external debt.

Cointegration analysis for Total debt disaggregated into Domestic and External Debt

The bound test for cointegration results of the ARDL for the variables in the disaggregated total debt model are presented in Table 13. The F-statistics is used to test the joint null hypothesis that the coefficients of the lagged levels are zero (Pesaran et al., 2001). Thus $H_0 = \gamma1 = \gamma2 = \gamma3 = \gamma4 = \gamma5 = \gamma6 = \gamma7 = \gamma8 = 0$ against the alternative hypothesis $H_1 = \gamma1 \neq \gamma2 \neq \gamma3 \neq \gamma4 \neq \gamma5 \neq \gamma6 \neq \gamma7 \neq \gamma8 \neq 0$.

Table 13: Bounds test result for Co-integration for Linear ARDL model.

Test Statistic	Value	K
F-Statistic	4.23	8
Critical Value Bounds		
Significance	I(0) Bound	I(1) Bound
10 %	1.85	2.85
5%	2.11	3.15
1%	2.62	3.42

Source: Author's Computation (2023)

The bound test results in Table 13 show that the computed F-statistics is 4.23 and is higher than the upper and lower bound critical values, co-integration tests affirm that the null hypothesis of no long run relationship among the variables is rejected; hence, there is a long run relationship among the variables (Banerjee et al., 1998; Davidson et al., 1993; Engle & Granger, 1987). The study moved on to assess the disaggregated ARDL results presented in Tables 14.

Disaggregated Total Debt ARDL Model Results

The ARDL model results for the Disaggregated Total Debt are displayed in Table 14, organized into panels for clarity. These panels, labelled A, B, and C, respectively, present findings related to the long run, short run, and ARDL diagnostic aspects of the analysis.

Table 14: Estimated Long and Short -run Coefficients using ARDL (Domestic and External debt)

Dependent Variable: Financial Development				
Independent Variable	Coefficient	Std. Err	t-Statistic	P-value
Panel A: Long Run Results				
LOG(DOM_DEBT)	0.031038	0.027425	1.131726	0.2595
LOG(EXT_DEBT)	0.151540	0.044007	3.443574	0.0007
GDPGRTH	0.009776	0.004061	2.407234	0.0172
MPR	-0.000937	0.003542	-0.264434	0.7918
LOG(INF)	-0.036955	0.027001	-1.368650	0.1731
LOG(REMIT)	-0.188549	0.048717	-3.870252	0.0002
LOG(REER)	0.141378	0.074549	1.896452	0.0598
LOG(TRDOPEN)	-0.088784	0.084150	-1.055070	0.2930
C	-3.695137	0.445863	-8.287611	0.0000
Panel B: Short Run Results				
DLOG(FINDEV(-1))	0.153693	0.067371	2.281305	0.0239
DLOG(FINDEV(-2))	0.151501	0.067060	2.259182	0.0253
DLOG(FINDEV(-3))	0.137334	0.066823	2.055185	0.0415
DLOG(FINDEV(-4))	0.128938	0.065564	1.966588	0.0510
DLOG(EXT_DEBT)	-0.028870	0.008136	-3.548447	0.0005
D(MPR)	-0.000268	0.000872	-0.307879	0.7586
D(MPR(-1))	-0.002009	0.000858	-2.341781	0.0205
D(MPR(-2))	-0.001808	0.000900	-2.008614	0.0463
DLOG(REMIT)	-0.078470	0.020350	-3.856072	0.0002
DUM_1	-0.005489	0.001463	-3.751836	0.0002
C	-0.005489	0.001463	-3.751836	0.0002
ECT(-1)	-0.081101	0.012123	-6.689941	0.0000
R-squared	0.468127	Mean dependent var		0.001713
Adjusted R-squared	0.435695	S.D. dependent var		0.009016
S.E. of regression	0.006773	Akaike info criterion		-7.091082
Sum squared resid	0.007522	Schwarz criterion		-6.892153
Log likelihood	631.4697	Hannan-Quinn criterion		-7.010391
Durbin-Watson stat	1.971073			
Panel C: Diagnostic			F-statistic	p-value
Breusch-Godfrey Serial Correlation LM Test			0.852253	0.5149
Heteroskedasticity Test: Breusch-Pagan-Godfrey			0.8290	0.6699

*Note: ***, ** and * indicates the rejection of the null hypothesis of non-stationary at 1%, 5% and 10% level of significance respectively.*
Domestic Debt to GDP (DOM_DEBT); External Debt to GDP (EXT_DEBT); GDP Growth (GDPGRTH); Monetary Policy Rate (MPR); Inflation rate (INF); Remittances (REMIT); Real Effective Exchange Rate (REER); Trade Openness (TRDOPEN); Financial Development (FINDEV); External Debt to GDP (EXT_DEBT)
Source: Author's Computation (2023)

Results of the Long run relationship (Total debt disaggregated into Domestic and External Debt)

The study makes efforts to disaggregate total debt into domestic and external with the aim of identifying which component affects (and in what direction) development in the Ghanaian financial sector. Thus, after determining how the overall total government debt (comprising both the domestic and external debt) affects financial development (see Table 12).

From Table 14, government internal or domestic borrowing was estimated to be statistically insignificant. The coefficient of 0.0310 is statistically insignificant, suggesting that the level of domestic debt does not have a significant long-term impact on financial development. Thus, this reveals that government debt or borrowing from the domestic economy does not have any significant effect on development in the Ghanaian financial sectors within the study period. The result is consistent with the argument by Shahe Emran and Farazi (2011) explaining that higher government borrowing from banking sector may not have any significant effect on private credit or even crowd in private sector credit. For example, when the banks have excess liquidity, higher lending to the government may not result in any significant reduction of credit to the private sector. It has also been argued that government borrowing might actually induce the banks to undertake relatively more risky private lending because the safe government assets in a bank's portfolio allow it to bear more risk.

The result also implies that domestic debt might not be a primary driver of financial sector development. This finding does not align with the idea that government borrowing can crowd out private investment as posited by Benayed

and Gabsi (2019). Although the current study's results are insignificant it is in contrary to Bui (2018) who found a negative relationship between domestic debt and financial development. İlgün (2016) suggests that government borrowing from domestic banks has negative effect on financial development in the long run. In Turkey, using country-specific data from 2002 to 2012, Altaylıgil and Akkay (2013) adopted regression analysis and reported a negative relationship between public debt (measured as domestic debt to GDP) and financial development (measured as financial aggregate).

Government borrowing from external sources (captured as external debt) was positive and statically significant at 1 percent. The findings indicate that a percentage increase in government external borrowing leads to about a 0.152 percent increase in the Ghanaian financial sector development. This positive relationship suggests that external borrowing may contribute to financial sector development, possibly by increasing the availability of funds for lending and investment. At moderate levels, public debt may increase the economic growth rate, positively affecting financial sector development (Benayed & Gabsi, 2019; Pedersoli & Presbitero, 2023). This implies that since a lot of work stipulates that too much government borrowing is bad, moderate government borrowing will positively impact economic activities which in effect lead to financial development. The external debt result is in line with the findings of Agyapong and Bedjabeng (2020) who posited that external debt has a positive effect on financial development in Africa.

The real effective exchange rate is positive and statistically significant at 10 percent. Thus, all other variables held constant, a percentage increase in the exchange rate led to a 0.141 percent increase in financial development in

Ghana. An increase in the real effective exchange rate implies an appreciation of the local currency (Ghana cedi) which is expected to promote development in the financial sector. As the Ghana cedi becomes stronger (appreciates), domestic inflation reduces. Costs of companies are therefore reduced to increase productivity. Interest rates may be reduced by the government to stimulate demand internally. The opposite effect is also true for the depreciation of the local currency. This explains that an increase in the real effective exchange rate (appreciation of the local currency) boosts financial developments in Ghana. Trade openness was also estimated to be negative and statistically insignificant.

Just as found in the previous estimations, growth in GDP was estimated to be positive and statistically significant at 5 percent. A percentage increase in growth in the gross domestic product leads to about a 0.98 percent increase in financial development all other variables held constant. This again implies that as the economy grows, development in the Ghanaian financial sector is directly affected. This result aligns with the Financial Intermediation Theory. According to this theory, a well-developed financial sector is essential for efficient capital allocation, and economic growth is positively related to the depth of the financial system.

Monetary policy rate and consumer price index used as proxies for interest rate and inflation respectively were estimated to be statistically insignificant when government total debt is disaggregated into domestic and external debt. Remittances again were estimated to be negative and statistically significant at 1 percent. All other variables held constant, a percentage increase in remittances leads to about a 0.19 percent decrease in development in the Ghanaian financial sector. Thus, an increase in remittances has the potential of

reducing financial development in Ghana over the period under study since most of the volumes of remittances enter into consumption. Remittances have a negative effect on financial development, possibly because they reduce the demand for domestic financial services.

Results of the Short Run Relationship (Total debt disaggregated into Domestic and External Debt)

Table 14 Panel B, presents the short run estimates of the determinants of financial development in Ghana with total debt disaggregated into domestic and external debts. It was estimated that the coefficients of the lagged values of financial development DLOG (FINDEV (-1)) (DLOG (FINDEV (-2)), DLOG (FINDEV (-3)) and DLOG (FINDEV (-4)) are all positive and statistically significant. This indicates that the financial sector development in the previous periods has a positive impact on the current state of financial sector development. This suggests a persistent and positive relationship over time. Thus, a well-developed financial sector in the past sets a foundation for its further development in subsequent periods. In essence a developed financial sector can efficiently allocate resources and facilitate economic growth.

The coefficient of DLOG(EXT_DEBT) is also negative and statistically significant. This indicates that in the short run, an increase in external debt is associated with a decrease in financial sector development. Thus, high levels of external debt might raise concerns about debt sustainability and credit risk, which could make lenders more cautious, thus negatively affecting the financial sector. In theory this could be related to the risk perception of lenders in an environment with high external debt.

The coefficient of MPR is statistically insignificant but its lags are all statistically significant at 10%, implying that the current or contemporaneous value of the variable doesn't have a statistically significant impact on the financial development, while its past values (lags) do have a significant impact. In simpler terms, the current level of the MPR doesn't seem to influence the financial development significantly in the short run, as indicated by the insignificant coefficient. However, the past values of MPR, represented by its lags, appear to play a more important role in influencing the financial development, as they have statistically significant coefficients. This pattern suggests a lagged effect of monetary policy on financial development. It implies that changes in the MPR might not have an immediate impact but could influence the financial development with a time delay. It's not uncommon for monetary policy changes to affect the financial development with a lag because it takes time for the policy changes to work their way through the economic system. In this context, the significant lags of MPR suggests that its impact on the financial development becomes evident only after some time has passed since the policy changes were implemented. The results are in line with Ho (2022) who found a negative relationship between MPR and financial development.

The coefficient of DLOG(REMIT) is negative and statistically significant. This implies that increases in remittances in the short run are associated with a reduction in financial sector development. High levels of remittances might lead to currency appreciation and reduced lending by banks, which could negatively impact the financial sector. The results could be related

to the Dutch Disease phenomenon, where an influx of foreign currency can harm other sectors of the economy.

The dummy variable measures the crisis (structural breaks) within the Ghanaian economy (therefore the financial system) during the period of study. It was estimated to be negative and statistically significant at 1 percent. This implies that the crisis negatively affected development in the financial system. Again, it is revealed that the coefficient of the lagged error term thus ECT (-1) shows the expected negative sign (-0.081) and is statistically significant at 1 percent (Olayungbo & Quadri, 2019; Qamruzzaman & Karim, 2020; Shrestha & Chowdhury, 2005; Udoh et al., 2021). The significant error correction term indicates that the disequilibrium caused by previous years' shocks converges back to the long-run equilibrium in the current year. The negative and significant coefficient of the error correction term confirms the existence of the co-integration relationship between the dependent variable (Financial development in Ghana) and its independent variables employed in the study.

In the analysis presented in Panel C of Table 14, it is noteworthy that the p-value obtained from the Breusch-Godfrey Serial Correlation LM test is 0.5149. This value significantly exceeds the conventional significance level of 0.05 as outlined by Godfrey (1978). Consequently, we can confidently conclude that there is no evidence of autocorrelation within the ARDL model. Furthermore, the assessment of heteroscedasticity through a dedicated test yields a p-value of 0.6699 for the ARDL model. This result comfortably surpasses the established threshold of 0.05, as proposed by Breusch and Pagan (1979), signifying that the model exhibits homoscedasticity, where the variance of the errors remains constant across the different levels of the independent

variables. Additionally, the graphical representation in Figure 11, which includes CUSUM and CUSUMSQ plots for the estimated ARDL model, further supports the conclusion that the model is devoid of structural breaks or shifts. This verification is pivotal in ensuring the robustness of the model's results.

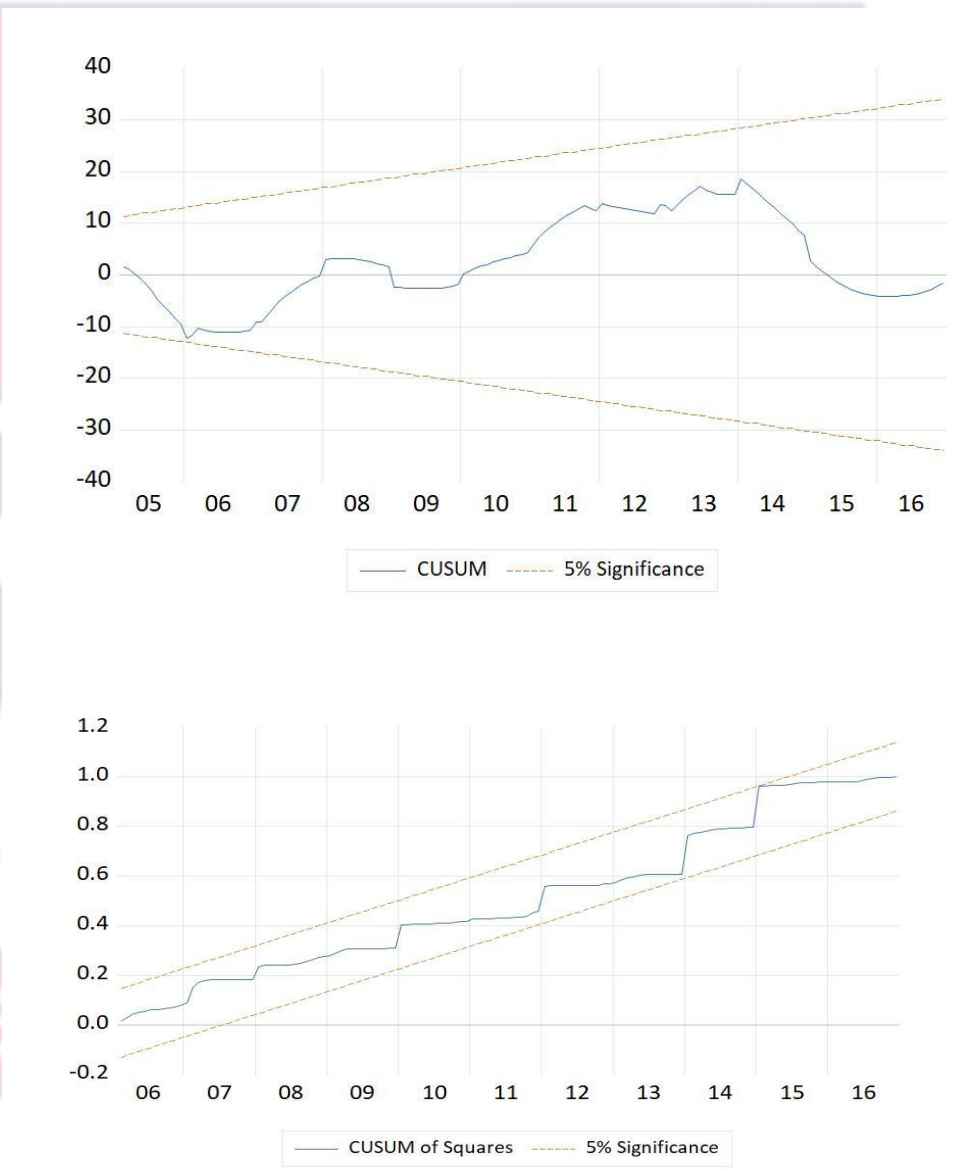


Figure 1: Stability test for the Disaggregated total debt ARDL model
Source: Author's Construct (2023)

Robustness Test from Dominance Analysis

The study employed dominance analysis as a robustness test (Budescu, 1993). Dominance analysis is a valuable tool in assessing the robustness of empirical findings, particularly in the context of regression models and statistical relationships (Azen & Budescu, 2003, 2006; Huo & Budescu, 2009). It allowed the study to explore the relative importance and influence of various independent variables within both models (total debt and disaggregated debt model) (Budescu & Azen, 2004; Luchman, 2021). The goal of the study is to evaluate the dominance relationships among several key variables in the ARDL framework. Understanding which variables conditionally dominate or generally dominate others is essential for comprehending the driving forces behind the observed statistical relationships for policy implications. Such insights can enhance the reliability and validity of the ARDL results, shedding light on which variables have the most substantial impact on the model's outcomes and which relationships persist under different conditions. These dominance assessments provide a robustness test to ensure the consistency and stability of the ARDL model's findings, thereby strengthening the confidence in the reported results for policy implications. The results are presented in Table 15 and Table 16.

Table 15: Results of Dominance Analysis with Financial Development as the dependent variable with Total Debt

General Dominance Analysis			
Regressors	Dominance statistic	Standardized Dominance Statistic.	Rank
TOTAL DEBT	0.5070	0.6410	1
REMIT	0.1480	0.1871	2
REER	0.0770	0.0973	3
TRDOPEN	0.0289	0.0365	4
MPR	0.0187	0.0236	5
GDPGRTH	0.0079	0.0100	6
INF	0.0035	0.0044	7

Note: Remittances (REMIT); Real Effective Exchange Rate (REER); Trade Openness (TRDOPEN); Monetary Policy Rate (MPR); GDP Growth (GDPGRTH); Inflation rate (INF)

Source: Author's Computation (2023)

The results from the General Dominance Analysis provide valuable insights into the relative importance and influence of various independent variables on the dependent variable, which, in this case, is financial development (Budescu, 1993). The dominance statistics, both in their raw and standardized forms, offer a ranking of the explanatory variables based on their contribution to explaining the variation in financial development (Azen & Budescu, 2003, 2006; Huo & Budescu, 2009).

Total debt, with a dominance statistic of 0.5070 and a standardized dominance statistic of 0.6410, emerges as the dominant variable in explaining changes in financial development. This implies that variations in total debt have the most substantial impact on the level of financial development. Thus, higher levels of total debt may indicate increased financial activity, which, in turn, can

affect financial development. Remittances come in second place, with a dominance statistic of 0.1480 and a standardized dominance statistic of 0.1871. This suggests that remittances also play a notable role in influencing financial development, albeit to a lesser extent compared to total debt. Remittances may contribute to the development of the financial sector by increasing household income and, consequently, savings and investments. On another occasion, higher remittances may reduce the need for individuals to access formal financial services, as they have an alternative source of funds as individuals instead of borrowing from banks then decides to keep the funds sent from out from foreign countries. As a result, it can lead to a short-term decline in the demand for financial services.

Real effective exchange rate (REER) and trade openness follow as the third and fourth-ranked variables respectively. They exhibit relatively lower dominance statistics, indicating their comparatively weaker influence on financial development. REER may impact financial development through its effect on international trade and capital flows, while trade openness can promote financial development by fostering economic integration and access to global financial markets. Monetary policy rate (MPR), GDP growth (GDPGRTH), and inflation (INF) are ranked lower in terms of dominance, suggesting that their impact on financial development is relatively limited.

In summary, the dominance analysis underscores the importance of total debt and remittances in explaining variations in financial development, with total debt being the most dominant factor (Abbas et al., 2022; Aimola & Odhiambo, 2021; Gomez-Gonzalez, 2021; Hauner, 2009; Ismihan & Ozkan, 2012; Kutivadze, 2013; Neaime, 2015; Pedersoli & Presbitero, 2023). The

rankings of the other variables provide insights into their respective contributions to the financial development process, allowing for a more nuanced understanding of the factors driving this economic phenomenon.

Table 16: Results of Dominance Analysis with Financial Development as the dependent variable with External and Domestic Debt

General Dominance Analysis			
Regressors	Dominance stat	Standardized Dominance Stat.	Rank
REMIT	0.172	0.223	1
REER	0.169	0.219	2
EXTERNAL DEBT	0.163	0.211	3
DOMESTIC DEBT	0.085	0.111	4
TRADE OPENNESS	0.074	0.096	5
INF	0.064	0.082	6
GDPGRTH	0.026	0.034	7
MPR	0.018	0.023	8

Note: Remittances (REMIT); Real Effective Exchange Rate (REER); Inflation rate (INF); GDP Growth (GDPGRTH); Monetary Policy Rate (MPR)
Source: Author's Computation (2023)

Table 16 provides the results of the Dominance Analysis for financial development, considering both external and domestic debts, and it offers insights into the relative importance of each factor. Remittances (REMIT) hold the highest rank with a raw dominance statistic of 0.172 and a standardized dominance statistic of 0.223. This suggests that remittances significantly influence financial development, indicating that the funds sent by expatriates play a crucial role in fostering the growth of the financial sector.

Real Effective Exchange Rate (REER) follows closely behind, ranking second. It has a raw dominance statistic of 0.169 and a standardized dominance statistic of 0.219. These values indicate that changes in the exchange rate, particularly its real effective value, have a substantial impact on financial

development. A stable or strong currency may contribute to the growth of the financial sector.

External Debt (EXT_DEBT) secures the third rank, with a raw dominance statistic of 0.163 and a standardized dominance statistic of 0.211. These results emphasize the significant influence of external borrowing and debt management on financial development. Domestic Debt (DOM_DEBT) ranks fourth, with a raw dominance statistic of 0.085 and a standardized dominance statistic of 0.111. These values suggest that, within this analysis, the impact of domestic debt on financial development is relatively less significant compared to remittances, the exchange rate, and external debt. This means that when both external debt and domestic debt (Total Debt) are considered together, it has greater relative importance than when they are disaggregated.

Trade Openness (TRADOPEN) holds the fifth rank with a raw dominance statistic of 0.074 and a standardized dominance statistic of 0.096. While trade openness remains an important factor, its relative influence on financial development falls below the top four factors. Inflation (INF) ranks sixth, with a raw dominance statistic of 0.064 and a standardized dominance statistic of 0.082, indicating its impact on financial development. GDP Growth (GDPGRTH) follows as the seventh factor, with a raw dominance statistic of 0.026 and a standardized dominance statistic of 0.034. These values underscore the importance of economic growth in shaping the financial sector.

Monetary Policy Rate (MPR) ranks lowest in this analysis, with a raw dominance statistic of 0.018 and a standardized dominance statistic of 0.023, indicating that it has the least influence on financial development among the variables examined. These results highlight the relative importance of various

factors in shaping financial development. Remittances, represented by REMIT, play a critical role by emphasizing the positive impact of funds transferred from abroad on the growth of the financial sector. The exchange rate, represented by REER, stands out as a crucial determinant, suggesting that exchange rate stability and strength are conducive to financial development.

The significant influence of external debt management on financial development underscores the importance of prudent international borrowing practices. Domestic debt, while still relevant, appears to exert a comparatively lesser influence. Trade openness, inflation, and GDP growth, while essential, are outranked by remittances, exchange rates, and external debt in their relative importance for financial development. Finally, the monetary policy rate ranks as the least influential factor in this context, underscoring its limited role in shaping financial sector growth. These findings provide valuable insights for policymakers and researchers, emphasizing the pivotal roles of remittances, exchange rates, and external debt in promoting financial sector development and stability.

Chapter Summary

The chapter was primarily aimed to assess the factors influencing financial development using the ARDL approach, with a specific focus on public debt. The study also disintegrated public debt into domestic debt and external debt to investigate their individual impacts. The findings revealed the existence of long-run relationships among the variables in both the aggregated and disaggregated models. Unexpectedly, the results indicated that domestic debt did not exert a significant influence on financial development. To validate these results, a robustness check was conducted through dominance analysis,

which identified public debt as the dominant variable in explaining variations in financial development.

CHAPTER SIX

THE RESPONSIVENESS OF COMMERCIAL BANKS TO MONETARY POLICY IN GHANA; THE EXPERTS' OPINION

Introduction

This chapter explores the perception of the respondents who are seen to have an in-depth knowledge in the topic understudy. These respondents include workers at the headquarters of commercial banks (GCB Bank Limited, Fidelity Bank Ghana Limited, Absa, Zenith Bank, Standard Chartered Bank, Ecobank (Ghana) Limited, CalBank Limited, and Consolidated Bank Ghana Limited) who are experts in the area of study especially from credit or risk departments. The questions set for the interview were based on the responsiveness of commercial banks to the policy rate set by the central bank and the extent to which financial development affects the responsiveness of the policy rate by the central bank of Ghana. The study first employed linear ARDL to assess quantitatively the responsiveness of banking sector to monetary policy rate using monthly data gleaned from Bank of Ghana. This was done to help prepare for more informed and structured discussions with experts, ensuring a valuable foundation for the research by establishing a theoretical framework, identifying variables of interest, and providing initial insights. The interviewees were identified by assigning alphabet with numbers to represent their names for the sake of anonymity because of the fact that respondents' views were recorded. Finally, key themes that arose from the interviews were identified and discussed using thematic analysis.

Preliminary Results from ARDL

The study employed the ARDL approach in investigating the responsiveness of commercial banks to monetary policy in Ghana which serves as a foundational step in comprehensive research. The ARDL model establishes a theoretical framework, offering data-driven insights, and identifying key variables that influence bank responsiveness to monetary policy, such as interest rates and reserve requirements. Furthermore, it provides context for expert interviews, enabling validation of findings and fostering focused, in-depth discussions. The historical perspective offered by ARDL's trend analysis can be compared to expert opinions, contributing to a more holistic understanding of how the relationship between monetary policy and commercial banks has evolved over time, ultimately enhancing the quality and depth of research in this critical area.

Descriptive Statistics

Table 17 provides a summary of key statistics for the variables used in this study, offering insights into the data's distribution. The descriptive statistics include the average (mean) value of each variable, the degree of variation from the mean (standard deviation), and the range of values represented by the minimum and maximum values. The mean value represents the typical or average value for each variable, while the standard deviation quantifies the degree of dispersion around the mean. Additionally, the minimum and maximum values highlight the full range of values encompassed by the dataset.

Table 17: Descriptive Statistics

Variable	Mean.	Std. Dev.	Max	Min
ACBL	25.6446	2.5510	29.2200	20.9500
EXC	4.5508	0.6934	5.7100	3.2400
FIN_DEV	0.1690	0.0034	0.1773	0.1619
INF	12.4153	3.7552	18.6000	5.5300
MOMO	18979.3500	15693.6600	67732.3200	1805.9000
MPR	19.9444	4.2414	26.0000	14.5000
NPL	17.5276	3.3323	23.4500	11.1900
PSC	32105.5900	5448.2750	43533.1900	20961.0200

Note: Average Commercial Banks Lending Rate (ACBL); Exchange Rate (EXC); Financial Development (FINDEV); Inflation rate (INF); Mobile Money (MOMO);Monetary Policy Rate (MPR);Non-Performing Loans (NPL); Private Sector Credit (PSC)
Source: Author's Computation (2023)

The descriptive results presented in Table 17 provide valuable insights into the distribution and characteristics of the variables used in this study. These statistics help us gain a better understanding of the central tendencies, variability, and ranges of the data, which are essential for the subsequent analysis and interpretation. Average Commercial Banks Lending Rate (ACBL) has a mean value of approximately 25.6446%, with a standard deviation of 2.5510%. This indicates that, on average, commercial banks in Ghana charge this rate on their loans. The lending rates range from a minimum of 20.9500% to a maximum of 29.2200%, demonstrating a relatively narrow spread in lending rates among banks. Exchange Rate (EXC) exhibit a mean of 4.5508 Ghana Cedis to the US Dollar, with a standard deviation of 0.6934. This suggests that the exchange rate shows moderate fluctuations. The data ranges from a minimum of 3.2400 to a maximum of 5.7100 Ghana Cedis per US Dollar.

The Financial Development Index (FIN_DEV) has an average value of 0.1690, with a low standard deviation of 0.0034. This index reflects the level of financial development in Ghana, with values ranging from 0.1619 to 0.1773.

The limited variability indicates relative stability in financial development over the observed period. Core Inflation (INF) has a mean of 12.4153%, with a substantial standard deviation of 3.7552%. This indicates notable variability in core inflation rates, which have ranged from a minimum of 5.5300% to a maximum of 18.6000%. These fluctuations suggest the importance of understanding the factors driving inflation in the Ghanaian economy.

Total value of mobile money (MOMO) transactions for the month demonstrates a wide range of values. The mean value is 18,979.35 million Ghana Cedis, but the standard deviation is quite high at 15,693.66 million Ghana Cedis. This indicates significant variability in monthly MOMO transaction values, with a minimum of 1,805.90 million Ghana Cedis and a maximum of 67,732.32 million Ghana Cedis. Monetary Policy Rate (MPR) has an average rate of 19.9444%, accompanied by a standard deviation of 4.2414%. This suggests variability in the central bank's policy rate, ranging from a minimum of 14.5000% to a maximum of 26.0000%.

Non-Performing Loans (NPL) have an average rate of 17.5276% and a standard deviation of 3.3323%. NPL rates vary between 11.1900% and 23.4500%, indicating fluctuations in the quality of banks' loan portfolios. Private Sector Credit (PSC) has a mean value of 32,105.59 million Ghana Cedis, with a standard deviation of 5,448.28 million Ghana Cedis. The data spans from a minimum of 20,961.02 million Ghana Cedis to a maximum of 43,533.19 million Ghana Cedis, suggesting substantial variations in the amount of credit extended to the private sector.

Table 18: Distribution of the Variables

Variable	SKW	KRT	JB	Probability
ACBL	-0.2153	1.6531	5.9985	0.049824
EXC	0.1976	1.9374	3.8559	0.145448
FIN_DEV	0.4620	2.7985	2.6826	0.261504
INF	-0.0420	1.9715	3.1948	0.202421
MOMO	1.2867	4.2081	24.2469	0.000005
MPR	0.2157	1.5330	7.0147	0.029977
NPL	-0.1948	2.0955	2.9096	0.233446
PSC	0.1500	2.3101	1.6981	0.427812

Note: Average Commercial Banks Lending Rate (ACBL); Exchange Rate (EXC); Financial Development (FINDEV); Inflation rate (INF); Mobile Money (MOMO); Monetary Policy Rate (MPR);Non-Performing Loans (NPL); Private Sector Credit (PSC)
Source: Author's Computation (2023)

Table 18 provides information about the distribution of the variables in the study, including measures of skewness (SKW), kurtosis (KRT), and the Jarque-Bera (JB) test statistic, along with their associated probabilities (Jarque & Bera, 1980; Joanes & Gill, 1998; Royston, 1982). These statistics help assess the normality and distribution characteristics of the variables. ACBL has a slightly negative skewness of -0.2153, indicating a slight leftward tail in its distribution. The kurtosis of 1.6531 suggests that it has moderate peakiness. The Jarque-Bera test statistic of 5.9985, with a probability of 0.049824, indicates that the distribution is not perfectly normal but may still be approximately normally distributed (Jarque & Bera, 1980). EXC has a positive skewness of 0.1976, indicating a slight rightward tail. The kurtosis of 1.9374 suggests that it has moderate peakiness. The Jarque-Bera test statistic of 3.8559, with a probability of 0.145448, suggests that the distribution may not be perfectly normal but is relatively close to normal (Jarque & Bera, 1980).

