The Relationship Between Financial Sector Development and Economic Growth: The Case of Zambia

A Dissertation

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by

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Plagiarism Declaration

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Signature: M.Mwachande

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Acknowledgments

My Bible tells me that I should trust in the Lord with all my heart and lean not on my own understanding, but in all my ways, I should acknowledge Him, and He will make my path straight. I therefore acknowledge the Lord in my life, for through Him, I have and am my being; apart from Him, I have no good thing. It is He who gives every good gift from above.

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Finally, I thank the Lord once again, as the Bible says, "The joy of the Lord is my strength." Through Him, I have found the perseverance to complete this work

Abstract

This study examines the relationship between financial sector development and economic growth in Zambia, focusing on the roles of financial sector growth, bank efficiency, human capital, and institutional quality. Given Zambia's ongoing financial reforms, the research aims to fill the gap in understanding how these factors influence economic performance, particularly in the short and long term. The problem addressed by the study is the unclear impact of financial sector reforms on economic growth, despite substantial progress in financial sector development. The study's objectives were to estimate the short- and long-run relationships between financial sector development and economic growth, analyse the effect of bank efficiency on financial sector development, and explore the moderating influence of human capital and institutional quality.

The results, derived from the ARDL model, indicate that financial sector development has a positive long-term relationship with economic growth, with no significant short-term effects. While improvements in bank efficiency were found to be positively associated with financial sector development in the long run, no substantial short-term impact was observed. Human capital and institutional quality did not show significant effects on economic growth or bank efficiency, suggesting that these areas need further development for full economic benefits.

The study concludes that while financial sector development plays a critical role in driving long-term economic growth, improvements in human capital and institutional quality are necessary to enhance the sector's effectiveness. The findings offer valuable insights for policymakers seeking to strengthen Zambia's financial sector and achieve sustainable economic growth. Further research is recommended to explore the delayed effects of financial reforms, the role of financial technology, and the impact of institutional quality on economic outcomes.

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List of Abbreviations

AfDB	African Development Bank
ARDL	Autoregressive Distributed Lag
ATM	Automated Teller Machine
BFSA	Banking and Financial Services Act
BoZ	Bank of Zambia
FDI	Foreign Direct Investment
FSD	Financial Sector Development
FSDP	Financial Sector Development Plan
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GMM	Generalised Method of Moments
IMF	International Monetary Fund
KCY	Know Your Customer
M3	Broad Money
MFI	Microfinance Institutions
NBFIs	Non-Banking Financial Institutions
NIM	Net Interest Margin
NSCB	National Savings Credit Bank
PBT	Profit Before Tax
SADC	Southern African Development Community
SMEs	Small and Medium-Sized Enterprises
SSA	Sub Saharan Africa
UNCTAD	United Nations Conference on Trade and Development
ZANACO	Zambia National Commercial Bank
ZNBS	Zambia National Building Society

1. Introduction

1.1 Background To The Study

Financial sector development (FSD) has long been recognized as a critical enabler of economic growth. It improves the quality, quantity, and efficiency of financial services, enabling economic agents to access savings and credit, which reduces unemployment, boosts income levels, and enhances economic resilience (Levine, 1997; Schumpeter, 1934). By efficiently allocating resources, managing risk, and facilitating technological innovation, FSD serves as a catalyst for sustained economic growth (Arayssi & Fakih, 2017). These dynamics have been at the heart of debates in economic development, particularly in the context of developing economies where structural deficiencies often inhibit the realization of these benefits (Olowu et al., 2018; Allen et al., 2016).

Three key perspectives frame the finance-growth nexus. The *supply-leading hypothesis* suggests that financial development drives economic growth by mobilizing savings, enhancing resource allocation, and stimulating investment. Conversely, the *demand-following hypothesis* argues that economic growth generates increased demand for financial services, leading to financial development. The third perspective, emphasizing *bidirectional causality*, posits that financial development and economic growth mutually reinforce one another (Odhiambo, 2005; Christopoulos & Tsionas, 2004). Despite significant theoretical contributions, empirical findings on the finance-growth relationship remain mixed. These inconsistencies are often attributed to country-specific factors, including institutional quality, regulatory frameworks, and the depth and breadth of financial markets (Ibrahim & Alagidede, 2018).

The importance of FSD is particularly evident in developing economies such as those in Sub-Saharan Africa (SSA), where underdeveloped financial systems hinder economic progress. Financial markets in the region are characterized by inefficiencies, high transaction costs, and limited access to formal financial services, which exclude a significant portion of the population and restrict private sector growth (Beck & Cull, 2013). While middle-income SSA countries show signs of progress, the region as a whole lags behind other developing regions in terms of financial depth and inclusion (Montfort et al., 2016). Zambia offers a compelling case for examining the complexities of FSD in the context of a developing economy. Historically, the country has faced significant structural challenges in its financial sector, characterized by limited financial inclusion, high costs of borrowing, and unequal access to credit. These challenges have persisted despite policy interventions and liberalization efforts.

During the 1990s, Zambia embarked on financial liberalization, aimed at enhancing competition and efficiency in the financial sector. This period saw the entry of foreign banks, the removal of capital transaction restrictions, and the liberalization of interest rates (World Bank, 2007). By 1995, foreign banks dominated the sector, controlling 67% of banking assets, 76% of loans, and 64% of deposits. However, the anticipated benefits, including improved access to credit and financial deepening, were not fully realized. Credit to the private sector remained stagnant, accounting for only 8% of Gross Domestic Product (GDP) by 2005, and financial inclusion metrics showed dismal performance, with just 8% of adults holding a bank account (World Bank, 2007, p. 156).

More recent data highlights the continued dominance of foreign banks in Zambia. Between 2018 and 2023, subsidiaries of foreign banks controlled an average of 71.3% of banking assets, 70% of deposits, and over 60% of loans. Although their dominance has slightly waned, they remain the largest players in the financial sector. In contrast, government-linked banks have steadily increased their market share, reflecting a shift toward state intervention in the sector. Local private banks, however, have struggled to compete, with their asset and loan shares declining significantly during the same period (Bank of Zambia, 2024).

Before liberalization, large firms relied heavily on external capital, with approximately one-fifth of commercial bank balances placed abroad. While liberalization facilitated the entry of foreign capital, it also exposed systemic weaknesses, including insufficient regulatory capacity and a lack of risk management frameworks. Between 1995 and 2001, several bank failures occurred, costing taxpayers an estimated 7% of GDP and further eroding confidence in the financial system (World Bank, 2007, p.166).

Financial services in Zambia remain expensive and inaccessible for a large segment of the population. Lending rates have historically been prohibitively high, averaging 48% annually in 2005, with microfinance institutions (MFIs) charging even higher rates of 50-60%. Such costs exclude small and medium-sized enterprises (SMEs) and rural populations from formal financial markets. Additionally, savings instruments have been impractical due to high inflation, monthly account charges, and prohibitive minimum deposit requirements (Beck & Cull, 2013).

Inadequate rural banking services, coupled with restrictive Know Your Customer (KYC) regulations, further inhibit financial inclusion. These barriers disproportionately affect informal sector workers and SMEs, which form the backbone of Zambia's economy. By 2022, credit to the private sector as a percentage of GDP stood at 12.98%, considerably lower than the SSA average of 45% (Bank of Zambia, 2023).

The uneven outcomes of Zambia's financial liberalization highlight the critical role of institutional frameworks and regulatory capacity. While foreign bank dominance has contributed to financial stability, it has not translated into broader financial inclusion or economic diversification. This underscores the need for targeted policy interventions that address structural inefficiencies.

Incentivizing innovation has proven critical in expanding financial access, particularly in regions with limited-service penetration. According to Bryan and Williams (2021), mechanisms such as open innovation platforms and targeted grants help address market failures by encouraging private actors to develop solutions tailored to underserved populations. Evidence suggests that non-monetary incentives, including public recognition and peer validation, play a substantial role in fostering creativity in financial technology. Policymakers are urged to adopt flexible, context-specific approaches to incentivize innovation, balancing financial rewards with mechanisms that preserve the intrinsic motivation of innovators.

Reducing transaction costs is a cornerstone of financial inclusion efforts. Research highlights the effectiveness of leveraging existing infrastructure, such as postal networks, to provide low-cost financial services. For example, Kenya’s M-Pesa and India’s Aadhaar-enabled payment systems have successfully expanded access to banking services by integrating cost-effective technologies with established local networks. These approaches demonstrate that market-friendly subsidies and cost-sharing mechanisms can significantly lower barriers to entry for rural populations, ensuring broader participation in formal financial systems without distorting market competition.

Strengthened regulatory frameworks are essential to sustaining innovation-driven financial inclusion. The World Economic Forum (2021) emphasizes the significance of regulatory sandboxes, which provide fintech companies with a controlled environment to test and develop new products. Such environments have proven effective in fostering innovation while maintaining systemic stability. Additionally, regulatory measures addressing anti-money laundering and market risk management ensure that expanded access does not compromise financial integrity. Zambia could benefit from adopting similar strategies to encourage innovation, reduce compliance barriers, and ultimately boost financial inclusion in rural and underserved areas.

Zambia's economy has encountered substantial challenges over the last ten years, with average GDP growth rates declining to approximately 3.1% annually between 2013 and 2023. This period of slow growth marked a departure from the high growth rates of over 6% during the 2000s, largely driven by increased copper exports and strong global demand (World Bank, 2023). Macroeconomic stability deteriorated due to rising debt levels, declining foreign direct investment (FDI), and external shocks, including fluctuating copper prices and the COVID-19 pandemic (UNCTAD, 2023). These challenges exacerbated poverty, with over 60% of the population residing below the national poverty threshold as of 2021 (World Bank, 2022).

In response, the Zambian government successfully negotiated a debt restructuring deal with creditors under an International Monetary Fund (IMF) program in 2022. This program emphasizes fiscal consolidation, economic diversification, and structural reforms aimed at stabilizing the economy and fostering growth (IMF, 2023). Current forecasts project GDP growth of 3.5% in 2024**,** 4.1% in 2025**,** and 4.5% in 2026**,** supported by improved fiscal discipline, investments in infrastructure, and expansions in mining output (African Development Bank, 2023). Over the next decade, Zambia's economy is projected to expand at an average annual rate of 4–5%**,** contingent on maintaining macroeconomic stability and implementing key policy reforms (World Bank, 2023).

Against this backdrop, the relationship between financial sector development and economic growth warrants renewed attention. A well-functioning financial system is critical for mobilizing savings, facilitating credit, and supporting investment, which are essential for sustaining economic recovery and promoting inclusive growth (Levine, 1997; Beck & Levine, 2004). Despite decades of financial liberalization, Zambia's financial sector remains shallow. The M3 (broad money supply) to GDP ratio, a critical indicator of financial development, highlights Zambia's underperformance in financial intermediation and access to financial services compared to SSA averages. Between 2014 and 2022, Zambia's M3-to-GDP ratio fluctuated significantly, ranging from a low of 20.62% in 2016 to a high of 31.21% in 2020, before stabilizing at 27.13% in 2022. In contrast, the SSA regional averages remained consistently higher, starting at 34.53% in 2014, peaking at 42.29% in 2021, and concluding at 40.40% in 2022 (Bank of Zambia, 2023; World Bank, 2023).

This disparity underscores Zambia’s limited financial depth, with domestic financial institutions struggling to mobilize and allocate savings effectively. For instance, during the global economic disruptions of 2020, Zambia's ratio briefly spiked to 31.21%, likely reflecting emergency monetary policies, while SSA’s average surged to 41.26%. However, Zambia’s ratio fell back in subsequent years, signifying structural weaknesses in financial intermediation. Persistent challenges, such as low formal financial inclusion, high lending costs, and reliance on informal financial systems, contribute to this underperformance (Ibrahim & Alagidede, 2018).

The consistently lower M3-to-GDP ratio indicates constrained financial access for businesses and households, limiting their ability to save and invest productively. This financial shallowness contrasts sharply with SSA peers that have made strides in expanding financial inclusion and developing capital markets. Addressing these gaps is essential for Zambia to leverage its financial sector as a catalyst for broader economic growth and development.

This study revisits the finance-growth relationship in the context of Zambia, where financial development remains constrained despite liberalization. The persistently low levels of private sector credit, high lending rates, and limited financial inclusion underscore the need for reforms that deepen financial markets and enhance the sector’s contribution to growth (Beck et al., 2014; Odhiambo, 2005). By investigating the nexus between financial development and economic growth, this research aims to provide evidence-based recommendations for policymakers. Understanding these dynamics is critical not only for Zambia but also for other SSA economies facing similar challenges, highlighting the broader relevance of the study.

1.2 Statement of the Research Problem

The financial sectors in SSA have historically struggled to contribute significantly to economic growth, particularly in low-income countries. Financial systems in the region tend to be underdeveloped relative to the size of their economies, with a limited range of institutions predominantly led by commercial banks (Beck & Cull, 2013). Restricted access to fundamental financial services, such as credit, continues to impede entrepreneurial initiatives and overall welfare improvements (Demirgüç-Kunt & Levine, 2008). Nonetheless, reforms have led to progress, with financial systems expanding their range of products, enhancing lending capacity, and increasing their reach. Developing more robust and efficient financial systems remains essential for bolstering growth forecasts in SSA (Svirydzenka, 2016).