FIN_DEV has a positive skewness of 0.4620, indicating a rightward tail. The kurtosis of 2.7985 suggests it has moderate peakiness. The Jarque-Bera test statistic of 2.6826, with a probability of 0.261504, indicates that while it exhibits some deviations from normality, it may still approximate a normal distribution reasonably well. INF has a slightly negative skewness of -0.0420, indicating a slight leftward tail. The kurtosis of 1.9715 suggests moderate peakiness. The Jarque-Bera test statistic of 3.1948, with a probability of 0.202421, suggests that the distribution is not significantly different from normal. MOMO exhibits a substantial positive skewness of 1.2867, indicating a pronounced rightward tail. The kurtosis of 4.2081 reflects significant peakiness. The Jarque-Bera test statistic of 24.2469, with an extremely low probability of 0.000005, suggests that the distribution significantly deviates from normality.

MPR has a positive skewness of 0.2157, indicating a rightward tail. The kurtosis of 1.5330 suggests it has moderate peakiness. The Jarque-Bera test statistic of 7.0147, with a probability of 0.029977, indicates that the distribution is not perfectly normal but may still be approximately normally distributed. NPL has a slightly negative skewness of -0.1948, indicating a slight leftward tail. The kurtosis of 2.0955 suggests moderate peakiness. The Jarque-Bera test statistic of 2.9096, with a probability of 0.233446, suggests that the distribution is not significantly different from normal. PSC has a positive skewness of 0.1500, indicating a rightward tail. The kurtosis of 2.3101 suggests moderate peakiness. The Jarque-Bera test statistic of 1.6981, with a probability of 0.427812, suggests that the distribution is not significantly different from normal.

Unit Root Test

Before proceeding with the ARDL and the Granger-causality test, the stationarity properties of the study's variables were examined through unit root tests. While the ARDL approach to cointegration does not inherently require preliminary unit root testing, it is essential to conduct these tests to confirm that the variables do not possess integration orders higher than one, as this can lead to spurious results. This precaution is necessary because the computed F-statistics provided by Pesaran et al. (2001) are not valid when dealing with I(2) variables.

Time series variables are inherently non-stationary, and according to Engel and Granger (1987), utilizing such data can yield misleading outcomes. The ARDL Bounds testing method for cointegration, employed in this study, mandates that the dependent variable should be integrated at levels I(0) or of the first order I(1). As a result, the ADF and PP tests were applied to all variables both in their taking natural log of the original levels and in first differences of the natural log values to formally determine their order of integration. Table 19 present the results of the stationarity tests conducted at levels and in the first difference, respectively. It's worth noting that these unit root tests were performed with a constant term and trend component (Fuller, 1976; Phillips & Perron, 1988).

Table 19: Augmented Dicky Fuller Test for Unit Root

	ADF Statistics		PP Statistics	
	Level	First Diff	Level	First Diff
LNACBL	-3.3425***	-11.9479***	-3.0863***	-11.3681***
LNEXC	-0.2183	-6.4337***	-0.2183	-6.4337***
LNFIN_DEV	-0.8087	-1.9551**	-1.3355	-2.0636**
LNINF	-0.5314	-8.6972***	-0.5402	-8.6983***
LNMOMO	5.84	-2.6446***	6.5022	-8.2613***
LNNPL	0.5023	-4.3881***	0.4334	-7.6874***
LNMPR	-1.5455	-7.802***	-1.2895	-8.0223***
LNPSC	2.7981	-9.65***	3.5199	-9.6029***

*Note: ***, ** and * indicates the rejection of the null hypothesis of non-stationary at 1%, 5% and 10% level of significance respectively,* First Diff *denotes the first difference.*

LN (log); Average Commercial Banks Lending Rate (ACBL); Exchange Rate (EXC); Financial Development (FINDEV); Inflation rate (INF); Mobile Money (MOMO); Monetary Policy Rate (MPR); Non-Performing Loans (NPL); Private Sector Credit (PSC)

Source: Author's Computation (2023)

Natural logarithm was applied on the dataset before conducting the unit root tests which serves several important purposes in time series analysis. Firstly, taking the natural logarithm of the data is a common practice when dealing with time series. It is often applied to address issues related to the scale and magnitude of variables. Economic data typically exhibits wide-ranging values, and applying the logarithm helps in reducing the impact of extreme values, making the data more amenable to statistical analysis. This transformation also helps linearize relationships and stabilize variances, which can be particularly useful when working with financial and economic data.

Secondly, taking the natural logarithm is commonly used to convert data that grows exponentially over time, which can result in non-stationarity into a more linear and stationary form. By taking the natural logarithm, the researcher

effectively transforms such data into a form where linear trends can be more easily detected and analysed. The results presented in Table 19 reflect the outcomes of these unit root tests on the transformed data, which is an essential step in determining the stationarity properties of the variables and ensuring the validity of subsequent analyses.

Table 19 presents the results of the Augmented Dickey-Fuller (ADF) and Philips Perron (PP) unit root tests for the variables in both their original levels and first differences of the natural logarithm (LN) transformed variables (Fuller, 1976; Phillips & Perron, 1988). These tests are crucial for determining the stationarity properties of the variables, which is a fundamental step in time series analysis.

In both ADF and PP tests, LNACBL exhibits statistically significant negative values for both the level and first difference, suggesting that it is stationary at conventional significance levels (1%, 5%, and 10%). This indicates that LNACBL is integrated of order 0, or I (0), which means it is stationary. LNEXC similar to LNACBL, LNEXC also shows statistically significant negative values in both ADF and PP tests for both the level and first difference. This suggests that LNEXC is integrated of order 0 (I (0)), indicating stationarity. LNFIN_DEV, the ADF test yields statistically significant results for the first difference but not for the level, while the PP test shows significance in the level but not in the first difference. This suggests that LNFIN_DEV may be integrated of order 1 (I(1)), indicating that it is stationary in first differences.

LNINF results for both ADF and PP tests yield statistically significant negative values for both the level and first difference of LNINF, indicating that LNINF is stationary at conventional significance levels (1%, 5%, and 10%) and

is integrated of order 0 (I(0)). LNMOMO in the ADF test, LNMOMO exhibits a statistically significant positive value for the first difference but not for the level. The PP test also shows significance in the first difference but not in the level. This suggests that LNMOMO may be integrated of order 1 (I(1)), indicating stationarity in first differences. LNNPL results for both ADF and PP tests yield statistically significant negative values for both the level and first difference of LNNPL, indicating that LNNPL is stationary at conventional significance levels (1%, 5%, and 10%) and is integrated of order 0 (I(0)).

LNMPR in both ADF and PP tests, LNMPR shows statistically significant negative values for both the level and first difference, indicating that it is stationary at conventional significance levels (1%, 5%, and 10%) and is integrated of order 0 (I(0)). LNPSC in both ADF and PP tests yield statistically significant negative values for both the level and first difference of LNPSC, indicating that LNPSC is stationary at conventional significance levels (1%, 5%, and 10%) and is integrated of order 0 (I(0)).

In summary, the results of the unit root tests reveal the order of integration for each variable. Variables that are integrated of order 0 (I(0)) are stationary, while those integrated of order 1 (I(1)) are stationary in first differences. These findings are crucial for subsequent time series analysis, such as cointegration and Granger-causality tests, and help ensure the validity of the ARDL.

Bounds test result for Cointegration for Linear ARDL model

The results of the bounds test for cointegration, as applied to the linear ARDL model, indicate whether long-term relationships exist between the variables under investigation (Davidson et al., 1993). These results help in

understanding the dynamics and interconnections among the variables in the study. In cases where the bounds test for cointegration yields statistically significant results, it suggests that there is evidence of a long-term relationship between at least some of the variables in the model (Granger & Yoon, 2002). This implies that the variables move together in the long run and are not just influenced by short-term fluctuations. If the Bounds Test does not find statistically significant results, it indicates that there is no long-term equilibrium relationship among the variables. Thus, the variables may exhibit short-term correlations or causal relationships but do not share a stable, long-term connection. The results of the bounds test guide the choice of the appropriate econometric model for further analysis are presented in Table 20.

Table 20: Bounds test result for Cointegration for Linear ARDL model

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.881707	10%	2.38	3.45
k	7	5%	2.69	3.83
		1%	3.31	4.63

Source: Author's Computation (2023)

Table 20 presents the results of the Bounds Test for Cointegration, specifically for a Linear ARDL model. This test is used to determine whether a long-run relationship exists among the variables studied. The null hypothesis of the bounds test is that there is no long-run relationship (cointegration) among the variables in their levels. The calculated F-statistic value of 4.881707 is compared to the critical values provided for different significance levels. The F-statistic falls above the critical values at the 10%, 5%, and 1% significance levels. This suggests that there is evidence to reject the null hypothesis (No

levels relationship) in favour of the alternative hypothesis, indicating the presence of a long-run relationship (cointegration) among the variables. In summary, the bounds test results suggest that there is a long-run relationship (cointegration) among the studied variables. This finding is significant for further econometric modelling and analysis, as it indicates that the variables are not purely driven by short-term fluctuations but share a stable long-term relationship that can be explored and utilized in the ARDL.

The Results of Long – Run Relationship

Having established the presence of cointegration among the variables of interest, the study has advanced to estimate the long-run impact of the explanatory variables using the ARDL model (Pesaran et al., 2001). This modelling approach is particularly suited for analysing the relationships among integrated time series variables in both the short and long term. The chosen ARDL model, as determined by the Akaike Information Criterion (AIC), is specified as (1, 0, 0, 2, 0, 1, 1, 3), which represents the lag structure for each variable in the model. These lag orders are instrumental in capturing the dynamic relationships and dependencies among the variables over time.

The subsequent section, presented in Table 21, provides detailed long run estimates derived from this selected ARDL model. These estimates offer insights into the long-run implications of the explanatory variables on the dependent variable, shedding light on the magnitude and direction of their influence in the context of the studied economic or financial phenomena. The results presented in Table 21 will be valuable for drawing meaningful conclusions and informing policy implications based on the established long-run relationships among the variables.

Table 21: Long – Run estimates based on - ARDL Approach

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNFIN_DEV	-0.88313	0.237362	-3.7206	0.0005
LNINF	-0.02071	0.013386	-1.54718	0.128
LNMPR	0.240864	0.044637	5.396009	0.000
LNPSC	-0.10378	0.122347	-0.8482	0.4003
LNMOMO	-0.00569	0.027241	-0.20888	0.8354
LNNPL	0.004875	0.029694	0.164185	0.8702
LNEXC	0.202954	0.17786	1.141088	0.2592

Note: Dependent Variable: LNACBL

Source: Author's Computation (2023)

LN (Log); Average Commercial Banks Lending Rate (ACBL); Exchange Rate (EXC); Financial Development (FIN_DEV); Inflation rate (INF); Mobile Money (MOMO); Monetary Policy Rate (MPR); Non-Performing Loans (NPL); Private Sector Credit (PSC)

From Table 21, is presented the long run estimate of the ARDL. The results presented provide crucial insights into the long-run relationship between LNACBL and several key explanatory variables, including LNFIN_DEV, LNINF, LNMPR, LNPSC, LNMOMO, LNNPL, and LNEXC. These estimates are derived from an ARDL help elucidate the responsiveness of LNACBL to changes in these variables, particularly emphasizing the role of the monetary policy rate set by the Central Bank of Ghana.

From the table 21 above, the coefficient for LNFIN_DEV is -0.88313 with a low standard error, and it is statistically significant at the 1% level. This indicates that an increase in the Financial Development Index leads to a notable decrease in LNACBL in the long run. This relationship suggests that a more developed financial sector may exert downward pressure on lending rates in Ghana, potentially making credit more affordable and accessible. The coefficient for LNINF is -0.02071, though statistically significant at the 10% level, it indicates a relatively weak relationship between core inflation and

lending rates in the long run. This result suggests that changes in core inflation may have a limited impact on LNACBL over extended periods. Other factors are likely more influential in determining lending rates. The results are in line with findings from Asamoah & Adu (2016) who revealed a negative association between lending rates and real GDP, inflation rates, and fiscal deficits in the long term. Feyen & Zuccardi Huertas (2020) postulated that factors such as public debt, policy interest rates, non-performing loans, non-interest rates, inflation, and the time needed to resolve insolvency (business environment) significantly affected nominal lending rates.

The coefficient for LNMPR is 0.240864, and it is highly statistically significant. This result underscores a robust and positive long-run relationship between the monetary policy rate and LNACBL. In practical terms, it implies that an increase in the central bank's policy rate tends to lead to higher lending rates in the long run, reflecting the transmission of monetary policy to the commercial banking sector. The results are in line with that of Asamoah & Adu (2016) who revealed that lending rates exhibited a positive correlation with the monetary policy rate set by the Bank of Ghana and exchange rates in both the short and long run. Miho et al. (2022) revealed a non-linear link between monetary policy and bank credit. Contrarily Dang (2021) indicated that Vietnam's monetary policies were not adequately enforced, which led to a decline in the performance of commercial banks and an increase in the country's liquidity levels. Akanbi & Ajagbe (2012) investigated the impact of monetary policy on commercial banks (using data on three banks). The results showed that monetary policy that seeks to regulate the interest rate of commercial banks

leads to decrease in banks' lending rates. Also, Ayodele reports that monetary policy is not effective to stimulate commercial loans and advances.

The coefficient for LNPSC is -0.10378, though not statistically significant. This suggests that, in the long run, the level of private sector credit does not exert a substantial influence on lending rates, implying that other factors may play a more significant role in determining credit costs. The coefficients for LNMOMO, LNNPL, and LNEXC do not exhibit statistically significant relationships with LNACBL in the long run. This implies that variations in mobile money transactions, non-performing loans, and exchange rates may not be the primary drivers of changes in lending rates over extended periods. Ayodele (2014) found that commercial banks react negatively to the influence of exchange rate and interest rate significantly though there is a long-run relation.

In conclusion, the findings from the ARDL model highlight the central role of the monetary policy rate set by the Central Bank of Ghana in influencing lending rates in the long run. Additionally, financial development, as represented by the Financial Development Index, appears to have a notable impact on lending rates, making it a key consideration for policymakers. While other variables such as core inflation, private sector credit, mobile money transactions, non-performing loans, and exchange rates do not exhibit substantial long-term relationships with lending rates, they may still play crucial roles in shaping short-term dynamics and warrant further investigation in a comprehensive analysis of the financial landscape in Ghana.

Short Run Dynamics

With the establishment of a long-run relationship among the variables through the ARDL approach to cointegration, the study proceeds to delve into the dynamics of the short run. According to Engel and Granger's (1987) theory, an error correction representation can be a useful tool for modelling the dynamic interplay of cointegrated variables. With the use of this representation, which includes an error correction term derived from the long-run equation, we are able to capture the system's long- and short-term interactions.

The coefficient of the Error Correction Mechanism (ECM) plays a pivotal role. It signifies how swiftly the variables adjust and converge back to equilibrium following a disturbance or shock. Importantly, a statistically significant ECM coefficient, typically bearing a negative sign, carries significant implications. It not only validates the existence of a long-run relationship but also sheds light on the speed and direction of adjustment in the short run.

Drawing on the insights of Banerjee et al. (1998), the presence of a highly significant error correction term serves as strong confirmation of the enduring long-run relationship among the variables. Therefore, as the study explore the short-run ARDL results in the subsequent sections, pay particular attention to the ECM coefficients, as they provide valuable insights into the rapidity and direction of adjustments in response to short-term shocks within this established long-run framework.

Table 22: Estimated Short-Run ECM using ARDL (1, 0, 0, 2, 0, 1, 1, 3)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.431459	0.213695	6.698597	0
@TREND	-0.00211	0.000302	-6.97205	0
D(LNMPR)	-0.08005	0.059686	-1.34116	0.1858
D(LNMPR(-1))	-0.11695	0.06302	-1.85578	0.0693
D(LNMOMO)	0.005857	0.020803	0.281558	0.7794
D(LNMOMO(-1))	-0.04366	0.020472	-2.13262	0.0378
D(LNNPL)	-0.12995	0.035427	-3.66802	0.0006
D(LNEXC)	0.001333	0.020055	0.066448	0.9473
D(LNEXC(-1))	-0.05299	0.043693	-1.21267	0.2308
D(LNEXC(-2))	-0.10752	0.041873	-2.56772	0.0132
CointEq(-1)*	-0.74737	0.112143	-6.66438	0
R-squared	0.598565	Mean dependent var		-0.0046
Adjusted R-squared	0.529352	S.D. dependent var		0.01763
S.E. of regression	0.012095	Akaike info criterion		-5.84691
Sum squared resid	0.008484	Schwarz criterion		-5.49075
Log likelihood	212.7183	Hannan-Quinn criter.		-5.70561
F-statistic	8.648164	Durbin-Watson stat		1.913206
Prob(F-statistic)	0			

Note: Average Commercial Banks Lending Rate (ACBL); Exchange Rate (EXC); Financial Development (FINDEV); Inflation rate (INF); Mobile Money (MOMO); Monetary Policy Rate (MPR); Non-Performing Loans (NPL); Private Sector Credit (PSC)

Source: Author's Computation (2023)

Table 22 presents the estimated short-run Error Correction Model (ECM) results using the ARDL (1, 0, 0, 2, 0, 1, 1, 3) framework. The coefficient for the intercept term (C) is 1.431459 with a low standard error, and it is highly statistically significant. This term represents the short-run impact on LNACBL when all other explanatory variables are held constant. The coefficient for the trend term (@TREND) is -0.00211 and is also highly statistically significant. This trend term captures any systematic changes or trends in the data over time.

The coefficients for (D(LNMPR)) and the(D(LNMPR(-1))) of LNMPR are -0.08005 and -0.11695, respectively. These coefficients measure the short-

run impact of changes in the monetary policy rate on LNACBL. Both coefficients are not statistically significant at conventional significance levels (5%), suggesting that changes in the monetary policy rate do not exert a statistically significant short-run impact on LNACBL. The coefficients for the current period (D(LNMOMO)) and the first lag (D(LNMOMO (-1))) of LNMOMO are 0.005857 and -0.04366, respectively. These coefficients represent the short-run effects of changes in mobile money transactions on LNACBL.

The coefficient for D (LNMOMO (-1)) is statistically significant at the 5% level, indicating that the previous period's mobile money transactions have a significant short-run impact on LNACBL. The coefficient for LNNPL is -0.12995 and is statistically significant at conventional significance levels. This coefficient signifies the short-run impact of changes in non-performing loans on LNACBL, and it indicates a significant negative relationship. The coefficients for the current period (D(LNEXC)), the first lag (D (LNEXC (-1))), and the second lag (D (LNEXC (-2))) of LNEXC are 0.001333, -0.05299, and -0.10752, respectively. These coefficients measure the short-run effects of changes in the exchange rate on LNACBL. None of these coefficients are statistically significant, suggesting that exchange rate fluctuations do not have a statistically significant short-run impact on LNACBL.

The coefficient for the lagged cointegration term (CointEq (-1)) is -0.74737 and is highly statistically significant. This term represents the speed of adjustment back to long-run equilibrium following a short-run disturbance or shock. Its highly significant and negative coefficient indicates a rapid convergence to equilibrium in response to short-term deviations (Banerjee et

al., 1998; Davidson et al., 1993; Granger & Yoon, 2002). While changes in the monetary policy rate, mobile money transactions, and exchange rates do not exhibit statistically significant short-run impacts on LNACBL, non-performing loans have a significant negative effect. Moreover, the highly significant and negative coefficient for the cointegration term underscores the system's rapid adjustment to restore long-run equilibrium following short-term disruptions.

Post Estimation (Model Diagnostic) Test

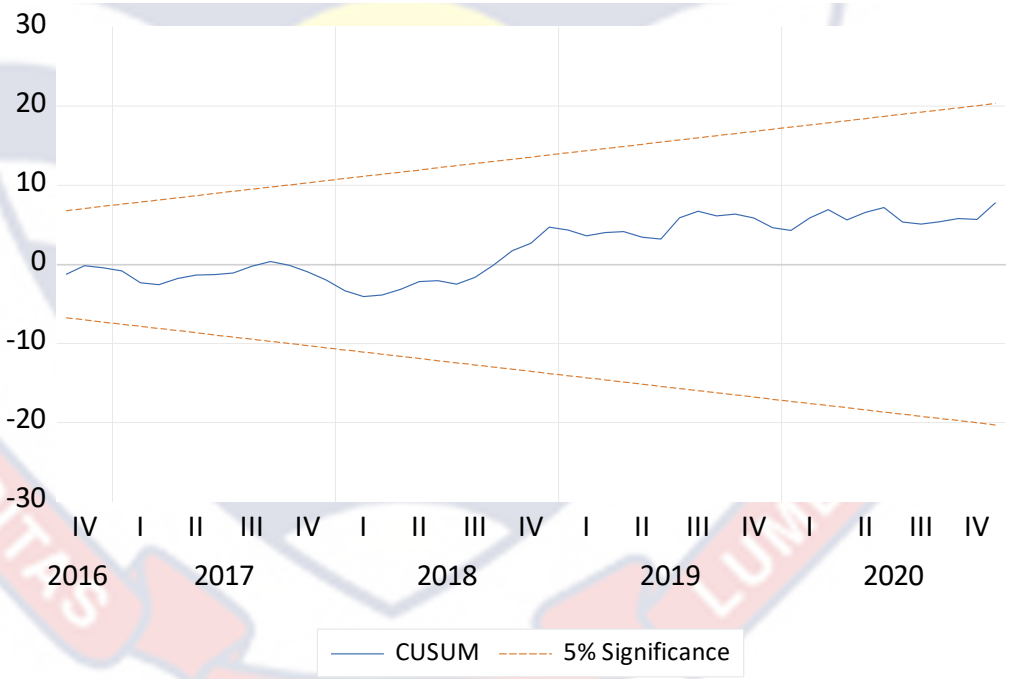
In the aftermath of estimating the linear ARDL model, it is imperative to subject our model to a battery of diagnostic tests to ensure its robustness and reliability. As presented in Appendix C, these diagnostic tests encompass a comprehensive evaluation of key aspects, including normality, heteroscedasticity, functional form (Ramsey RESET), and the detection of serial correlation using the Breusch-Godfrey test (Breusch, 1978; Breusch & Pagan, 1979; Godfrey, 1978; Jarque & Bera, 1980; Ramsey, 1969). The Jarque-Bera test statistic is 0.651917, and the associated probability is 0.721835. The high p-value indicates that the residuals do not significantly deviate from a normal distribution, suggesting that they pass the normality test.

Overall, based on the results of the Breusch-Godfrey Serial Correlation LM Test calculated F-statistic which is 0.126729 with a probability of 0.9438 (Prob. F(3,48)). A high p-value indicates that there is no significant evidence to reject the null hypothesis of no serial correlation at up to 3 lags. Based on the results of the Breusch-Pagan-Godfrey Heteroskedasticity Test, there is no compelling evidence to suggest that heteroskedasticity is present in the residuals of the model. e calculated F-statistic is 0.759446 with a probability of 0.7279 (Prob. F(17,51)). In summary, based on the Ramsey RESET Test and the

unrestricted model results, the model's specification is deemed suitable for the given dataset, and it explains a high proportion of the variance in LNACBL.

Stability Test

The stability test for the ARDL results utilizes two essential metrics, namely the Cumulative of Recursive Residuals (CUSUM) and the Cumulative Sum of the Square of Recursive Residual (CUSUMSQ). These metrics serve as diagnostic tools to assess the stability and consistency of the model, as advocated by Pesaran et al. (2001). Figure 1, displayed below, illustrates the CUSUM and CUSUMSQ plots for the estimated Linear ARDL model. The patterns observed in this plot provide valuable insights into the model's stability and the presence of structural breaks.



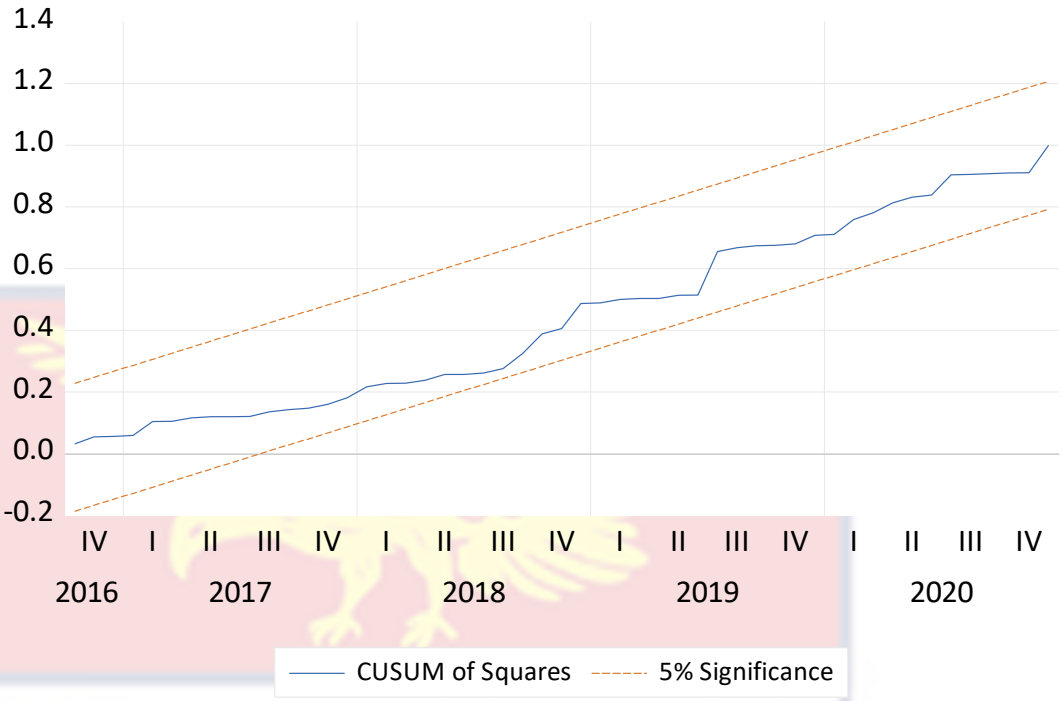


Figure 12: Graph of CUSUM and CUSUMSQ
Source: Author's Construct (2023)

Upon careful examination of Figure 12, it becomes evident that all the coefficients lie comfortably within the critical bounds established at the five percent significance level. This key observation implies that the estimated models remain stable throughout the study period, and the coefficients do not exhibit any systematic or significant changes over time. In summary, the CUSUM and CUSUMSQ stability test, as depicted in Figure 12, supports the conclusion that there are no structural breaks in the model. It confirms the stability of the estimated models and provides assurance that the coefficients maintain their stability without systematic changes throughout the study period, reinforcing the reliability of the model's results.

Pairwise Granger Causality Tests

The pairwise granger causality tests are a critical component of the analysis, aimed at uncovering the dynamic relationships between the key variables in the study, thus revealing whether a causal relationship exists

between different pairs of variables in the study. These findings provide valuable insights into how changes in one variable may influence or lead to changes in another, contributing to a more comprehensive understanding of the complex dynamics at play within the financial landscape.

Table 23: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
LNFIN_DEV does not Granger Cause LNACBL	69	3.52741	0.0199
LNACBL does not Granger Cause LNFIN_DEV		5.08296	0.0033
LNINF does not Granger Cause LNACBL	69	0.18043	0.9093
LNACBL does not Granger Cause LNINF		0.41190	0.7450
LNMPR does not Granger Cause LNACBL	69	3.89485	0.0129
LNACBL does not Granger Cause LNMPR		2.55244	0.0636
LNPSC does not Granger Cause LNACBL	69	2.13277	0.1051
LNACBL does not Granger Cause LNPSC		0.53909	0.6573
LNMOMO does not Granger Cause LNACBL	69	3.73794	0.0155
LNACBL does not Granger Cause LNMOMO		1.41292	0.2475
LNNPL does not Granger Cause LNACBL	69	0.12389	0.9457
LNACBL does not Granger Cause LNNPL		2.83415	0.0454
LNEXC does not Granger Cause LNACBL	69	3.20527	0.0292
LNACBL does not Granger Cause LNEXC		0.04106	0.9888
LNINF does not Granger Cause LNFIN_DEV	69	3.62364	0.0178
LNFIN_DEV does not Granger Cause LNINF		2.85739	0.0441
LNMPR does not Granger Cause LNFIN_DEV	69	2.88534	0.0427
LNFIN_DEV does not Granger Cause LNMPR		7.35117	0.0003
LNPSC does not Granger Cause LNFIN_DEV	69	4.11146	0.0100
LNFIN_DEV does not Granger Cause LNPSC		0.61906	0.6053
LNMOMO does not Granger Cause LNFIN_DEV	69	3.32560	0.0253
LNFIN_DEV does not Granger Cause LNMOMO		0.39240	0.7589
LNNPL does not Granger Cause LNFIN_DEV	69	2.34721	0.0813
LNFIN_DEV does not Granger Cause LNNPL		0.44824	0.7194
LNEXC does not Granger Cause LNFIN_DEV	69	3.60592	0.0181
LNFIN_DEV does not Granger Cause LNEXC		0.43473	0.7289

Table 23:Cont'D

LNMPR does not Granger Cause LNINF	69	0.32737	0.8056
LNINF does not Granger Cause LNMPR		1.08955	0.3602
LNPSC does not Granger Cause LNINF	69	0.28850	0.8335
LNINF does not Granger Cause LNPSC		0.43911	0.7258
LNMOMO does not Granger Cause LNINF	69	0.80940	0.4935
LNINF does not Granger Cause LNMOMO		3.70316	0.0162
LNNPL does not Granger Cause LNINF	69	3.74313	0.0154
LNINF does not Granger Cause LNNPL		1.19780	0.3181
LNEXC does not Granger Cause LNINF	69	0.21261	0.8873
LNINF does not Granger Cause LNEXC		2.14217	0.1039
LNPSC does not Granger Cause LNMPR	69	4.38340	0.0073
LNMPR does not Granger Cause LNPSC		0.57350	0.6346
LNMOMO does not Granger Cause LNMPR	69	6.44019	0.0007
LNMPR does not Granger Cause LNMOMO		2.43697	0.0730
LNNPL does not Granger Cause LNMPR	69	3.36772	0.0240
LNMPR does not Granger Cause LNNPL		1.81542	0.1536
LNEXC does not Granger Cause LNMPR	69	2.91953	0.0410
LNMPR does not Granger Cause LNEXC		1.00712	0.3957
LNMOMO does not Granger Cause LNPSC	69	1.23891	0.3033
LNPSC does not Granger Cause LNMOMO		2.29743	0.0863
LNNPL does not Granger Cause LNPSC	69	0.35281	0.7872
LNPSC does not Granger Cause LNNPL		1.68139	0.1802
LNEXC does not Granger Cause LNPSC	69	1.49350	0.2251
LNPSC does not Granger Cause LNEXC		0.31811	0.8122
LNNPL does not Granger Cause LNMOMO	69	4.40568	0.0071
LNMOMO does not Granger Cause LNNPL		1.42762	0.2432
LNEXC does not Granger Cause LNMOMO	69	2.01077	0.1216
LNMOMO does not Granger Cause LNEXC		0.28799	0.8339
LNEXC does not Granger Cause LNNPL	69	0.85550	0.4690
LNNPL does not Granger Cause LNEXC		0.43184	0.7309

Note: LN (Log); Average Commercial Banks Lending Rate (ACBL); Exchange Rate (EXC); Financial Development (FINDEV); Inflation rate (INF); Mobile Money (MOMO); Monetary Policy Rate (MPR); Non-Performing Loans (NPL); Private Sector Credit (PSC)

Source: Author's Computation (2023)

The Pairwise Granger Causality Tests presented in Table 23 provide essential insights into the dynamic relationships between the key variables examined in our study. The test results suggest that LNFIN_DEV Granger causes LNACBL, with a statistically significant F-statistic of 3.52741, implying that past values of LNFIN_DEV contain information that helps predict LNACBL. However, the reverse causality from LNACBL to LNFIN_DEV is also significant, indicating a bidirectional relationship between these variables. In this case, neither LNINF nor LNACBL Granger causes each other, as both F-statistics are not statistically significant. This suggests that there is no strong evidence to support a causal relationship between these variables.

LNMPR Granger causes LNACBL, with a significant F-statistic of 3.89485, indicating that past values of LNMPR contain valuable information for predicting LNACBL. However, LNACBL does not Granger cause LNMPR. The test results suggest that LNPSC does not Granger cause LNACBL, and vice versa, as both F-statistics are not statistically significant. LNACBL Granger causes LNMOMO, with a statistically significant F-statistic of 3.73794, implying that changes in LNACBL can predict changes in LNMOMO. However, the reverse causality from LNMOMO to LNACBL is not significant.

Although LNNPL does not Granger cause LNACBL, the reverse causality from LNACBL to LNNPL is significant, suggesting that LNACBL influences LNNPL, but not vice versa. LNEXC Granger causes LNACBL, with a significant F-statistic of 3.20527, indicating that past values of LNEXC contain valuable information for predicting LNACBL. However, the reverse causality from LNACBL to LNEXC is not significant.

These findings help us better understand the intricate dynamics within the financial system, shedding light on which variables influence others and to what extent. The results are in line with the previous literature (Akanbi & Ajagbe, 2012; Asamoah & Adu, 2016; Ayodele, 2014; Bangura, 2011; Coetzee & Genukile, 2020; Dang, 2021; Djiogap & Ngomsi, 2012; Fang & Jiang, 2016; Farajnezhad & Suresh, 2019; Feyen & Zuccardi Huertas, 2020; Gray, 1963; Harun et al., 2005; Krause & Rioja, 2006; Mbowe et al., 2020; Miho et al., 2022; Olokoyo, 2011; Sengonul & Thorbecke, 2005; Vera, 2012).

How do commercial banks respond to the changes in the monetary policy rate in Ghana?

The monetary policy rate (MPR) is a key tool used by the central bank of Ghana to control inflation and stabilize the economy. Commercial banks in Ghana play a vital role in the transmission of monetary policy, as they are responsible for providing credit to businesses and individuals. The ARDL results presented (see Tables 21 and 22) in this study offer valuable insights into the relationship between the MPR and the ACBL of commercial banks in Ghana. The ARDL analysis reveals significant coefficients for the lagged MPR (LNMPR) in the short-run model, indicating that changes in the MPR have a lasting impact on the financial performance of commercial banks in Ghana. This highlights the presence of a transmission mechanism through which monetary policy affects the banking sector and, by extension, the broader economy (Asamoah & Adu, 2016; Dang, 2021; Feyen & Zuccardi Huertas, 2020; Vera, 2012).

As such, commercial banks must respond to changes in the MPR to ensure that they remain competitive and profitable. The Interest Rate Channel

of monetary policy posits those changes in the MPR influence interest rates in the economy (Dale & Haldane, 1995; Kumiarso et al., 2002; Oyadeyi, 2023). In this case, the ARDL results confirm this theory, as an increase in the MPR leads to higher interest rates charged by commercial banks to maintain their profit margins. This can, in turn, reduce borrowing, dampen investment, and slow down economic growth.

Conversely, when the central bank decreases the MPR, it signals to commercial banks that borrowing costs have gone down. This allows commercial banks to lower their interest rates on loans and other forms of credit, which can stimulate economic growth by making it easier and more affordable for businesses and individuals to borrow money. However, the response of commercial banks to changes in the MPR is not always immediate or uniform. When commercial banks respond to MPR changes by adjusting their lending rates, it impacts the access to credit for businesses and individuals. The ARDL results align with the Credit Channel theory, as they indicate that variations in the MPR influence the financial performance of commercial banks, ultimately affecting their lending behavior (Abbate & Thaler, 2019; Farajnezhad & Suresh, 2019; Koch, 2011).

Some banks may be more responsive to changes in the MPR than others, depending on their business strategies and risk management policies (Akanbi & Ajagbe, 2012; Ayodele, 2014; Bangura, 2011; Glindro et al., 2015; Ray, 2008). Additionally, other factors such as the level of competition in the banking sector and the state of the economy can also influence the response of commercial banks to changes in the MPR (Olokoyo, 2011). Commercial banks in Ghana play a key role in transmitting the effects of changes in the MPR to the wider

economy (Farajnezhad & Suresh, 2019; Miho et al., 2022; Nguyen & Nguyen, 2021). They must respond to changes in the MPR to remain competitive and profitable, but their response may vary depending on a range of factors (Aharony et al., 1986; Kwashie et al., 2022). Understanding the response of commercial banks to changes in the MPR is crucial for policymakers and economists seeking to analyze and predict the impact of monetary policy on the wider economy.

While the ARDL results provide quantitative insights, a qualitative study through interviews with commercial bank managers is essential for a more profound understanding. Qualitative research can help elucidate the decision-making processes within commercial banks when responding to MPR changes. It can uncover the nuances, challenges, and strategies employed by these banks, shedding light on why certain banks may exhibit different responses to MPR adjustments. As such, qualitative research is employed in the next section to provide deeper insights into the factors shaping the responses of commercial banks to MPR changes, thereby enhancing our understanding and informing more effective policymaking.

Qualitative results of how commercial banks responsive to MPR

The quantitative analysis presented in this study has provided valuable insights into the relationship between the MPR and the ACBL of commercial banks in Ghana. However, to gain a more comprehensive understanding of the dynamics at play, it is imperative to delve into the qualitative aspects of this relationship. Qualitative research, in the form of interviews with commercial bank managers, offers a nuanced exploration of the strategies, challenges, and decision-making processes that underpin the responses of these banks to

changes in the MPR. This qualitative phase of the research aims to provide context, depth, and richness to the quantitative findings. It seeks to uncover the qualitative factors that may explain variations in how different commercial banks respond to MPR adjustments. By engaging directly with bank managers, we gain access to their expert insights and experiences, allowing us to discern the intricate mechanisms through which monetary policy impacts their institutions.

The qualitative results presented in the subsequent shed light on the rationale behind the observed quantitative patterns, potentially revealing unique approaches, risk management practices, and strategic considerations that influence commercial banks' behavior in response to changes in the MPR. Moreover, this qualitative exploration bridges the gap between statistical correlations and real-world decision-making, offering a more holistic perspective on the intricate interplay between monetary policy and commercial banking in the Ghanaian context.

Background of the participants

In all, eight (8) participants were interviewed from eight banks for the qualitative aspect of the study. The working experience of these participants ranged between ten (10) and twenty (20) years. Five (5) of the participants had worked in the banking sector for fifteen (15) years, whilst one of the participants had worked for seventeen (17) years, and the remaining two (2) participants had worked for nineteen (19) and twenty (20) years respectively. For reference and easy identification of the participants' pseudonyms names **EB1, EB2, EB3……EB8,** were given.

Analysis of Qualitative Data

Several opinions were shed by the various participants. Through the coding and generation of themes for analysis, the following themes emerged for the analysis; clients' ability to pay, central bank policy, and risk assessment.

Determinants of lending rate among commercial banks in Ghana

The researcher inquired from the participants about what factors are considered by commercial banks in determining the lending rate. Several factors were mentioned.

Client's ability to pay

The responses gathered from the interviewees revealed that the client's ability to pay back their credit is strongly considered when determining the lending rate. An employee of one of the banks had this to say…

...financial position of the client if the clients will be able to pay that amount then they make the necessary adjustment to it (**EB1**). In a similar vein, a participant was of the view that the viability of the business entity also influences how the commercial banks respond to the monetary policy…*If it is a business entity, they look at the viability of the entity and how long the entrepreneur can sustain the business before he or she will be given that credit* (**EB6**).

A participant gave a firm assertion on the fact that no bank is in the market to make losses and would therefore go to every length to ensure that clients' background poses no threat and is thoroughly examined before monetary transactions are made.

No bank wants its money to go to waste and so, therefore, make sure due diligence is done to ascertain the customer or client's ability to pay back that which he or she seeks to contract a loan from the bank (**EB8**).

Policy Rate of the Bank of Ghana

Another theme that emerged for analysis was the policy rate of the Bank of Ghana. The commercial banks could not have determined lending rate without considering that of the apex bank of the land. An employee of one of the banks had this to say…

…their lending rates are normally going to be a conversion about a policy being stated by the Bank of Ghana or the Central Bank. On the basic level, you will say banks' lending rates are linked to the monetary policy which prevails in the market at the time (**EB 4**).

Another participant reiterated the fact that lending rate responses of the commercial banks are based upon the Central Bank policy rate.

…what I know is that first and foremost they will look at the Central Bank's policy rate at the time (**EB1**).

A Risk Assessment by the Banks

One way in which commercial banks respond to changes in the monetary policy rate is through risk assessment. Risk assessment in banking refers to the process of identifying, analyzing, and evaluating the potential risks associated with a bank's operations, including lending and investment activities. The objective of risk assessment is to identify potential risks that could adversely impact the bank's financial performance or reputation, and to develop strategies to manage and mitigate this risk. Risk assessment as asserted by the participants implies before the bank lends money to clients, they need to assess every form

of threat that is likely to cause the bank to loss (Aharony et al., 1986; Kwashie et al., 2022). In simple terms, risk assessment is an act of finding a potential loss that the bank is likely to incur in the monetary transactions between the bank and the client. A **Participant** had this to say:

...you look at the risk profile of the customer so whether the customer is high-risk, low risk or non-risked customer based on that you determine how much rate that customer will be picking the funds at. But banks have a robust system that they use to score, or credit grade the client so is a risk grading system based on the financial (**EB2**).

Another participant corroborated the earlier point made on the risk assessment of the client before any monetary transaction is agreed upon.

...we also look at the risk of the client or the client we assess the client to risk rate the client, so we give every client a particular risk rating depending on the type of industry you find yourself in and the balance sheet of the client as well and so these are some of the things we consider (**EB3**).

In a similar vein, an employee of the selected commercial bank opinionated that the risk assessment is one of the ways through which commercial banks respond to the monetary policy rate in Ghana.

...You're looking at what is the prevailing risk when you are pricing a free investment. So, for instance, if you were to invest in the government of Ghana treasury bills or bonds, which are largely risk-free, how much will that cost? So, at the very least, you would want to price above the risk-free (**EB8**).

Evident from the above analysis is the fact commercial banks respond to changes in the monetary policy through client's ability to pay what they borrow

from the banks, central bank's policy rate, and also by doing proper risk assessment of clients they transact business with.

Discussion

The findings of the study indicated that commercial banks respond to changes in monetary policy rate through the central bank policy rate, assessing clients'/customers' ability to pay, and assessing the monetary transaction. These responses corroborate the findings from the ARDL result and it is also supported by prior findings from other researchers (Fang & Jiang, 2016; Farajnezhad & Suresh, 2019; Miho et al., 2022). This means commercial banks' response to changes in monetary policies is influenced by these aforementioned factors.

Clients' ability to pay what they borrow from the banks can be looked at in terms of commercial banks reducing the amount of credit they extend to their clients in response to changes in monetary policy (Abbate & Thaler, 2019; Brei et al., 2020; Kusi et al., 2016; Kwashie et al., 2022; McKinnon & Pill, 1998). This may happen if the central bank increases the reserve requirements for banks. Banks will have to hold more funds in reserve, which will reduce the amount of money available for lending. As a result, banks may become more cautious in extending credit to their clients and may only lend to those who have a higher ability to repay their loans (Kwashie et al., 2022).

When the central bank raises its policy rate, commercial banks typically increase the interest rates they charge on loans to consumers and businesses (Dale & Haldane, 1995; Kumiarso et al., 2002; Oyadeyi, 2023). This is because the cost of borrowing money from the central bank becomes more expensive, and so the banks pass on this increased cost to their customers (Akosah et al., 2020b). Conversely, when the central bank lowers its policy rate, commercial

banks may reduce the interest rates they charge on loans. This is because the cost of borrowing money from the central bank becomes cheaper, and so the banks can afford to charge lower rates to attract more customers. Changes in the central bank's policy rate can also affect the interest rates that commercial banks pay on deposits (Oyadeyi, 2023). When the policy rate is raised, commercial banks may increase the interest rates they pay on deposits to attract more funds and to cover the increased cost of borrowing from the central bank. Changes in the central bank's policy rate can also affect the liquidity position of commercial banks (Benigno & Nisticó, 2017; Ghossoub, 2012; Lagos, 2011; Lester et al., 2012). When the policy rate is raised, commercial banks may find it more difficult to borrow money from the central bank or from other banks, so they may reduce their lending activities to conserve liquidity.

Turning to the empirical evidence, there are only a handful of studies that try to explore how commercial banks respond to changes in monetary policies, especially in the Ghanaian context (Adoah, 2015; Kwashie et al., 2022), however, the findings of this current study align with some works (Akanbi & Ajagbe, 2012; Ayodele, 2014; Bangura, 2011; Farajnezhad & Suresh, 2019; Glindro et al., 2015; Gray, 1963; Harun et al., 2005; Li & Wang, 2012; Miho et al., 2022; Nguyen & Nguyen, 2021;. Nguyen et al., 2021; Njiru, 2014; Olokoyo, 2011; Ray, 2008; Vuchelen, 1980). The study by Jiménez et al. (2011) uses micro data of the Spanish Credit Register over the period 1984–2006 to investigate whether the stance of monetary policy has an impact on the level of risk of individual bank loans discovered that low-interest rates affect the risk of the loan portfolio of Spanish banks. Even though the context differs, their findings point to the fact that changes in monetary policy have a direct

relationship with how banks respond to these changes in several ways as revealed by this study.

Another study by Ioannidou et al. (2009) found that, when interest rates are low, not only do banks increase the number of new risky loans but they also reduce the rates they charge to riskier borrowers relative to what they charge to less risky ones. This aligns with commercial banks' responses through thorough risk assessments done on their clients before any monetary transactions are reached. Through risk assessment, commercial banks may need to adjust their lending rates to maintain their profitability. To assess the impact of the change in interest rates, commercial banks will analyze their loan portfolios and determine which loans will be affected the most by the change. Commercial banks are likely to assess the risks associated with the change in monetary policy if the central bank raises interest rates to control inflation, commercial banks may need to adjust their lending practices to mitigate the risk of loan defaults (Csaba, 2017; Wezel et al., 2012).

Adoah (2015), explored the determinants of universal bank lending rates in Ghana. The study found that factors that affect the determinants of the lending rate in Ghana are the Policy rate, Exchange rate, Treasury bill rate, GDP, Inflation, Bank size, and HHI. This finding is in line with the findings of this current study where the policy rate of the central bank influences banks' response to changes in monetary policies. The findings of this current study went the extra to add to the literature clients' ability to pay money borrowed and risk assessment as other factors that play a significant role in the ways in which banks respond to changes in monetary policies.

Godswill et al. (2018) study revealed that it is difficult to adjudge a single monetary tool most effectively rather the effectiveness of each monetary policy tool depends on the economic problems it is intended to solve. Specifically, the results revealed that where the target of monetary policy is to maximally increase output and/or credit to the private sector, the use of money supply (M2) is advised as both variables respond most substantially to innovations in the money supply. However, M2 is equally the most inflation-inducing. By contrast, while the real exchange rate (RER) increases output and credit to the private sector (CPS) by almost as much as money supply does, its effect appears more sustained as well as has least effect on inflation. The use of policy interest rate, the MPR, is probably the weakest among the variables. The results of the pre and post banking consolidation periods show that the 2005 banking consolidation altered the responses of some target variables to innovations in some monetary policy instruments. Also, the study tried to empirically ascertain the presence of fiscal dominance and crowding out in Nigeria.

The findings of Ayodele (2014) revealed that exchange rate and interest significantly influenced commercial banks' lending, while liquidity ratio and money supply exert a negative effect on commercial banks' loans and advances. This finding aligns with this current study where through central banks' policy rate, clients' ability to pay their loans, as well as risk assessment of potential losses, commercial banks respond to the monetary policy rate in Ghana. From the findings, the researchers opined that monetary policy instruments are not effective to stimulate commercial bank loans and advances in the long run, while banks' total credit is more responsive to the cash reserve ratio, however,

in my current findings, monetary policy instruments were effective to the course of commercial banks.

Several implications could be drawn from the findings of commercial banks responses to changes in monetary policy rate. The implications for commercial banks' response to changes in the monetary policy rate in Ghana can be significant and have a range of effects on the banking system and the broader economy. When the monetary policy rate is changed, it can influence the cost of borrowing and lending for commercial banks, which can impact their profitability, liquidity, and overall performance (Adabor & Buabeng, 2021; Almalki & Batayneh, 2015; Ari et al., 2021). One of the most direct implications of changes in the monetary policy rate is that it can impact on rates of interest that commercial banks charge.

When the policy rate is lowered, commercial banks may lower their lending rates to make credit more affordable and stimulate borrowing (Bangura, 2011; Macey, 2022). Conversely, when the policy rate is raised, commercial banks may increase their lending rates, which can reduce borrowing and slow economic growth. Again, changes in the policy rate can also affect commercial banks' profitability. When the policy rate is lowered, commercial banks may earn lower interest income on their lending activities, which can reduce their net interest margins and overall profitability. Likewise, when the policy rate is raised, commercial banks may earn higher interest income, which can increase their net interest margins and profitability. Changes in the policy rate can also impact commercial banks' liquidity. When the policy rate is lowered, commercial banks may experience an increase in loan demand, which can lead to a higher demand for liquidity.

On the other hand, when the policy rate is raised, commercial banks may experience a decrease in loan demand, which can lead to a lower demand for liquidity. Changes in the policy rate can also influence commercial banks' credit risk. When the policy rate is lowered, commercial banks may be more willing to lend to riskier borrowers, which can increase their credit risk exposure. In sharp contrast, when the policy rate is raised, commercial banks may be more cautious in their lending practices, which can reduce their credit risk exposure. Finally, changes in the policy rate can impact commercial banks' foreign exchange risk exposure. When the policy rate is lowered, capital inflows may increase, which can lead to a stronger domestic currency (Bräuning & Ivashina, 2020; Lutsyshyn & Reznikova, 2013; Marthinsen & Gordon, 2022). This can increase commercial banks' foreign exchange risk exposure, as they may have to convert foreign currency assets into a stronger domestic currency, which can reduce their profitability.

In summary, changes in the monetary policy rate can have significant implications for commercial banks in Ghana. These implications can impact their profitability, liquidity, credit risk exposure, and foreign exchange risk exposure. Commercial banks must carefully manage their exposure to these risks and adjust their lending practices and risk management strategies in response to changes in the policy rate.

How does financial development affect the responsiveness of commercial banks to monetary policy rates in Ghana?

The intricate correlation between financial development and commercial banks' responsiveness to monetary policy rates varies based on the circumstances. In the case of Ghana, where the financial sector has undergone

significant reforms over the past two decades, financial development is likely to have an impact on the responsiveness of commercial banks to monetary policy rates (Ghossoub & Reed, 2017; Ho, 2022; Krause & Rioja, 2006; Ma, 2018; Ma & Lin, 2016; Oyadeyi, 2023). Generally speaking, a more developed financial sector can increase the effectiveness of monetary policy by increasing the transmission of changes in policy rates to lending and borrowing rates (Ndjokou & Mbassi, 2018; Nguyen et al., 2022). This is because a more developed financial sector typically means that there is a larger and more diversified pool of borrowers and lenders, which can lead to more competition among banks and more efficient allocation of credit. In addition, a more developed financial sector can also improve the quality and availability of information about borrowers, which can help banks make better lending decisions and reduce the risk of default.

In the case of Ghana, the financial sector has undergone significant reforms over the past two decades, including the fixed interest rate regime, liberalization of interest rates, and the introduction of new financial instruments and technologies (Najimu, 2019; Ofori & Obeng, 2023; Quartey, 2008; Sena et al., 2021; Ziorklui & Barbee, 2003). These reforms have helped to increase the efficiency and competitiveness of the financial sector and have made it easier for monetary policy to influence lending and borrowing rates.

However, despite these reforms, there are still challenges facing the financial sector in Ghana that could limit the effectiveness of monetary policy. For example, there is still a high level of informality in the economy, particularly in the agricultural sector, which can limit the availability of information about borrowers and make it more difficult for banks to assess

creditworthiness. In addition, there are still significant disparities in access to financial services between urban and rural areas, which can limit the effectiveness of monetary policy. Despite all these, there is a paucity of empirical evidence in the Ghanaian sector on how financial development affect the responsiveness of commercial banks to monetary policy rates.

The researcher explored from employees of some selected commercial banks their views on how financial development affects responsiveness of commercial banks to monetary policy of Ghana. Three (3) themes emerged for analysis and discussions.

Financial Development Affects the Client's Ability to Borrow from the Banks

For clients of commercial banks to be able to go for loans, financial development plays a significant role. An employee had this to say …

I think financial development has a huge role to play because if you have a financial sector that is not developed then it becomes difficult for clients to even go in for loans and for that matter it becomes difficult for the transmission process of the monetary policies to actually take place. So I mean, in terms of the transaction process of the monetary policies, financial development plays a very important role…(**EB1**).

Clients' ability to borrow from commercial banks is also influenced by financial development that is the position of an employee in the banks.

It is financial development even makes it possible for clients of the banks to borrow money. Because for someone to desire to borrow from the bank, he or she must know the legal and regulatory framework of the bank. This can only be made known to the clients through financial development (**EB4**).

Enhances a Commercial Bank's Ability to Do Due Diligence

It was asserted by the participants in the study that financial development helps commercial banks to do due diligence. That is, they believed financial development assists the banks in unraveling any fishy deal by a client of the bank.

Yes, it has influenced it in a way but it has also become more of a bit of a hindrance because now you because of the Internet and technology clients or people can forge documents and easily come for facilities from the banks so based on that the due diligence you do now takes quite some time especially when the client is coming for a mortgage facility or a facility and securing it by a mortgage, a client can go and forge any documents at all and give it to you. If you don't do your due diligence well, you may end up losing that money because the security the clients might have given you is a false one (**EB3**).

To add to the fact that financial development helps commercial banks to fight fraud, an employee of a bank had this to say…

we are in an era where technology has made it so easy for people to breakthrough the banking system to defraud the banks. Without financial development, that is, the use of instruments, markets, legal and regulatory frameworks to allow transactions between the banks and customers, some of these instruments aid the banks to detect these clients who want to dupe the banks (**EB1**).

In a similar vein, an employee who participated in the study shared his thought on the issue of financial development when he outlines how financial development aids banks in responding to monetary policy rate and other bank operations.

You cannot run a banking business smoothly without proper financial development. You are likely to run into serious difficulty because there are fraudulent people everywhere these days. And with the aid of the internet people try to generate means and ways of defrauding the banks, so financial development will do a lot of good to the banks (**EB7**).

Ability to attract customers and sell their products.

Other participants were of the view that financial development enhances commercial banks' ability to attract customers and sell their products which in effect go a long way to influence the responsiveness of the commercial banks to monetary policy.

…financial development helps commercial banks to attract customers and also sell our products. When there is financial development or financial development is taken into consideration and its well advanced, it attracts customers. Customers get to know the different kinds of products that the banks have for the public (**EB8**).

Likewise, an employee who was interviewed was of the view that financial development had a role to play in attracting customers to the banks.

For customers of the bank to even know the products the banks sell, it is through financial development they get to know these products. So, for me, finances do a lot in the banking sector for the banks and their clients (**EB5**).

From the above analysis, it could be said financial development affects the client's ability to borrow from the banks, enhances a commercial bank's ability to do due diligence, and also gives commercial banks' ability to attract customers and also sell their products there by increasing the rate at which commercial banks respond to policy rate by the central bank.

Discussion

The findings of the study revealed that financial development affects commercial banks' responsiveness to monetary policy (Alnaa & Matey, 2022; Ofori & Obeng, 2023; Sena et al., 2021). This is because financial development affects clients' ability to go for loans. That is with well-developed financial development, clients could go for financial credit to expand their business. Financial development also enhanced the ability to do due diligence. If financial sector is well developed it will help the commercial banks to be diligent in their service delivery. Since some clients have the tendency to defraud the bank without financial development, banks are likely to be at risk of being duped by some of such clients.

Literature has ascertained that financial development helps commercial banks to attract customers to the products they sell (Abdel-Halim & Al-Assaf, 2022; De la Torre et al., 2013; Fry, 1978; Ghazali & A. Rahman, 2020; Ma & Lin, 2016; Ofori & Obeng, 2023; Ziorklui et al., 2001). Financial development can lead to an increase in financial inclusion, where more people have access to financial services. This can lead to an increase in demand for banking services, which can attract more clients to commercial banks. Financial development can also improve the financial infrastructure, making it easier for commercial banks to offer their services (Chinn & Ito, 2006; De la Torre et al., 2013; Ma, 2018). This can include the development of electronic payment systems, which can make it more convenient for clients to access their accounts and conduct transactions. As businesses and individuals grow, they may require more banking services, which can attract more clients to commercial banks which is more likely the influence commercial banks responsiveness to policy rate (Ma,

2018). Financial development increases the availability of credit, making it easier for individuals and businesses to borrow money. This can attract more clients to commercial banks, as they may be more likely to use banking services to obtain credit.

Exploring the literature points to several works in relation to financial development across Africa, and the World. For instance, Effiong et al. (2020), explored financial development and monetary policy effectiveness in Africa. The study investigated whether financial development influences the effectiveness of monetary policy on output and inflation in Africa. The findings indicated that there was no statistical evidence for the relationship between output growth and inflation; however, this relationship only holds true for levels that are current at the time. Therefore, deliberate efforts to further the development of the financial sector are required to strengthen the monetary transmission mechanism in African nations. This suggests that financial development did not influence monetary policies in their study, however, in this current study financial development influenced or affected commercial banks responsiveness to monetary policies in several ways as shown in the finding. The current study's findings bring another angle as the previous study conducted employed a statistical approach whilst this current study used a qualitative dimension.

Sena et al. (2021) investigated monetary policy and economic growth in Ghana to ascertain if financial development matters. The study used the Autoregressive Distributed Lag (ARDL) approach to investigate whether financial development influences the effectiveness of monetary policy and assessed their joint effect on economic growth in Ghana for the period 1980 to

2016. The results revealed that financial development strengthens the effectiveness of the monetary policy on economic growth in Ghana. That is financial development has a significant role in monetary policy in Ghana as revealed by this current study pointing out the various ways in which financial development affects monetary policy transmission.

Ahiadorme (2022) explored financial development and the redistributive channel of monetary policy. The paper aimed to examine the distributional channel of monetary policy (MP) and evaluate how financial development (FD) affects the transmission mechanism from MP to income inequality. The study showed that MP has a significant impact on income inequality and the financial system plays an important role by dampening the dis-equalising effects of MP shocks. Both MP and FD directly exert redistributive effects. However, the financial system appears to wield the greatest impact and contribute more to the inequality dynamics.

The discussion concludes by drawing implications on financial development on the commercial banks responsiveness to monetary policies in Ghana. The implications of financial development on the responsiveness of commercial banks to monetary policy rates in Ghana are complex and multifaceted. Financial development refers to the growth and deepening of financial markets, institutions, and systems in a country, including the availability of financial products and services, the level of financial intermediation, and the degree of financial inclusion (Aduda, 2012; Mohan, 2006; Ndebbio, 2004). In other words, financial development is functionally defined as the access, depth and efficiency of financial sector in a given economy. By implication, financial development can increase competition

among banks, which can drive down borrowing costs and increase the responsiveness of banks to changes in the monetary policy rate. This is because banks that are more competitive will be more likely to adjust their lending rates in response to changes in the policy rate in order to attract borrowers and maintain market share there by hating the intended reason for monetary policy rate change.

Financial development can also improve the transmission mechanism of monetary policy by increasing the efficiency and effectiveness of financial intermediation. This means that changes in the policy rate are more likely to be transmitted to the broader economy through the banking system, which can stimulate economic growth. Financial development can also enhance the ability of banks to manage risk and withstand shocks, which can increase their willingness to lend and respond to changes in the policy rate (Bandiera, 2021; Basa et al., 2019; Ho, 2022; Ma, 2018; Zenghelis et al., 2022). This is because banks that are better able to manage risk are less likely to be negatively impacted by changes in the policy rate, which can increase their confidence in lending in responding to changes the monetary policy change.

Despite the implications been positively outlined, there are also potential drawbacks to financial development that may hinder the responsiveness of commercial banks to monetary policy rates in Ghana. Firstly, financial development may lead to the concentration of the banking sector, which can reduce competition and make banks less responsive to changes in the policy rate (Ho, 2022). This is because dominant banks may be less motivated to adjust their lending rates in response to changes in the policy rate if they do not face significant competition from other banks. Furthermore, financial development

may also reveal structural weaknesses in the banking sector, such as underdeveloped risk management practices or inadequate regulatory frameworks (Nakhli & Gaies, 2021). These weaknesses can make banks less responsive to changes in the policy rate and more vulnerable to economic shocks. Finally, financial development may increase the vulnerability of banks to external shocks, such as global financial crises or changes in commodity prices (Asafo-Adjei et al., 2021). In these cases, banks may be less responsive to changes in the policy rate due to external factors beyond their control.

In conclusion, the implications of financial development on the responsiveness of commercial banks to monetary policy rates in Ghana are complex and depend on a range of factors. While greater financial development is generally expected to enhance the responsiveness of banks to changes in the policy rate, there are also potential drawbacks that may hinder the effectiveness of monetary policy transmission. Policymakers and regulators must carefully monitor the impact of financial development on the banking sector and adjust policies and regulations accordingly to ensure that monetary policy remains effective in stimulating economic growth and stability.

Chapter Summary

This chapter focused on assessing the responsiveness of commercial banks to the monetary policy rate given development in the financial sector in Ghana. The study employed a mixed method approach with the quantitative aspect serving as a basis for a qualitative analysis. ARDL on secondary data and thematic analysis on the in-depth interview were the data analysis technique employed.

The results shows that monetary policy affect lending rate of commercial banks in Ghana. Also, this chapter revealed that financial development affects commercial banks' responsiveness to monetary policy rate.