Zambia's financial system, prior to the economic reforms of the 1990s, was heavily repressed. Strict regulation of interest rates, credit allocation, and exchange rates characterized this period. Credit allocation was skewed toward government, agriculture, and mining sectors, with government institutions receiving the majority of available funds. Interest rates were capped, exchange rates were fixed, and capital movement was tightly controlled (World Bank, 2007). These conditions stifled savings and investment, leading to economic stagnation. High inflation and negative real deposit rates further exacerbated the situation, contributing to low allocative and operational efficiency within the financial system (Pal, 2012).

In response to the economic costs of financial repression, Zambia launched a financial sector reform program in 1992. Key measures included interest rate liberalization, introduction of the Treasury bill auction system in 1993, and the creation of a market-oriented interest rate structure (Cooray, 2009). These reforms led to increases in both lending and deposit rates, although deposit rates remained negative in real terms. The persistent gap between high lending rates and low deposit rates resulted in significant interest rate spreads, driven by high default risks and a large volume of non-performing loans. Subsequent reforms targeted banking infrastructure, oversight, regulations, and payment systems, culminating in the Banking and Financial Act of 1994 and the adoption of the Basel I Accord (Bank of Zambia, 1994). A more development-focused financial reform program followed in 2002, informed by recommendations from the IMF and World Bank, which encouraged competition through the entry of regional and private foreign banks (World Bank, 2007).

Despite these reforms, Zambia has faced challenges in achieving financial deepening, an essential component of financial sector development. Financial deepening, often measured by indicators such as the M3:GDP ratio, reflects the extent to which a financial system facilitates the movement of capital between borrowers and financiers (Svirydzenka, 2016). According to Pal (2012), financial deepening depends on wealth holders' willingness to place savings with financial intermediaries and is influenced by the real deposit interest rate. A positive real deposit rate encourages financial deepening, while a negative rate discourages it by driving wealth holders to seek less liquid alternatives.

Pal's research highlights Zambia's limited progress in financial deepening despite financial sector reforms. For instance, financial deepening peaked at 24% in 1986 before declining and showing only gradual recovery thereafter (Pal, 2012). Persistent negative real deposit rates in Zambia reflect either high inflation or low deposit rates, which continue to undermine financial deepening efforts (Beck et al., 2009). Comparatively, countries like India, which implemented financial sector reforms on a larger scale following its 1991 economic policy shift, have achieved significantly higher levels of financial deepening. By 2009-10, India's financial deepening stood at over 78%, supported by consistently positive real deposit rates over two decades (Pal, 2014). This stark contrast underscores the challenges Zambia faces in leveraging its financial system to drive sustainable economic growth.

The limited success in addressing financial deepening raises questions about the effectiveness of Zambia's financial sector reforms, and its impact thereafter on economic growth. Despite some improvements in banking infrastructure and financial services, the financial system has struggled to provide a solid foundation for savings mobilization and investment (Demirgüç-Kunt & Levine, 2008). This study aims to investigate the key factors driving financial sector development in Zambia, with the goal of identifying strategies to bolster its financial system and improve its role in promoting economic growth.

One measure of financial sector development that can be used is the M3:GDP ratio. Zambia's M3:GDP ratio has consistently been lower than the SSA average between 2014 and 2022, highlighting significant challenges in financial development, economic monetization, liquidity management and economic stability. While SSA's ratio increased steadily from 34.53% in 2014 to 40.40% in 2022, as shown in figure 1.1, Zambia's ratio remained comparatively low, rising only modestly from 20.93% to 27.13% over the same period (Bank of Zambia, 2023). This disparity reflects Zambia's under-monetization, characterized by a limited supply of broad money to support economic activities and a less developed financial system. These structural challenges restrict financial inclusion and the ability to mobilize domestic savings, thereby limiting credit availability and economic growth.

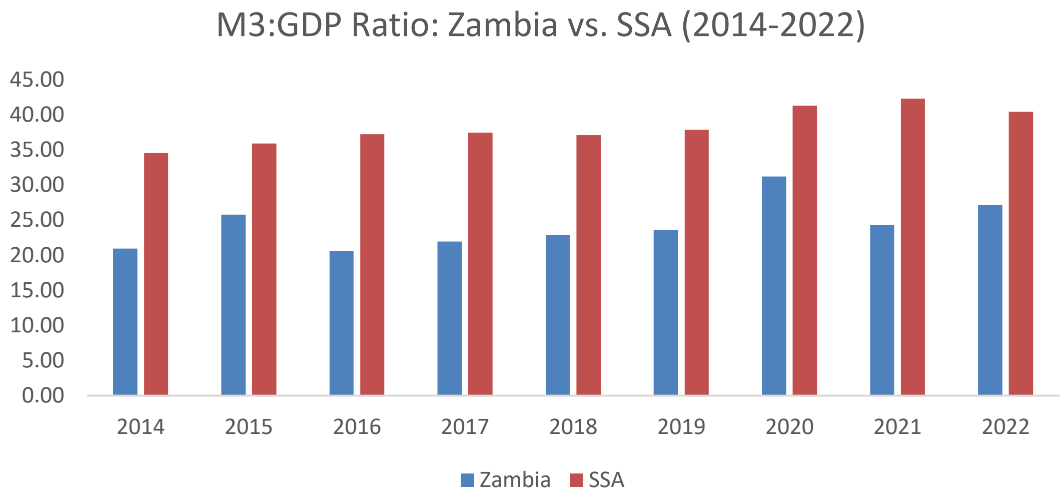

Figure 1.1:Financial Sector Depth in Zambia

(Source: Bank of Zambia, 2024)

Zambia's M3:GDP ratio also exhibits greater volatility compared to the more stable trends in SSA. Sharp fluctuations, such as the significant rise to 31.21% in 2020 followed by a decline to 24.33% in 2021, underline the country's susceptibility to external shocks and policy inconsistencies. The spike in 2020 may be attributed to monetary expansions during the COVID-19 pandemic, while the subsequent decline likely reflects inflationary pressures and policy adjustments. In contrast, SSA's gradual and sustained growth suggests more robust monetary policies and financial systems capable of withstanding economic disruptions.

The divergence in trends between Zambia and SSA after 2019 further emphasizes Zambia's lagging financial sector development. While SSA's M3:GDP ratio rose consistently from 37.87% in 2019 to 40.40% in 2022, Zambia's increase during this period was marginal, reflecting inefficiencies in its financial system (Bank of Zambia, 2024). This highlights Zambia's inability to keep pace with regional benchmarks in expanding financial inclusion, mobilizing savings, and deepening credit markets. The contrast underscores the need for reforms to align Zambia's financial sector with its regional peers.

Another metric that may be utilized to measure financial sector development is the amount of credit that flows in an economy. From figure 1.1, Zambia's domestic credit to the private sector (% of GDP) has consistently lagged behind the SSA average from 2011 to 2022, reflecting persistent challenges in mobilizing and allocating financial resources for private sector growth. While SSA’s ratio started at 46.50% in 2011 and declined to 34.47% in 2022, Zambia’s ratio remained significantly lower, increasing modestly from 13.69% in 2011 to a peak of 19.76% in 2015 before declining to 12.98% in 2022. This persistent gap points to Zambia’s structural limitations in fostering credit availability and financial intermediation for private sector development.

Zambia’s trend exhibits volatility, with a notable rise in domestic credit to the private sector between 2011 and 2015, reaching its highest level at 19.76%. However, this growth proved unsustainable, as the ratio declined steadily after 2016, hitting a low of 11.36% in 2021. Factors such as tighter monetary policies, macroeconomic instability, and rising non-performing loans likely contributed to this downward trend. By contrast, as shown in figure 1.2, SSA experienced a more gradual decline, maintaining higher levels of private sector credit relative to GDP, which suggests better financial system resilience and stronger credit facilitation mechanisms across the region.

The widening gap between Zambia and SSA after 2015 highlights Zambia’s growing struggle to provide adequate credit to its private sector. While SSA’s ratio remained above 40% until 2018, Zambia’s ratio dropped significantly, signalling reduced financial inclusion and constrained credit markets. The private sector in Zambia, particularly SMEs, likely faces significant barriers to accessing credit, such as high interest rates, limited financial sector outreach, and a lack of well-developed credit markets.

The declining trend in Zambia’s ratio from 2016 to 2022 also reflects broader macroeconomic challenges, including fiscal pressures, exchange rate volatility, and inflation, which undermine the financial sector’s capacity to extend credit. These constraints have resulted in a financial system that prioritizes lending to the government and other safer investments over private sector credit, further stifling economic diversification and growth. SSA’s relative stability in private sector credit provision indicates that other countries in the region have been more successful in balancing public and private sector financing needs.

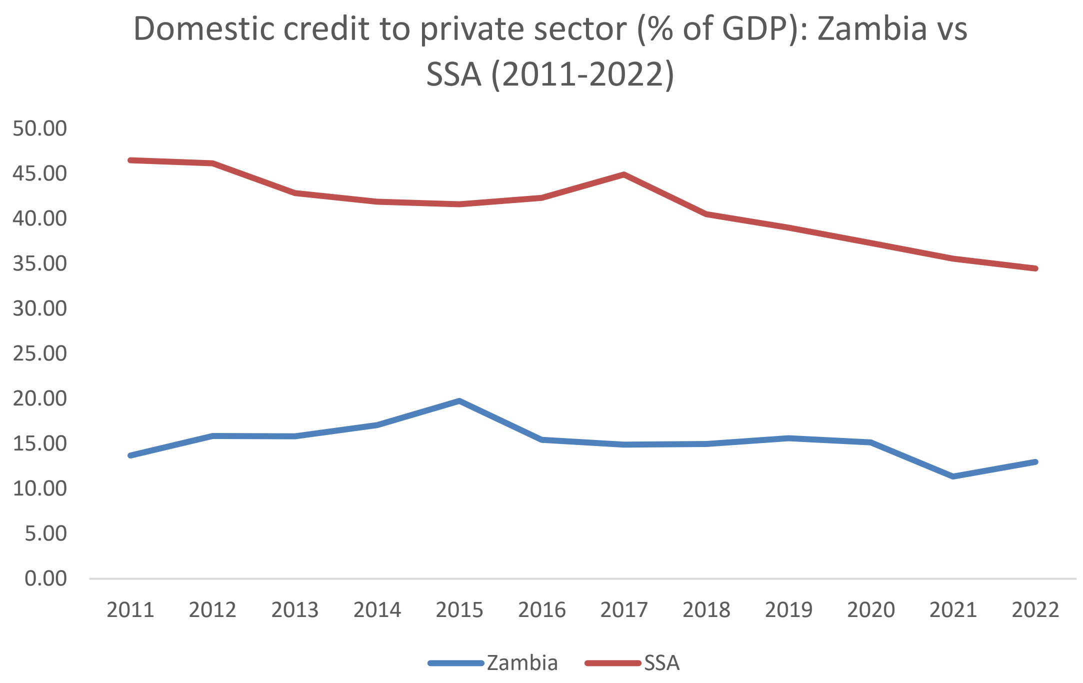

Figure 1.2: Credit allocation to private sector in Zambia
(Source: Bank of Zambia, 2024)

While extensive research exists on the impact of financial sector development on economic growth and the effects of financial system liberalization in Zambia, limited attention has been given to identifying the specific factors that drive financial sector development. This study seeks to fill that gap by examining the main factors influencing financial sector development in Zambia. While there is no universally agreed-upon metric for assessing financial sector development, numerous studies use a single indicator—private sector credit as a percentage of GDP—to gauge the progress of the financial sector.

Svirydzenka (2016) argues that relying on a single measure is inadequate to provide a comprehensive understanding of the financial sector's current state and trajectory. This is because financial sector development is inherently complex and multifaceted. Previous studies by King and Levine (1993), Levine and Zervos (1996), and Demirgüç-Kunt and Maksimovic (1996), among others, highlight three key dimensions of financial sector development: the depth and scale of financial intermediation, the role of non-bank financial institutions, and the operational efficiency of the financial system. While these studies may not fully encapsulate the quality of financial sector attributes, they provide a foundation for understanding the breadth of existing research.

Empirical studies focusing on Sub-Saharan Africa, and Zambia in particular, have largely relied on limited indicators of financial sector development. For example, studies by Montfort et al., (2016) and Mahawiya (2015) used metrics that primarily reflect the financial sector's size (depth) while neglecting other critical aspects. This narrow focus fails to capture the multidimensional nature of financial sector development. To address this shortcoming, the Financial Augmented Model proposed by Cooray (2009)—and adopted in this thesis—constructs composite indices that incorporate multiple measures. These indices provide a more holistic assessment of financial sector development by considering all three critical dimensions: depth, efficiency, and the role of non-bank intermediaries.

Additionally, Zambia's persistent underperformance in key financial indicators, such as the M3: GDP ratio and domestic credit to the private sector, underscores the pressing need for financial sector reforms. The country's low and volatile M3: GDP ratio reflects challenges such as liquidity constraints, limited banking penetration, and an over-reliance on external financing and commodity exports. These factors expose Zambia's economy to external shocks and constrain its ability to mobilize domestic resources for long-term growth. Similarly, Zambia's declining domestic credit to the private sector highlights the financial system's inefficiency in supporting businesses, particularly SMEs. This restricts opportunities for investment, job creation, and economic diversification.

In conclusion, Zambia's financial sector continues to face structural weaknesses that hinder its ability to effectively support economic growth and private sector development. Despite extensive financial reforms, persistent challenges in financial deepening, credit allocation, and economic monetization signal the need for more targeted interventions. Addressing these limitations is critical for improving financial intermediation, enhancing credit market efficiency, and stabilizing the macroeconomic environment.

This study seeks to solve the identified research problem by exploring the key determinants of financial sector development in Zambia. By employing a multidimensional framework that incorporates measures of financial depth, efficiency, and the role of non-bank intermediaries, this research aims to provide a comprehensive understanding of the factors influencing Zambia's financial system. The findings will contribute to formulating policies that can strengthen the financial sector, align it with regional benchmarks, and support sustainable economic growth driven by private sector participation.

1.3 Research Questions

This study is structured around several key research questions aimed to examine the links between Zambia's financial sector development and its economic growth, alongside the pivotal roles of banking and government institutions:

1. **Economic Growth and Financial Sector Development:**

- How does economic growth relate to financial sector development in the short term?
- What is the long-run relationship between economic growth and financial sector development?

2. **Bank Efficiency and Financial Sector Development:**

- How does bank efficiency influence financial sector development in the short term?
- What is the long-run relationship between bank efficiency and financial sector development?

1.4 Research Objectives

The objectives of this research are to systematically examine the interplay between financial sector development and economic growth in Zambia, with a focus on the contributions of the banking sector and institutional quality. Specifically, this study seeks to;

1. **Economic Growth and Financial Sector Development:**

- To estimate and analyse the short-run relationship between economic growth (GDP per capita) and financial sector development.
- To estimate and analyse the long-run relationship between economic growth (GDP per capita) and financial sector development.

2. **Bank Efficiency and Financial Sector Development:**

- To estimate and analyse the short-run relationship between bank efficiency (e.g., BNKE) and financial sector development.
- To estimate and analyse the long-run relationship between bank efficiency (e.g., BNKE) and financial sector development.

1.5 Justification of the Research

This study contributes to the discourse on financial sector development and economic growth by adapting Cooray's (2009) Financial Sector Augmented Model to the Zambian context. By replicating and applying this model, the study aims to align Zambia's recent growth policies with appropriate financial sector connections to influence the country's economic trajectory. In doing so, the research seeks to facilitate the formulation of long-term, sustainable economic growth strategies tailored to Zambia's unique challenges. This approach provides insights into the structural parameters influencing the financial sector and its role in achieving broader economic objectives.

The rationale for this study lies in its potential to fill critical gaps in the existing literature on Zambia's financial sector development and economic growth, a subject that remains underexplored. While financial sector reforms and their macroeconomic impacts have been studied in Zambia, econometric-based empirical research explicitly focusing on the relationship between financial sector development and economic growth is sparse, with fewer than five studies dedicated to this topic. By addressing this gap, the research offers significant implications for policymakers, regulators, researchers, and economic participants, providing actionable insights to guide both short-term and long-term strategies for enhancing economic growth.

The study underscores the importance of understanding the direction and nature of the relationship between financial sector development and economic growth in Zambia. This understanding is critical for evidence-based policymaking, particularly in prioritizing interventions. For example, identifying whether financial sector development drives economic growth or vice versa has far-reaching implications for regulatory and institutional strategies. Unlike broader regional studies, such as Phiri and Phiri's (2024) research on 12 SADC countries, this study focuses specifically on Zambia to uncover dynamics unique to its financial sector.

Moreover, this study builds on findings from South Africa and the SADC region, contextualizing them within Zambia's economic framework. For instance, Monareng (2022) examined the role of the banking sector and institutional quality in South Africa's financial sector development and economic growth. Similarly, Phiri and Phiri's (2024) study demonstrated a bidirectional causality between financial development and economic growth in the SADC region, emphasizing the need for coordinated economic and financial policies.

Previous research on Zambia has largely explored the impact of financial sector reforms implemented in the 1990s and their subsequent influence on macroeconomic outcomes. For example, Mwenda and Mutoti (2011) found that while financial sector reforms improved bank cost efficiency, their direct contribution to economic growth remained limited. Pal (2014) and Patel (2010) highlighted that financial deepening, a critical condition for economic growth, has not significantly improved in Zambia, reflecting persistent structural challenges in financial intermediation. Additionally, Odhiambo (2012) demonstrated a long-term negative relationship between inflation and financial development in Zambia, emphasizing the importance of a stable macroeconomic environment for fostering financial growth.

While institutions are widely recognized as pivotal to financial sector development, Cooray's (2009) original model does not adequately incorporate their role. Empirical evidence, such as the findings of Aluko and Ajayi (2018), highlights the critical influence of institutional quality on financial sector advancement. To address this limitation, this study introduces an institutional quality variable to Cooray's model, enabling a more comprehensive analysis of the impact of institutions on Zambia's financial sector and its contribution to economic growth. Additionally, the research examines the banking sector's influence on financial sector development, aiming to provide actionable recommendations for enhancing institutional frameworks and banking sector performance.

This study distinguishes itself by combining insights from regional and international research while addressing Zambia-specific dynamics. By adapting Cooray's (2009) model and incorporating institutional quality, it offers a nuanced understanding of the factors influencing financial sector development and economic growth in Zambia. The findings will provide practical recommendations for improving financial sector efficiency, strengthening institutional frameworks, and fostering sustainable economic growth. In doing so, the research contributes to the broader discourse on financial sector development in sub-Saharan Africa and equips policymakers with tools to achieve Zambia's national economic objectives, including poverty alleviation, reducing inequality, and creating sustainable employment opportunities.

1.6 Organization of the research

This study is structured into five chapters. Chapter one introduces the research, including its background, objectives, and significance. Chapter two offers a detailed literature review, discussing the historical development of Zambia's financial sector, relevant theories on financial sector growth and economic development, and previous empirical studies. Chapter three outlines the research methodology, describing the adapted model, data sources, and analytical techniques used. Chapter four presents the research results, highlighting the relationship between financial sector development and economic growth in Zambia. Lastly, Chapter five concludes with a summary of the findings, their implications, and recommendations for policymakers and future research.

2. Literature Review

2.1 Introduction

The first part of this chapter examines the structure and dynamics of Zambia's financial system, focusing on its key components—banks and non-banking financial institutions—and their roles in economic growth. The analysis highlights the significance of financial intermediation in channelling funds efficiently between savers, borrowers, and investors, while also identifying potential disruptions that may affect macroeconomic stability. Furthermore, this chapter discusses the historical and regulatory developments in Zambia’s banking sector, including notable changes such as mergers, acquisitions, and the evolving ownership structure. By providing detailed empirical insights, this chapter sets the foundation for understanding the relationship between financial sector development and economic growth, with particular attention to Zambia’s context and its comparative standing within the Sub-Saharan Africa region.

2.2 Structure of the Zambian Financial System

The Zambian financial system plays a pivotal role in supporting economic growth by facilitating the intermediation of funds between borrowers, lenders, and investors. This system is primarily composed of financial markets and institutions, which include both banks and non-banking financial institutions (NBFIs). The effectiveness of the financial system in channelling funds impacts macroeconomic stability, and disruptions in this process—such as lack of credit provision or misallocation of resources—can have negative consequences for economic growth. This research seeks to explore the relationship between the development of Zambia's financial sector and its broader economic growth.

Zambia’s financial system, while growing, is relatively small compared to its regional peers in Sub-Saharan Africa. The banking sector is the dominant component, and at the close of 2023, there were 17 commercial banks operating in the country. However, as of December 2024, the number of commercial banks has decreased to 15. This reduction was due to Access Bank Zambia's acquisition and merger with Atlas Mara Bank Zambia, following regulatory approval from the Bank of Zambia (BoZ). Additionally, the BoZ took possession of Investrust Bank Plc in April 2024, in line with provisions of the Banking and Financial Services Act No. 7 of 2017

(BFSA). Notably, Access Bank had already expanded its presence in Zambia by acquiring Cavmont Bank in 2021.

As shown in Table 2.1, the banking sector is characterized by a high degree of foreign ownership, with foreign subsidiaries from regional financial groups—particularly those based in South Africa—holding around two-thirds of total sector assets. Foreign ownership refers to the portion of the bank's total value (assets) held by investors from other countries. Four of the commercial banks are partially state-owned, including Zambia National Commercial Bank (ZANACO), which is the largest and most systemic institution in the sector. These state-owned banks account for approximately 29 percent of the banking sector's total assets. The remaining commercial banks are smaller, locally-owned private institutions.

Table 2.1 : Assets, Loans, Deposits and PBT[1] by Ownership Type (share of industry, percent), 2021-2023

	2021				2022				2023			
	Assets	Loans	Deposits	PBT	Assets	Loans	Deposits	PBT	Assets	Loans	Deposits	PBT
Subsidiaries of Foreign Banks	71.0	63.8	70.9	71.0	67.4	60.1	66.8	60.0	67.3	60.6	67.0	68.4
Banks with Government Stake	25.9	32.0	25.9	26.6	29.4	35.1	30.0	37.2	29.0	34.4	29.1	33.9
Local Private Banks	3.1	4.1	3.1	2.3	3.2	4.8	3.2	2.8	3.7	5.0	3.8	-2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Bank of Zambia, 2024

By the end of 2023, the total assets of Zambia's banking sector had risen to K238.9 billion, an increase of 21.8% compared to K196.2 billion in 2022. Assets refer to everything a bank owns that has economic value, including cash, loans extended to clients, investments, and property. This growth was mainly driven by an expansion in deposit liabilities, which rose by 21.3% to K178.4 billion, up from K147.0 billion in 2022. Deposit liabilities represent the funds that customers deposit into banks, which the bank uses for lending and other financial activities. These deposit liabilities have been the primary source of funding for the sector’s assets. Correspondingly, total liabilities (what the bank owes to others) also grew by 21.2% to K211.0 billion in 2023. An important development in 2023 was the BoZ’s decision to increase the statutory reserve ratio to 17.0% from 9.0%. The statutory reserve ratio is the minimum percentage of a bank's deposits that it must hold in reserve, rather than lending it out or investing it. This measure ensures that banks maintain sufficient liquidity to meet withdrawal demands and stabilize the banking system.

[1] PBT = Profit Before Tax

Table 2.2: Asset Structure (K'billion and percent), 2021-2023

	2021		2022		2023	
	K'billion	Percent of total assets	K'billion	Percent of total assets	K'billion	Percent of total assets
Net loans and advances	41.9	26.7	50	25.5	68.3	28.6
Balances with foreign financial institutions	30.1	19.2	35.5	18.1	32	13.4
Balances with Bank of Zambia	19.2	12.3	26.8	13.7	42.7	17.9
Investments in government securities	41.9	26.7	56.8	29	61.8	25.9
Other	23.8	15.1	27.1	13.8	34.2	14.3
Total	156.9	100	196.2	100	238.9	100

Source: Bank of Zambia, 2024

Table 2.3: Liability Structure (K' billion and percent), 2021–2023

	2021		2022		2023	
	K'billion	Percent of total liabilities	K'billion	Percent of total liabilities	K'billion	Percent of total liabilities
Deposits	113	81	147	84.5	178.4	84.5
Other liabilities	9.8	7	10.7	6.1	13.5	6.4
Balances due to financial institutions abroad	4.3	3.1	3.9	2.2	6.1	2.9
Other borrowed funds	2.8	2	2.2	1.2	3	1.4
Balances due to financial institutions in Zambia	0.7	0.5	1.2	0.7	1.2	0.6
Others	8.9	6.4	9.2	5.3	8.8	4.2
Total	139.5	100	174.1	100	221	100

Source: Bank of Zambia, 2024

Additionally, net loans and advances (loans that banks have issued to clients, minus repayments) as well as investments in government securities (bonds and other debt issued by the government) saw significant growth during the period. As shown in figure 2.1, the banking sector remains adequately capitalized, with both primary and total regulatory capital ratios comfortably exceeding the minimum regulatory requirements of 5.0% and 10.0%, respectively. Regulatory capital refers to the amount of capital a bank must hold to cover its risks, ensuring that it can absorb losses without becoming insolvent. The primary regulatory capital is the core capital that banks hold, while total regulatory capital includes both primary and supplementary capital. The capital adequacy ratio is used to measure this capital as percentage of the bank's risk-weighted assets, which include loans and investments that may be at risk of default. Notably, primary capital increased by 30.8%, reaching K26.1 billion, while total capital rose by 29.9% to K27.0 billion, largely due to a 55.2% increase in retained earnings (profits kept by the bank instead of being paid out as dividends), which stood at K17.1 billion by year-end 2023.