CHAPTER SEVEN

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

The final chapter captures the summary, conclusions and recommendations for the study. The summary entails the research process and the summary of key findings based on the research hypotheses. The conclusions drawn from the findings are linked to theoretical, practical and policy decisions. The chapter subsequently presented recommendations based on the conclusions. Lastly, suggestions for further studies are provided.

The study aimed to investigate the relationship among financial development, public debt dynamics, commercial banks' responsiveness and monetary policy effectiveness in Ghana. Therefore, the specific research objectives were to:

1. examine the role of financial development in the effectiveness of monetary policy in Ghana
2. assess the effect of public debt on financial development in Ghana
3. find out the responsiveness of commercial banks to the monetary policy rate given development in the financial sector in Ghana.

The study employed a positivist and interpretivist philosophies as foundational frameworks. Moreover, this study embraces an explanatory research design within the quantitative paradigm for the research objectives one and two. The mixed method approach is also integrated into the research methodology to offer a profound understanding of the economic phenomena under investigation for objective three. The study employed major macroeconomic variables such as MPR, Public debt, domestic debt, external

debt and financial development in the Ghanaian economy. This study employed diverse monthly variables, thus, six (6) for objective 1, nine (9) for objective 2, and eight (8) for objective 3. The dataset used in this study covers the period from January 2002 to December 2020. The study employed three inference statistics, two main techniques (SVAR and ARDL) and one robustness technique (Dominance Analysis). The study also used thematic analysis on the in-depth interviews that were recorded from eight (8) participants who were purposely selected and interviewed from eight banks for the qualitative aspect of the study. Pre and post estimations techniques employed in the study confirm the reliability and validity of the results presented.

Summary of Findings

The summary of findings for the study is done according to the research objectives presented in the study.

In addressing the first research objective regarding the contribution of financial development to monetary policy's efficacy in Ghana, the study made several noteworthy findings. The investigation revealed that a shock to financial development had discernible effects on key economic indicators, encompassing inflation rates, exchange rates, trade openness, and the output gap. This influence persisted over the study period from 2002 to 2020. Notably, the impact of a financial development shock was found to be closely associated with fluctuations in the output gap, underlining the significance of financial development. However, it is worth mentioning that the influence on the output gap, while initially observable, diminished significantly over time.

Furthermore, a positive shock to financial development was identified as a precursor to an initial increase in both inflation rates and exchange rates.

Specifically, the study indicated that the effect of a positive shock to the monetary policy rate on inflation rates was significant in the first three months. However, the findings suggested that monetary policy shocks had an insignificant effect on exchange rates and the output gap. Interestingly, the study also highlighted that a positive monetary policy shock had a significant and immediate effect on reducing trade openness in the first two months, although this effect became less significant subsequently.

The study found that the interactions between financial development and monetary policy led to a swift reduction in inflation during the initial two months, followed by a more gradual decline. Additionally, the output gap and trade openness experienced initial increases in the first month due to these interactions. Notably, in contrast to the other variables, the interaction between financial development and monetary policy did not yield a significant relationship with the exchange rate. These findings collectively contribute to our understanding of the intricate dynamics between financial development, monetary policy, and key macroeconomic variables in the Ghanaian context.

The second aim of the research was to evaluate the impact of public debt on financial development in Ghana. The research yielded insightful findings by employing both the total debt model and the disaggregated total debt model. Significantly, these models exhibited cointegration, signifying a long-term relationship among the variables. In the long run, it was observed that total debt displayed a positive association with financial development. However, a contrasting pattern emerged in the short run, where total debt demonstrated a negative relationship with financial development. The study identified a positive and statistically significant link between GDP growth and financial

development at the 5% significance level. In contrast, the Monetary Policy Rate (MPR) exhibited a negative sign, though it lacked statistical significance in the long run. Nevertheless, in the short run, the lagged values of MPR (D (MPR (-1)) and D (MPR (-2))) were both negative and statistically significant.

Furthermore, it was discovered that there were statistically significant negative effects of inflation and remittances. In the near term, the Real Effective Exchange Rate showed a positive and statistically significant link at the 10 percent significance level, but in the long run, it did not appear to have any statistically significant impact on financial development. For the disaggregated model, domestic debt emerged as statistically insignificant regarding its effect on financial development. In contrast, external debt, representing government borrowing from external sources, displayed a positive and statistically significant relationship. Also, the Real Effective Exchange Rate demonstrated a positive and statistically significant influence at the 10% significance level. The Monetary Policy Rate and Inflation were statistically insignificant when the government's total debt was disaggregated into domestic and external debt.

Notably, GDP growth exhibited a positive and statistically significant relationship with financial development. In the short run, external debt exhibited a negative and statistically significant relationship, while the Monetary Policy Rate proved statistically insignificant. However, its lags displayed statistical significance, indicating the influence of past values on financial development. Remittances, in the short run, displayed a negative and statistically significant coefficient. The Dominance Analysis emphasized the pivotal roles of total debt and remittances in elucidating variations in financial development, with total debt emerging as the most dominant factor.

In the context of the disaggregated model, external debt stock influence on financial development underscored the importance of prudent international borrowing practices in Ghana. Domestic debt, while not devoid of relevance, appeared to exert a comparatively diminished influence. Notably, trade openness, inflation, and GDP growth, were outranked in relative importance by remittances, exchange rates, and external debt concerning financial development. Lastly, the MPR ranked as the least influential factor, underscoring its limited role in shaping the development of the financial sector.

The final objective of the study delved into examining the responsiveness of commercial banks to the MPR amidst developments in the Ghanaian financial sector. Through ARDL analysis, significant coefficients were unveiled for the lagged MPR (LNMPR) within the short-run model. These findings underscore the enduring influence of MPR changes on commercial banks' lending rates in Ghana. The study's qualitative results shed light on how commercial banks' reactions to shifts in the monetary policy rate are contingent upon their assessments of clients' creditworthiness and the dynamics of monetary transactions. Essentially, commercial banks' responses to alterations in monetary policies are intricately tied to these factors. This is primarily because financial development plays a pivotal role in shaping clients' credit accessibility. A well-developed financial sector facilitates clients' access to financial credit, enabling them to expand their businesses more readily.

Conclusions

The first objective of this study aimed to uncover the relationship between financial development and the effectiveness of monetary policy in Ghana. From the SVAR analyses, financial development facilitated the

effective transmission of the monetary policy in Ghana as it was able to cause change in the movement in the output gap and inflation. The findings have yielded valuable insights into the economic dynamics of the country. Unexpectedly, the study discovered a complex interplay between financial development and key economic indicators including inflation, exchange rates, trade openness, and the output gap. An initial surprise came when it was revealed that a shock to monetary policy had an insignificant impact on the exchange rate and trade openness, indicating a more dynamic relationship between monetary policy and these variables. This unexpected outcome raises the need for further exploration and underscores the multifaceted nature of Ghana's economic landscape.

The second objective of this study aimed to investigate the impact of public debt on financial development in Ghana, and the results have provided significant insights. The findings reveal a complex relationship between public debt and financial development that was not entirely expected. In the long run, a positive association between total debt and financial development suggests that debt accumulation could positively contribute to financial sector growth. This is an unexpected finding given the common notion that high levels of debt could potentially hinder financial development. Moreover, the short-run dynamics indicate a negative relationship between total debt and financial development, suggesting that in the immediate term, debt accumulation might adversely impact the financial sector.

The study has brought new dimensions to understanding the relationship between public debt and financial development in Ghana. The long-run positive relationship between total debt and financial development challenges

conventional wisdom and calls for further investigation into the mechanisms at play. These results provide fresh perspectives for policymakers and researchers, inviting them to delve deeper into the nuances of Ghana's economic landscape. Moreover, the significant influence of external debt on financial development in the disaggregated model emphasizes the importance of responsible international borrowing practices, which can be a guiding principle for future policymaking.

The dominance analysis underscores the crucial roles of total debt and remittances in explaining variations in financial development, with total debt emerging as the dominant factor. The prominence of external debt in the disaggregated model highlights the relevance of managing international borrowing prudently. The comparatively lesser influence of domestic debt suggests a more nuanced role in the financial development context. While trade openness, inflation, and GDP growth remain vital factors, remittances, exchange rates, and external debt have outshined them in their relative importance, providing a fresh perspective on the hierarchy of influences on financial development.

The study's third objective sought to uncover the responsiveness of commercial banks to the monetary policy rate, considering the state of financial development in Ghana. The findings emphasize the pivotal role of financial development in shaping the effectiveness of monetary policy. A well-developed financial system enhances the transmission mechanism of monetary policy, enabling it to more directly and prominently influence the economy. This is achieved through the efficient flow of funds from savers to borrowers, allowing changes in interest rates to impact borrowing costs and credit availability for

both businesses and consumers. As a result, monetary policy actions can have a more pronounced effect on inflation and the output gap.

Furthermore, the study concludes that the stability and robustness of the financial sector are vital for maintaining the effectiveness of monetary policy. A sound financial system is better equipped to absorb and manage shocks, reducing the likelihood of financial crises that can disrupt the transmission mechanism of monetary policy. In times of financial instability, the capacity of monetary policy to control inflation or stimulate output may be compromised.

The development of financial markets, including stock markets, bond markets, and derivatives markets, also emerges as a significant factor affecting the effectiveness of monetary policy. In well-functioning markets, monetary policy signals are rapidly integrated into asset prices, influencing investment decisions, borrowing costs, and consumption patterns. However, the efficiency and functionality of financial markets are critical, as underdeveloped or inefficient markets may limit the transmission of monetary policy signals, affecting their impact on inflation and the output gap.

Moreover, financial development that fosters greater financial inclusion, providing access to credit and financial services to a broader population, can enhance the effectiveness of monetary policy. When monetary policy actions reach a wider spectrum of individuals and businesses, they can stimulate economic activity and influence inflation dynamics positively. Conversely, the absence of financial inclusion may restrict the reach and effectiveness of monetary policy measures.

It is essential to recognize that the relationship between financial development and the effectiveness of monetary policy is context-dependent and

can vary across different economies. The specific institutional characteristics, economic structure, and developmental stage of each country play a crucial role in shaping this relationship. Thus, definitive conclusions should be drawn while considering the unique context of each economy, acknowledging that the impact may differ accordingly.

Based on the identified effects of financial development on various economic indicators, Bank of Ghana could consider implementing reforms to enhance financial development. This might involve measures to improve the depth, efficiency, and stability of the financial sector, such as strengthening regulatory frameworks, promoting financial inclusion, and fostering competition among financial institutions. This involves strengthening and expanding financial intermediaries, such as banks and non-bank institutions, to ensure they are well-developed, efficient, and accessible. This would improve the transmission mechanism of monetary policy and support the central bank's efforts to manage.

The Bank of Ghana should work on refining the implementation of monetary policy to ensure that changes in interest rates are swiftly and accurately transmitted throughout the financial system. This includes close monitoring of the interbank lending rates and the pass-through effect of policy rate adjustments to lending and deposit rates in commercial banks.

As the study indicates, shocks to financial development affect trade openness, hence, Ministry of Trade and Industry may need to align trade policies with efforts to enhance financial development. This could involve measures to facilitate trade, reduce trade barriers, promote export diversification, and encourage foreign direct investment. By promoting a

conducive trade environment, policymakers can harness the potential benefits of financial development on trade openness. The findings of the study emphasize the importance of sustained financial development for overall economic performance. Bank of Ghana should incorporate financial sector development as a key component of long-term development strategies. This may involve focusing on initiatives that promote financial literacy, improve access to finance, foster technological innovation in financial services, and enhance the resilience and stability of the financial system. It is important to note that the specific recommendations should be tailored to the unique context of Ghana, taking into account the country's institutional framework, economic conditions, and policy priorities.

The central bank should ensure effective communication and coordination with commercial banks regarding changes in the MPR. Clear and timely communication can help banks better understand the central bank's policy intentions and adjust their lending rates accordingly. Regular meetings, consultations, and dialogues between the central bank and commercial banks can facilitate a smoother transmission of monetary policy signals. Commercial banks should focus on enhancing their ability to assess the creditworthiness and ability to pay off their clients. This can be done through robust credit risk assessment frameworks, including comprehensive financial analysis, credit scoring models, and the assessment of collateral or guarantees. Banks should continuously invest in improving credit assessment skills and technology to make informed lending decisions. Banks should develop effective risk management strategies that consider the impact of changes in the monetary policy rate. This includes stress testing, scenario analysis, and contingency

planning to assess the potential effects of interest rate fluctuations on loan portfolios, profitability, and overall financial stability.

The study reveals the importance of prudent international borrowing practices. Therefore, Ghana should maintain a prudent approach to external borrowing. This involves thorough assessments of the terms and conditions of external loans to ensure they are favorable and sustainable, minimizing the risks associated with debt accumulation. Ghana should aim for total debt sustainability by balancing the positive effects of debt on financial development with the potential negative short-run impacts. Implementing a sound debt management strategy that prioritizes the long-term stability of financial development can be beneficial.

Bank of Ghana should focus on enhancing the financial infrastructure within the country. This includes improving the efficiency and accessibility of payment systems, developing a robust credit information system, and promoting the adoption of advanced technologies in the financial sector. By strengthening the financial infrastructure, banks can operate more effectively, facilitating their responsiveness to monetary policy signals. Bank of Ghana should implement measures to increase access to banking services, promote financial literacy, and support initiatives that provide affordable credit to underserved individuals and businesses. By expanding the reach of financial services, banks can have a broader customer base and effectively transmit monetary policy signals to a larger portion of the economy. A sound regulatory framework is essential for promoting financial development and ensuring the effectiveness of monetary policy transmission. Bank of Ghana should strengthen regulatory oversight of banks and other financial institutions to

maintain financial stability, mitigate risks, and encourage responsible lending practices. Implementing appropriate prudential regulations and supervisory mechanisms can enhance banks' responsiveness to monetary policy while safeguarding the stability of the financial system.

The Bank of Ghana and Ministry of Finance should focus on policies that promote greater financial inclusion by improving access to credit and financial services for a broader population. Monetary policy measures can have a more far-reaching and effective impact on stimulating economic activity and influencing inflation dynamics. The Bank of Ghana should closely monitor the responsiveness of commercial banks to changes in the monetary policy rate. Transparent and effective communication between the central bank and commercial banks is crucial to ensure a smooth transmission of monetary policy actions. Maintaining the stability and robustness of the financial sector is essential. Regulatory authorities should continue to strengthen the resilience of financial institutions and implement measures to reduce systemic risks, ultimately supporting the effectiveness of monetary policy in Ghana. Commercial banks should improve their credit assessment processes, focusing on clients' ability to repay loans and evaluating monetary transactions carefully. This would ensure a more effective response to changes in monetary policy rates, as they consider the implications for their clients and the broader financial system.

Implication for practice

Encouraging research and knowledge-sharing initiatives can contribute to a better understanding of the relationship between financial development, commercial banks' responsiveness, and monetary policy effectiveness in

Ghana. Collaboration between academia, policymakers, and practitioners can lead to evidence-based policy decisions, innovative approaches, and improved practices in the financial sector. Regulators in Ghana should maintain strong regulatory oversight to ensure the stability and soundness of the financial system. This includes implementing appropriate prudential regulations, supervisory mechanisms, and risk management frameworks. Regular monitoring and evaluation of the responsiveness of commercial banks to monetary policy in Ghana are essential. This involves analyzing data on lending rates, credit growth, loan performance, and other relevant indicators. Such assessments can provide insights into the effectiveness of monetary policy transmission and help identify areas for improvement or policy adjustments.

Implication for policy

Bank of Ghana should make efforts to strengthen the monetary policy framework in Ghana. This may include ensuring the independence of the central bank and granting it the necessary policy tools and autonomy to effectively conduct monetary policy. Bank of Ghana should also focus on enhancing communication and coordination between the central bank, commercial banks and clients to facilitate the transmission of monetary policy signals. Clear, and well defined credit model and communication of policy decisions and intentions can improve banks' understanding and responsiveness to monetary policy. Regulatory authorities should strengthen banking regulations to ensure responsible lending practices and risk management. Prudential regulations should be enforced effectively to mitigate risks, maintain financial stability, and safeguard the banking system. Policymakers should also emphasize the importance of robust credit assessment frameworks and encourage the adoption

of internationally recognized best practices in credit risk management by commercial banks.

Contribution to knowledge

There has been a clarion call in recent times to intensify research and policy advocacy in the financial sector. One area that has received little attention as far as financial development research is concerned, is how financial development influences the effectiveness of monetary policy through inflation and the output gap. To the best of my knowledge, this is one of the few studies that have investigated, financial development and monetary policy effectiveness in Ghana, determinants of financial development and qualitative analysis of commercial banks' responsiveness in Ghana. In the context of SDGs, this research is crucial as it shed light on financial development in Ghana.

In terms of methodology, this research adds up to the paucity of literature that combined quantitative and qualitative dimensions to research financial phenomenon-in this case financial development, and commercial banks' responsiveness to monetary policy rate in Ghana.

Areas for Further Studies

Further research and analysis are recommended to validate the findings from this research and also to explore potential causal relationships between financial development and the identified variables. Also, future research in Ghana could focus on several areas to enhance the understanding of financial development, public debt, and monetary policy. These include delving deeper into the macroeconomic determinants influencing financial development, investigating regional disparities, conducting micro-level analyses of specific financial institutions, assessing the impact of financial inclusion initiatives,

exploring political economy factors, and examining the long-term effects of public debt accumulation. Additionally, researchers might investigate the impact of regulatory changes on the financial sector, conduct cross-country comparisons, analyze the post-financial crisis landscape, and study consumer behavior and financial literacy. Exploring the influence of technological innovations, such as fintech and digital currencies, on monetary policy and financial development is also suggested for further research. These avenues of research would contribute valuable insights for policymakers and stakeholders in Ghana.

REFERENCES

Abango, M. A., Yusif, H., & Issifu, A. (2019). Monetary Aggregates Targeting, Inflation Targeting and Inflation Stabilization in Ghana. *African Development Review*, *31*(4), 448–461. https://doi.org/10.1111/1467-8268.12399

Abbas, Q., Ramzan, M., & Fatima, S. (2022). Financial development and public debt. Estimating the role of institutional quality. *Theoretical and Applied Economics, XXIX* (3), 5–26.

Abbate, A., & Thaler, D. (2019). Monetary Policy and the Asset Risk-Taking Channel. *Journal of Money, Credit and Banking*, *51*(8), 2115–2144. https://doi.org/10.1111/jmcb.12621

Abdel-Halim, M., & Al-Assaf, G. (2022). "Lazy banks" and "Safe asset" Hypothesis: Is it the answer to Public Debt and Financial Development Indicators Puzzle in Emerging Markets? *Review of Applied Socio-Economic Research*, *23*(1), 18–27. https://doi.org/10.54609/reaser.v23i1.127

Abdul Karim, Z., Kamal Basa, D. E., & Abdul Karim, B. (2021). The relationship between financial development and effectiveness of monetary policy: new evidence from ASEAN-3 countries. *Journal of Financial Economic Policy*, *13*(6), 665–685. https://doi.org/10.1108/JFEP-11-2019-0245

Aboagye, A. Q. Q., Akoena, S. K., Antwi-Asare, T. O., & Gockel, A. F. (2008). Explaining interest rate spreads in Ghana. *African Development Review*, *20*(3), 378–399. https://doi.org/10.1111/j.1467-8268.2008.00190.x

Abradu-Otoo, P., Amoah, B., & Bawumia, M. (2003). An investigation of the transmission mechanisms of monetary policy in Ghana: A structural vector error correction analysis. *Bank of Ghana Working Paper*, *WP/BOG-200*, 1–37. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=9e0d01738b5af60181981eb947324ed44a3e6aa6

Acheampong, I. K. (2007). Testing Mckinnon-Shaw thesis in the context of Ghana's financial sector liberalisation episode. *International Journal of Management Research and Technology*, *1*(2), 156–183.

Adabor, O. (2023). Averting the "resource curse phenomenon" through government effectiveness. Evidence from Ghana's natural gas production. *Management of Environmental Quality: An International Journal*, *34*(1), 159–176. https://doi.org/10.1108/MEQ-04-2022-0118

Adabor, O., & Buabeng, E. (2021). Assymetrical effect of oil and gas resource rent on economic growth: Empirical evidence from Ghana. *Cogent Economics and Finance*, *9*(1). https://doi.org/10.1080/ 23322039.2021.1971355

Adams, S., Klobodu, E. K. M., & Lamptey, R. O. (2017). Electric power transmission, distribution losses, and economic growth in Ghana. In *Social, Health, and Environmental Infrastructures for Economic Growth* (pp. 216–233). IGI Global. https://doi.org/1 0.4018/978-1-5225-2364-2.ch011

Adoah, I. (2015). Determinants of Universal Bank Lending Rate in Ghana. *University of Ghana*, 1–75.

Adu, G., & Marbuah, G. (2011). Determinants of inflation in Ghana: An empirical investigation. *South African Journal of Economics*, *79*(3), 251–269. https://doi.org/10.1111/j.1813-6982.2011.01273.x

Aduda, E. K. (2012). Financial inclusion and financial sector stability with reference to Kenya. *Journal of Applied Finance and Banking*, *2*(6), 95–120. http://www.scienpress.com/Upload/JA FB/Vol 2_6_8.pdf

Aduda, E. K. (2012). Financial inclusion and financial sector stability with reference to Kenya. *Journal of Applied Finance and Banking*, *2*(6), 95–120. http://www.scienpress.com/Upload/JA FB/Vol 2_6_8.pdf

Aduda, J., & Kalunda, E. (2012). Financial inclusion and financial sector stability with reference to Kenya: A review of literature. *Journal of Applied Finance and Banking*, *2*(6), 95.

Adu-Darko, E., & Aidoo, E. K. (2022). Government Stability in the Remittance-Economic Growth Link in Ghana. *International Journal of Applied Economics, Finance and Accounting*, *14*(1), 1–14. https://doi.org/10.33094/ijaefa.v14i1.630

Agyapong, D., & Bedjabeng, K. A. (2020). External debt stock, foreign direct investment and financial development: Evidence from African economies. *Journal of Asian Business and Economic Studies*, *27*(1), 81–98. https://doi.org/10.1108/JABES-11-2018-0087

Aharony, J., Saunders, A., & Swary, I. (1986). The effects of a shift in monetary policy regime on the profitability and risk of commercial

banks. *Journal of Monetary Economics*, *17*(3), 363–377. https://doi.org/10.1016/0304-3932(86)90063-2

Ahiadorme, J. W. (2022). Financial development and the redistributive channel of monetary policy. *Studies in Economics and Finance*, *39*(2), 279–296. https://doi.org/10.1108/SEF-03-2021-0104

Ahiakpor, F., Cantah, W., Brafu-Insaidoo, W., & Bondzie, E. (2019). Trade Openness and Monetary Policy in Ghana. *International Economic Journal*, *33*(2), 332–349. https://doi.org/10.1080/10168737.2019.1610027

Ahiawodzi, A. K. (2012). The Effect of financial liberalisation policy on financial market efficiency in Ghana: An empirical study. *International Research Journal of Finance and Economics*, *95*, 79–96. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84865831639&partnerID=40&md5=684dd625e91c4f8fc6b8e6482995b50f

Aimola, A. U., & Odhiambo, N. M. (2021). Public debt and inflation: empirical evidence from Ghana. *Development Studies Research*, *8*(1), 1–13. https://doi.org/10.1080/21665095.2021.1872392

Airaudo, M., Nisticò, S., & Zanna, L. F. (2015). Learning, Monetary Policy, and Asset Prices. *Journal of Money, Credit and Banking*, *47*(7), 1273–1307. https://doi.org/10.1111/jmcb.12245

Akanbi, T. A., & Ajagbe, F. A. (2012). Analysis of monetary policy on commercial banks in Nigeria. *African Journal of Business Management*, *6*(51), 12038–12042. https://doi.org/10.5897/ajbm11.1843

Akanyonge, J., Obeng-Amponsah, W., & Owusu, E. L. (2023). Financial Development and SMEs in African Countries. *Finance for Sustainable Development in Africa*, 252–276. https://doi.org/ 10.4324/9781003215042-18

Akber, N., & Paltasingh, K. R. (2019). Is public investment complementary to private investment in Indian agriculture? Evidence from NARDL approach. *Agricultural Economics (United Kingdom)*, *50*(5), 643–655. https://doi.org/10.1111/agec. 125 15

Akber, N., Gupta, M., & Paltasingh, K. R. (2020). The Crowding-in/ out Debate in Investments in India: Fresh Evidence from NARDL Application. *South Asian Journal of Macroeconomics and Public Finance*, *9*(2), 167–189. https://doi.org/10.1177/2277978720942 676

Akinsola, F. A., & Odhiambo, N. M. (2017). Financial development and monetary policy in sub-saharan Africa. Dynamic panel analysis. *Journal of Applied Economic Sciences*, *12*(7), 1870–1881.

Akosah, N. K. (2015). Empirical appraisal of fiscal stability: the case of Ghana. *Journal of Economic Studies*, *42*(5), 753–779. https://doi.org/1 0.1108/JES-03-2014-0045

Akosah, N. K., Acquaye, I., & Loloh, F. W. (2017). Monetary policy credibility and macrodynamics: evidence from Ghana. *Applied Economics Letters*, *24*(21), 1567–1574. https://doi.org/10.1080 /13504851.2017.1332739

Akosah, N. K., Alagidede, I. P., & Schaling, E. (2020a). Testing for asymmetry in monetary policy rule for small-open developing

economies: Multiscale Bayesian quantile evidence from Ghana. *Journal of Economic Asymmetries*, *22*. https://doi.org/10.1016/j.jeca.2020.e00182

Akosah, N. K., Alagidede, I. P., & Schaling, E. (2021). Dynamics of Money Market Interest Rates in Ghana: Time-Frequency Analysis of Volatility Spillovers. *South African Journal of Economics*, *89*(4), 555–589. https://doi.org/10.1111/saje.12287

Akosah, N. K., Alagidede, P., & Schaling, E. (2020b). Interest Rate and Exchange Rate Volatility Spillovers: Multiscale Perspective of Monetary Policy Transmission in Ghana. *Journal of Central Banking Theory and Practice*, *9*(1), 135–167. https://doi.org/10.2478/jcbtp-2020-0008

Al Hajj, F., Dufrénot, G., Sugimoto, K., & Wolf, R. (2015). Reactions to Shocks and Monetary Policy Regimes: Inflation Targeting Versus Flexible Currency Board in Sub-Saharan Africa. *Developing Economies*, *53*(4), 237–271. https://doi.org/10.1111/deve.12088

Alagidede, P., Coleman, S., & Cuestas, J. C. (2012). Inflationary shocks and common economic trends: Implications for West African monetary union membership. *Journal of Policy Modeling*, *34*(3), 460–475. https://doi.org/10.1016/j.jpolmod.2011.10.001

Alexandre, F., & Bação, P. (2005). Monetary policy, asset prices, and uncertainty. *Economics Letters*, *86*(1), 37–42. https://doi.org/10.1016/j.econlet.2004.06.004

Alfahl, H., Houghton, L., & Sanzogni, L. (2017). Mobile commerce adoption in saudi organizations: A qualitative study. *International*

Journal of Enterprise Information Systems, *13*(4), 31–57. https://doi.org/10.401 8/IJEIS.2017100103

Alhassan, A. L., Kyereboah-Coleman, A., & Andoh, C. (2014). Asset quality in a crisis period: An empirical examination of Ghanaian banks. *Review of Development Finance*, *4*(1), 50–62. https://doi.org/10.1016/j.rdf.2014.03.001

Ali, M., Tursoy, T., Samour, A., Moyo, D., & Konneh, A. (2022). Testing the impact of the gold price, oil price, and renewable energy on carbon emissions in South Africa: Novel evidence from bootstrap ARDL and NARDL approaches. *Resources Policy*, *79*. https://doi.org/10.1016/j.resourpol.2022.102984

Ali, W., Abdullah, A., & Azam, M. (2017). Re-visiting the environmental Kuznets curve hypothesis for Malaysia: Fresh evidence from ARDL bounds testing approach. *Renewable and Sustainable Energy Reviews*, *77*, 990–1000. https://doi.org/10.1016/J.RSER. 2016.11.236

Alichi, A., Mills, M., Laxton, D., & Weisfeld, H. (2018). Inflation forecast targeting in a low-income country: The case of Ghana. In *Monetary Policy in Sub-Saharan Africa* (pp. 398–417). Oxford University Press. https://doi.org/10.1093/oso/9780198785811.0 03.0019

Aliyu, A. A., Bello, M. U., Kasim, R., & Martin, D. (2014). Positivist and Non-Positivist Paradigm in Social Science Research: Conflicting Paradigms or Perfect Partners? *Journal of Management and Sustainability*, *4*(3). https://doi.org/10.5539/JMS.V4N3P79

Almalki, A. M., & Batayneh, K. I. (2015). The relationship between inflation and financial development in Saudi Arabia. *The Journal of Developing Areas*, *49*(6), 321–332. https://doi.org/10.1353/jda .2015.0088

Alnaa, S. E., & Matey, J. (2022). Private Saving in Ghana: the Combined Efforts of Financial Development, Interest Rates, and Inflation. *Asian Development Policy Review*, *10*(3), 186–199. https://doi.org /10. 55493/5008.v10i3.4552

Alpanda, S., & Aysun, U. (2012). Global banking and the balance sheet channel of monetary transmission. *International Journal of Central Banking*, *8*(3), 141–175. https://www.ijcb.org/journal/ijc_b12q3 a4.htm

Alper, C. E., Armando Morales, R., & Yang, F. (2017). Monetary Policy Implementation and Volatility Transmission Along the Yield Curve: The Case of Kenya. *South African Journal of Economics*, *85*(3), 455–478. https://doi.org/10.1111/saje.12155

Altayligil, Y. B., & Akkay, R. C. (2013). The Effect of the Domestic Debt on the Financial Development: A Case Study for Turkey. *International Journal of Economics and Finance*, *5*(5). https://doi.org/10.5539/ijef.v5n5p64

Amankwah-Poku, A., & Preko, A. (2022). Perspectives on Public Financial Management Reforms in Ghana. *Asia-Pacific Management Accounting Journal*, *17*(2), 161–199. https://doi.org/ 10.24191/a pmaj.v17i2-06

Amberger, J., Fendel, R., & Stremmel, H. (2017). Improved output gaps with financial cycle information? An application to G7 countries' new Keynesian Phillips curves. *Applied Economics Letters*, *24*(4), 219–228. https://doi.org/10.1080/13504851.2016.1178840

Amidu, M. (2006). The link between monetary policy and banks lending behaviour: The Ghanaian case. *Banks and Bank Systems*, *1*(4), 38–48. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84960846387&partnerID=40&md5=93060db694a5280ecd1ce634b9fbe403

Amoako-Tuffour, J. (1999). Ghana government fiscal deficits: How small or how large? *Journal of African Economies*, *8*(1), 1–30. https://doi.org/10.1093/jae/8.1.1

Amrial, Mikail, A., & Arundina, T. (2019). Implementation of dual monetary policy and its relevance to inflation and unemployment in the Phillips curve context in Indonesia. *International Journal of Islamic and Middle Eastern Finance and Management*, *12*(5), 680–697. https://doi.org/10.1108/IMEFM-11-2018-0398

Andolfatto, D., Berentsen, A., & Waller, C. (2016). Monetary policy with asset-backed money. *Journal of Economic Theory*, *164*, 166–186. https://doi.org/10.1016/j.jet.2015.08.006

Angelopoulou, E., Balfoussia, H., & Gibson, H. D. (2014). Building a financial conditions index for the euro area and selected euro area countries: What does it tell us about the crisis? *Economic Modelling*, *38*, 392–403. https://doi.org/10.1016/j.econmod.2014.0 1.013

Apanisile, O. T. (2021). Remittances, financial development and the effectiveness of monetary policy transmission mechanism in Nigeria: a DSGE approach (1986–2018). *Indian Economic Review*, *56*(1), 91–112. https://doi.org/10.1007/s41775-021-00110-z

Apanisile, O. T., & Osinubi, T. T. (2020). Financial Development and the Effectiveness of Monetary Policy Channels in Nigeria: A DSGE Approach. *Journal of African Business*, *21*(2), 193–214. https://doi.org/10.1080/15228916.2019.1625021

Arango, M. (2019). Collateralized assets prices and monetary policy. *Revista de Economia Del Rosario*, *22*(2), 155–185. https://doi.org/10.12804/revistas.urosario.edu.co/economia/a.8116

Ari, D., Riwu Manu, R. E. H., & Nggandung, Y. (2021). The Effect of Corporate Governance Medied by Capital Adequacy and Credit Risk on Financial Performance (Study on Commercial Banks Listed on the Indonesia Stock Exchange). *Research Journal of Finance and Accounting*, *12*(20). https://doi.org/10.7176/rjfa/12-20-06

Arnold, L. (2000). A Model of Debt Deflation and the Phillips Curve: Implications for Business Cycles and the Balance Sheet Channel of Monetary Policy. *Jahrbucher Fur Nationalokonomie Und Statistik*, *220*(4), X–399. https://www.scopus.com/inward/record.uri?eid=2-s2.0-0011149775&partnerID=40&md5=01de2e45bff7994068a4018754f6cb5a

Asafo-Adjei, E., Boateng, E., Isshaq, Z., Idun, A. A. A., Owusu, P., & Adam, A. M. (2021). Financial sector and economic growth amid

external uncertainty shocks: Insights into emerging economies. *PLoS ONE*, *16*(11), 1–27. https://doi.org/10.1371/journal. pone.0259303

Asamoah, L. A., & Adu, G. (2016). An Empirical Analysis of the Determinants of Interest Rates in Ghana. *Journal of African Business*, *17*(3), 377–396. https://doi.org/10.1080/152289 16.2016.1207493

Asiedu, E. L., Mireku - Gyimah, D., Kamasa, K., & Otoo, H. (2021). Interest rate, inflation and stock market performance in Ghana: A sector based vector error correction model perspective. *African Journal of Business and Economic Research*, *16*(1), 185–206. https://doi.org/10.31920/1750-4562/2021/v16n1a8

Assibey-Yeboah, M., Mallick, S., & Mohsin, M. (2016). Real Effects of Inflation on External Debt in Developing Economies. *International Journal of Finance and Economics*, *21*(4), 398–416. https://doi.org/10.1002/ijfe.1553

Atmowardoyo, H. (2018). Research Methods in TEFL Studies: Descriptive Research, Case Study, Error Analysis, and R & D. *Journal of Language Teaching and Research*, *9*(1), 197. https://doi.org /10.17507 /JLTR.0901.25

Awad, I. L., & Eid, A. G. (2017). The mechanisms of stagflation in Egypt:The arab spring five years later. *Ikonomicheski Izsledvania*, *26*(4), 129–145. https://www.scopus.com/inward/ record.uri?ei d=2-s2.0-85042163105&partnerID=40& md5=4658c5199813230 22f8f0ddab248121f

Ayadi, R., Arbak, E., Naceur, S. Ben, & De Groen, W. P. (2015). Determinants of financial development across the mediterranean. In *Economic and Social Development of the Southern and Eastern Mediterranean Countries* (pp. 159–181). Springer International Publishing. https://doi.org/10.1007/978-3-319-11122-3_11

Ayodele, J. C. (2014). Effects of monetary policy on the commercial banks lending in Nigeria. *Review of Public Administration and Management*, *400*(3614), 1–13.