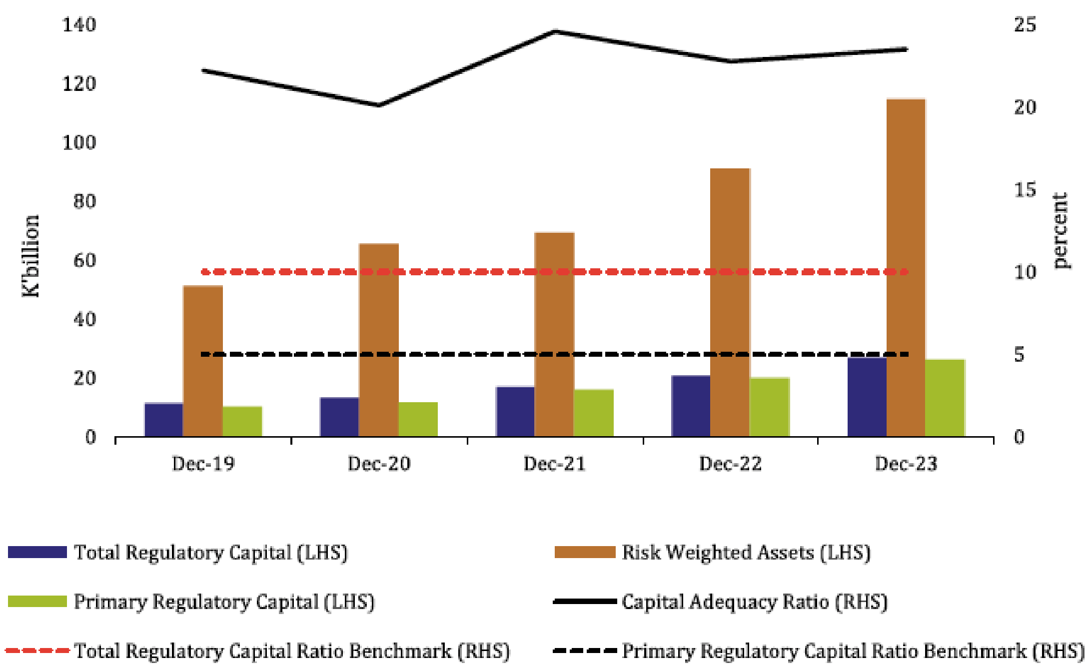

Figure 2.1 : Regulatory Capital, Risk Weighted Assets and Capital Adequacy Ratio, 2019-2023

Source: Bank of Zambia, 2024

Asset quality within the banking sector has also remained satisfactory. Asset quality is a measure of the reliability and risk associated with a bank's assets, especially its loans. As shown in figure 2.2 the ratio of non-performing loans (NPLs) to total loans decreased from 5.0% in December 2022 to 4.2% at the end of 2023. Non-performing loans are loans where the borrower is unlikely to repay, usually because of financial distress or default. This improvement can largely be attributed to a 35.4% growth in gross loans and advances, which reached K71.0 billion during the year.

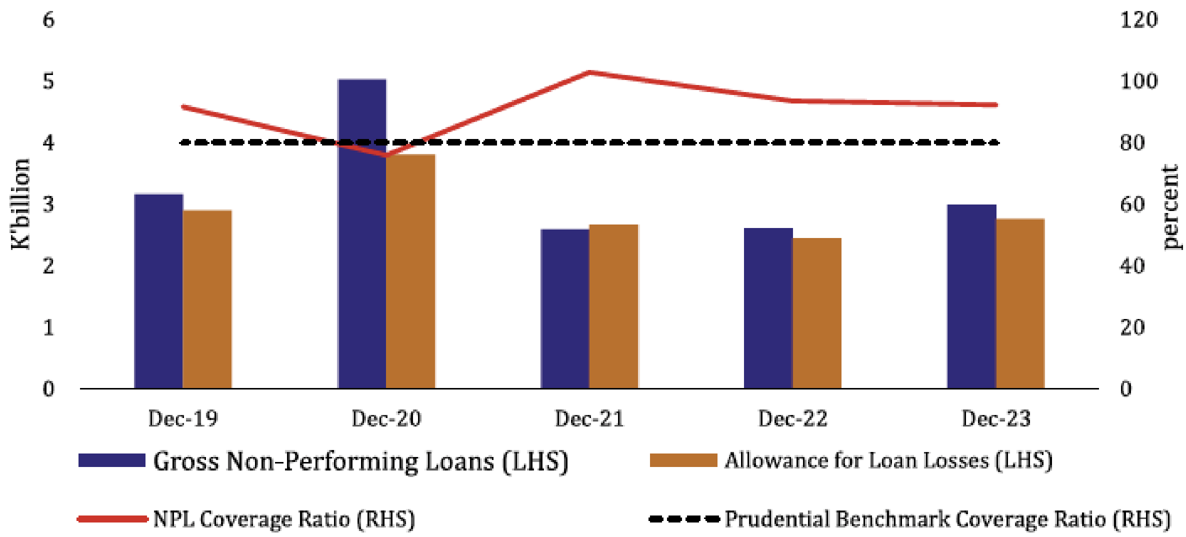

Figure 2.2: Non-Performing Loans, Provisions, and NPL Coverage Ratio, 2019-2023

(Source: Bank of Zambia, 2024)

The allocation of loans across various sectors provides insights into the priorities and dynamics of Zambia's banking sector. As shown in figure 2.3, in 2023, the manufacturing sector received the largest share of loans, accounting for 21.2% of the total, reflecting its critical role in driving industrial growth and economic diversification. Households, primarily through personal loans, constituted the second-largest category, with 17.4% of the total, highlighting the growing demand for consumer credit. Wholesale and retail trade, transportation, and agriculture followed, with shares of 10.9%, 9.8%, and 9.6%, respectively, demonstrating the banking sector's contribution to supporting key economic activities. Sectors such as electricity, gas, water, and mining also received notable allocations, collectively accounting for over 16% of loans, underscoring their importance in infrastructure development and resource extraction. Other sectors, including construction and financial services, received smaller portions of the total loans. This distribution indicates a diverse allocation strategy, balancing support for production, consumption, and essential services. The accompanying pie chart provides a visual representation of this sectoral distribution.

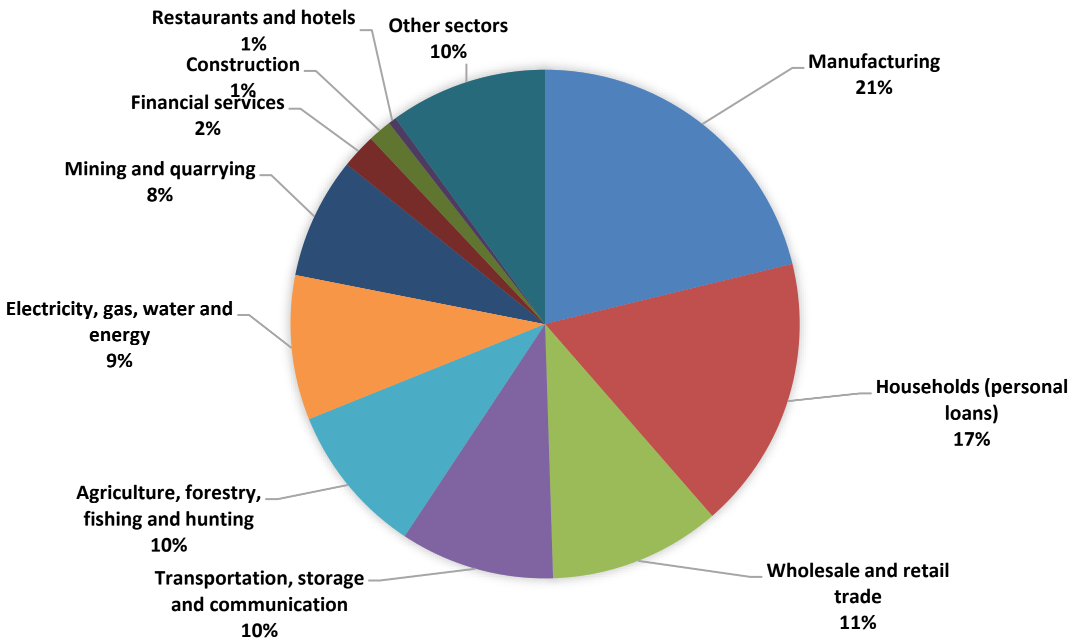

Figure 2.3: Sectoral Distribution of Loans in Zambia (2023)

Source: Bank of Zambia, 2024

Alongside the banking sector, Zambia's financial landscape comprises a variety of smaller non-bank financial institutions (NBFIs), including pension funds, insurance companies, building societies, and a large number of microfinance institutions. However, the number of licensed NBFIs declined from 121 in 2022 to 114 in 2023, mainly due to license cancellations, particularly for bureaux de change, which were often affected by changes in business conditions or non-compliance with the regulatory requirements set forth in the Banking and Financial Services Act of 2017.

The pension sector in Zambia plays a vital role but covers less than 10% of the workforce. The National Pension Scheme, overseen by the National Pension Scheme Authority (NAPSA), caters to both private sector employees and public sector workers who joined the workforce after 2000. NBFIs such as NAPSA are usually long-term investors in government bonds, with NAPSA being the largest non-bank holder of government securities.

2.3 Financial Sector Development Reforms in Zambia

Before the economic reforms of the 1990s, Zambia's financial system was characterized by significant financial repression. Policies regulating interest rates, credit allocation, and exchange rates were tightly controlled, with credit primarily directed toward preferred sectors such as government, agriculture, and mining. Government organizations received most available funds, while interest rates were capped, exchange rates were fixed, and capital movements were heavily restricted. These measures kept the financial system operating below market-clearing levels, resulting in low savings, reduced investments, and ultimately, stagnant economic growth (Mwenda & Mutoti, 2011; Pal, 2018).

During this period, high inflation and low deposit rates created negative real interest rates, further discouraging savings and investments. Additionally, the financial system faced inefficiencies in resource allocation and operations, contributing to poor economic performance. Acknowledging the negative economic impact of financial repression, the Zambian government launched financial sector reforms in 1992. These reforms involved the liberalization of interest rates, enabling them to be determined by the market, and the establishment of a treasury bill auction system in 1993. These changes led to an increase in both lending and deposit rates, with lending rates turning positive in real terms; however, deposit rates remained negative, resulting in wide interest rate spreads (Odhiambo, 2012).

Subsequent reforms focused on strengthening the banking sector, with initiatives to improve banking infrastructure, supervision, regulation, and payment systems. The enactment of the Banking and Financial Act in 1994 and the adoption of the Basel I Accord provided a framework for sound banking practices and regulation. In 2002, following recommendations from the IMF and World Bank's financial sector assessment report, the government adopted a more development-focused strategy for financial sector reforms. This phase included opening up the financial market to regional and foreign private banks to increase competition and market size (IMF, 2002). The detailed financial sector reforms are explained below.

2.3.1 Phase I Financial Sector Reforms: 1992-1994

The first phase of Zambia's financial sector reforms, implemented between 1992 and 1994, was characterized by a rapid and bold approach often referred to as "shock treatment." This phase aimed to address the systemic distortions caused by years of financial repression and to establish a robust, market-based financial system as a foundation for sustainable economic growth and development. Key elements of these reforms included the removal of interest rate controls and credit supply ceilings, which began in 1992, signalling a move towards financial liberalization. The introduction of a treasury bill auction system in early 1993 further enhanced liquidity control and facilitated government financing without resorting to monetizing fiscal deficits (Kani, 1996).

Along with these reforms, exchange controls were removed, and a unified, market-driven exchange rate system replaced the multiple exchange rates. To further encourage market-oriented policies, the Bureau-de-Change Legislation was introduced, allowing non-metal exporters to keep 50% of their foreign exchange earnings. By 1994, additional measures were put in place, including the repeal of the Exchange Control Act and the removal of all capital controls, making the Zambian Kwacha fully convertible. The Bank of Zambia (BoZ) also established a foreign exchange dealing system, enabling the country's main exporter, ZCCM, to retain 55% of its earnings, thus enhancing operational flexibility in managing foreign exchange revenues (Muke, 1996; Kani, 1996).

BoZ played a central role in these reforms. In 1992, it ceased the direct determination of interest rates, introducing weekly treasury bill auctions to allow interest rates to reflect market forces. By 1993, all restrictions on commercial bank lending and deposit rates were removed, enabling market-driven rate adjustments. Simultaneously, BoZ began aligning the foreign exchange rate to reflect the true value of the Kwacha. Weekly foreign exchange auctions commenced, and by January 1994, the official government-controlled exchange rate and the market rate had converged. Moreover, licensing requirements for imports and exports were suspended, and exporters, including ZCCM, were no longer mandated to surrender a portion of their foreign exchange earnings to the central bank (Muke, 1998).

Despite these reforms, many financial institutions encountered significant difficulties. By the late 1980s, institutions like the Zambia National Building Society (ZNBS), Zambia National Provident Fund (ZNPF), National Savings and Credit Bank (NSCB), Lima Bank, and Cooperative Bank were either financially troubled, facing liquidity issues, or insolvent. These organizations, which had once been successful in offering savings services, struggled due to high transaction costs, mismanagement, political interference, and the removal of government subsidies that had previously supported their operations.

By 1992, the NSCB had become insolvent but avoided failure through a government-led restructuring and a K400 million (about US$100,000) investment program. The restructuring process detached NSCB from the national post office and redefined its role to manage external financing for micro and small enterprises. In contrast, Lima Bank and Cooperative Bank were less fortunate. Lima Bank, which handled agricultural loan disbursements, incurred heavy financial losses due to mismanagement, extended drought periods, low loan repayment rates, and inconsistent government funding, ultimately leading to its closure. Likewise, Cooperative Bank collapsed as a result of poor management and structural issues within the agricultural cooperative sector (Kani, 1996; Muke, 1996).