Azen, R., & Budescu, D. V. (2003). The Dominance Analysis Approach for Comparing Predictors in Multiple Regression. *Psychological Methods*, *8*(2), 129–148. https://doi.org/10.1037/1082-989X.8.2.129

Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives*, *21*(2), 129–151. https://doi.org/10.1257/JEP.21.2.129

Baltagi, B., Demetriades, P., & Law, S. H. (2007). Financial Development, Openness and Institutions. *University of Leicester Discussion Paper in Economics*, *5*.

Bandiera, L. (2021). Monetary Policy, Monetary Areas, and Financial Development with Electronic Money. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.878946

Banerjee, A., Dolado, J. J., & Mestre, R. (1998). Error-correction mechanism tests for cointegration in a single-equation framework. *Journal of Time Series Analysis*, *19*(3), 267–283. https://doi.org/10.1111/1467-9892.00091

Bangara, B. C. (2019). *A New Keynesian DSGE model for Low Income Economies with Foreign Exchange Constraints A New Keynesian DSGE model for Low Income Economies with Foreign Exchange Constraints* (795). https://ideas.repec.org/p/rza/wpaper/795.html

Bangura, L. (2011). *Adjustment of Commercial Banks'Interest Rates and the Effectiveness of Monetary Policy: Evidence From Anglophone West Africa*. Rhodes University.

Bank of Ghana. (2015). *Bank of Ghana Annual Report and Financial Statements 2015*. https://www.bog.gov.gh/wp-content/uploads/2019/07/AnnRep-2015.pdf

Bank of Ghana. (2020). *Bank of Ghana Annual Report and Financial Statements 2020*. https://www.bog.gov.gh/wp-content/uploads/2021/09/Annual-Report-2020_Electronic-Print-Version_BOG_NOV-2021.pdf

Bank of Ghana. (2022). *Bank of Ghana Annual Report and Financial Statements 2022*. https://www.bog.gov.gh/wp-content/uploads/2023/07/Annual-Report-2022.pdf

Banu, M., & Vepa, S. (2019). Influence of monetary policy on the profitability of the commercial bank– an analytical study of the state bank of India. *International Journal on Emerging Technologies*, *10*(4), 239–248. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85077693218&partnerID=40&md5=d1fe68706b1d73c778d068f68b1d65b0

Baranowski, R., Chen, Y., & Fryzlewicz, P. (2019). Narrowest-over-threshold detection of multiple change points and change-point-

like features. *Journal of the Royal Statistical Society. Series B: Statistical Methodology*, *81*(3), 649–672. https://doi.org/10.1111/rssb.12322

Basa, D. E. K., Abdul Karim, Z., & Zaidi, M. A. S. (2019). Financial development and the effectiveness of monetary policy: New evidence from Malaysia. *Asian Academy of Management Journal*, *24*(2), 21–39. https://doi.org/10.21315/aamj2019.24.2.2

Basile, A., & Joyce, J. P. (2001). Asset bubbles, monetary policy and bank lending in Japan: An empirical investigation. *Applied Economics*, *33*(13), 1737–1744. https://doi.org/10.1080/0 0036840010018621

Batuo, M. E., & Mlambo, K. (2012). *Financial liberalisation, Banking Crises and Economic Growth in African Countries*. University Library of Munich, Germany. http://mpra.ub.uni-muenchen.de/41524/

Belongia, M. T., & Ireland, P. N. (2021). A Classical View of the Business Cycle. *Journal of Money, Credit and Banking*, *53*(2–3), 333–366. https://doi.org/10.1111/jmcb.12767

Benayed, W., & Gabsi, F. B. (2019). Domestic public debt and financial development in Sub-Saharan Africa: Is there an inverted-U relationship? *Economics Bulletin*, *40*(1), 846–854.

Benigno, P., & Nisticó, S. (2017). Safe assets, liquidity, and monetary policy. *American Economic Journal: Macroeconomics*, *9*(2), 182–227. https://doi.org/10.1257/mac.20150073

Benigno, P., & Paciello, L. (2014). Monetary policy, doubts and asset prices. *Journal of Monetary Economics*, *64*, 85–98. https://doi.org/10.1016/j.jmoneco.2014.02.004

Berg, A., Aiyar, S., Hussain, M., Roache, S., Mirzoev, T., & Mahone, A. (2007). The macroeconomics of scaling up aid: Lessons from recent experience. *IMF Occasional Papers*, *253*, vii–2. https://www.scopus.com/inward/record.uri?eid=2-s2.0-34249939708&partnerID=40&md5=f5dc7e3622da6b9de9b56a559536e120

Bernardo, J. L., Stockhammer, E., & Martínez, F. L. (2016). A post Keynesian theory for Tobin's q in a stock-flow consistent framework. *Journal of Post Keynesian Economics*, *39*(2), 256–285. https://doi.org/10.1080/01603477.2016.1145061

Bertrand, P. V., Sakamoto, Y., Ishiguro, M., & Kitagawa, G. (1988). Akaike Information Criterion Statistics. *Journal of the Royal Statistical Society. Series A (Statistics in Society)*, *151*(3), 567. https://doi.org/10.2307/2983028

Bhattacharya, M., Inekwe, J., & Paramati, S. R. (2018). Remittances and financial development: empirical evidence from heterogeneous panel of countries. *Applied Economics*, *50*(38), 4099–4112. https://doi.org/10.1080/00036846.2018.1441513

Bilquess, F., Mukhtar, T., & Sohail, S. (2011). What matters for financial development in D-8 countries? Capital flows, trade openness and institutions. *Journal of Economic Cooperation and Development*, *32*(1), 71–91.

Bittencourt, M. (2011). Inflation and financial development: Evidence from Brazil. *Economic Modelling*, *28*(1–2), 91–99. https://doi.org/10.1016/j.econmod.2010.09.021

Bittencourt, M., Gupta, R., & Stander, L. (2014). Tax evasion, financial development and inflation: Theory and empirical evidence. *Journal of Banking and Finance*, *41*(1), 194–208. https://doi.org/10.1016/j.jbankfin.2014.01.009

Bleaney, M., Morozumi, A., & Mumuni, Z. (2020). Inflation targeting and monetary policy in Ghana. *Journal of African Economies*, *29*(2), 121–145. https://doi.org/10.1093/jae/ejz021

Boadi, I. (2016). Determinants of Ghanaian banks' credit to the "missing middle": a supply side approach. *International Journal of Bank Marketing*, *34*(6), 924–939. https://doi.org/10.1108/IJBM-12-2015-0194

Boadi, I., Dana, L. P., Mertens, G., & Mensah, Lord. (2017). SMEs' Financing and Banks' Profitability: A "Good Date" for Banks in Ghana? *Journal of African Business*, *18*(2), 257–277. https://doi.org/10.1080/15228916.2017.1285847

Boehl, G. (2022). Monetary policy and speculative asset markets. *European Economic Review*, *148*. https://doi.org/10.1016/j.euroe corev.2022.104250

Bonchi, J. (2023). Asset price bubbles and monetary policy: Revisiting the nexus at the zero lower bound. *Review of Economic Dynamics*, *47*, 186–203. https://doi.org/10.1016/j.red.2021.11.004

Boufateh, T., & Saadaoui, Z. (2021). The time-varying responses of financial intermediation and inflation to oil supply and demand shocks in the US: Evidence from Bayesian TVP-SVAR-SV approach. *Energy Economics*, *102*. https://doi.org/10.1016/j.eneco.2021.105535

Bouraoui, T. (2019). External debts, current account balance and exchange rates in emerging countries. *Economics Bulletin*, *39*(4), 2333–2342. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85075385751&partnerID=40&md5=0b35d7d3c90fce9cd727fc1c95b8b00c

Bräuning, F., & Ivashina, V. (2020). US monetary policy and emerging market credit cycles. Journal of Monetary Economics, 112, 57-76.

Brei, M., Jacolin, L., & Noah, A. (2020). Credit risk and bank competition in Sub-Saharan Africa. *Emerging Markets Review*, *44*. https://doi.org/10.1016/j.ememar.2020.100716

Bresz, J. W., Creswell, J. D. W. D., Creswell, J. D. W. D., Bresz, J. W., & Creswell, J. D. W. D. (2017). Research design: Qualitative, quantitative, and mixed methods approaches. In *Journal of Reproductive Health* (Vol. 2, Issue 3). Sage publications.

Breusch, T. S. (1978). Testing for Autocorrelation in Dynamic Linear Models. *Australian Economic Papers*, *17*(31), 334–355. https://doi.org/10.1111/j.1467-8454.1978.tb00635.x

Breusch, T. S., & Pagan, A. R. (1979). A Simple Test for Heteroscedasticity and Random Coefficient Variation. *Econometrica*, *47*(5), 1287. https://doi.org/10.2307/1911963

Brissimis, S. N., & Delis, M. D. (2022). Bank Heterogeneity and Monetary Policy Transmission. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4165754

Brownbridge, M. (1995). Credit supply, monetary policy and structural adjustment in Ghana. *Savings & Development/African Review of Money Finance & Banking*, *1–2*, 155–175. https://www.scopus.com/inward/record.uri?eid=2-s2.0-0029501625&partnerID=40&md5=471a6a1712d84f143484b3b91c3a27d5

Bryman, A. (2007). Barriers to Integrating Quantitative and Qualitative Research. *Journal of Mixed Methods Research*, *1*(1), 8–22. https://doi.org/10.1177/2345678906290531

Budescu, D. V. (1993). Dominance analysis: A new approach to the problem of relative importance of predictors in multiple regression. *Psychological Bulletin*, *114*(3), 542–551. https://doi.org/10.1037/0033-2909.114.3.542

Budescu, D. V., & Azen, R. (2004). Beyond global measures of relative importance: Some insights from dominance analysis. *Organizational Research Methods*, *7*(3), 341–350. https://doi.org/10.1177/1094428104267049

Bui, D. T. (2018). How Financial Freedom and Integration Change Public Debt Impact on Financial Development in the Asia-Pacific: A Panel Smooth Transition Regression Approach. *Australian Economic Review*, *51*(4), 486–501. https://doi.org/10.1111/1467-8462.12279

Burns, S. (2016). The road less travelled: Monetary disequilibrium, Austrian Capital Theory, and the 'keynesian diversion'. *Research in the History of Economic Thought and Methodology*, *34B*, 337–363. https://doi.org/10.1108/S0743-41542016000034B012

Ca' Zorzi, M., Kolasa, M., & Rubaszek, M. (2017). Exchange rate forecasting with DSGE models. In *NBP Working Paper* (260). https://doi.org/10.1016/j.jinteco.2017.03.011

Calvo, G. A. (1983). Staggered prices in a utility-maximizing framework. *Journal of Monetary Economics*, *12*(3), 383–398. https://doi.org/10.1016/0304-3932(83)90060-0

Cantah, W. G. (2018). *Differential impact of Oil Price Shocks on External Balance, Stock Market, Inflation and Output in Ghana* [Doctoral Thesis, University of Cape Coast]. http://hdl.handle.net/123456789/5258

Cantah, W. G., & Ahiakpor, F. (2017). Doves, Hawks or Pigeons? Characterising monetary policy regime switches in Ghana. *African Finance Journal*, *19*(2), 47–57. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85041665350&partnerID=40&md5=2584b16ef718481528cf920cb3b66181

Cantah, W. G., Peprah, J. A., & Takyi, P. O. (2023). Financial Inclusion and Monetary Policy Effectiveness in Ghana. In *Palgrave Macmillan Studies in Banking and Financial Institutions* (pp. 81–103). Palgrave Macmillan. https://doi.org/10.1007/978-3-031-09345-6_4

Caporale, G. M., Helmi, M. H., Çatık, A. N., Menla Ali, F., & Akdeniz, C. (2018). Monetary policy rules in emerging countries: Is there an augmented nonlinear taylor rule? *Economic Modelling*, *72*, 306–319. https://doi.org/10.1016/j.econmod.2018.02.006

Cardarelli, R., Elekdag, S. A., & Lall, S. (2009). *Financial stress, downturns, and recoveries*.

Carlstrom, C. T., & Fuerst, T. S. (2007). Asset prices, nominal rigidities, and monetary policy. *Review of Economic Dynamics*, *10*(2), 256–275. https://doi.org/10.1016/j.red.2006.11.005

Carranza, L., Galdon-Sanchez, J. E., & Gomez-Biscarri, J. (2010a). Understanding the Relationship between Financial Development and Monetary Policy. *Review of International Economics*, *18*(5), 849–864. https://doi.org/10.1111/j.1467-9396.2010.00926.x

Carranza, L., Galdon-Sanchez, J. E., & Gomez-Biscarri, J. (2010b). Understanding the Relationship between Financial Development and Monetary Policy. *Review of International Economics*, *18*(5), 849–864. https://doi.org/10.1111/j.1467-9396.2010.00926.x

Castro, V. (2011). Can central banks' monetary policy be described by a linear (augmented) Taylor rule or by a nonlinear rule? *Journal of Financial Stability*, *7*(4), 228–246. https://doi.org/10.1016/j.jfs.2010.06.002

CCmara, N., & Tuesta, D. (2015). Measuring Financial Inclusion: A Muldimensional Index. *SSRN Electronic Journal*, *14/26*. https://doi.org/10.2139/ssrn.2634616

Cecchetti, S. (1999). *Legal Structure, Financial Structure, and the Monetary Policy Transmission Mechanism*. https://doi.org/10.3386/w7151

Cecchetti, S. G., & Kharroubi, E. (2013). Why does financial sector growth crowd out real economic growth? In *Working Paper* (Issue September). CEPR Working Paper.

Cetorelli, N., & Goldberg, L. S. (2012). Banking Globalization and Monetary Transmission. *Journal of Finance*, *67*(5), 1811–1843. https://doi.org/10.1111/j.1540-6261.2012.01773.x

Chadha, J. S., Sarno, L., & Valente, G. (2004). Monetary policy rules, asset prices, and exchange rates. *IMF Staff Papers*, *51*(3), 529–552. https://www.scopus.com/inward/record.uri?eid=2-s2.0-12844281864&partnerID=40&md5=a9228d4ba9d92e095d22d4888cf0a678

Chauhan, G. S., & Ramesha, K. (2016). Macroeconomic Determinants of Financial Stability in a Business Cycle. *The Indian Economic Journal*, *63*(4), 702–724. https://doi.org/10.1177/0019466220160409

Chen, C., Yao, S., & Ou, J. (2017). Exchange rate dynamics in a Taylor rule framework. *Journal of International Financial Markets, Institutions and Money*, *46*, 158–173. https://doi.org/10.1016/j.intfin.2016.07.008

Chen, N.-K., Cheng, H.-L., & Chu, H.-L. (2015). Asset price and monetary policy: The effect of expectations formation. *Oxford Economic Papers*, *67*(2), 380–405. https://doi.org/10.1093/oep/gpu045

Chinn, M. D., & Ito, H. (2005). Capital Account Liberalization, Institutions and Financial Development: Cross Country Evidence. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.315865

Chinn, M. D., & Ito, H. (2006). What matters for financial development? Capital controls, institutions, and interactions. *Journal of Development Economics*, *81*(1), 163–192. https://doi.org/10.101 6/j.j devec o.2005.05.010

Chowdhury, M. (2016). Financial Development, Remittances and Economic Growth: Evidence Using a Dynamic Panel Estimation. *Margin*, *10*(1), 35–54. https://doi.org/10.1177/09738010156126 66

Chung-Yee, L., Wana Ismail, N., & Ai-Lian, T. (2020). Is Public Debt Asymmetrically Link to Financial Development in Malaysia? *Asian Journal of Empirical Research*, *10*(3), 97–110. https://doi.org/10.18488/journal.1007/2020.10.3/1007.3.97.110

Cihák, M., Demirgüç-Kunt, A., Feyen, E., & Levine, R. (2012). Benchmarking Financial Systems around the World. In *Global Financial Development Report 2013* (pp. 15–43). The World Bank. https://doi.org/10.1596/9780821395035_ch01

Clark, P. B., Goodhart, C. A. E., & Huang, H. (1999). Optimal monetary policy rules in a rational expectations model of the Phillips curve. *Journal of Monetary Economics*, *43*(2), 497–520. https://doi.org/ 10.1 016/S0304-3932(98)00055-5

Coetzee, J., & Genukile, L. (2020). The short- and long-run drivers of lending behaviour by South African banks. *African Journal of*

Economic and Management Studies, *11*(4), 639–651. https://doi.org/10.1108/AJEMS-08-2019-0316

Coibion, O., Gorodnichenko, Y., & Kamdar, R. (2018). The formation of expectations, inflation, and the Phillips curve. *Journal of Economic Literature*, *56*, 1447–1491. https://doi.org/10.125 7/jel.20171300

Cole, D. C., & Shaw, E. S. (1974). Financial Deepening in Economic Development. *The Journal of Finance*, *29*(4), 1345. https://doi.org /10.2307/2978421

Cooley, T. F., & Quadrini, V. (2004). Optimal monetary policy in a Phillips-curve world. *Journal of Economic Theory*, *118*(2), 174–208. https://doi.org/10.1016/j.jet.2003.12.010

Creswell, J. W. (2015). Qualitative, Quantitative, and Mixed Methods Approaches. In *Syria Studies* (Vol. 7, Issue 1).

Creswell, J. W., & Creswell, J. D. (2018). Research design: qualitative, quantitative, and mixed methods approaches. In *SAGE Publications, Inc. (US)*. SAGE.

Cristiano, C. (2016). J. M. KEYNES'S lectures on fisher in 1909. *Research in the History of Economic Thought and Methodology*, *34B*, 367–401. https://doi.org/10.1108/S0743-41542016000034 B003

Csaba, K. (2017). Modelling of provision under new international financial and reporting standard (IFRS 9). *Proceedings - 31st European Conference on Modelling and Simulation, ECMS 2017*, 153–157. https://doi.org/10.7148/2017-0153

da Silva, T. G., de Carvalho Guillén, O. T., Morcerf, G. A. N., & de Melo Modenesi, A. (2022). Effects of monetary policy news on financial

assets: Evidence from Brazil on a bivariate VAR-GARCH model (2006–17). *Emerging Markets Review*, *52*. https://doi.org/10.1016/j.ememar.2022.100916

Dabachi, U. M., Mahmood, S., Ahmad, A. U., Jakada, A. H., Abdullahi, A. T., Abubakar, M. A., & Kamalu, K. (2022). The Asymmetric Influence of Exchange Rate and Inflation on Financial Development in Nigeria: Evidence from NARDL. *Iranian Economic Review*, *26*(4), 833–851. https://doi.org/10.22059/ier.2022.90659

Dabla-Norris, E., & Floerkemeier, H. (2006). Transmission Mechanisms of Monetary Policy in Armenia: Evidence from VAR Analysis. *IMF Working Papers*, *06*(248), 1. https://doi.org/10.5089/9781451865080.001

Dabla-Norris, E., & Srivisal, N. (2013). Revisiting the Link Between Finance and Macroeconomic Volatility. *IMF Working Papers*, *13*(29), 1. https://doi.org/10.5089/9781475543988.001

Dafe, F., Essers, D., & Volz, U. (2018). Localising sovereign debt: The rise of local currency bond markets in sub-Saharan Africa. *World Economy*, *41*(12), 3317–3344. https://doi.org/10.1111/twec.12624

Dale, S., & Haldane, A. G. (1995). Interest rates and the channels of monetary transmission: Some sectoral estimates. *European Economic Review*, *39*(9), 1611–1626. https://doi.org/10.1016/0014-2921(94)00108-1

Dang, V. D. (2021). Liquidity injection, bank lending, and security holdings: The asymmetric effects in Vietnam. *Journal of Economic*

Asymmetries, *24*, e00212. https://doi.org/10.1016/j. jeca.2021. e00212

Dar, M. H., & Nain, M. Z. (2023). Does inflation affect asymmetrically to financial development in India? Fresh insights based on NARDL approach. *International Journal of Social Economics*. https://doi.org/10.1108/IJSE-02-2023-0094

Davidson, J., Engle, R. F., & Granger, C. W. J. (1993). Long-Run Economic Relationships: Readings in Cointegration. *Economica*, *60*(237), 117. https://doi.org/10.2307/2554738

De Brouwer, G., & Kawai, M. (Eds.). (2004). *Exchange Rate Regimes in East Asia*. London: RoutledgeCurzon.

De Grauwe, P., & Grimaldi, M. (2001). Exchange rates, prices and money: A long-run perspective. *International Journal of Finance and Economics*, *6*(4), 289–313. https://doi.org/10.1002/ijfe.162

De Haan, J., & Elbourne, A. (2021). Asymmetric Monetary Transmission in Emu: The Robustness of VAR Conclusions and Cecchetti's Legal Family Theory. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.622641

De la Torre, A., Feyen, E., & Ize, A. (2013). Financial development: Structure and dynamics. *World Bank Economic Review*, *27*(3), 514–541. https://doi.org/10.1093/wber/lht005

De Paoli, B. (2009). Monetary policy under alternative asset market structures: The case of a small open economy. *Journal of Money, Credit and Banking*, *41*(7), 1301–1330. https://doi.org/10.111 1/j.1538-4616.2009.00257.x

Demetriades, P. O., & Rousseau, P. L. (2010). Government, Trade Openness and Financial Development 1. In *Nottingham.Ac.Uk*. https://www.nottingham.ac.uk/gep/documents/conferences/2010/april2010confmunich/demetriades-april2010.pdf

Deng, C., Liang, C., Hong, Y., & Jiang, Y. (2023). CCTV News' Asymmetric Impact on the Chinese Stock Market during COVID-19: A Combination Analysis Based on the SVAR and NARDL Models. *Emerging Markets Finance and Trade*, *59*(4), 1232–1246. https://doi.org/10.1080/1540496X.2022.2123219

Deshui, M., Akbar, A., & Bilal. (2023). Monetary policy, assets mispricing and share pledge: empirical evidence from A-share listed companies of China. *Applied Economics*, *55*(25), 2889–2901. https://doi.org/10.1080/00036846.2022.2107987

Devereux, J., & Connolly, M. (1996). Commercial policy, the terms of trade and the real exchange rate revisited. *Journal of Development Economics*, *50*(1), 81–99.

Dimand, R. W. (2013). David Hume and Irving Fisher on the quantity theory of money in the long run and the short run. *European Journal of the History of Economic Thought*, *20*(2), 284–304. https://doi.org/10.1080/09672567.2012.758760

Djiogap, F., & Ngomsi, A. (2012). determinants of Bank Long-term Lending Behavior in the Central African Economic and Monetary Community (CEMAC). *Review of Economics and Finance*, *2*(May), 107–114.

Do, Q., & Levchenko, A. a. (2004). Trade and Financial Development ∗. *World*, 1–30.

Dogan, E., & Seker, F. (2016). The influence of real output, renewable and non-renewable energy, trade and financial development on carbon emissions in the top renewable energy countries. *Renewable and Sustainable Energy Reviews*, *60*, 1074–1085. https://doi.org/10.1016/ j.rser.2016.02.006

Dorn, J. A. (2020). The Phillips curve: A poor guide for monetary policy. *Cato Journal*, *40*(1), 133–151. https://doi.org/10.36009/CJ.40.1.8.

Dupor, B. (2002). Comment on: Monetary policy and asset prices. *Journal of Monetary Economics*, *49*(1), 99–106. https://doi.org/10.1016/S0304-3932(01)00094-0

Dwyer, G. P., Gilevska, B., Nieto, M. J., & Samartín, M. (2023). The effects of the ECB's unconventional monetary policies from 2011 to 2018 on banking assets. *Journal of International Financial Markets, Institutions and Money*, *87*. https://doi.org/10.1016/j.intfin.2023.101800

Effiong, E. L., Esu, G. E., & Chuku, C. (2020). Financial development and monetary policy effectiveness in Africa. *Journal of Social and Economic Development*, *22*(1), 160–181. https://doi.org/10. 1007/s4 0847-020-00098-x

Égert, B., Cuaresma, J. C., & Reininger, T. (2011). Interest Rate Pass-Through in Central and Eastern Europe: Reborn from Ashes Merely to Pass Away? *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.949491

Ehigiamusoe, K. U., Narayanan, S., & Poon, W. C. (2022). Revisiting the role of inflation in financial development: unveiling non-linear and moderating effects. *Asia-Pacific Journal of Business Administration*, *14*(3), 380–401. https://doi.org/10.1108/APJBA-04-2021-0171

Eijffinger, S. C. W., & Qian, Z. (2016). Trade openness and the Phillips curve: The neglected heterogeneity and robustness of empirical evidence. *International Review of Economics and Finance*, *44*, 13–18. https://doi.org/10.1016/j.iref.2016.03.006

Emam, H. A. (2021). Interest rate setting in Egypt: a NARDL approach for estimating backward-looking monetary policy reaction function. *Applied Economics*, *53*(57), 6655–6669. https://doi.org/10.1080/00036846.2021.1948961

Engle, R. F., & Granger, C. W. J. (1987). Co-Integration and Error Correction: Representation, Estimation, and Testing. *Econometrica*, *55*(2), 251. https://doi.org/10.2307/1913236

Engle, R. F., & Granger, C. W. J. (2015). Co-integration and error correction: Representation, estimation, and testing. *Applied Econometrics*, *39*(3), 107–135. https://doi.org/10.2307/1913236

Ersoy, I. (2011). On reserve hoarding in Emes: The case of Turkey. *Journal of Applied Economic Sciences*, *6*(3), 31–44. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84856006966&partnerID=40&md5=4606e271a1a9aa0bc1c74c407fd51399

Ewodo-Amougou, M. R., Sapnken, F. E., Mfetoum, I. M., & Tamba, J. G. (2023). Analysis of the relationship between oil rent and crude oil production in Cameroon: Evidence from ARDL and NARDL models. *Resources Policy*, *85*. https://doi.org/10.1016/j.resourpol.2023.103891

Fang, X., & Jiang, Y. (2016). Impact of the joint-stock reform of commercial banks on the effectiveness of monetary policy in China. *Panoeconomicus*, *63*(3), 325–338. https://doi.org/10.2298/PAN1603325F

Fang, X., Liu, H., & Qian, X. (2018). Political incentives and the effectiveness of monetary policy: evidence from China's city commercial banks. *Applied Economics Letters*, *25*(2), 70–73. https://doi.org/10.1080/13504851.2017.1296538

Farajnezhad, M., & Suresh. (2019). Effectiveness of credit channel of monetary policy transmission mechanism on commercial banks in malaysia. *International Journal of Recent Technology and Engineering*, *8*(1C2), 913–926. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85070531827&partnerID=40&md5=5f04a9f91b438de9ccf3cb2cc7bbcb71

Farhani, S., & Ozturk, I. (2015). Causal relationship between CO2 emissions, real GDP, energy consumption, financial development, trade openness, and urbanization in Tunisia. *Environmental Science and Pollution Research*, *22*(20), 15663–15676. https://doi.org/10.100 7/S11356-015-4767-1

Farmer, R. E. A., & Nicolò, G. (2018). Keynesian economics without the Phillips curve. *Journal of Economic Dynamics and Control*, *89*, 137–150. https://doi.org/10.1016/j.jedc.2018.01.012

Ferrero, G., Loberto, M., & Miccoli, M. (2021). The assets' pledgeability channel of unconventional monetary policy. *Economic Inquiry*, *59*(4), 1547–1568. https://doi.org/10.1111/ecin.13013

Feyen, E., & Zuccardi Huertas, I. (2020). Bank Lending Rates and Spreads in Emdes: Evolution, Drivers, and Policies. In *Bank Lending Rates and Spreads in Emdes: Evolution, Drivers, and Policies*. The World Bank. https://doi.org/10.1596/1813-9450-9392

Fiador, V. O. L. (2016). *Monetary policy and economic performance-evidence from selected African countries*.