This phase of financial sector reforms laid the groundwork for a market-oriented financial system, addressing critical inefficiencies while paving the way for subsequent policy interventions aimed at strengthening the financial sector.

2.3.2 Phase II Financial Sector Reforms: 1995-2002

The second phase of Zambia's financial sector reforms, spanning 1995 to 2002, focused on creating and strengthening the foundational infrastructure necessary for a resilient and efficient banking system. Monetary authorities prioritized two critical areas: enhancing bank supervision and regulation, and improving payments and settlement systems. These efforts aimed to address systemic vulnerabilities and establish a framework for sound banking practices.

Key reforms were anchored on the Banking and Financial Services Act (BFSA) of 1994, which underwent several revisions to align with global best practices, particularly the 25 core principles of effective bank supervision and regulation recommended by the Basel Capital I Accord. The enhancements included the introduction of off-site and on-site bank supervision mechanisms, fit-and-proper tests for senior management to ensure capable leadership, and a restriction limiting single investors to a maximum 25% shareholding in any bank. Additionally, the regulatory capital requirements for banks were increased to mitigate risks in a fragile banking system that saw as many as 10 banks collapse during the early years of this phase (Kani, 1996).

To further liberalize the financial sector, monetary authorities implemented foreign exchange policy reforms to create a robust, market-oriented foreign exchange system. In 1995, commercial banks were granted the ability to hold foreign exchange deposits, and by 1996, the retention rate for export earnings was increased to 100%, giving exporters full control over their foreign currency revenues. These measures were designed to promote liquidity and foster confidence in Zambia’s financial markets (Muke, 1996).

Prudential reforms played a central role in strengthening financial oversight and governance. The 1972 Banking Act was revised, and the BFSA of 1994 introduced new reporting and accounting standards, further enhancing the regulatory framework. The Act granted the Bank of Zambia expanded legal powers to license, regulate, and supervise banks. Licensing decisions and other banking activities became subject to BoZ approval, ensuring stricter oversight. Banks were required to submit more comprehensive and frequent financial reports. In addition, statutory instruments were introduced to address capital adequacy, insider loans, large exposures, fixed assets, loan classification, provisioning, and interest rate disclosure (Mwape, 1997a; Mwape, 1997b).

The BoZ also embarked on an extensive capacity-building program to strengthen its supervisory capabilities. This included the recruitment of professionally qualified personnel, provision of specialized training, and expansion of the off-site inspection team. The number of off-site bank inspectors increased from four in 1994 to thirteen by 1995, highlighting the BoZ’s commitment to improving regulatory oversight (Kani, 1996; Maimbo, 2002).

Overall, the reforms implemented during Phase II laid the groundwork for a more resilient financial system, reducing systemic risks and aligning Zambia’s banking practices with international standards. These measures also fostered greater transparency and accountability, which were critical in building trust and confidence in the country's financial institutions.

2.3.3 Phase III Financial Sector Reforms: 2003-2008

During the third phase of financial sector reforms, spanning 2003 to 2008, the Zambian government adopted a more comprehensive and development-focused approach. This shift was informed by the recommendations of the joint IMF and World Bank Financial Sector Assessment Programme (FSAP) report of 2002, as well as the government's Financial Sector Development Plan I (FSDP I), which served as a roadmap for reforms between 2004 and 2008. The FSAP report highlighted critical challenges within Zambia's financial and banking system that needed to be addressed to foster stability and growth (IMF and World Bank, 2008).

One key issue identified was the structural shift in the banking sector precipitated by the failure of several domestic private banks. The lack of a deposit insurance scheme left depositors and investors seeking safe havens for their savings and investments, resulting in a significant migration of assets, loans, deposits, and capital to foreign-owned private banks, which were perceived as more stable. This shift reinforced the dominance of large foreign-owned banks in the Zambian market, further consolidating their control over the financial sector (IMF and World Bank, 2008).

The collapse of several banks during the 1990s had already reduced the number of banks operating in Zambia. By 2000, only 16 banks remained, and the subsequent amalgamation of two domestic banks brought the number down to 14 in 2005. By the end of 2008, there were 15 banks in the system, including 9 foreign private banks (four of which were subsidiaries of multinational banking corporations), 4 domestic private banks, and 2 foreign public banks. However, despite the presence of these banks, their capitalization levels were relatively modest by global standards. As of 2008, the largest four banks had capital levels between USD 20million – USD24 million, while others had capitalization ranging from USD3million – USD13 million, and six banks had less than USD 2 million in capital (IMF and World Bank, 2008).

Despite the continued dominance of a few large banks, there were signs of gradual improvement and transformation in the banking sector during this period. The physical banking infrastructure expanded significantly, with the establishment of new branches, agencies, and ATMs. This expansion, coupled with measures such as lowering minimum account balances and a heightened focus on consumer lending, improved the accessibility of banking services, particularly for salaried individuals. These developments led to enhanced commercial bank intermediation, contributing to increased consumer lending and financial inclusion (IMF and World Bank, 2008).

However, banking system assets and deposits remained heavily concentrated among a few large foreign-owned banks, underscoring the low level of competition in the sector. The continued dominance of foreign private banks was evident in their increasing share of system-wide assets and deposits, highlighting the persistent challenges in achieving a more diversified and competitive banking sector (IMF and World Bank, 2008).

These Phase III reforms marked an important step toward addressing structural weaknesses in Zambia's financial sector, while laying the foundation for a more inclusive and resilient banking system. Nonetheless, challenges related to market concentration and competition persisted, necessitating further interventions to promote a balanced and sustainable financial system.

2.4 Theoretical Framework

2.4.1 Classical Theories of Financial Sector Development and Economic Growth

The relationship between financial sector development and economic growth has been explored through various classical theories, notably those proposed by Schumpeter (1934) and Bagehot (1873). These theories emphasize the central role of financial systems in driving innovation, entrepreneurship, and industrial development, providing a foundation for understanding the financial sector's impact on long-term economic growth.

Schumpeter's Theory of Economic Development (1911)

Schumpeter was one of the earliest economists to recognize the critical role of the financial sector in fostering economic growth. In his seminal work *The Theory of Economic Development* (1911), Schumpeter emphasized that financial systems are key to promoting innovation and entrepreneurship. He argued that an effective financial system identifies and supports the most promising innovative projects, thereby enabling technological progress. By funding new businesses and novel ideas, banks and financial intermediaries act as catalysts for economic expansion. Schumpeter's theory suggests that technological advancement and economic growth are inherently linked to the capacity of the financial system to direct resources to the most productive uses, particularly in the form of innovative ventures. King and Levine (1993) extended Schumpeter's ideas with their supply-side theory, further elaborating on how the financial sector stimulates innovation, which in turn drives economic growth. They argued that an efficient financial system enhances the capacity for capital formation, investment in research and development, and the creation of new technologies, all of which are fundamental for economic expansion.

Bagehot's Role of Financial Systems in Industrialization (1873)

Bagehot (1873) provided a complementary view of the financial sector's role, particularly during England's industrialization. In *Lombard Street*, Bagehot discussed how the financial system contributed to economic development by effectively mobilizing savings and allocating capital for industrial investments. He emphasized the role of banks in facilitating the flow of funds into productive ventures, which were critical for industrial and economic progress. According to Bagehot, a well-functioning financial system ensures that capital is directed toward the most profitable and productive investments, providing the necessary resources for expanding industries. This allocation of capital, Bagehot argued, was essential for sustained economic growth, as it enabled businesses to expand and innovate, ultimately contributing to national development. His work highlights the indispensable role of banks and financial institutions in economic transformation, particularly during periods of industrialization.

Both Schumpeter and Bagehot's theories underscore the importance of the financial sector as a driver of economic growth. Schumpeter's focus on innovation and technological progress aligns with Bagehot's emphasis on capital allocation, illustrating how financial systems contribute to economic development through different mechanisms. Schumpeter's theory highlights the financial sector's role in fostering entrepreneurship and technological progress, while Bagehot's work demonstrates how financial institutions help allocate resources to drive industrial growth. Together, these classical theories provide a foundational understanding of how financial development supports long-term economic expansion by facilitating innovation, entrepreneurship, and capital formation.

2.4.2 The Role of Financial Intermediation in Economic Growth

In an idealized Arrow-Debreu world, characterized by perfect information, complete markets, and the absence of transaction costs, financial intermediation would be redundant. However, real-world economies are fraught with market imperfections and frictions, such as information asymmetries and transaction costs. These constraints necessitate the role of financial intermediaries, which act to mitigate these frictions, thereby enabling economic exchanges that would otherwise be prohibitively costly. By addressing these inefficiencies, financial intermediaries help offset market imperfections and facilitate economic activity.

The theoretical foundation for the existence of financial intermediaries stems from two primary sources of friction. First, technological limitations prevent individuals from leveraging economies of scale. Second, costly and asymmetric information creates challenges in assessing risks and enforcing contracts in a world where not all contingencies can be accounted for. Financial intermediaries address these issues by providing five key functions: (i) pooling and managing risks, (ii) efficiently allocating resources, (iii) monitoring corporate management and exerting governance, (iv) mobilizing savings, and (v) facilitating transactions of goods and services.

Financial systems play a pivotal role in addressing market frictions by influencing how resources are distributed across different times and locations. For instance, banks that enhance the flow of information about firms and managers can significantly impact credit allocation. Similarly, financial contracts that boost investor confidence in repayment by firms may shape savings allocation decisions. Furthermore, the establishment of liquid stock and bond markets enables individuals who are hesitant to commit their savings for long durations to trade claims on long-term projects more frequently, potentially altering both the volume and destination of their savings (Levine, 2005).

2.4.3 Measuring Financial Intermediation

The measurement of financial intermediation has evolved significantly over time. Early indicators, such as monetary aggregates (M1 and M2), were widely used but often proved inadequate as proxies for financial development. These measures tended to reflect the transactional role of the financial system rather than its ability to channel funds from savers to borrowers. More comprehensive measures, like M3 (liquid liabilities), addressed some of these shortcomings but still fell short of capturing the full depth of financial intermediation. Recently, credit to the private sector has emerged as a preferred indicator, offering a more precise measure of the financial system's role in directing resources to productive uses within the private sector. However, this too is only a partial measure, as it focuses solely on banking systems and excludes other aspects of financial development.

2.4.4 Financial Development and Economic Growth

Financial development plays a critical role in economic growth by addressing market frictions and influencing the allocation of resources across time and space. Levine (2005) highlights that financial systems promote growth by producing ex-ante information about investment opportunities, monitoring investments, managing risks, pooling savings, and facilitating exchanges. These functions directly influence savings and investment decisions, ultimately impacting economic growth. Similarly, Barajas, Chami, and Yousefi (2013) emphasize that financial systems mobilize savings, allocate resources to productive uses, and support transactions and risk management. These functions create an environment conducive to higher productivity, which is often a stronger driver of economic growth than increased investment alone.

While the majority of studies find a positive relationship between financial development and growth, the causality remains complex. Growth itself may stimulate financial sector development by increasing the demand for financial services. Thus, the relationship is bidirectional, with financial development and economic growth reinforcing each other over time.

2.4.5 Transmission Channels of Financial Intermediation

The relationship between financial systems and economic growth can be explained through several transmission channels, highlighting how financial development influences economic activity. Thiel (2001) identifies three key mechanisms in this context: the reduction of resource losses in capital allocation, the impact on savings rates, and the enhancement of capital productivity.

The first channel relates to the efficiency of the financial system in minimizing the loss of financial resources. As financial systems develop, they improve the process of transforming savings into investments, ensuring that resources are allocated to their most productive uses. This efficiency reduces wastage during the allocation process and allows a larger share of savings to be directed toward productive investments, driving higher economic output. For instance, an efficient banking system can identify profitable projects, mobilize funds, and allocate them effectively, ensuring that savings contribute directly to economic growth.

The second mechanism, the influence of financial development on savings rates, is more ambiguous and complex. Thiel (2001) notes that a well-functioning financial system offers savers improved return-risk combinations. Higher efficiency can lead to better returns on investments and lower risks, which might encourage individuals to save more, increasing the pool of resources available for investments and ultimately fostering economic growth. However, the opposite effect is also possible. If savers perceive higher returns on their savings, they may choose to reduce their savings rate because their future consumption goals can be met with less current savings. This paradoxical outcome highlights the dual impact financial development can have on savings behaviour and its uncertain implications for growth. Moreover, the cultural and institutional context, such as the degree of financial literacy and trust in financial institutions, plays a significant role in determining how savers respond to improved financial system efficiency.

Finally, financial development enhances the productivity of capital by optimizing its allocation to ventures with the highest returns. An efficient financial system reduces barriers to investment, such as high transaction costs or information asymmetry, allowing resources to flow more effectively to areas where they can generate maximum returns. For example, advancements in stock and bond markets provide mechanisms for investors to trade claims to long-term projects, encouraging greater participation in capital markets and enabling the funding of innovative, high-return projects. Additionally, liquid markets reduce the reluctance of investors to commit to long-term savings, as they can easily access their funds when needed, further stimulating productive investment.

These mechanisms illustrate the multifaceted ways in which financial development supports economic growth. By reducing inefficiencies in capital allocation, influencing savings behaviour, and improving capital productivity, financial systems serve as a crucial catalyst for economic advancement. However, the complexity of these channels, particularly the dual effects on savings rates, underscores the need for context-specific analyses to fully understand the impact of financial development on economic outcomes (Thiel, 2001).

2.4.6 The Causality Debate: Supply-Lead vs. Demand-Follow Hypothesis

Supply-Lead Hypothesis

The supply-leading hypothesis posits that financial development actively stimulates economic growth by mobilizing resources and improving their allocation. Patrick (1966) highlighted that financial development serves as a driver for investment and innovation, thereby establishing the foundation for sustained economic growth. This theory aligns with Schumpeter's (1912) perspective on the financial system's proactive role, particularly the ability of financial intermediaries to efficiently channel resources towards innovative and high-return projects. Moreover, the financial sector acts as a bridge, transferring limited credit resources from surplus units (savers) to deficit units (borrowers), thus ensuring optimal resource utilization.

Schumpeter (1911), as referenced by Adamopoulos (2010), explored the theoretical connection between financial development and economic growth, emphasizing the critical role of financial intermediaries in fostering innovation and development. The theory highlights the positive impact of financial sector growth on a nation's per capita income and overall economic development, underscoring the importance of financial services as a driving force for growth. Building on this perspective, Rajan and Zingales (1998) identified key functions of financial intermediaries, such as reallocating capital to its most productive uses while mitigating risks related to moral hazard, adverse selection, and transaction costs. Economic theory further emphasizes that financial development plays a pivotal role in identifying viable investment opportunities, reducing unproductive investments in liquid assets, mobilizing savings, fostering technological innovation, and enhancing risk-taking behaviours to drive economic progress.

Empirical studies have reinforced this perspective. King and Levine (1993) provided robust evidence on the role of financial intermediation in fostering innovation and economic expansion. Similarly, McKinnon (1973) and Shaw (1973) emphasized that well-functioning financial systems reduce transaction costs and information asymmetries, thereby enhancing resource allocation. This perspective suggests that financial development catalyses growth by transferring credit resources from surplus units (savers) to deficit units (borrowers), optimizing capital allocation and supporting productive investments (Levine, 1997; Rajan & Zingales, 1998).

However, critiques of this hypothesis caution against overgeneralization. While financial sector development can foster growth, its effectiveness often depends on institutional quality and governance. For example, Arestis and Demetriades (1997) highlighted that in economies with weak institutions, financial sector expansion may not translate into productive investment but instead facilitate rent-seeking behaviour. Furthermore, the hypothesis has been critiqued for its limited applicability to economies in the early stages of development, where financial markets may not yet be sophisticated enough to drive growth independently.

Demand-Follow Hypothesis

The demand-following hypothesis, by contrast, argues that economic growth is the primary driver of financial development. Robinson (1952) succinctly expressed this view with the assertion, "*where enterprise leads, finance follows.*" According to this perspective, economic expansion creates the demand for sophisticated financial instruments and institutions, which subsequently develop in response to these demands.

Kuznets (1955) similarly posited that financial markets grow as economies approach an intermediate stage of development and mature further with sustained economic growth. As economies expand, their increasing complexity necessitates enhanced financial systems to meet the demands for more diverse financial products and services. Empirical evidence by Liang and Teng (2006) and Akinlo and Egbetunde (2010) supports this view, showing that financial development often lags behind growth, evolving to meet the demands of an expanding real sector.

The core argument of the demand-follow hypothesis is that economic growth drives demand for financial intermediation and innovation. Financial markets, in turn, adapt to these demands, thereby creating a mutually reinforcing relationship. This perspective contrasts with the supply-leading view by emphasizing financial development consequently rather than a catalyst of economic growth.

However, this hypothesis is not without its limitations. Critics, including Chang (2015) and Christopoulos and Tsionas (2004), argue that financial sector underdevelopment can constrain economic growth, thereby undermining the demand-led argument. Additionally, in economies where growth is driven by external factors (e.g., resource booms), financial systems may fail to adapt adequately, highlighting a potential gap in the demand-led hypothesis.

Bidirectional Causality

Demetriades and Hussein (1996), Greenwood and Jovanovic (1990), and Hunjra et al. (2021) propose a bi-directional causality between financial development and economic growth. The bidirectional causality hypothesis suggests that financial development and economic growth are mutually reinforcing processes. This view integrates elements of both the supply–lead and demand–follow hypotheses, positing that financial systems not only drive economic growth but also evolve and expand in response to economic activity. This perspective acknowledges that financial systems can drive growth and simultaneously evolve in response to it. Ndikumana (2001) supports this view, emphasizing the dynamic interaction between financial systems and economic expansion. Ndikumana (2001) highlights the critical role of the financial system in mobilizing funds and converting them into assets that align with the needs of investors. While substantial historical and econometric evidence supports the view that financial development promotes economic growth, the potential for a reverse causal relationship also exists. Financial systems may evolve in response to higher levels of economic growth or in anticipation of future prosperity. Therefore, these causal relationships should not be considered mutually exclusive but rather as interconnected dynamics that naturally characterize the relationship between finance and economic growth.

Patrick (1966) proposed a theory suggesting that the relationship between financial development and economic growth changes over the course of development. At the early stages, financial development drives investment and innovation, establishing a foundation for sustained economic growth. As growth becomes established, the role of financial stimulus shifts from being supply-led to demand-driven. Patrick argued that this transition can occur within industries or sectors, where some start with supply-led financing and later move to demand-driven financing as they mature. However, industries shaped more by government policies than by private demand may follow a different timeline in their development phases.

Moreover, the relationship is likely influenced by contextual factors, such as the level of institutional development, governance quality, and macroeconomic stability. For instance, studies such as Odhiambo (2005, 2012) emphasize the bidirectional nature of this relationship in developing economies, where financial systems and economic growth reinforce each other.

2.4.7 Endogenous vs. Exogenous Growth Theories

Endogenous Growth Theory: McKinnon-Shaw Hypothesis

The relationship between financial development and economic growth has been extensively explored, with notable contributions from the McKinnon-Shaw hypothesis under the endogenous growth theory. McKinnon (1973) and Shaw (1973) emphasized the critical role of financial liberalization in fostering economic growth, arguing that government-imposed restrictions, such as interest rate ceilings and directed credit programs, impede the efficient functioning of the financial system. These constraints suppress savings, limit resource allocation efficiency, and ultimately reduce economic growth. By advocating for financial liberalization, the McKinnon-Shaw framework suggests that removing interest rate controls enables rates to align with their market equilibrium, thereby encouraging higher savings and increasing the volume of financial intermediation. This process supports economic development by improving both the quality and quantity of investments through efficient allocation of resources (Dritsakis, 2004; Andrianaivo & Yartey, 2010; Ang, 2008).

The endogenous growth theory complements this perspective, explicitly modelling the services provided by financial intermediaries—such as risk sharing, liquidity provision, and information collection and analysis—and their impact on economic growth. According to this theory, financial intermediation facilitates a steady-state growth trajectory by efficiently channelling savings into productive investments and reducing the risks associated with resource allocation (Greenwood & Jovanovic, 1990). Similar to the McKinnon-Shaw hypothesis, endogenous growth models suggest that government intervention in the financial system, through policies like high reserve requirements or direct credit allocation, undermines financial development and growth. The mutually reinforcing relationship between financial system efficiency and economic growth posited by Greenwood and Jovanovic (1990) further aligns with McKinnon and Shaw's emphasis on the pivotal role of financial depth in sustaining economic development (Schumpeter, 1912; Dritsakis & Adamapoulos, 2004).

Exogenous Growth Theories: Solow (1957) and Technological Change

Exogenous growth theories, such as Solow's (1957) neoclassical growth model, emphasize the role of external factors, particularly technological change, in driving economic growth. Solow's model treats technological change as an exogenous variable, unaffected by domestic economic policies or the openness of the economy (Dritsakis & Adamapoulos, 2004). While this contrasts with endogenous growth theories that emphasize internal mechanisms, modern interpretations suggest that trade policy and economic openness can indirectly influence long-term growth by facilitating access to advanced technologies embedded in imported inputs. By increasing the economy's exposure to international markets, openness enables the adoption of new technologies, fostering productivity and economic expansion (Thiel, 2001).

Rajan and Zingales (2003) further expanded the discussion by examining the role of economic openness in reducing barriers to financial development. According to their interest group theory, trade and financial openness undermine the entrenched advantages of incumbent firms that benefit from financial subjugation in closed economies. Openness to trade and foreign capital flows not only reduces monopolistic rents for these incumbents but also encourages competition, innovation, and investment by providing broader access to financial resources. This dynamic fosters financial sector development and enhances economic growth by improving capital productivity, increasing savings, and reducing resource misallocation (Aluko & Ajayi, 2018). Thus, exogenous growth theories underscore the importance of external influences, such as trade liberalization and technological diffusion, in shaping the interplay between financial sector development and economic growth.

2.5 Empirical Review

2.5.1 Review of International Empirical Evidence

Singh et al. (2023) explored the impact of policy-related factors on the relationship between FSD and economic growth, focusing on advanced economies. Their study extended earlier research by Liang and Jian-Zhou (2006) on developing countries, offering a comparative perspective. Utilizing panel data from developed countries covering the period 1995–2003, the authors sought to identify how external factors such as legal, regulatory, and technological variables influence economic growth either directly or indirectly by affecting the FSD-growth nexus.

The methodology adopted a neo-classical aggregate production function model that incorporated measures of FSD such as liquid liabilities (M3) and broader indicators of financial sector performance. Control variables included annual labour growth rate, capital stock ratio, and export growth rate. Stepwise regression techniques were employed to address multicollinearity among variables and to select the most influential factors.

Key findings indicated that policy-related factors significantly enhanced the relationship between FSD and economic growth in advanced economies, contrary to results observed in developing countries. Specifically, the inclusion of external factors improved the explanatory power of the model and highlighted nuanced impacts. For instance, the growth rate of liquid liabilities (M3) emerged as a critical yet limited proxy for FSD, offering better explanatory power in advanced countries compared to emerging economies.

In emerging economies, the influence of FSD on growth was moderated by certain policy-related factors. For example, the net interest margin (NIM), indicative of a large yet less competitive banking sector, negatively impacted growth, while a higher share of foreign bank participation positively influenced economic outcomes. Additionally, overhead costs relative to total assets exhibited a surprising positive impact on growth, suggesting the strategic regulation of banking sectors to promote employment and income in emerging markets.

Conversely, in advanced economies, robust legal frameworks, and secure property rights—often assumed to facilitate growth—unexpectedly showed a negative correlation with economic performance. Inefficiencies within the banking sector, proxied by high overhead costs relative to total assets, were also detrimental to growth. These findings underscored the importance of tailored policy approaches depending on a country's stage of financial sector development.

The study concluded that sophisticated measures of FSD and the inclusion of direct and indirect policy-related factors are vital for accurately modelling the relationship between financial sector development and economic growth. For advanced economies, external factors significantly enhance the FSD-growth linkage, whereas emerging economies experience more varied and context-dependent outcomes.

Ahmed and Ansari (1998) examined the connection between financial sector development and economic growth in three prominent South Asian countries: India, Pakistan, and Sri Lanka. The study utilized standard Granger causality tests to identify the causal relationships between different indicators of financial sector development and economic growth. Additionally, several regression models were estimated using the Cobb-Douglas production function approach to assess the effect of financial sector development on economic growth.

The findings from the causality analysis revealed that financial sector development Granger-caused economic growth, supporting the supply-leading hypothesis. The regression results, derived from pooled time series and cross-sectional data, further confirmed the causality analysis results. These findings indicated that financial sector development had a substantial positive impact on economic growth.

The study utilized three methods to examine the relationship between financial development and economic growth. First, the correlation analysis results showed a strong association between the financial sector and economic growth. Second, the Granger causality tests strongly supported the supply-leading hypothesis, indicating that financial development drives economic growth. This finding aligned with Patrick's (1996) view that financial development plays a significant role in fostering economic growth during the early stages of development.

Since the causality tests did not incorporate other important variables affecting economic growth, the authors estimated a Cobb-Douglas production function by pooling data from the three countries. The results from this pooled regression model further supported the conclusions of the causality analysis. The key policy implication derived from this study was that governments in these countries could stimulate economic growth by fostering financial sector development through liberalization policies.

2.5.2 Review of Empirical Evidence in Southern African Development Community Countries

The link between financial sector development and economic growth has been widely discussed and debated. Ahmed and Ansari (1998) pointed out the significant attention this topic has received in both theoretical and empirical literature, although the debate continues to be unresolved. Their study explored the connection between financial sector development and economic growth within the Southern African Development Community (SADC), adding to the ongoing discourse by using the SADC region as a case study. The research was driven by the SADC Protocol on Finance and Investment, which sought to align financial and investment policies across member countries to promote sustainable economic growth and development.

The study utilized a Fixed Effects panel data methodology and Seemingly Unrelated Regression Estimators (SURE) techniques, analyzing data from 1990 to 2014. Financial development was assessed using the money supply, while control variables such as inflation, interest rates, and openness to trade were included. Other growth-related factors considered in the analysis included the population growth rate and gross fixed capital formation (GFCF).