Fiador, V., Sarpong-Kumankoma, E., & Karikari, N. K. (2022). Monetary policy effectiveness in Africa: the role of financial development and institutional quality. *Journal of Financial Regulation and Compliance*, *30*(3), 335–352. https://doi.org/10.1 10 8/JFRC-03-2021-0024

Filardo, A. J., & Siklos, P. L. (2016). Prolonged reserves accumulation, credit booms, asset prices and monetary policy in Asia. *Emerging Markets Finance and Trade*, *52*(2), 364–381. https://doi.org/10.1 080/ 1540496X.2014.998562

Fischer, S. (2008). Mundell-fleming lecture: Exchange rate systems, surveillance, and advice. *IMF Staff Papers*, *55*(3), 367–383. https://doi.org/10.1057/imfsp.2008.12

Folawewo, A.O. and T.S. Osinubi, 2006)(. Monetary policy and macroeconomic instability in nigeria: A rational expectation approach. Journal of Social Sciences, 12(2): 93- 100

Forson, J. A., Braimah, A. I., Asiamah, S. K., Kuranchie-Pong, R., Daniels, E., & Adjavon, S. E. (2023). Banking Supervision and Nonperforming Loans in Africa: Does Institutional Quality Matter in the Ghanaian Banking Space? *Journal of African Business*, *24*(3), 384–403. https://doi.org/10.1080/15228916.2022.2087443

Forson, R., Obeng, C. K., & Brafu-Insaidoo, W. G. (2017). Determinants of Capital Flight In Ghana. *Journal of Business and Enterprise Development (JOBED)*, *7*, 108–130. https://doi.org/10.47963/jobed.v7i0.133

Frimpong, J. M., & Marbuah, G. (2010). The determinants of private sector investment in Ghana: An ARDL approach. *European Journal of Social Sciences*, *15*(2), 84–95. https://www .scopus.com/inward/record.uri?eid=2-s2.0-77956515601&partnerID=40&md5=106e4f75567084ce41d1eff0f0af6f6b

Frimpong, S. (2022). On the Macroeconomic Conditions of West African Economies to External Uncertainty Shocks. *Risks*, *10*(7). https://doi.org/10.3390/risks10070138

Fromentin, V. (2017). The long-run and short-run impacts of remittances on financial development in developing countries. *Quarterly Review of Economics and Finance*, *66*, 192–201. https://doi.org/10.1016/j.qref.2017.02.006

Fry, M. J. (1978). Money and Capital or Financial Deepening in Economic Development? *Journal of Money, Credit and Banking*, *10*(4), 464. https://doi.org/10.2307/1991576

Fry-McKibbin, R., & Souza, R. da S. (2018). Chinese Resource Demand or Commodity Price Shocks: Macroeconomic Effects For an Emerging Market Economy. In *CAMA Working Paper*. Elsevier BV. https://doi.org/10.2139/SSRN.3253992

Fryzlewicz, P. (2014). Wild binary segmentation for multiple change-point detection. *Annals of Statistics*, *42*(6), 2243–2281. https://doi.org/10.1214/14-AOS1245

Fu, Z., Chen, Z., Sharif, A., & Razi, U. (2022). The role of financial stress, oil, gold and natural gas prices on clean energy stocks: Global evidence from extreme quantile approach. *Resources Policy*, *78*. https://doi.org/10.1016/j.resourpol.2022.102860

Fuhrer, J., & Moore, G. (1992). Monetary policy rules and the indicator properties of asset prices. *Journal of Monetary Economics*, *29*(2), 303–336. https://doi.org/10.1016/0304-3932(92)90017-V

Fujiki, H., Kaihatsu, S., Kurebayashi, T., & Kurozumi, T. (2016). Monetary Policy and Asset Price Booms: A Step Towards a Synthesis. *International Finance*, *19*(1), 23–41. https://doi.org/10.1111/infi.12081

Fuller, W. A. (1976). *Introduction to Statistical Time Series, New York, John Wiley and Sons*. IS 0-471-28715-6.

Furlanetto, F. (2011). Does monetary policy react to asset prices? Some international evidence. *International Journal of Central Banking*,

7(3), 91–111. https://www.scopus.com/inward/record.uri?eid=2-s2.0-80052585832&partner ID=40&md5=97c08b6f9fed83e5994916d0c23585ad

Furuoka, F., Ling, P. U. I. K., Chomar, M. A. T. I. N., & Nikitina, L. (2020). Trade openness and the phillips curve: Evidence from asean countries. *Singapore Economic Review*. https://doi.org/10.1142/S0217590820500599

Galí, J. (2014). Monetary policy and rational asset price bubbles. *American Economic Review*, *104*(3), 721–752. https://doi.or g/10.1257/aer.104.3.721

Gentle, P. F., & Thornton, M. (2014). Issues concerning Hayekian triangles and Phillips curves, with real wage and real interest variables. *Banks and Bank Systems*, *9*(2), 8–17. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84960848983&partnerID=40&md5=f492ae32718efd6e092e42b464daa268

Gentle, P. F., Paudel, K. P., & Upadhyaya, K. P. (2005). Real wages, real interest rates, and the Phillips curve. *Applied Economics*, *37*(4), 397–402. https://doi.org/10.1080/00036840412331315024

George, P. V. (1994). Asset Price Inflation and Monetary Policy. *Economic Papers*, *13*(4), 1–10. https://doi.org/10.1111/j.1759-3441.1994.tb01169.x

Geromichalos, A., & Herrenbrueck, L. (2016). Monetary Policy, Asset Prices, and Liquidity in Over-the-Counter Markets. *Journal of*

Money, Credit and Banking, *48*(1), 35–79. https://doi.org/10.1111/jmcb.12290

Geromichalos, A., Licari, J. M., & Suárez-Lledó, J. (2007). Monetary policy and asset prices. *Review of Economic Dynamics*, *10*(4), 761–779. https://doi.org/10.1016/j.red.2007.03.002

Gertler, M., & Gilchrist, S. (1993). The Role of Credit Market Imperfections in the Monetary Transmission Mechanism: Arguments and Evidence. *The Scandinavian Journal of Economics*, *95*(1), 43. https://doi.org/10.2307/3440134

Ghazali, N. A., & A. Rahman, A. (2020). Monetary Policy, Development of Financial Market and Banking Lending : An Analysis of the Bank-Lending Channel in Malaysia. *Malaysian Management Journal*, *5*. https://doi.org/10.32890/mmj.5.1-2.2001.8591

Ghossoub, E. A. (2010). Liquidity Risk and Banks' Asset Composition: Implications for Monetary Policy. *Southern Economic Journal*, *77*(2), 465–481. https://doi.org/10.4284/sej.2010.77.2.465

Ghossoub, E. A. (2012). Liquidity risk and financial competition: Implications for asset prices and monetary policy. *European Economic Review*, *56*(2), 155–173. https://doi.org/10.1016/j.euroecorev.2011.09.006

Ghossoub, E. A., & Reed, R. R. (2014). The cost of capital, asset prices, and the effects of monetary policy. *Journal of Macroeconomics*, *42*, 211–228. https://doi.org/10.1016/j.jmacro.2014.08.004

Ghossoub, E. A., & Reed, R. R. (2017). Financial development, income inequality, and the redistributive effects of monetary policy.

Journal of Development Economics, *126*, 167–189. https://doi.org / 10.1 016/j.jdeveco.2016.12.012

Glindro, E., Lemence, R., & Sabuga, I. (2015). Universal and commercial banks' reaction to monetary policy in the Philippines. *Photocopy, November*.

Gockel, A. F. (2010). *The world financial crisis and its implications for Ghana*. Friedrich-Ebert-Stiftung. https://doi.org/10.1007/springerreference_76095

Godfrey, L. G. (1978). Testing Against General Autoregressive and Moving Average Error Models when the Regressors Include Lagged Dependent Variables. *Econometrica*, *46*(6), 1293. https://doi.org/10.2307/1913829

Godswill, O., Ailemen, I., Osabohien, R., Chisom, N., & Pascal, N. (2018). Working capital management and bank performance: Empirical research of ten deposit money banks in Nigeria. *Banks and Bank Systems*, *13*(2), 49–61. https://doi.org/10.21511/bb s.13(2).2018.05

Gomez-Gonzalez, P. (2021). Drivers of inflation-linked public debt: an empirical investigation. *International Economics and Economic Policy*, *18*(1), 223–244. https://doi.org/10.1007/s10368-020-00485-z

Granger, C. W. J. (1969). Investigating Causal Relations by Econometric Models and Cross-spectral Methods. *Econometrica*, *37*(3), 424. https://doi.org/10.2307/1912791

Granger, C. W. J., & Yoon, G. (2002). Hidden Cointegration. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.313831

Gray, H. P. (1963). the Effects on Monetary Policy of Rising Costs in Commercial Banks. *The Journal of Finance*, *18*(1), 29–48. https://doi.org/10.1111/j.1540-6261.1963.tb01620.x

Gross, M., & Semmler, W. (2019). Mind the Output Gap: The Disconnect of Growth and Inflation during Recessions and Convex Phillips Curves in the Euro Area. *Oxford Bulletin of Economics and Statistics*, *81*(4), 817–848. https://doi.org/10.11 11/obes.12291

Guender, A. V., & Xie, Y. (2007). Is there an exchange rate channel in the forward-looking phillips curve? A theoretical and empirical investigation. *New Zealand Economic Papers*, *41*(1), 5–28. https://doi.org/10.1080/00779950709558497

Gujarati, Damodar. N., & Porter, Dawn. C. (2009). Multicollinearity: What Happens If the Regressors Are Correlated? In *Basic econometrics* (5th Editio, pp. 320–364). McGraw-Hill.

Gupta, J. (2018). Trends and macro-economic determinants of FDI inflows to India. In Ö. T., G. P.K., F. J., T. V., & S. M. (Eds.), *Communications in Computer and Information Science* (Vol. 906, pp. 346–358). Springer Verlag. https://doi.org/10.1007/978-981-13-1813-9_35

Gyamfi, E. N., Adam, A. M., & Appiah, E. F. (2019). Macroeconomic convergence in the West African monetary zone: Evidence from rank tests. *Economics and Business Letters*, *8*(4), 191–198. https://doi.org/10.17811/ebl.8.4.2019.191-198

Ha, V. D., Nguyen, T. H. Y., & Nguyen, van C. (2022). Factors Influencing the Financial Development—A Metadata Analysis. In *Studies in*

Systems, Decision and Control (Vol. 427, pp. 375–385). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-030-98689-6_25

Haldane, A., & Quah, D. (1999). UK Phillips curves and monetary policy. *Journal of Monetary Economics*, *44*(2), 259–278. https://doi.org/10.1016/S0304-3932(99)00025-2

Hall, G. J. (2004). Exchange rates and casualties during the first world war. *Journal of Monetary Economics*, *51*(8), 1711–1742. https://doi.org/10.1016/j.jmoneco.2004.02.001

Hamma, I. E. (2017). Linking remittances with financial development and institutions: a study from selected MENA countries. *Proceedings of Middle East Economic Association*, *19*(1), 1–23. https://shs.hal.science/halshs-01655353/

Hannan, E. J., & Quinn, B. G. (1979). The Determination of the Order of an Autoregression. *Journal of the Royal Statistical Society: Series B (Methodological)*, *41*(2), 190–195. https://doi.org/10.1111/j.2517-6161.1979.tb01072.x

Harun, S. M., Hassan, M. K., & Zaher, T. S. (2005). Effect of Monetary Policy on Commercial Banks Across Different Business Conditions. *Multinational Finance Journal*, *9*(1/2), 99–128. https://doi.org/10.17578/9-1/2-5

Harville, D. A. (1974). Bayesian inference for variance components using only error contrasts. *Biometrika*, *61*(2), 383–385. https://doi.org/10.1 093/biomet/61.2.383

Hauner, D. (2009). Public debt and financial development. *Journal of Development Economics*, *88*(1), 171–183. https://doi.org/10.1016/j.jdeveco.2008.02.004

Hausman, D. M. (2015). Economics, Philosophy of. *International Encyclopedia of the Social & Behavioral Sciences: Second Edition*, 99–104. https://doi.org/10.1016/B978-0-08-097086-8.63059-3

Ho, S. Y., & Iyke, B. N. (2020). The Determinants of Economic Growth in Ghana: New Empirical Evidence. *Global Business Review*, *21*(3), 626–644. https://doi.org/10.1177/0972150918779282

Ho, T. L. (2022). Financial development: Is it an advantage or obstacle for monetary policy? *Journal of Advances in Management Research*, *19*(3), 349–366. https://doi.org/10.1108/JAMR-03-2021-0103

Hollander, H. (1990). A Social Exchange Approach to Voluntary Cooperation. *American Economic Review*, *80*(5), 1157–1167. https://doi.org/10.1126/science.151.3712.867-a

Holz, M. (2007). Asset-based reserve requirements: A new monetary policy instrument for targeting diverging real estate prices in the euro area. *European Journal of Economics and Economic Policies: Intervention*, *4*(2), 331–351. https://doi.org/10.4337/ejeep.2007.02.10

Hosono, K. (2006). The transmission mechanism of monetary policy in Japan: Evidence from banks' balance sheets. *Journal of the Japanese and International Economies*, *20*(3), 380–405. https://doi.org/10.1016/j.jjie.2005.07.003

Houssa, R., Otrok, C., & Puslenghea, R. (2010). A model for monetary policy analysis for Sub-Saharan Africa. *Open Economies Review*, *21*(1), 127–145. https://doi.org/10.1007/s11079-009-9142-8

Hu, C., Liu, X., Pan, B., Chen, B., & Xia, X. (2018). Asymmetric Impact of Oil Price Shock on Stock Market in China: A Combination Analysis Based on SVAR Model and NARDL Model. *Emerging Markets Finance and Trade*, *54*(8), 1693–1705. https://doi.org/10.1080/1540496X.2017.1412303

Hu, G., Ma, G., Qiao, W., & Wallace, N. (2023). "Conventional" Monetary Policy in Olg Models: Revisiting the Asset-Substitution Channel. *International Economic Review*, *64*(3), 875–892. https://doi.org/10.1111/iere.12618

Huang, W. (2006). Emerging markets financial openness and financial development. *University of Bristol Discussion Paper*, *588*. https://www.bristol.ac.uk/efm/media/workingpapers/working_papers/pdffiles/dp06588.pdf

Hughes, H. S., & Hoffmann, S. (2018). Max Weber and the Transcending of Positivism and Idealism. *Consciousness and Society*, 278–335. https://doi.org/10.4324/9781315080574-8

Hung, L. D. (2020). Public Safe Assets Determination. *Global Economic Review*, *49*(4), 350–368. https://doi.org/10.1080/1226508X.2020.1748083

Huo, Y., & Budescu, D. V. (2009). An extension of dominance analysis to canonical correlation analysis. *Multivariate Behavioral Research*, *44*(5), 688–709. https://doi.org/10.1080/00273170903 187673

Hur, J. (2017). Monetary Policy and Asset Prices: A Markov-Switching DSGE Approach. *Journal of Applied Econometrics*, *32*(5), 965–982. https://doi.org/10.1002/jae.2560

Ibrahim Anyars, S., & Adabor, O. (2023). The impact of oil price changes on inflation and disaggregated inflation: Insights from Ghana. *Research in Globalization*, *6*. https://doi.org/10.1016/j.resglo.2023.100125

Ibrahim, M. H. (2020). Monetary Policy, Financial Development and Income Inequality in Developing Countries. *Singapore Economic Review*. https://doi.org/10.1142/S0217590821410010

Iddrisu, A. A., & Alagidede, I. P. (2020). Is the interest rate setting behaviour of the Bank of Ghana constrained by high debt levels? *African Development Review*, *32*(3), 459–471. https://doi.org/10.1111/1467-8268.12452

Iddrisu, A. A., & Alagidede, I. P. (2021). Estimating bank of Ghana's policy responses in the context of Taylor rule: Is the inflation target realistic? *Cogent Economics and Finance*, *9*(1). https://doi.org/10.1080/23322039.2021.1988201

Iddrisu, A.-A., & Alagidede, I. P. (2022). Monetary policy and price stability in Ghana's fourth republic: Have the dues been paid? In *Monetary and Financial Systems in Africa: Integration and Economic Performance* (pp. 43–62). Springer International Publishing. https://doi.org/10.1007/978-3-030-96225-8_2

Iheonu, C. O., Asongu, S. A., Odo, K. O., & Ojiem, P. K. (2020). Financial sector development and Investment in selected countries of the

Economic Community of West African States: empirical evidence using heterogeneous panel data method. *Financial Innovation*, *6*(1), 29. https://doi.org/10.1186/s40854-020-00195-0

Ikeda, D. (2022). Monetary Policy, Inflation, and Rational Asset Price Bubbles. *Journal of Money, Credit and Banking*, *54*(6), 1569–1603. https://doi.org/10.1111/jmcb.12880

İlgün, M. F. (2016). Financial Development and Domestic Public Debt in Emerging Economies: A Panel Cointegration Analysis. *Journal of Applied Economics & Business Research*, *Vol. 6*(Issue 4), p284-296.

Ilyas, M., Song, L., Galadima, M. D., Hussain, M. N., & Sattar, A. (2022). Shocks effects of inflation, money supply, and exchange rate on the West African Monetary Zone (WAMZ): Asymmetric SVAR modelling. *Journal of International Trade and Economic Development*, *31*(2), 255–276. https://doi.org/10.1080/09638199.2021.1965191

International Monetary Fund. (2011). Ghana: Financial System Stability Assessment Update. *IMF Staff Country Reports*, *11*(131), i. https://doi.org/10.5089/9781455282579.002

Ioannidou, V., Ongena, S., & Peydró, J. L. (2009). Monetary Policy and Subprime Lending: A Tall Tale of Low Federal Funds Rates, Hazardous Loans and Reduced Loan Spreads. *European Banking Centre Discussion Paper*, *45*. http://consulting.greta.it/credit/credit2008/Tuesday/03_Ioannidou_Ongena_Peydro.pdf

Isayev, M., Irani, F., & Attarzadeh, A. (2023). Asymmetric effects of monetary policy on non-bank financial intermediation (NBFI) assets: a panel quantile regression approach. *Journal of Economic Studies*. https://doi.org/10.1108/JES-01-2023-0024

Isiksal, A. Z., Samour, A., & Resatoglu, N. G. (2019). Testing the impact of real interest rate, income, and energy consumption on Turkey's CO2 emissions. *Environmental Science and Pollution Research*, *26*(20), 20219–20231. https://doi.org/10.1007/s11356-019-04987-5

Ismihan, M., & Ozkan, F. G. (2012). Public debt and financial development: A theoretical exploration. *Economics Letters*, *115*(3), 348–351. https://doi.org/10.1016/j.econlet.2011.12.040

Itoo, H. H., & Ali, N. (2023). Analyzing the causal nexus between CO2 emissions and its determinants in India: evidences from ARDL and EKC approach. *Management of Environmental Quality: An International Journal*, *34*(1), 192–213. https://doi.org/10.1108/MEQ-01-2022-0014

Iyke, B. N., & Ho, S. Y. (2019). Inflation, inflation uncertainty, and growth: Evidence from Ghana. *Contemporary Economics*, *13*(2), 123–136. https://doi.org/10.5709/ce.1897-9254.30

Jackson, P. T., & Dolan, L. (2021). Positivism, Post-positivism, and Social Science. *Research Methods in the Social Sciences: An A-Z of Key Concepts*, 214–218. https://doi.org/10.1093/HEPL/9780198850298.003.0050

Jaiblai, P., & Shenai, V. (2019). The determinants of FDI in sub-Saharan economies: A study of data from 1990–2017. *International Journal of Financial Studies*, *7*(3). https://doi.org/10.3390/ijf s7030043

Jarque, C. M., & Bera, A. K. (1980). Efficient tests for normality, homoscedasticity and serial independence of regression residuals. *Economics Letters*, *6*(3), 255–259. https://doi.org/10.1016/0165-1765(80)90024-5

Jiang, C., Zhang, Y., Kamran, H. W., & Afshan, S. (2021). Understanding the dynamics of the resource curse and financial development in China? A novel evidence based on QARDL model. *Resources Policy*, *72*. https://doi.org/10.1016/j.re sourpol.2021.102091

Jiang, S., Qiu, S., & Zhou, H. (2022). Will digital financial development affect the effectiveness of monetary policy in emerging market countries? *Economic Research-Ekonomska Istrazivanja*, *35*(1), 3437–3472. https://doi.org/10.1080/1331677X.2021.1997619

Jiménez, G., Ongena, S. R. G., Peydro, J.-L., & Saurina Salas, J. (2011). Hazardous Times for Monetary Policy: What Do Twenty-Three Million Bank Loans Say about the Effects of Monetary Policy on Credit Risk-Taking? *SSRN Electronic Journal*. https://doi.org/10 .2139/ssrn.1333538

Jiménez-Sotelo, R. A. (2023). The influence of domestic public debt market in the financial development: Evidence of 52 countries in 1990-2020. *Trimestre Economico*, *90*(359), 773–804. https://doi. org/10.20430/ete.v90i359.1775

Joanes, D. N., & Gill, C. A. (1998). Comparing measures of sample skewness and kurtosis. *Journal of the Royal Statistical Society: Series D (The Statistician)*, *47*(1), 183-189.https://doi.org/10.1016/j.econlet.2007.0 5.018

Johansen, S., & Juselius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration — With Applications To the Demand for Money. *Oxford Bulletin of Economics and Statistics*, *52*(2), 169–210. https://doi.org/10.1111/j.1468-0084.1990.mp52002003.x

Jones, B. E., Fleissig, A. R., Elger, T., & Dutkowsky, D. H. (2008). Monetary policy and monetary asset substitution. *Economics Letters*, *99*(1), 18–22. https://doi.org/10.1016/j.econlet.2007.05.018

Kaldor, N. (1966). Marginal productivity and the macro-economic theories of distribution: Comment on Samuelson and Modigliani. *Review of Economic Studies*, *33*(4), 309–319. https://doi.or g/10.2307/2974428

Kallmes, K. (2018). Imperial monetary policy and social reaction in third century Rome. *Journal Des Economistes et Des Etudes Humaines*, *24*(1). https://doi.org/10.1515/jeeh-2017-0002

Kaputo, C. C. (2011). *Macroeconomic Policy and Domestic Private Investment: the Case of Zambia, 1980-2008*. http://dspace.unza.zm/handle/123456789/1060

Kara, A., & Nelson, E. (2004). International evidence on the stability of the optimizing IS equation. In *Oxford Bulletin of Economics and*

Statistics (Vol. 66, Issue SUPPL., pp. 687–712). https://doi.org/10.1111/j.1468-0084.2004.00098.x

Karwowski, E. (2022). Commercial finance for development: a back door for financialisation. *Review of African Political Economy*, *49*(171), 161–172. https://doi.org/10.1080/03056244.2021.19 12722

Katagiri, M. (2022). Equilibrium Yield Curve, the Phillips Curve, and Monetary Policy. *Journal of Money, Credit and Banking*, *54*(8), 2235–2272. https://doi.org/10.1111/jmcb.12919

Kawai, M., & de Brouwer, G. (2004). Exchange rate regimes in East Asia. In *Exchange Rate Regimes in East Asia* (pp. 1–466). https://doi.org/10.4324/9780203356401

Keho, Y. (2017). The impact of trade openness on economic growth: The case of Cote d'Ivoire. *Cogent Economics & Finance*, *5*(1), 1332820.

Kim, D. H., Lin, S. C., & Suen, Y. B. (2012). Dynamic effects of financial openness on economic growth and macroeconomic uncertainty. *Emerging Markets Finance and Trade*, *48*(1), 25–54. https://doi.org/10.2753/REE1540-496X480102

Kipyego, S., Njoka, C., & Muniu, J. (2022). Relationship Between Public Debt And Financial Development In Kenya. *International Journal of Finance and Accounting*, *7*(4), 55–83. https://doi.org/10.47604/ijfa.1704

Klobodu, E. K. M., & Adams, S. (2016). Capital Flows and Economic Growth in Ghana. *Journal of African Business*, *17*(3), 291–307. https://doi.org/10.1080/15228916.2016.1169784

Klutse, S. K., Sági, J., & Kiss, G. D. (2022). Exchange Rate Crisis among Inflation Targeting Countries in Sub-Saharan Africa. *Risks*, *10*(5). https://doi.org/10.3390/risks10050094

Koch, C. (2011). *Essays on the Credit Channel of Monetary Transmission*. https://ethos.bl.uk/OrderDetails.do?uin=uk.bl.etho s.420242

Kontonikas, A., & Montagnoli, A. (2006). Optimal monetary policy and asset price misalignments. *Scottish Journal of Political Economy*, *53*(5), 636–654. https://doi.org/10.1111/j.1467-9485.2006.00398.x

Krause, S., & Rioja, F. (2006). Financial development and monetary policy efficiency. *Emory Economics*, *613*(September), 100–121. http://www.banque-france.fr/fileadmin/user_upload/banque_de_france/publications/Bulletin-de la-Banque-de-France/krause_06_13_paper.pdf

Krause, S., Economics, F. R.-E., & 2006, undefined. (2006). Financial development and monetary policy efficiency. *CiteseerS Krause, F RiojaEmory Economics, 2006•Citeseer*. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=46cb275ff61ca26099ab89a2ebb9531190069df2

Krinichansky, K. (2015). Financial systems and economic development in the Russian regions: A comparative analysis. *Voprosy Ekonomiki*, *2015*(10), 94–108. https://doi.org/10.32609/0042-8736-2015-10-94-108

Krupkina, A., Deryugina, E., & Ponomarenko, A. (2015). Estimating sustainable output growth in emerging market economies. *Comparative Economic Studies*, *57*(1), 168–182.

Kumhof, M., & Tanner, E. (2013). Government Debt: A Key Role in Financial Intermediation. *Money, Crises, and Transition*, 249–278. https://doi.org/10.7551/mitpress/9780262182669.003.0011

Kumiarso, B., Sukawati, E., Pambudi, S., Angkoro, D., Prasmuko, A., & Hafidz, I. S. (2002). Interest Rate Channel of Monetary Transmission in Indonesia. In Eds (Ed.), *Transmission Mechanism of Monetary Policy in Indonesia* (pp. 27–102). Financial Market Structure and Studies Division.

Kusairi, S., Maulina, V., & Margaretha, F. (2019). Public debt and private consumption in Asia pacific countries: Is there evidence for Ricardian equivalence? *Journal of International Studies*, *12*(1), 50–64. https://doi.org/10.14254/2071-8330.2019/12-1/3

Kusi, B. A., Agbloyor, E. K., Fiador, V. O., & Osei, K. A. (2016). Credit referencing bureaus and bank credit risk: Evidence from Ghana. *African Finance Journal*, *18*(2), 69–92. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85026839780&partnerID=40&md5=b330cf99bf0df1dc77da95e47838f791

Kutivadze, N. (2013). Public debt, financial development and economic growth. In *Public Debt, Financial Development and Economic Growth*. Nova Science Publishers, Inc. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84895840289&partnerID=40&md5=22c74cc2941e5313d58fcd5714057ceb

Kwashie, A. A., Baidoo, S. T., & Ayesu, E. K. (2022). Investigating the impact of credit risk on financial performance of commercial banks in Ghana. *Cogent Economics and Finance*, *10*(1). https://doi.org/10.1080/23322039.2022.2109281

Kwiatkowski, D., Phillips, P. C. B., Schmidt, P., & Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root. How sure are we that economic time series have a unit root? *Journal of Econometrics*, *54*(1–3), 159–178. https://doi.org/10.1016/0304-4076(92)90104-Y

Kyei, C. B., Asafo-Adjei, E., Owusu Junior, P., Adam, A. M., Idun, A. A.-A. A., & Boateng, J. K. G. A. G. A. (2023). Nexus between commodities and banking sector financial soundness: The role of general macroeconomic setting in Ghana. *Cogent Economics & Finance*, *11*(1), 2173871. https://doi.org/10.1080/23322039.2023.2 173871

Kyereme, S. (2010). Effects of exchange-rate volatility & changes in macroeconomic fundamentals on economic growth in Ghana. In *The Economy of Ghana: Analytical Perspectives on Stability, Growth and Poverty* (pp. 95–110). Boydell and Brewer Ltd. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84940907251&partnerID=40&md5=6c762c10f9b0d091c51a777e933bace1

Lagos, R. (2011). Asset prices, liquidity, and monetary policy in an exchange economy. *Journal of Money, Credit and Banking*,

43(SUPPL. 2), 521–552. https://doi.org/10.1111/j.1538-4616.2011.00450.x

Lahiri, K., & Lee, J. S. (1979). Rational expectations and the short-run Phillips curves. *Journal of Macroeconomics*, *1*(2), 167–190. https://doi.org/10.1016/0164-0704(79)90010-7

Lai, Y. W. (2017). Output gaps and the new keynesian phillips curve: An application of the empirical mode decomposition. *Economics Bulletin*, *37*(2), 952–961. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85020109995&partnerID=40&md5=49d3d3b30afec9775aa741185dd0a035

Law, S. H., Ng, C. H., Kutan, A. M., & Law, Z. K. (2021). Public debt and economic growth in developing countries: Nonlinearity and threshold analysis. *Economic Modelling*, *98*, 26–40. https://doi.org/10.1016/j.econmod.2021.02.004

Lee, F., & Cronin, B. (2016). Philosophical Foundation and Research Strategy. *Handbook of Research Methods and Applications in Heterodox Economics*, 13–14. https://doi.org/10.4337/9781782548461.00006

Leedy, P. D., & Ormrod, J. E. (2018). Practical research. Planning and design. Planning and design (11th ed.). *Journal of Applied Learning & Teaching*, *1*(2), 73–74. https://doi.org/10.37074/jalt.2018.1.2.15

Leith, C., & Wren-Lewis, S. (2009). Taylor rules in the open economy. *European Economic Review*, *53*(8), 971–995. https://doi.org/10.1016/j.euroecorev.2009.04.009

Lester, B., Postlewaite, A., & Wright, R. (2012). Information, liquidity, asset prices, and monetary policy. *Review of Economic Studies*, *79*(3), 1209–1238. https://doi.org/10.1093/restud/rds003

Leu, S. C. Y. (2011). A New Keynesian SVAR model of the Australian economy. *Economic Modelling*, *28*(1–2), 157–168. https://doi.org/10.1016/j.econmod.2010.09.015

Li, Y., & Wang, M. (2012). Capital regulation, monetary policy and asymmetric effects of commercial banks' efficiency. *China Finance Review International*, *2*(1), 5–26. https://doi.org/10.1108/20441391211197438

Liao, G. Y. (2020). Credit migration and covered interest rate parity. *Journal of Financial Economics*, *138*(2), 504–525. https://doi.org/10.1016/j.jfineco.2020.06.002

Lindgren, C.-J., Garcia, G., & Saal, M. I. (1996). Bank Soundness and Macroeconomic Policy. In *Bank Soundness and Macroeconomic Policy*. International Monetary Fund. https://doi.org/10.5089/9781557755995.071

Luchman, J. N. (2021). Determining relative importance in Stata using dominance analysis: domin and domme. *Stata Journal*, *21*(2), 510–538. https://doi.org/10.1177/1536867X211025837

Luintel, K. B. (2001). Heterogeneous panel unit root tests and purchasing power parity. *Manchester School*, *69*(SUPPL.), 42–56. https://doi.org/10.1111/1467-9957.69.s1.3

Luo, W., & Azen, R. (2013). Determining Predictor Importance in Hierarchical Linear Models Using Dominance Analysis. *Journal of*

Educational and Behavioral Statistics, *38*(1), 3–31. https://doi.org/10.3102/1076998612458319

Lutsyshyn, Z., & Reznikova, N. (2013). Competitive Devaluations in Currency Wars: Financial Projections of Neo-Protectionism. *International Economic Policy*, *19*(2), 47–62. http://iepjournal.com/journals_eng/19/2013_3_Lutsyshyn_Reznikova_eng.pdf

Ma, Y. (2018). Financial Development, Financial Structure, and the Growth Effect of Monetary Policy: International Evidence. *Global Economic Review*, *47*(4), 395–418. https://doi.org/ 10.1080/1226508X.2018.1521297

Ma, Y., & Lin, X. (2016). Financial development and the effectiveness of monetary policy. *Journal of Banking and Finance*, *68*, 1–11. https://doi.org/10.1016/j.jbankfin.2016.03.002

Macey, J. (2022). Fair Credit Markets: Using Household Balance Sheets to Promote Consumer Welfare. *Texas Law Review*, *100*(4), 683–745. https://heinonline.org/hol-cgi-bin/get_pdf.cgi?handle=hein.journals/tlr100&section=28&casa_token=NOM_uC1e9VcAAAAA:7J8YAXxIdHH6mSlVs_zusPVcA3xpn0wiLHA-jwpozE8eiKo1oKfWe28lbO6MwArznzlRwYbWt_0

Mahawiya, S. (2015). Financial sector development, Inflation and Openness: A comparative panel study of ECOWAS and SADC. In *econrsa.orgS MahawiyaEconomic Research Southern Africa Working Paper, 2015•econrsa.org*. https://econrsa.org/wp-content/uploads/2022/06/working_paper_528.pdf

Makina, D. (2017). Introduction to the financial services in Africa special issue. *African Journal of Economic and Management Studies*, *8*(1), 2–7. https://doi.org/10.1108/AJEMS-03-2017-149

Malik, W. S., Mariyam, S., & Shafiq, H. (2023). Monetary Policy and Asset Prices: the Case of Pakistan. *Singapore Economic Review*, 1–23. https://doi.org/10.1142/S0217590823500200

Manamba, E. (2014). An Empirical Analysis of Interest Rate Spreads in Tanzania. *Asian Journal of Research in Banking and Finance*, *4*(10), 244. https://doi.org/10.5958/2249-7323.2014.01425.4

Maphiri, M., Matasane, M. A., & Mudimu, G. (2021). Challenges to the Effective Implementation of SDG 8 in Creating Decent Work and Economic Growth in the Southern African Hemisphere: Perspectives from South Africa, Lesotho and Zimbabwe. In *CSR, Sustainability, Ethics and Governance* (pp. 39–63). Springer Nature. https://doi.org/10.1007/978-3-030-62501-6_3

Marthinsen, J. E., & Gordon, S. R. (2022). Hyperinflation, Optimal Currency Scopes, and a Cryptocurrency Alternative to Dollarization. *Quarterly Review of Economics and Finance*, *85*, 161–173. https://doi.org/10.1016/j.qref.2020.12.007

Matemilola, B. T., Bany-Ariffin, A. N., & Muhtar, F. E. (2015). The impact of monetary policy on bank lending rate in South Africa. *Borsa Istanbul Review*, *15*(1), 53-59.