The key findings indicated that inflation, GFCF, and country openness had a significant impact on economic growth, with the Fixed Effects results confirming a positive relationship between financial sector development and economic growth in the SADC region. The SURE results revealed variation across the countries in the region.

The methodology was based on a standard growth model derived from Levine (2005), as well as approaches used by Mwenda (2002), Barajas (2013), and Rateiwa (2018). The study adopted a Cobb-Douglas production function, considering capital (K) and labor (L) in output (Y) production. Econometric models included Fixed/Random Effects and SURE models, with the Hausman test used to identify the best model to address homogeneity. Unit root tests like Levin-Lin-Chu, Im-Pesaran-Shin, and Breitung were conducted to confirm the stationarity of the variables.

The study concluded that financial sector development had a positive effect on economic growth, boosting growth by enhancing competition and fostering innovation. Random effects panel regression results identified inflation, GFCF, money supply, and domestic credit to the private sector as significant factors. However, the SURE results presented mixed findings, emphasizing the diversity across SADC countries.

The findings suggested that SADC countries should improve access to financial services to enhance economic growth. Recommendations included increasing the availability of financial services, particularly in rural areas, through ICT adoption and the growth of microfinance institutions. Policymakers were advised to promote the use of mobile banking and plastic money while addressing rural-urban disparities in financial service access. The study also emphasized the need to improve financial institutions, particularly in urban areas, to meet growing economic demands. Strengthening cross-border financial institutions and resolving institutional challenges were considered essential for leveraging financial intermediation within the region.

Inflation was found to have a significant and negative impact on economic growth, underscoring the importance of maintaining fiscal discipline and a stable macroeconomic environment. Openness was positively associated with growth, suggesting that intra-SADC trade should be encouraged to boost domestic and regional economic development. Lastly, the study highlighted that certain countries, including Swaziland, Zambia, and Zimbabwe, exhibited a negative link between financial sector development and economic growth. It was recommended that these countries diversify their growth strategies to include other sectors such as agriculture, mining, and tourism. Above all, creating a conducive macroeconomic environment with stable fiscal and monetary policies was deemed crucial for fostering a well-functioning financial system in the SADC region.

Phiri & Phiri (2024) investigated the causal relationship between financial development and economic growth in 12 SADC countries over the period 2008–2020, using panel data from the World Bank database, Penn tables, and national statistics websites. The study employed the Autoregressive Distributed Lag (ARDL) model to analyze both short- and long-term dynamics. The countries included in the study were Angola, Botswana, Democratic Republic of Congo, Eswatini, Lesotho, Madagascar, Mauritius, Namibia, South Africa, Tanzania, Zambia, and Zimbabwe. The findings showed bidirectional causality between financial development and economic growth, suggesting that these factors mutually influence each other.

The results indicated that financial development had a positive long-term correlation with economic growth. However, the short-term effects varied, with factors such as physical capital accumulation, government spending, trade openness, population growth, and life expectancy playing key roles in shaping growth trends. Financial development was measured using private sector credit, given the underdeveloped nature of SADC's stock and bond markets.

The study highlighted the need for coordinated financial and economic policies, acknowledging the interdependence between financial development and economic growth. It also pointed out the limitations of using panel data, potential biases due to omitted variables, and the necessity for more detailed research to refine policy recommendations. Policy suggestions included improving financial sector development by expanding access to credit, promoting financial inclusion, and strengthening regulatory frameworks. Additionally, the study advocated for regional cooperation, greater investment in infrastructure, education, and technology, and a strategic approach to government spending to avoid stifling private sector activities. These findings emphasized the complex and multidimensional nature of development dynamics in the SADC region.

In contrast to the findings of Phiri & Phiri (2024), Moyo (2018) investigated the relationship between financial sector development and economic growth within the SADC. The countries studied included Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe. The research aimed to provide empirical insights into how financial systems interact with economic performance in the region.

The study employed both qualitative and quantitative methodologies. The qualitative approach involved reviewing theoretical frameworks and existing empirical studies conducted internationally and within specific SADC countries. The quantitative analysis utilized panel data from 14 SADC member states covering the period 1990–2012. GDP was used as the dependent variable, while various indicators of financial sector development and other explanatory factors were included as independent variables.

The findings underscored the importance of the financial sector in supporting economic growth. However, the econometric results presented a complex picture. At the regional level, financial sector development—measured through indicators such as money supply and credit extension—was negatively associated with economic growth. At the individual country level, the results were mixed. In seven member states, financial sector development contributed positively to economic growth, while in the remaining seven, no supportive relationship was observed. The study attributed this variation to a lack of financial integration within the region, suggesting that greater integration could enhance growth outcomes.

Ndlovu (2013) investigated the relationship between financial system development and economic growth in Zimbabwe between 1980 and 2006, employing the Granger causality test to determine the direction of the relationship. The study identified unidirectional causality from economic growth to financial development, affirming the "*demand-following hypothesis.*" This suggested that financial development in Zimbabwe was a passive response to economic growth rather than a driver, challenging the conventional view of finance-led growth.

Ndlovu (2013) highlighted several contextual challenges, including political and regulatory uncertainty, underdeveloped capital markets, and financial sector fragility. Persistent issues such as high levels of non-performing loans and the closure of numerous financial institutions were noted as barriers to effective financial intermediation. The study also underscored the ineffectiveness of financial reforms, which failed to foster significant contributions from the financial sector to economic growth.

Obiora et al. (2022) investigated the impact of financial sector development on economic growth in 25 sub-Saharan African countries between 2010 and 2017. The study employed three dynamic panel data models to estimate how financial sector depth, access, and efficiency influenced economic growth using a two-step system GMM estimation. The proxies for financial depth, access, and efficiency were private sector credit as a percentage of GDP, commercial bank branches per 100,000 adults, and return on assets, respectively.

The findings revealed that financial sector depth, access, and efficiency had positive and statistically significant effects on economic growth in the countries analyzed. As a result, the researchers recommended that financial institutions increase their depth by providing more credit to the private sector, improve accessibility to financial services by expanding financial institutions, and enhance efficiency through the use of modern financial technologies and improved employee performance.

The study used unbalanced panel data sourced from various international databases. Economic growth was measured by GDP per capita, with other explanatory variables including trade openness, foreign direct investment (FDI) as a percentage of GDP, government consumption expenditure as a percentage of GDP, inflation (measured by the GDP deflator), unemployment rate, and remittance inflows. Data for private sector credit, commercial bank branches, and return on assets were obtained from the World Bank Global Financial Database, while governance indicators were sourced from Transparency International and the World Bank's Worldwide Governance Indicators. To account for potential influences of past economic growth on current growth, the study used a dynamic panel data model and the system GMM estimator (Blundell and Bond, 1998) to address endogeneity concerns. The validity of the instruments was tested using the Sargan test of overidentifying restrictions.

The findings supported the "*supply-leading hypothesis*", emphasizing the importance of financial institutions in economic growth. They further revealed that financial development in sub-Saharan Africa was largely driven by financial institutions rather than financial markets, with the latter being relatively underdeveloped except in countries such as South Africa.

Bekele and Degu (2023) recommended that countries in the region should prioritize reducing bureaucratic barriers in loan development, decreasing non-performing loans, and expanding financial services to underserved populations, particularly in rural areas. Additionally, they suggested formalizing the informal sector to enhance domestic resource mobilization and reduce the investment gap. The researchers also called for country-specific studies to supplement their findings and explore other dimensions of financial development, such as financial instability, which was excluded from their analysis due to data limitations.

Takaendesa and Odhiambo (2007) investigated the causal relationship between financial development and economic growth in Zimbabwe and Malawi. In contrast to many previous studies, they used five different proxies for financial development and real GDP per capita as a measure of economic growth. The study aimed to determine whether financial sector development drove economic development, as proposed by the supply-leading hypothesis, or whether the growth of the real sector spurred financial development, in line with the demand-following hypothesis.

Using the Johansen and Juselius and Hsiao's test procedures, the results showed that the direction of causality between financial development and economic growth varied depending on how financial development was measured. In Malawi, the study found clear bi-directional causality, whereas in Zimbabwe, a supply-leading response was more dominant. The analysis used annual data for both countries from 1975 to 2002, sourced from the IMF's International Financial Statistics (IFS) CD-ROM 2005, with data gaps filled using submissions from the Reserve Banks of the two countries to the SADCBANKERS online database. The study emphasized the importance of a long time span for unit root and cointegration tests, with annual data preferred over high-frequency interpolated data, as higher-frequency observations did not add statistical power (Liang & Reichert, 2012).

The findings revealed that in Malawi, there was consistently bi-directional causality regardless of the financial development proxy used. In contrast, Zimbabwe exhibited a stronger supply-leading response according to all five proxies, although the demand-following response was only confirmed by three of them. This suggested that the direction of causality between financial development and economic growth varied, depending on the measurement of financial development, challenging the notion of a universal approach.

Mwenda and Mutoti (2011) studied the effects of market-based financial sector reforms on the competitiveness, efficiency, and economic growth of commercial banks in Zambia. Their research found that reforms implemented during Phase II (which focused on strengthening regulatory and supervisory frameworks and payments and settlements) and Phase III (which involved implementing a comprehensive financial sector development plan) led to significant improvements in bank cost efficiency. However, the study concluded that macroeconomic factors, such as per capita GDP and inflation, had no substantial impact on cost efficiency.

The authors used the P-R method to measure bank competitiveness, revealing a banking market characterized by monopolistic tendencies dominated by a few multinational banks. Despite overall improvements in cost efficiency, there were notable disparities among bank categories. Some domestic private banks outperformed foreign-owned banks, while public banks occasionally performed better than private banks.

An endogenous growth model was employed to identify the determinants of economic growth. Results indicated that bank cost efficiency, financial depth, economic openness, and financial sector reforms were significant contributors to growth, while Phase II reforms and inflation negatively affected growth. The study highlighted several policy lessons. It emphasized the importance of sequencing financial sector reforms appropriately to avoid instability, incorporating reforms into a comprehensive financial sector development plan, and addressing systemic constraints specific to Zambia's financial environment. Additionally, the authors argued that financial efficiency is not exclusive to foreign-owned banks, suggesting that public-private partnerships and domestic banks can also achieve significant cost efficiency. Finally, they recommended promoting non-bank financial intermediaries and enacting anti-competitive regulations to enhance competition and efficiency in the financial sector.

2.6 Conclusion

This chapter has outlined the structure and functioning of Zambia's financial system, emphasizing its critical role in facilitating economic activities through financial intermediation. The analysis identified key trends in the banking sector, including its asset growth, foreign ownership dominance, and regulatory developments, as well as challenges such as non-performing loans and limited pension coverage. The sector's contribution to economic growth is evident through its support for diverse industries, yet gaps remain in financial inclusion and competitiveness. These observations highlight the need for continued reforms to strengthen the financial sector's capacity to drive inclusive and sustainable economic growth. The insights presented here provide a foundation for further exploration of the linkages between financial development and macroeconomic outcomes, which this research aims to investigate.

3. Methodology

3.1 Introduction

This chapter outlines the methodological framework adopted to explore the relationship between financial sector development and economic growth in Zambia. It begins by detailing the research approach, emphasizing the rationale for selecting a quantitative methodology guided by a positivist paradigm. The chapter discusses the data sources, including key macroeconomic and financial indicators, and specifies the sample period of 2004–2022. The theoretical model underpinning the analysis, derived from the Solow-Swan growth model, and augmented by institutional quality factors, is presented. Additionally, the chapter provides an overview of the econometric techniques employed, including the Autoregressive Distributed Lag (ARDL) model and Instrumental Variables (IV) methods, chosen for their robustness in handling time series data and addressing potential endogeneity issues. Diagnostic checks for stationarity, multicollinearity, and other econometric assumptions are also detailed to ensure the reliability of the findings. The chapter concludes with a discussion on the limitations of the selected methods and their implications for the study.

3.2 Research Approach

Research can generally be approached in three ways, as outlined by Saunders et al. (2007): qualitative, quantitative, or a blend of both (mixed methods). The qualitative approach deals with data that is non-numerical or cannot be easily quantified, while the quantitative approach focuses on data that is numerical and can be measured. A mixed methods approach uses both qualitative and quantitative data.

For this study, a quantitative research design is used, as the objective is to assess the relationship between the financial sector development and economic growth. In this case, financial sector development and economic growth are both measurable variables, as such a quantitative approach allows for a statistical analysis to be undertaken to establish if they are any relationships.

The decision to use this method is grounded in the suitability of a positivist paradigm, which allows for drawing conclusions about the impact of financial sector development on economic growth through observable and measurable data. This approach is like the method employed by Monareng (2022), who investigated the role of financial sector development on economic growth in South Africa. While a qualitative approach might have been considered, it would be more appropriate for studies focused on understanding meanings expressed through words and concepts, rather than numeric data (Saunders et al., 2007).