Mbilla, S. A. E., Atindaana, P. A., Gadzo, S. G., Adeniyi, A., & Salifu, I. (2021). Monetary policy and macro economic indicators: A review of a developing country's perspectives 2002–2017. *Cogent*

Economics and Finance, *9*(1). https://doi.org/10.1080/23322039.2021.1935530

Mbowe, W. E., Mrema, A., & Shayo, S. (2020). Determinants of Bank Lending Interest Rates in Tanzania. *American Journal of Industrial and Business Management*, *10*(07), 1206–1236. https://doi.org/10.4236/ajibm.2020.107081

McCallum, B. T. (1994). A reconsideration of the uncovered interest parity relationship. *Journal of Monetary Economics*, *33*(1), 105–132. https://doi.org/10.1016/0304-3932(94)90016-7

McCallum, B. T., & Nelson, E. (2004). Timeless Perspective vs. Discretionary Monetary Policy in Forward-Looking Models. *Review*, *86*(2). https://doi.org/10.20955/r.86.43-56

McCalluma, B. T., & Nelson, E. (1999). Nominal income targeting in an open-economy optimizing model*. *Journal of Monetary Economics*, *43*(3), 553–578. https://doi.org/10.1016/s0304-3932(99)00005-7

McKinnon, R. I. (1974). Money and Capital in Economic Development. *International Journal*, *29*(4), 649. https://doi.org/10.2307/40201473

McKinnon, R. I., & Pill, H. (1998). International overborrowing: a decomposition of credit and currency risks. *World Development*, *26*(7), 1267–1282. https://doi.org/10.1016/S0305-750X(98)00045-X

Meade, E. E., & Thornton, D. L. (2012). The Phillips curve and US monetary policy: What the FOMC transcripts tell us. *Oxford*

Economic Papers, *64*(2), 197–216. https://doi.org/10.109 3/oep/gpr047

Mencinger, J., Aristovnik, A., & Verbic, M. (2014). The impact of growing public debt on economic growth in the European Union. *Amfiteatru Economic Journal*, *16*(35), 403–414.

Mensah, L., Aboagye, A. Q., & Akosah, N. K. (2018). The state of monetary policy and industrial asset allocation: the Ghanaian perspective. *African Journal of Economic and Management Studies*, *9*(4), 449-46

Merton, R. C., & Bodie, Z. (1995). A conceptual framework for analyzing the financial system. *The Global Financial System: A Functional Perspective*, 3–31.

Mialou, A., & Amidzic, G. (2017). Assessing Countries' Financial Inclusion Standing — A New Composite Index. In *Journal of Banking and Financial Economics: Vol. 2/2017* (Issue 8). International Monetary Fund. https://doi.org/10.7172/2353-6845.jbfe.2017.2.5

Michie, J. (2018). Keynesian theory and policy. *International Review of Applied Economics*, *32*(5), 567–568. https://doi.org/10.1080/0269 2171.2018.1497829

Miho, A. A., Takanlou, Z. K., Fazlzadeh, A. R., & Aghajani, H. (2022). Does Monetary Policy Has an Asymmetric Effect on Commercial Banks Lending Channel in Iraq. *International Journal of Economics and Finance Studies*, *14*(2), 308–324. https://doi.org /10.34109/ijefs.20220039

Minea, A., & Villieu, P. (2010). Financial development, institutional quality and maximizing-growth trade-off in government finance. *Economic Modelling*, *27*(1), 324–335. https://doi.org/10.1016/j.econmod.2009.09.012

Ministry of Finance. (2022). *Highlights of the 2022 Budget of the Government of Ghana for the 2022 FINANCIAL YEAR. November 2021*.

Ministry of Finance (2023) 'Press Release: Re-audit of the Government of Ghana COVID-19 Expenditure for the Period March 2020 to June 2022'. Accra: Ministry of Finance. https://citinewsroom.com/2023/09/ghanas-public-debt-increases-to-gh%E2%82%B5575-5bn/#google_vignette

Minsky, H. P. (1969). Private Sector Asset Management and the Effectiveness of Monetary Policy: Theory and Practice. *The Journal of Finance*, *24*(2), 223–238. https://doi.org/10.1111/j.1540-6261.1969.tb01676.x

Misati, R. N., Lucas, N., Anne, K., & Shem, O. (2010). Financial innovation and monetary policy transmission in kenya. *International Research Journal of Finance and Economics*, *50*(1), 123–136.

Mishkin, F. (1996). The channels of monetary transmission: lessons for monetary policy. *NBER Working Paper Series*, 1–29. https://doi.org/10.3386/W5464

Mishkin, F. S. (1995). Symposium on the Monetary Transmission Mechanism. *Journal of Economic Perspectives*, *9*(4), 3–10. https://doi.org/10.1257/jep.9.4.3

Mishra, P., & Montiel, P. (2013). How effective is monetary transmission in low-income countries? A survey of the empirical evidence. *Economic Systems*, *37*(2), 187–216. https://doi.org/10.1016/j.ecosys.2012.12.001

Mishra, P., Montiel, P. J., & Spilimbergo, A. (2012). Monetary transmission in low-income countries: Effectiveness and policy implications. *IMF Economic Review*, *60*(2), 270–302. https://doi.org/10.1057/imfer.2012.7

Mizen, P. (2003). Discussion of 'UK monetary policy, 1972-97: A guide using Taylor rules'. *Central Banking, Monetary Theory and Practice: Essays in Honour of Charles Goodhart*, *1*, 217–220. https://doi.org/10.4337/9781781950777.00021

Moazzam, M. (2023). External Debt and Real Exchange Rate Volatility in South Asia. *South Asian Journal of Macroeconomics and Public Finance*, *12*(1), 83–110. https://doi.org/10.1177/227 797872211 07711

Mohammed, S., Mohammed, A., & Nketiah-Amponsah, E. (2021). Relationship between Exchange Rate Volatility and Interest Rates Evidence from Ghana. *Cogent Economics and Finance*, *9*(1). https://doi.org/10.1080/23322039.2021.1893258

Mohan, R. (2006). *Economic Growth, Financial Deepening and Financial Inclusion*. Reserve Bank of India Bulletin2. http://www.rakeshmohan.com/docs/RBIBulletinNov2006-2.pdf

Montiel, P., Spilimbergo, A., & Mishra, P. (2010). Monetary Transmission in Low Income Countries. *IMF Working Papers*, *10*(223), 1. https://doi.org/10.5089/9781455208883.001

Montoro, J. D., Paz, J. V., & Roig, M. (1998). Active monetary policy and instability in a Phillips curve system. *Journal of Macroeconomics*, *20*(4), 843–856. https://doi.org/10.1016/S0164-0704(98)00087-1

Mugenda, O., & Mugenda, A. (2019). Research Methods: Quantitative & Qualitative Approaches. In *Olive M. Mugenda and Abel G. Mugenda* (Vol. 1). https://exampapers.must.ac.ke/wp-content/uploads/2023/03/EEL-3201-READING-AND-WRITING-SKILLS-IN-ENGLISH.docx-1.pdf

Mukhtar, T., & Younas, M. Z. (2019). Monetary Policy Transmission Mechanism of Pakistan: Evidence From Bank Lending and Asset Price Channels. *Asian Journal of Economic Modelling*, *7*(3), 121–139. https://doi.org/10.18488/journal.8.2019.73.121.139

Najimu, A. (2019). Determinants of Financial Sector Development in Ghana. *International Journal of Innovative Research and Development*, *8*(10). https://doi.org/10.24940/ijird/2019/v8/i10/oct19084

Nakhli, M. S., & Gaies, B. (2021). Political risk and financial development in Nigeria: Can credit buy social peace?: Evidence from NARDL

approach. *Quarterly Review of Economics and Finance*, *82*, 55–62. https://doi.org/10.1016/j.qref.2021.07.004

Nanivazo, M. (2015). First Order Dominance Analysis: Child Wellbeing in the Democratic Republic of Congo. *Social Indicators Research*, *122*(1), 235–255. https://doi.org/10.1007/s11205-014-0673-z

Narayan, P. K. (2004). *Reformulating Critical Values for the Bounds F-statistics Approach to Cointegration: An Application to the Some of the authors of this publication are also working on these related projects: Financial News and Exchange Rate View project Terrorism and Inte*. https://www.researchgate.net/publication/268048533

Nasrullah, N., Husnain, M. I., & Khan, M. A. (2023). The dynamic impact of renewable energy consumption, trade, and financial development on carbon emissions in low-, middle-, and high-income countries. *Environmental Science and Pollution Research*, *30*(19), 56759–56773. https://doi.org/10.1007/s11356-023-26404-8

Nchor, D., & Darkwah, S. A. (2015). Inflation, exchange rates and interest rates in Ghana: An autoregressive distributed lag model. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, *63*(3), 969–977. https://doi.org/10.11118/actaun 201563030969

Ndebbio, J. E. U. (2004). *Financial deepening, economic growth and development: Evidence from selected sub- Saharan African countries by* (Issue August). https://www.africaportal.org/publications/financial-deepening-economic-growth-and-

development-evidence-from-selected-sub-saharan-african-countries/

Ndikumana, L., & Boyce, J. K. (2003). Public debts and private assets: Explaining capital flight from Sub-Saharan African countries. *World Development, 31*(1), 107–130. https://doi.org/10.1016/S0305-750X(02)00181-X

Ndjokou, I. M. M. M., & Mbassi, C. M. (2018). Does financial development explain the cyclicality of monetary policy in Sub-Saharan Africa? *Journal of Economic Development, 43*(4), 71–83. https://doi.org/10.35866/caujed.2018.43.4.004

Neaime, S. (2015). Sustainability of budget deficits and public debts in selected European Union countries. *Journal of Economic Asymmetries, 12*(1), 1–21. https://doi.org/10.1016/j.jeca.2014.10.002

Nelson, E. (2003). UK monetary policy, 1972-97: A guide using Taylor rules. In *Central Banking, Monetary Theory and Practice: Essays in Honour of Charles Goodhart* (Vol. 1, pp. 195–216). Edward Elgar Publishing. https://doi.org/10.4337/9781781950777.00020

Nene, S. T., Ilesanmi, K. D., & Sekome, M. (2022). The Effect of Inflation Targeting (IT) Policy on the Inflation Uncertainty and Economic Growth in Selected African and European Countries. *Economies, 10*(2). https://doi.org/10.3390/economies10020037

Nguyen, A. D. M., Pavlidis, E. G., & Peel, D. A. (2018). Modeling changes in US monetary policy with a time-varying nonlinear Taylor rule.

Studies in Nonlinear Dynamics and Econometrics, *22*(5). https://doi.org/10.1515/snde-2017-0092

Nguyen, C. V., Khoi, P. D., & Khai, H. V. (2018). Asymmetries in responses of commercial banks in a transitional economy to countercylical monetary policy: The case of Romania. *Journal of Eastern European and Central Asian Research*, *5*(1). https://doi.org/10.15549/jeecar.v5i1.192

Nguyen, D. T., & Nguyen, T. N. Q. (2021). Impacts of Monetary Policy on Stability of Commercial Banks – Evidence From Vietnam. *International Journal of Management and Sustainability*, *10*(4), 92–103. https://doi.org/10.18488/journal.11.2021.104.92.103

Nguyen, H. H., Ngo, M. V., & Nguyen, T. P. (2021). Market structure, state ownership and monetary policy transmission through bank lending channel: Evidence from Vietnamese commercial banks. *Economics and Business Letters*, *10*(3), 164–177. https://doi.org/10.17811/ebl.10.3.2021.164-177

Nguyen, T. P., Dinh, T. T. H., & Tran, N. T. (2022). Financial development and monetary policy transmission in a multiple-tool regime: The case of Vietnamese commercial banks. *Cogent Business and Management*, *9*(1). https://doi.org/10.1080/23311975.2022.2135218

Njiru, J. N. (2014). *Monetary policy and commercial banks lending rates in Kenya*. University of Nairobi. http://erepository.uonbi.ac.ke/handle/11295/77818

Nkalu, C. N. (2020). Empirical analysis of demand for real money balances in Africa: Panel evidence from Nigeria and Ghana. *African and Asian Studies*, *19*(4), 363–376. https://doi.org /10.1163/15692108-12341461

Nkegbe, P. K., & Mumin, Y. A. (2014). Inflation and interest rate movements in Ghana: Trends and possible causal links. *International Journal of Economics and Business Research*, *8*(3), 272–295. https://doi.org/10.1504/IJEBR.2014.064669

Nortey, E. N. N., Ngoh, D. D., Doku-Amponsah, K., & Ofori-Boateng, K. (2015). Modeling inflation rates and exchange rates in Ghana: application of multivariate GARCH models. *SpringerPlus*, *4*(1). https://doi.org/10.1186/s40064-015-0837-6

Nunnally, J. C. (1978). An overview of psychological measurement. *Clinical diagnosis of mental disorders: A handbook*, 97-146.Countries. *Economies*, *10*(2). https://doi.org/10.3390/economies10020037

Nyong, M. O. (1996). Monetary Policy and Commercial Bank's Performance in Nigeria: Some Theoretical and Empirical Extensions. *Economic and Financial Review*, *34*(3), 5.

Oanh, T. T. K., Van, L. T. T., & Dinh, L. Q. (2023). Relationship between financial inclusion, monetary policy and financial stability: An analysis in high financial development and low financial development countries. *Heliyon*, *9*(6). https://doi.org/ 10.1016/j.heliyon.2023.e16647

Obeng-Amponsah, W., & Owusu, E. (2023). Foreign direct investment, technological transfer, employment generation and economic growth: new evidence from Ghana. *International Journal of Emerging Markets*. https://doi.org/10.1108/IJOEM-02-2022-0200

Obstfeld, M. (1980). Imperfect asset substitutability and monetary policy under fixed exchange rates. *Journal of International Economics*, *10*(2), 177–200. https://doi.org/10.1016/0022-1996(80)90053-7

Obuobi, B., Nketiah, E., Awuah, F., & Amadi, A. G. (2020). Recapitalization of Banks: Analysis of the Ghana Banking Industry. *Open Journal of Business and Management*, *08*(01), 78–103. https://doi.org/10.4236/ojbm.2020.81006

Ofori, I. K., & Obeng, C. K. (2023). *What Really Drives Financial Sector Development in Ghana?* 13–53. https://doi.org/10.1007/978-3-031-09345-6_2

Olayungbo, D. O., & Quadri, A. (2019). Remittances, financial development and economic growth in sub-Saharan African countries: evidence from a PMG-ARDL approach. *Financial Innovation*, *5*(1). https://doi.org/10.1186/s40854-019-0122-8

Olokoyo, F. O. (2011). Determinants of Commercial Banks' Lending Behavior in Nigeria. *International Journal of Financial Research*, *2*(2), 61. https://doi.org/10.5430/ijfr.v2n2p61

Olorogun, L. A. (2021). The nexus between FDI inflows and economic development in Ghana: empirical analysis from ARDL model. *Journal for Global Business Advancement*, *14*(1), 93–114. https://doi.org/10.1504/JGBA.2021.114319

Ongan, S., Gocer, I., & Ongan, A. (2022). Revisiting the quantity theory of money in Euro Area: the case of Greece. *European Journal of Comparative Economics*, *19*(1), 63–77. https://doi.org/10.25428/1824-2979/007

Opuala-Charles, S., Omoke, P. C., & Uche, E. (2022). The Dynamic Role of Financial Development in Analyzing the N-Shaped Tourism-Led Growth Hypothesis in Mauritius. *Journal of the Knowledge Economy*. https://doi.org/10.1007/s13132-022-01048-0

Osei-Assibey, E., & Asenso, J. K. (2015). Regulatory capital and its effect on credit growth, non-performing loans and bank efficiency: Evidence from Ghana. *Journal of Financial Economic Policy*, *7*(4), 401–420. https://doi.org/10.1108/JFEP-03-2015-0018

Oyadeyi, O. (2023). Financial development, interest rate pass-through and interest rate channel of monetary policy. *Cogent Economics and Finance*, *11*(1). https://doi.org/10.1080/23322039.2023.2 209952

Ozatac, N., Gokmenoglu, K. K., & Taspinar, N. (2017). Testing the EKC hypothesis by considering trade openness, urbanization, and financial development: the case of Turkey. *Environmental Science and Pollution Research*, *24*(20), 16690–16701. https://doi.org/10.1007/S11356-017-9317-6

Pang, D., Li, K., Wang, G., & Ajaz, T. (2022). The asymmetric effect of green investment, natural resources, and growth on financial inclusion in China. *Resources Policy*, *78*. https://doi.org/10.1016/j.resourpol.2022.102885

Paweenawat, S. W., & Plyngam, S. (2017). Does the causal relationship between renewable energy consumption, CO2 emissions, and economic growth exist in Thailand? An ARDL approach. *Economics Bulletin*, *37*(2), 697–711. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85017395200&partnerID=40&md5=f2c9c48c85c295f1d14c069316c2e3ef

Pedersoli, S., & Presbitero, A. F. (2023). Public debt management and private financial development. *Economic Systems*, *47*(1). https://doi.org/10.1016/j.ecosys.2022.101010

Peek, J., & Rosengren, E. E. (1995). Bank lending and the transmission of monetary policy. *Conference Series - Federal Reserve Bank of Boston*, *39*, 47–79. https://core.ac.uk/download/pdf/6706734.pdf

Peersman, G., & Smets, F. (1999). The Taylor rule: A useful monetary policy benchmark for the Euro area? *International Finance*, *2*(1), 85–116. https://doi.org/10.1111/1468-2362.00020

Peprah, J. A., Kwesi Ofori, I., & Asomani, A. N. (2019). Financial development, remittances and economic growth: A threshold analysis. *Cogent Economics and Finance*, *7*(1), 1625107. https://doi.org/10.1080/23322039.2019.1625107

Pesaran, H. H., & Shin, Y. (1998). Generalized impulse response analysis in linear multivariate models. *Economics Letters*, *58*(1), 17–29. https://doi.org/10.1016/S0165-1765(97)00214-0

Pesaran, M. H., & Pesaran, Bahram. (1997). Working with Microfit 4.0 : interactive econometric analysis. In *Oxford University Press*,

Oxford. https://www.worldcat.org/title/working-with-microfit-40-interactive-econometric-analysis/oclc/38275774

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289–326. https://doi.org/10.1 002/jae.616

Phillips, P. C. B., & Hansen, B. E. (1990). Statistical inference in instrumental variables regression with i(1) processes. *Review of Economic Studies*, *57*(1), 99–125. https://doi.org/10.2307/2297545

Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, *75*(2), 335–346. https://doi.org/10.1093/BIOMET/75.2.335

Phylaktis, K. (1992). Purchasing power parity and cointegration: The Greek evidence from the 1920s. *Journal of International Money and Finance*, *11*(5), 502–513. https://doi.org/10.1016/0261-5606(92)90015-P

Pinter, J. (2022). Monetarist arithmetic at COVID-19 time: A take on how not to misapply the quantity theory of money. *Economic Notes*, *51*(2). https://doi.org/10.1111/ecno.12200

Pitchford, J. D. (1981). A consistent model of the expectations augmented Phillips curve and inflation. *Journal of Macroeconomics*, *3*(4), 489–499. https://doi.org/10.1016/0164-0704(81)90079-3

Priya, P., & Sharma, C. (2023). Monetary policy, macroeconomic uncertainty and corporate liquid asset demand: a firm-level

analysis for India. *International Journal of Managerial Finance*. https://doi.org/10.1108/IJMF-02-2023-0065

Pruteanu-Podpiera, A. M. (2007). The role of banks in the Czech monetary policy transmission mechanism. *Economics of Transition*, *15*(2), 393–428. https://doi.org/10.1111/j.1468-0351.2007.00281.x

Pushkareva, N. (2021). Taxing Times for Development: Tax and Digital Financial Services in Sub-Saharan Africa. *Journal on Financing for Development*, *1*(3), 33–64. http://uonjournals.uonbi.ac.ke/ojs/index.php/ffd/article/view/777

Qamruzzaman, M., & Jianguo, W. (2020). The asymmetric relationship between financial development, trade openness, foreign capital flows, and renewable energy consumption: Fresh evidence from panel NARDL investigation. *Renewable Energy*, *159*, 827–842. https://doi.org/10.1016/j.renene.2020.06.069

Qamruzzaman, M., & Karim, S. (2020). Nexus between economic volatility, trade openness and FDI: An application of ARDL, NARDL and asymmetric causality. *Asian Economic and Financial Review*, *10*(7), 790–807. https://doi.org/10.18488/journal.aefr.2020.107.790-807

Quartey, P. (2008). Financial Sector Development, Savings Mobilization and Poverty Reduction in Ghana. In *Financial Development, Institutions, Growth and Poverty Reduction* (pp. 87–119). Palgrave Macmillan UK. https://doi.org/10.1057/978023059 4029_5

Quinn, B. G. (1980). Order Determination for a Multivariate Autoregression. *Journal of the Royal Statistical Society: Series B*

(Methodological), *42*(2), 182–185. https://doi.org/10.1111/j.2517-6161.1980.tb01116.x

Rady, E. H. A. E. B., Elsheikh, A. A., & Ezzeldin, M. R. (2020). Modified dominance analysis. *Pakistan Journal of Statistics*, *36*(4), 363–378. https://www.scopus.com/inward/record.uri?eid =2-s2.0-85091572665&partnerID=40&md5=3115dba8 deb1cd3c6c42d64b703500bd

Rahi, S. (2017). Research design and methods: A systematic review of research paradigms, sampling issues and instruments development. *International Journal of Economics & Management Sciences*, *6*(2), 1–5. https://doi.org/10.4172/2162-6359.1000403

Rajan, R. G., & Zingales, L. (2003). The great reversals: The politics of financial development in the twentieth century. *Journal of Financial Economics*, *69*(1), 5–50. https://doi.org/10.1016/S0304-405X(03)00125-9

Ramsey, J. B. (1969). Tests for Specification Errors in Classical Linear Least-Squares Regression Analysis. *Journal of the Royal Statistical Society: Series B (Methodological)*, *31*(2), 350–371. https://doi.org/10.1111/j.2517-6161.1969.tb00796.x

Rapa, N. (2016). *MEDSEA: a small open economy DSGE model for Malta* (WP/05/2016). http://hdl.handle.net/10419/210818%0ASta ndard-Nutzungsbedingungen:

Ray, P. (2008). *Commercial banks and monetary policy in India* (Vol. 1). Academic Foundation. https://books.google.com/books?hl=en&lr=&id=UN7DXoumxCoC&oi=fnd&pg=PA2&dq=invesment+on

+foreign+exchange+reserves&ots=Y-4ZpTNx_1&sig=-JS3wcvnsDKLoEaQ-yXiMCRg5-8

Razin, A., & Yuen, C. W. (2002). The 'New Keynesian' Phillips curve: Closed economy versus open economy. *Economics Letters*, *75*(1), 1–9. https://doi.org/10.1016/S0165-1765(01)00588-2

Rezende, F. (2015). Demand for financial assets and monetary policy: A restatement of the liquidity preference theory and the speculative demand for money. *Journal of Post Keynesian Economics*, *38*(1), 64–92. https://doi.org/10.1080/01603477.2015.1065672

Rhif, M., Ben Abbes, A., Farah, I. R., Martínez, B., Sang, Y., Abbes, A. Ben, Farah, I. R., Martínez, B., & Sang, Y. (2019). Wavelet transform application for/in non-stationary time-series analysis: A review. *Applied Sciences (Switzerland)*, *9*(7), 1–22. https://doi.org/10.3390/app9071345

Richter, R., & Teigen, R. L. (1982). Commercial bank behavior and monetary policy in an open economy. West Germany 1960-1980. *Journal of Monetary Economics*, *10*(3), 383–405. https://doi.org/10.1016/0304-3932(82)90034-4

Robinson, J. (1964). Pre-Keynesian Theory After Keynes. *Australian Economic Papers*, *3*(1–2), 25–35. https://doi.org/10.1111/j.1467-8454.1964.tb00729.x

Rød, J. K., & Van Der Meer, D. (2007). Visibility and dominance analysis: Assessing a high building project in Trondheim. *ScanGIS 2007 - Proceedings of the 11th Scandinavian Research Conference on Geographical Information Sciences*, 97–110. https://www.scopus.

com/inward/record.uri?eid=2-s2.0-84873590588&partnerID=40&md5=2216f6450713a9dcd692ce0b88111b57

Rød, J. K., & van der Meer, D. (2009). Visibility and dominance analysis: Assessing a high-rise building project in Trondheim. *Environment and Planning B: Planning and Design*, *36*(4), 698–710. https://doi.org/10.1068/b34118

Rogoff, K. (1999). The Open Economy Revisited: The Mundell–Fleming Model and the Exchange-Rate Regime. *Exchange Organizational Behavior Teaching Journal*, *9*(November 1962), 369–379. http://research.economics.unsw.edu.au/jmorley/econ402/slides23.pdf

Rossi, J. L., Delmondes de Carvalho Rossi, M., & Carvalho Cunha, D. (2019). Transmission of monetary policy through the wealth channel in Brazil: Does the type of asset matter? *Research in International Business and Finance*, *50*, 279–293. https://doi.org/10.1016/j.ribaf.2019.06.009

Rousseau, P. L., & Yilmazkuday, H. (2009). Inflation, financial development, and growth: A trilateral analysis. *Economic Systems*, *33*(4), 310–324. https://doi.org/10.1016/j.ecosys.2009.0 6.002

Royston, J. P. (1982). An Extension of Shapiro and Wilk's W Test for Normality to Large Samples. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, *31*(2), 115–124. https://doi.org/10.2307/2347973

Rubbo, E. (2023). Networks, Phillips Curves, and Monetary Policy. *Econometrica*, *91*(4), 1417–1455. https://doi.org/10.3982/ECTA18654

Rudolph, P. M. (1978). Monetary Policy and Commercial Bank Portfolio Behavior. *Financial Review*, *13*(3), 100–100. https://doi.org/10.1111/j.1540-6288.1978.tb01035.x

Russell, B. (2011). Non-stationary inflation and panel estimates of United States short and long-run Phillips curves. *Journal of Macroeconomics*, *33*(3), 406–419. https://doi.org/10.1016/j.jmacro.2011.02.006

Russell, B., & Banerjee, A. (2008). The long-run Phillips curve and non-stationary inflation. *Journal of Macroeconomics*, *30*(4), 1792–1815. https://doi.org/10.1016/j.jmacro.2007.11.001

Ryczkowski, M. (2021). Money and inflation in inflation-targeting regimes–new evidence from time–frequency analysis. *Journal of Applied Economics*, *24*(1), 17–44. https://doi.org/10.1080/15140326.2020.1830461

Safdar, S., & Khanm, A. (2013). Financial innovation and monetary policy transmission mechanism in Pakistan. *International Journal of Development and Sustainability*, *2*(1), 390-397.

Sağdiç, E. N., Yildiz, F., & Güney, T. (2021). Does domestic public debt affect financial development? New evidence from central and eastern european economies. *Economic Computation and Economic Cybernetics Studies and Research*, *55*(4), 149–164. https://doi.org/10.24818/18423264/55.4.21.10

Saheed, Z. S., Sani, I. E., & Idakwoji, B. O. (2015). Impact of Public External Debt on Exchange Rate in Nigeria. *International Finance and Banking*, *2*(1), 15. https://doi.org/10.5296/ fb.v2i1.7734

Saidi, L. O., Muthalib, A. A., Adam, P., Rumbia, W. A., & Sani, L. O. A. (2021). Exchange rate, exchange rate volatility and stock prices: An analysis of the symmetric and asymmetric effect using ardl and nardl models. *Australasian Accounting, Business and Finance Journal*, *15*(4), 179–190. https://doi.org/10.14453/aabfj.v15i4.11

Sakyi, D., Osei Mensah, I., & Obeng, S. K. (2017). Inflation Targeting Framework and Interest Rates Transmission in Ghana: An Empirical Investigation. *Journal of African Business*, *18*(4), 417–434. https://doi.org/10.1080/15228916.2017.1327299

Saman, C., & Szeles, M. R. (2020). Transmission of monetary policy to asset prices: Evidence using stochastic volatility models. *Transformations in Business and Economics*, *19*(2), 875–885. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85096898348&partnerID=40&md5=a200a5f74283aec13eed547b1beb0cb5

Saunders, M. N. K., Lewis, P., Thornhill, A., & Bristow, A. (2015). Understanding research philosophy and approaches to theory development. In *Research Methods for Business Students* (5th ed., pp. 122–161). Pearson Education. http://oro.open.ac.uk/53393/

Savvides, A. (1998). Inflation and monetary policy in selected West and Central African countries. *World Development*, *26*(5), 809–827. https://doi.org/10.1016/S0305-750X(98)00018-7

Saygılı, H. (2020). Sectoral inflationary dynamics: cross-country evidence on the open-economy New Keynesian Phillips Curve. *Review of World Economics*, *156*(1), 75–101. https://doi.org/ 0.1007/s10290-019-00340-7

Scheufele, R. (2010). Evaluating the German (New Keynesian) Phillips curve. *North American Journal of Economics and Finance*, *21*(2), 145–164. https://doi.org/10.1016/j.najef.2009.06.001

Schmidt, J. (2020). Risk, asset pricing and monetary policy transmission in Europe: Evidence from a threshold-VAR approach. *Journal of International Money and Finance*, *109*. https://doi.org/10.1016/j.jimonfin.2020.102235

Sehrawat, M., & Giri, A. K. (2015). Financial development and economic growth: Empirical evidence from india. *Studies in Economics and Finance*, *32*(3), 340–356. https://doi.org/10.1108/SEF-10-2013-0152

Sena, P. M., Asante, G. N., & Brafu-Insaidoo, W. G. (2021a). Monetary policy and economic growth in Ghana: Does financial development matter? *Cogent Economics and Finance*, *9*(1). https://doi.org/ 10.1080 /23322039.2021.1966918

Sengonul, A., & Thorbecke, W. (2005). The effect of monetary policy on bank lending in Turkey. *Applied Financial Economics*, *15*(13), 931–934. https://doi.org/10.1080/0960310050010225

Senjur, M. (2010). Differential inflation, Phillips curves, and price competitiveness in a new euro-member country. *Economic Change*

and Restructuring, *43*(4), 253–273. https://doi.org/10.1007/s10644-010-9090-8

Serrano, F., & Summa, R. (2015). Mundell-fleming without the lm curve: The exogenous interest rate in an open economy. *Review of Keynesian Economics*, *3*(2), 248–268. https://doi.org/10.4337/roke.2015.02.08

Seth, R., & Kalyanaraman, V. (2017). Effect of Financial Development on the Transmission of Monetary Policy. *Theoretical Economics Letters*, *07*(04), 795–813. https://doi.org/10.4236/tel.2017.74058

Shahbaz, M., Lean, H. H., & Shabbir, M. S. (2012). Environmental Kuznets Curve hypothesis in Pakistan: Cointegration and Granger causality. *Renewable and Sustainable Energy Reviews*, *16*(5), 2947–2953. https://doi.org/10.1016/J.RSER.2012.02.015

Shahe Emran, M., & Farazi, S. (2011). Lazy Banks? Government Borrowing and Private Credit in Developing Countries. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1418145

Shrestha, M. B., & Chowdhury, K. (2005). *ARDL Modelling Approach to Testing the Financial Liberalisation Hypothesis University of Wollongong Economics Working Paper Series ARDL Modelling Approach to Testing the Financial Liberali* (Issue June). https://ro.uow.edu.au/commwkpapers/121/

Slanicay, M. (2016). A Proposal for a Flexible Trend Specification in DSGE Models. *Review of Economic Perspectives*, *16*(2), 73–85. https://doi.org/10.1515/revecp-2016-0006

Small, S. F., & Sinha, B. (2022). Rules Are Meant to Be Broken: Arguments in Favour of Discretionary Monetary Policy. In *Debates in Monetary Macroeconomics: Tackling Some Unsettled Questions* (pp. 47–68). Springer International Publishing. https://doi.org/10.1007/978-3-031-11240-9_3

Sobiech, I. (2019). Remittances, finance and growth: Does financial development foster the impact of remittances on economic growth? In *World Development* (Vol. 113). FIW Working Paper. https://doi.org/10.1016/j.worlddev.2018.08.016

Sohail, H. M., & Li, Z. (2023). Nexus among foreign direct investment, domestic investment, financial development and economic growth: a NARDL approach in Pakistan. *International Journal of Economics and Business Research*, *25*(2), 249–269. https://doi.org/10.1504/IJEBR.2022.10040435

Soliman, A. M., Lau, C. K., Cai, Y., Sarker, P. K., & Dastgir, S. (2023). Asymmetric Effects of Energy Inflation, Agri-inflation and CPI on Agricultural Output: Evidence from NARDL and SVAR Models for the UK. *Energy Economics*, *126*. https://doi.org/10.1016/j.eneco.2023.106920

Sowa, N. K. (1994). Fiscal deficits, output growth and inflation targets in Ghana. *World Development*, *22*(8), 1105–1117. https://doi.org/10.1016/0305-750X(94)90079-5

Sowa, N. K., & Abradu-Otoo, P. (2009). Inflation management and monetary policy formulation in Ghana. In *Monetary Policy*

Frameworks for Emerging Markets (pp. 309–329). Edward Elgar Publishing Ltd. https://doi.org/10.4337/9781848449190.00022

Stein, J. C. (1998). An Adverse-Selection Model of Bank Asset and Liability Management with Implications for the Transmission of Monetary Policy. *The RAND Journal of Economics*, *29*(3), 466. https://doi.org/10.2307/2556100

Suriani, S., Abd. Majid, M. S., Masbar, R., A. Wahid, N., & Ismail, A. G. (2021). Sukuk and monetary policy transmission in Indonesia: the role of asset price and exchange rate channels. *Journal of Islamic Accounting and Business Research*, *12*(7), 1015–1035. https://doi.org/10.1108/JIABR-09-2019-0177

Svensson, L. E. O. (1989). Trade in nominal assets. Monetary policy, and price level and exchange rate risk. *Journal of International Economics*, *26*(1–2), 1–28. https://doi.org/10.1016/0022-1996(89)90036-6

Sylvester, A. N., Umar, A., & Tetteh Anang, B. (2023). The determinants of non-traditional agricultural exports' growth in Ghana. *Cogent Economics and Finance*, *11*(1). https://doi.org/10.1080/23322039.2023.2197322

Takyi, P. O., & Leon-Gonzalez, R. (2020). Macroeconomic impact of fiscal policy in Ghana: Analysis of an estimated DSGE model with financial exclusion. *Economic Analysis and Policy*, *67*, 239–260. https://doi.org/10.1016/j.eap.2020.07.007

Takyi, P. O., & Obeng, C. K. (2013). Determinants of financial development in Ghana. *International Journal of Development and*

Sustainability, *2*(4), 2324–2336. http://isdsnet.com/ijds-v2n4-11.pdf

Tamminen, K. A., & Poucher, Z. A. (2020). Research philosophies. *The Routledge International Encyclopedia of Sport and Exercise Psychology*, 535–549. https://doi.org/10.4324/9781315187259-39

Tan, W., & Cao, T. (2022). Do Green Technology Innovation, Renewable Energy Consumption and Renewable Energy Investment Improve Environmental Quality? *Journal of Environmental Assessment Policy and Management*, *24*(3). https://doi.org/10.1142/S1464333222500314

Taylor, M. P. (1988). An empirical examination of long-run purchasing power parity using cointegration techniques. *Applied Economics*, *20*(10), 1369–1381. https://doi.org/10.1080/00036848800000107

Taylor, M. P., & Sarno, L. (2004). International real interest rate differentials, purchasing power parity and the behaviour of real exchange rates: The resolution of a conundrum. *International Journal of Finance and Economics*, *9*(1), 15–23. https://doi.org/10.1002/ijfe.232

Tessema, N. S., & Geda, N. R. (2023). Exploring the most dominant drivers of inequalities in child survival in Ethiopia: Dominance analysis. *International Journal of Population Studies*, *9*(1). https://doi.org/10.36922/ijps.427

Thomson, T. A. (1989). Evaluating some financial uncertainties of tree improvement using the capital asset pricing model and dominance

analysis. *Canadian Journal of Forest Research*, *19*(11), 1380–1388. https://doi.org/10.1139/x89-212

Thorpe, R., & Holt, R. (2015). Positivism and Post-Positivism. *The SAGE Dictionary of Qualitative Management Research*. https://doi.org/10.4135/9780857020109.N73

Tule, M. K., Ajilore, T., & Ujunwa, A. (2019). Monetary Policy Contagion in the West African Monetary Zone. *Foreign Trade Review*, *54*(4), 375–398. https://doi.org/10.1177/001573251 9874219

Tweneboah, G., & Alagidede, P. (2019). Dollarization, Inflation Targeting, and Inflationary Dynamics in Ghana. *Journal of African Business*, *20*(3), 358–375. https://doi.org/10.1080/1522 8916.2019.1581011

Tweneboah, G., & Eshun, R. (2023). Integration of macroeconomic fundamentals in the West African Monetary Zone: A multi scale perspective. *Cogent Social Sciences*, *9*(1). https://doi.org/10.108 0/23311886.2023.2217000

Tweneboah, G., Gatsi, J. G., & Asamoah, M. E. (2019). Financial development and dollarization in Ghana: an empirical investigation. *Cogent Economics and Finance*, *7*(1). https://doi.org/10.1080/23322039.2019.1663699

Udoh, B. E., Jack, A. E., Prince, A. I., Ekeowa, K. I. L., Ndubuaku, V., & Samuel, U. E. (2021). Financial Deepening and Economic Growth in Nigeria: ARDL and NARDL Techniques. *Universal Journal of Accounting and Finance*, *9*(4), 667–677. https://doi.org/10.13 189/ujaf.2021.090413

Umar, M., & Dahalan, J. (2017). Does inflation targeting effectively combat the exchange rate volatility in GHANA and South Africa? *International Journal of Economic Perspectives*, *11*(1), 79–89. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85033479518&partnerID=40&md5=189abde7820b6e0753bbcbc969979a10

Umoru, D., Effiong, S. E., Umar, S. S., Eleh, C. C., Ihensekhien, O. A., Ovenseri-Ogbomo, F. O., Ihuoma, C. C., & Tizhe, A. N. (2023). Estimating Covariance Between Exchange Rate Devaluation and Oil Price Volatility During Covid-19. *Journal of Governance and Regulation*, *12*(2), 200–211. https://doi.org/10.22495/jg rv12i2art19

United Nations Conference on Trade and Development. (2021). *State of Commodity Dependence 2021* (The State of Commodity Dependence). United Nations. https://doi.org/10.18356/97 8921 0057790

Valogo, M. K., Duodu, E., Yusif, H., & Baidoo, S. T. (2023). Effect of exchange rate on inflation in the inflation targeting framework: Is the threshold level relevant? *Research in Globalization*, *6*. https://doi.org/10.1016/j.resglo.2023.100119

Vatsa, P., & Mixon, F. G. (2022). Money, prices, and output: stylised facts and implications for the quantity theory of money. *International Journal of Monetary Economics and Finance*, *15*(6), 614–629. https://doi.org/10.1504/IJMEF.2022.10051970

Vera, D. (2012). How responsive are banks to monetary policy? *Applied Economics*, *44*(18), 2335–2346. https://doi.org/10.1080/00036846.2011.564143

Vuchelen, J. (1980). Quantitative monetary policies and the portfolio composition of commercial banks. *European Economic Review*, *14*(1), 79–99. https://doi.org/10.1016/0014-2921(80)90038-0

Wai, U. T., & Wong, C. H. (1982). Determinants of Private Investment in Developing Countries. *The Journal of Development Studies*, *19*(1), 19–36. https://doi.org/10.1080/00220388208421848

Walsh, C. E. (1982). Asset substitutability and monetary policy. An alternative characterization. *Journal of Monetary Economics*, *9*(1), 59–71. https://doi.org/10.1016/0304-3932(82)90050-2

Wang, F., Ma, W., Mirza, N., & Altuntaş, M. (2023). Green financing, financial uncertainty, geopolitical risk, and oil prices volatility. *Resources Policy*, *83*. https://doi.org/10.1016/j.resourpol .2023.103716

Wang, L. (2023). Corporate money demand and the missing inflation. *Applied Economics Letters*. https://doi.org/10.1080/13504851.2023 .2186351

Wang, R., & Morley, B. (2023). Forecasting the exchange rate with the Taylor rule model during times of alternative monetary policies. *Journal of Forecasting*, *42*(6), 1341–1359. https://doi.org/10.1002/for.2957

Wanjaiya, W. (2017). The impact of monetary policy on bank lending rate in Kenya. *Proceedings of the 30th International Business*

Information Management Association Conference, IBIMA 2017 - Vision 2020: Sustainable Economic Development, Innovation Management, and Global Growth, *2017-Janua*(1), 2818–2832.

Warjiyo, Perry., Agung, Juda., & Bank Indonesia. Direktorat Riset Ekonomi dan Kebijakan Moneter. Financial Market Structuring and Development Studies Division. (2002). *Transmission mechanisms of monetary policy in Indonesia*. https://www.bi.go.id/id/bi-institute/policy-mix/core/Documents/Transmission_Mechanisms_of_Monetary_Policy_in_Indonesia_2002.pdf

Wasserfallen, F. (2019). Global diffusion, policy flexibility, and inflation targeting. *International Interactions*, *45*(4), 617–637. https://doi.org/10.1080/03050629.2019.1614573

Wenger, A. F. Z. (1991). Qualitative Evaluation and Research Methods (2nd ed.). By Michael Quinn Patton. 532 pp. Newbury Park, CA. *Nursing Research*, *40*(5), 281. https://doi.org/10.1097/00006199-199109000-00006

Wezel, T., Chan-Lau, J. A., & Columba, F. (2012). Dynamic Loan Loss Provisioning: Simulations on Effectiveness and Guide to Implementation. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2055716

White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity. *Econometrica*, *48*(4), 817. https://doi.org/10.2307/1912934

Wiafe, E. A., Quaidoo, C., & Sekyi, S. (2022). Monetary policy effectiveness in the advent of mobile money activity: Empirical evidence from Ghana. *Cogent Economics and Finance*, *10*(1). https://doi.org/10.1080/23322039.2022.2039343

Wong, A., & Zhou, X. (2011). Development of Financial Market and Economic Growth: Review of Hong Kong, China, Japan, The United States and The United Kingdom. *International Journal of Economics and Finance*, *3*(2). https://doi.org/10.5539/ijef.v3n2p111

Xu, Y., Ji, X., Zhan, S., & Zhan, M. (2023). How do the dual effects of financial development change the transmission of monetary policy? – Evidence from China. *North American Journal of Economics and Finance*, *68*. https://doi.org/10.1016/j.najef.2023.101952

Yacour, S., Dabo-Niang, S., & El Ghini, A. (2022). Investigating Environmental Kuznets Curve for CO2 Emissions: A Cointegration Analysis for Morocco. In J. Xu, F. Altiparmak, M. H. A. Hassan, F. P. García Márquez, & A. Hajiyev (Eds.), *Proceedings of the Sixteenth International Conference on Management Science and Engineering Management – Volume 2 . ICMSEM 2022* (pp. 506–525). Springer International Publishing. https://doi.org/10.1007/978-3-031-10385-8_36

Yakubu, I. N. (2019). Revisiting the factors influencing corporate dividend policy decisions: Evidence from listed banks in ghana. *Management and Accounting Review*, *18*(3), 31–49.

https://www.scopus.com/inward/record.uri?eid=2-s2.0-85114234556&partnerID=40&md5=0ac2276b74e0559b14bdec6ae14455e3

Yakubu, I. N. (2020). Institutional quality and foreign direct investment in Ghana: A bounds-testing cointegration approach. *Review of International Business and Strategy*, *30*(1), 109–122. https://doi.org/10.1108/RIBS-08-2019-0107

Yalçinkaya, Ö., Çelik, A. K., & Emsen, H. S. (2021). The relationship between price and financial stability in new monetary policy designs: The case of the us using the tvp-svar model. *Estudios de Economia*, *48*(2), 249–276. https://doi.org/10.4067/s0718-52862021000200249

Yusif, H., Baidoo, S. T., & Hanson, M. K. (2023). Estimating the effect of currency substitution on exchange rate volatility: Evidence from Ghana. *Cogent Social Sciences*, *9*(1). https://doi.org/10.1080/23311886.2023.2233318

Zayed, N. M., Islam, M. R., & Hasan, K. B. M. R. (2018). Testing Phillips curve to examine the inflation rate regarding unemployment rate, annual wage rate and GDP of Philippines: 1950-2017. *Academy of Accounting and Financial Studies Journal*, *22*(5). https://www.scopus.com/inward/record.uri?eid=2-s2.0-85057881679&partnerID=40&md5=38a78258e1f7263db279593e0265d478

Zenghelis, D., Taylor, C., & Stern, N. (2022). *Policies for investing in sustainable growth: risks and opportunities in the current*

macroeconomic environment (Issue July). https://www.cccep ac.uk/wp-content/uploads/2022/07/Policies-for-investing-in-sustainable-growth_risks-and-opportunities-in-the-current-macroeconomic-environment.pdf%0Ahttps://policycommons.net /artifacts/2621812/policies-for-investing-in-sustainable-growth

Zhang, P. (2018). Exchange rate and asset market: The trilemma for China's monetary policy. *Review of Economics and Finance*, *14*(4), 1–16. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85068580203&partnerID=40&md5=a81179 bab0052eb4e6 4ad02a4d1efab5

Zhao, Z., Meenagh, D., & Minford, P. (2022). Should Hong Kong switch to Taylor rule? Evidence from DSGE model. *Applied Economics*, *54*(50), 5851–5872. https://doi.org/10.1080/00036846 .202 2.2053655

Ziorklui, S. Q., & Barbee, W. (2003). Financial sector reform and financial savings in Sub-Saharan Africa: The case of Ghana. *Savings and Development*, *27*(1), 63–78. https://www. scopus.com/inward /record.uri?eid=2-s2.0-0038007933 &partnerID=40&md5=25109f5c42c45e7de6c6628204cc2fa5

Ziorklui, S. Q., Fanara, P., Mahone, C., Ahiakpor, C. W. K., Ameyaw, S., Doku, A., & Bank, M. (2001). The Impact of Financial Sector Reform on Bank Efficiency and Financial Deepening for Savings Mobilization in Ghana Office of Sustainable Development Equity and Growth through Economic Research. *Contract*, *81*, 1–74. https://pdf.usaid.gov/pdf_docs/Pnack912.pdf

Ziramba, E. (2010). Price and income elasticities of crude oil import demand in South Africa: A cointegration analysis. *Energy Policy*, *38*(12), 7844–7849. https://doi.org/10.1016/j.enpol.2010.08.044

APPENDICES

Appendix A

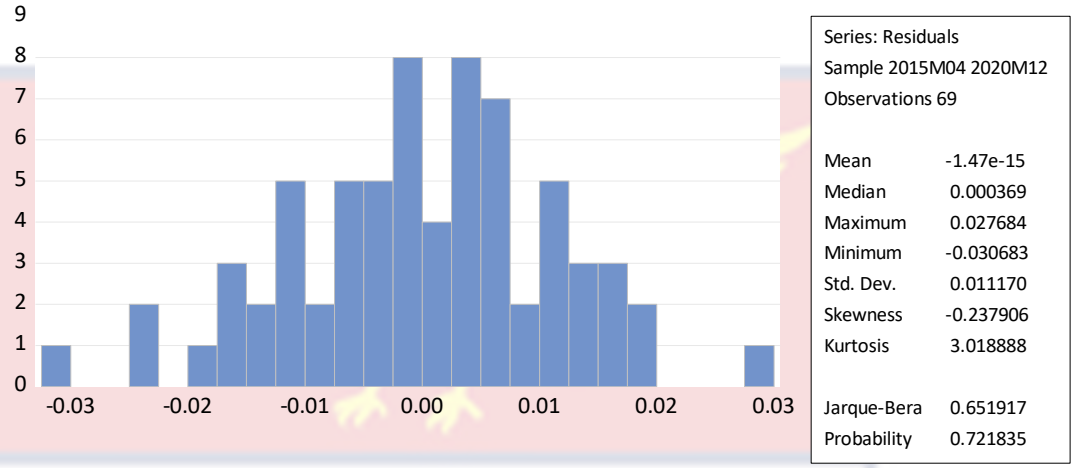


Figure 2: Normality Test

Appendix B

Table 24: Breusch-Godfrey Serial Correlation LM Test:

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 3 lags

F-statistic	0.126729	Prob. F(3,48)	0.9438
Obs*R-squared	0.542223	Prob. Chi-Square(3)	0.9095

Test Equation:

Dependent Variable: RESID

Method: ARDL

Date: 08/30/23 Time: 03:29

Sample: 2015M04 2020M12

Included observations: 69

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNACBL(-1)	-0.032470	0.274690	-0.118206	0.9064
LNFIN_DEV	-0.020593	0.294898	-0.069832	0.9446
LNINF	0.001366	0.015395	0.088743	0.9297
LNMPR	-0.014967	0.091073	-0.164337	0.8702
LNMPR(-1)	0.009064	0.094647	0.095771	0.9241
LNMPR(-2)	0.012304	0.081095	0.151719	0.8800
LNPSC	-0.005476	0.081407	-0.067273	0.9466
LNMOMO	-0.004417	0.028593	-0.154482	0.8779

LNMOMO(-1)	0.000956	0.027605	0.034622	0.9725
LNMOMO(-2)	0.000199	0.026617	0.007479	0.9941
LNNPL	-0.004183	0.053847	-0.077679	0.9384
LNNPL(-1)	0.005250	0.054123	0.097004	0.9231
LNEXC	0.000119	0.023733	0.005025	0.9960
LNEXC(-1)	-0.006845	0.066531	-0.102891	0.9185
LNEXC(-2)	0.002301	0.057554	0.039987	0.9683
LNEXC(-3)	0.000645	0.058328	0.011061	0.9912
C	0.131912	0.644185	0.204774	0.8386
@TREND	0.000134	0.001362	0.098165	0.9222
RESID(-1)	0.056723	0.301099	0.188388	0.8514
RESID(-2)	-0.009461	0.175118	-0.054028	0.9571
RESID(-3)	0.098400	0.177658	0.553873	0.5822

R-squared	0.007858	Mean dependent var	-1.47E-15
Adjusted R-squared	-0.405534	S.D. dependent var	0.011170
S.E. of regression	0.013243	Akaike info criterion	-5.564943
Sum squared resid	0.008418	Schwarz criterion	-4.884997
Log likelihood	212.9905	Hannan-Quinn criter.	-5.295186
F-statistic	0.019009	Durbin-Watson stat	1.929321
Prob(F-statistic)	1.000000		

Appendix C

Table 25: Heteroskedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey

Null hypothesis: Homoskedasticity

F-statistic	0.759446	Prob. F(17,51)	0.7279
Obs*R-squared	13.93869	Prob. Chi-Square(17)	0.6714
Scaled explained SS	7.686813	Prob. Chi-Square(17)	0.9728

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 08/30/23 Time: 03:28

Sample: 2015M04 2020M12

Included observations: 69

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006558	0.007535	0.870266	0.3882
LNACBL(-1)	-0.000105	0.002226	-0.047045	0.9627
LNFIN_DEV	-0.001879	0.002840	-0.661670	0.5112
LNINF	1.28E-05	0.000129	0.099318	0.9213
LNMPR	-0.000359	0.000543	-0.661398	0.5113
LNMPR(-1)	0.000624	0.000734	0.851320	0.3986

LNMPR(-2)	-6.01E-05	0.000910	-0.066040	0.9476
LNPSC	-0.000787	0.001135	-0.693500	0.4911
LNMOMO	0.000224	0.000327	0.685268	0.4963
LNMOMO(-1)	0.000150	0.000328	0.456454	0.6500
LNMOMO(-2)	-0.000661	0.000522	-1.265929	0.2113
LNNPL	2.69E-05	0.000408	0.065982	0.9477
LNNPL(-1)	3.80E-05	0.000382	0.099447	0.9212
LNEXC	-0.000257	0.000212	-1.212530	0.2309
LNEXC(-1)	0.000739	0.000939	0.787005	0.4349
LNEXC(-2)	-8.83E-05	0.000596	-0.148011	0.8829
LNEXC(-3)	-0.000528	0.000460	-1.147186	0.2567
@TREND	2.11E-05	1.67E-05	1.261792	0.2128

R-squared	0.202010	Mean dependent var	0.000123
Adjusted R-squared	-0.063987	S.D. dependent var	0.000176
S.E. of regression	0.000182	Akaike info criterion	-14.17075
Sum squared resid	1.68E-06	Schwarz criterion	-13.58794
Log likelihood	506.8908	Hannan-Quinn criter.	-13.93953
F-statistic	0.759446	Durbin-Watson stat	1.751990
Prob(F-statistic)	0.727898		

Appendix D

Table 26: Ramsey RESET Test

Ramsey RESET Test

Equation: EQNEW

Omitted Variables: Squares of fitted values

Specification: LNACBL LNACBL(-1) LNFIN_DEV LNINF LNMPR LNMPR(-1) LNMPR(-2) LNPSC LNMOMO LNMOMO(-1) LNMOMO(-2) LNNPL LNNPL(-1) LNEXC LNEXC(-1) LNEXC(-2) LNEXC(-3) C @TREND

	Value	df	Probability
t-statistic	0.322206	50	0.7486
F-statistic	0.103817	(1, 50)	0.7486
Likelihood ratio	0.143119	1	0.7052

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	1.76E-05	1	1.76E-05
Restricted SSR	0.008484	51	0.000166
Unrestricted SSR	0.008467	50	0.000169

LR test summary:

	Value
Restricted LogL	212.7183
Unrestricted LogL	212.7899

Unrestricted Test Equation:

Dependent Variable: LNACBL

Method: Least Squares

Date: 08/30/23 Time: 03:45

Sample: 2015M04 2020M12

Included observations: 69

HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNACBL(-1)	-0.043560	1.010231	-0.043119	0.9658
LNFIN_DEV	0.089569	2.423143	0.036964	0.9707
LNINF	0.000339	0.049002	0.006919	0.9945
LNMPR	0.010677	0.323360	0.033019	0.9738
LNMPR(-1)	-0.023274	0.573481	-0.040584	0.9678
LNMPR(-2)	-0.022119	0.456119	-0.048494	0.9615
LNPSC	0.012368	0.310437	0.039839	0.9684
LNMOMO	-0.003778	0.037686	-0.100241	0.9206
LNMOMO(-1)	0.010338	0.207824	0.049743	0.9605
LNMOMO(-2)	-0.009007	0.170205	-0.052919	0.9580
LNNPL	0.025876	0.525682	0.049224	0.9609
LNNPL(-1)	-0.019534	0.523016	-0.037349	0.9704
LNEXC	0.000505	0.021733	0.023249	0.9815
LNEXC(-1)	-0.020745	0.407468	-0.050912	0.9596

LNEXC(-2)	0.012498	0.209000	0.059801	0.9526
LNEXC(-3)	-0.019582	0.429515	-0.045592	0.9638
C	1.607045	0.760305	2.113685	0.0396
@TREND	0.000527	0.008701	0.060582	0.9519
FITTED^2	0.184161	0.604984	0.304406	0.7621

R-squared	0.987479	Mean dependent var	3.233809
Adjusted R-squared	0.982971	S.D. dependent var	0.099720
S.E. of regression	0.013013	Akaike info criterion	-5.617098
Sum squared resid	0.008467	Schwarz criterion	-5.001910
Log likelihood	212.7899	Hannan-Quinn criter.	-5.373033
F-statistic	219.0642	Durbin-Watson stat	1.926992
Prob(F-statistic)	0.000000	Wald F-statistic	1033.901
Prob(Wald F-statistic)	0.000000		

Appendix E

Department of Economic studies

University of Cape Coast

Interview Guide

Salutations,

This instrument is an interview guide from Mr. Bismark Anokye, a PhD candidate at the school of Economics, UCC studying the responsiveness of commercial banks to policy rate by the bank of Ghana. It will be pleasure for me to have your time for an interview based on the questions asked in this document.

The responses to the question or answers provided are going to be used for the purposes of this academic exercises only. Your responses shall be treated confidential. Your anonymity will be paramount concern and as such no trace of any part of the answers provided shall be linked to you and the organization Therefore, we seek your consent to be part of this interview process. The interview may last maximum of 30 minutes of your time.

Thank you.

Section A

1. Ask for years of experience in the teaching and learning of monetary economics or in the banking sector
2. ask for years of experience in the current capacity of the individual / lecturer

Section B

3. What things are considered when determining the lending rates of the various loans and credit portfolios of a bank?

4. What other factors do banks respond to in terms of setting the interest rate?
5. What processes do banks go through to determine lending rate for clients?
6. Among the relevant rates (monetary and money market rates) which one is given most priority (or attention) in the lending rate determination
7. Do you have a threshold margin or a percentage that is put on the policy rate that accounts for the difference in the MPR and the banks rates? What brings about that difference?
8. When there is a change in the relevant rate by the monetary authority, how does the bank adjust the rates and why?
9. On average how long does it take for changes in the relevant policy rates by the monetary authority to be reflected in the lending rate? And in what manner is the introduction of the adjustment feed into commercial rates of the banks?
10. What things do banks consider in order to adjust bank rates after any change in relevant rates by the monetary authority?
11. Are there any challenges that make it difficult to adjust the bank interest rates when the monetary authority makes changes in their respective rates?
12. What are the challenges that commercial banks experience in trying to respond promptly to monetary policy rate?
13. Why do you see them as challenges?

14. In your view how these challenges could be addressed to make it easy for the banks to adjust their rate to reflect some of the changes in the relevant rates by the monetary authority?
15. How do you understand financial development?
16. Does financial development affect the responsiveness of commercial banks to monetary policy rate?
17. How does the level of financial development affect the rate at which banks respond to the monetary policy rate by the central bank?
18. What are the main channels of monetary policy transmissions?
19. Can the level of financial development in the financial sector affect channels of monetary policy transmissions?
20. In your opinion, how does the financial development affect the channels of monetary policy transmission?

Thank you!!!.