3.3 Data source and Sample Period

Secondary economic data was obtained from the World Bank, International Monetary Fund, Zambia Statistical Agency, and the Bank of Zambia, covering the period between 2004 and 2022. For the Central Limit Theorem to apply and for the data to pass a normality test, it is essential that the sample size be at least 30 observations. If the sample size falls below this threshold, the results may lose statistical reliability, leading to a reduction in degrees of freedom, which could affect the robustness of the test and make it harder to generalize the findings (Gujrati, 2004). The data sources mentioned periodically compile macroeconomic statistics, which are tested and verified by their respective research departments before being released for public use.

Measuring financial development is complex due to the involvement of various financial institutions, such as banks and stock markets, which each play different roles in a country's economy. To capture a complete picture, several aspects must be considered, including whether the financial sector is predominantly driven by banks, stock markets, or a combination of both. The macroeconomic variables used in this study include real GDP per capita, money supply (M3) to GDP, private credit to GDP, assets of other financial institutions to GDP, banks' net interest margin to total assets, banks' overhead costs to total assets, and banks' concentration ratio. Additionally, variables that measure institutional quality—such as political stability, voice and accountability, government effectiveness, regulatory quality, rule of law, and control of corruption—are also considered.

3.4 Theoretical Model

This study adopts a theoretical framework inspired by the Solow-Swan growth model (Solow, 1956; Swan, 1956) and further augmented by Mankiw et al. (1992), which integrates financial capital as a distinct factor of production. The model emphasizes that economic growth (Y) is determined by the interplay of physical capital (K), human capital (H), financial capital (F), and labour (L), along with technology (A) and institutional factors that influence these inputs.

Building on this foundation, the investigation into the financial sector's role in economic growth is deepened by distinguishing between physical capital, financial capital, and human capital as distinct factors. This is accomplished by extending the Mankiw-Romer-Weil (MRW) augmented Solow-Swan model to include a variable that specifically represents financial capital. Within this expanded framework, the efficiency of the financial sector is also examined, with the hypothesis that greater efficiency promotes growth by enabling more productive use of the country's financial capital stock.

The inclusion of financial sector indicators is based on data compiled by Beck, Demirgüç-Kunt, and Levine (1999, updated in 2007). These indicators highlight the essential role of the financial system in directing funds from savers to borrowers, a process crucial for an economy's growth. The importance of finance in economic development was first emphasized by Schumpeter (1911) and later supported by Goldsmith (1969). The subsequent works of McKinnon (1973) and Shaw (1973) established a foundation for the widely accepted positive relationship between financial sector development and economic growth, a view further supported by studies such as King and Levine (1993a), Levine and Zervos (1996), Beck et al. (2000), and Demirgüç-Kunt and Maksimovic (1996).

This study distinguishes itself from previous literature by extending the MRW structural framework to assess the specific impact of the financial sector on economic growth. In doing so, it acknowledges the extensive structural changes in the size and efficiency of financial systems in many developing economies, driven by regulatory reforms.

The production function is represented using a constant return to scale Cobb-Douglas function as:

$$Y(t) = K(t)\alpha H(t)^\wedge\beta F(t)^\wedge\gamma[A(t)L(t)]^\wedge 1 - \alpha - \beta - \gamma$$

Where:

- Y(t) = Output at time t
- K(t) = Physical capital

- H(t) = Human capital
- F(t) = Financial capital
- A(t) = Technology
- L(t) = Labour force

In this model, the elasticity parameters α, β, and γ reflect how sensitive output is to changes in physical capital, human capital, and financial capital, respectively. The steady-state level of per capita output is influenced by the rates of saving, population growth, and depreciation, which are assumed to be consistent across countries, following the MRW framework.

The growth of L is expected to increase externally at a rate of n, while A(t) is also projected to grow at a rate of g. Depreciation of the capital stock is represented by δ. According to the MRW model (Mankiw et al., 1992), g and δ are considered to remain stable. The steady-state level of per capita output, expressed in logarithmic form, incorporates the savings rate (sK), human capital accumulation (sH), and financial capital accumulation (sF), and is represented as follows:

$$\ln\left[\frac{Y(t)}{L(t)}\right] = \ln A(O) + gt + \frac{\alpha}{1-\alpha-\beta-\gamma}\ln sK + \frac{\beta}{1-\alpha-\beta-\gamma}\ln sH + \frac{\gamma}{1-\alpha-\beta-\gamma}\ln sF - \frac{(\alpha+\beta+\gamma)}{1-\alpha-\beta-\gamma}\ln(n+g+\delta)$$

We work with the assumption that A(0)= $\alpha + \mu;\ \ \alpha;$ is a constant and μ is a shock. With those assumptions, the convergence rate is now expressed as:

$$d\,In\frac{y(t)}{dt} = (1-\alpha-\beta-\gamma)(n+g+\delta)X\,[\ln(y*) - \ln(y(t))]$$

From the above, y is the level of the output per worker, y* is the level of output per effective worker. Suppose that $\lambda = (1-\alpha-\beta-\gamma)(n+g+\delta)$, it then can imply that λ is the economy's speed of convergence (Barro & Sala-i-Martin, 1992).

It then follows that:

$$\ln y(t) = (1-e^{-\lambda t})\ln(y*) + e^{-\lambda t}\ \ln y(o)$$

If y(o) is deducted from both sides and substituted for y*, this gives:

$$\ln y(t) - \ln y(0)$$
$$= \left(1 - e^{-\lambda t}\right) \frac{\alpha}{1 - \alpha - \beta - \gamma} \ln sK + \left(1 - e^{-\lambda t}\right) \frac{\beta}{1 - \alpha - \beta - \gamma} \ln sH$$
$$+ \left(1 - e^{-\lambda t}\right) \frac{\gamma}{1 - \alpha - \beta - \gamma} \ln sF$$
$$- \left(1 - e^{-\lambda t}\right) \frac{\alpha + \beta + \gamma}{1 - \alpha - \beta - \gamma} \ln(n + g + \delta) - \left(1 - e^{-\lambda t}\right) \ln y(0))$$

It then follows that:

$$\ln y(t) - \ln y(0)$$
$$= \alpha 0 + \alpha 1 \ln sK + \alpha 2 \ln sH + \alpha 3 \ln sF + \alpha 4 \ln(n + g + \delta)$$
$$+ \alpha 5 \ln y(0) + \mu$$

Therefore, the output per capita growth rate is determined by the accrual of physical capital, population growth, financial and human capital.

3.5 Model Specification

Equations (5) and (6) suggest that countries utilizing their financial capital effectively tend to achieve higher per capita output levels than those that do not. To expand on Cooray's (2009) model, which incorporates financial sector efficiency measured by BNKE, this study introduces the impact of institutions. In equation (6), an institutions variable is added to yield the following model specification:

$$\ln y(t) - \ln y(0)$$
$$= \alpha + \alpha 1 \ln sKt + \alpha 2 \ln sHt + \alpha 3 \ln sFt$$
$$+ \alpha 4 \ln(n + g + \delta)t + \alpha 5 \ln y(0) + \alpha 5 \ln BNKEt + \alpha 6 \ln INSTt + \mu t$$

where INSTS represents institutional quality.

Additionally, the study includes interaction terms between financial sector development and institutions, which allows for richer interpretations. Prior studies suggest economic growth is tied to institutional development (Porta et al., 1998) and that economic growth can enhance institutional frameworks, bringing transparency to the banking sector (Dutta and Mukherjee, 2018). This relationship is modelled by the following equation:

$$\ln y(t) - \ln y(0) = \alpha 0 + \alpha 1 \ln sKt + \alpha 2 \ln sHt + \alpha 3 \ln sFt + \alpha 4 \ln(n + g + \delta)t + \alpha 5 \ln y(0) + \alpha 6 \ln BNKEt + \alpha 7(\ln sF * \ln INSTS)t + \mu t$$

In sum, the model in this research draws on MRW theory, endogenous growth theory, the McKinnon-Shaw hypothesis, the supply-following hypothesis, and law and finance theory.

3.6 Estimation Approach

This study utilizes an autoregressive distributed lag (ARDL) model along with instrumental variable (IV) techniques to examine the relationship between financial sector development and economic growth. The ARDL model is selected due to its ability to handle time series data with variables of mixed integration orders (Pesaran et al., 2001). It effectively captures both short-run and long-run dynamics, which aligns with the methodology adopted by Loayza and Rancière (2006), who highlighted the importance of differentiating between short-term financial volatility and long-term economic gains. Additionally, the ARDL model is particularly suitable for analysing datasets that contain variables integrated at either order I(0) or I(1), making it a fitting choice for time series analysis in financial sector research.

Financial development studies, historically, have been hesitant to use the ARDL model due to concerns about spurious regressions when proper unit root testing is not conducted (Moyo et al., 2018). However, since the revival of ARDL techniques (Pesaran et al., 2001), its use has gained momentum, especially for modelling Granger causality (Altaee and Al-Jafari, 2019; Samreth, 2008). The ARDL method is applicable even in small samples, providing largely unbiased estimations for both short- and long-term effects.

The ARDL model also incorporates critical bounds testing, with the lower bound being represented by I(0) and the upper by I(1). In cases where the F-statistic of the equation exceeds the bounds, co-integration between the variables is confirmed, regardless of their order of integration. This makes ARDL particularly robust for investigating the co-integrating relationship between financial sector development and economic growth (Harris, 2003; Granger & Newbold, 1974). By employing this technique, the study ensures accurate results without being constrained by traditional assumptions about variable stationarity.

Additionally, the study employs IV to address potential endogeneity concerns, particularly reverse causality between financial sector development and economic growth. By using lagged variables and institutional quality proxies, the IV technique accounts for factors such as institutional strength, which, as highlighted by Acemoglu and Robinson (2001) and Allen and Santomero (1997), is crucial for understanding the finance-growth nexus.

The general form of the ARDL model is specified as:

$$
\begin{aligned}
\Delta \ln yt = \vartheta 0 + & \sum_{i=1}^{p1} \alpha i \Delta yt - i \\
& + \sum_{i=0}^{p2} \beta i \Delta \ln sKt - i \\
& + \sum_{i=0}^{p3} \gamma i \Delta \ln sHt - i \\
& + \sum_{i=0}^{p4} \emptyset \Delta \ln sFt - i \\
& + \sum_{i=0}^{p5} \omega i \Delta \ln(n + g + \delta)t - i + \sum_{i=0}^{p6} \varphi i \Delta \ln y(0)t - i + \sum_{i=0}^{p7} \rho i \Delta \ln BNKEt - i \\
& + \sum_{i=0}^{p8} \tau i \Delta \ln(sF * INSRs)t - i + \vartheta 1 \ln sKt - 1 + \vartheta 2 \ln sHt - 1 + \vartheta 3 \ln sFt \\
& - 1 + \vartheta 4 \ln(n + g + \delta)t - 1 + \vartheta 5 \ln y(0)t - 1 + \vartheta 6 \ln BNKEt - 1 \\
& + \vartheta 7 \ln(sF * INSTs)t - 1 + \varepsilon t
\end{aligned}
$$

To address potential endogeneity concerns, the study also employs IV estimation techniques. This helps control for reverse causality, which may arise if economic growth influences financial sector development. Instruments such as lagged values of financial development indicators or institutional quality proxies are utilized to mitigate this issue.

3.7 Diagnostic Checks

Given the sensitivity of time series data to model specification, it is essential to apply appropriate diagnostic tests to ensure the reliability of the estimations. A range of diagnostic tests is employed to confirm the validity and suitability of the selected estimators:

3.7.1 Stationarity and Unit Root Tests

Since this study employs time series data, testing for stationarity is essential to avoid misleading results, as non-stationary variables can produce spurious regressions, making statistical tests unreliable. Brooks (2002) explains that non-stationary variables violate large-sample assumptions, potentially distorting the significance of individual variables and the overall model. Harris (1997) suggests achieving stationarity by differencing a series as needed. In this research, stationarity tests, including the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, are conducted for all variables, with differencing applied where necessary to remove stochastic trends.

Using Ordinary Least Squares (OLS) in time series analysis assumes that dependent and explanatory variables are stationary; otherwise, OLS results can be spurious unless these variables are co-integrated. Nelson and Plosser (1982) found many U.S. macroeconomic time series exhibit stochastic trends, or unit root processes. For non-stationary series, differencing may be required multiple times to achieve stationarity. Granger and Newbold (1974) argued that simple de-trending does not eliminate spurious correlation issues, making co-integration checks essential for integrated processes. Following Asteriou and Hall (2011), this study checks all variables for integration to prevent misleading high coefficients of determination in regressions that lack true relationships between variables.

3.7.2 Cointegration

To address potential stationarity issues, it is essential to test for the presence of a long-term relationship between the variables, which is done through cointegration tests. Cointegration refers to a statistical concept that identifies a long-term equilibrium relationship among economic time series that tend to move together over time. This characteristic is crucial in contemporary time series analysis, as such data often show either deterministic or stochastic trends. As highlighted by Moyo et al., (2018), two time series are considered cointegrated if they are integrated to the same order dd and have a linear combination integrated to an order less than d−bd - b, where b>0b > 0. In this study, the ARDL Bound Test is employed to assess the existence of cointegration among the variables.

3.7.3 Endogeneity

Endogeneity in regression analysis arises when an explanatory variable is correlated with the error term, often due to factors like omitted variable bias, measurement errors, or simultaneity (where causality runs in both directions between the dependent and explanatory variables). This correlation distorts the estimated relationships, leading to biased and inconsistent results, as it violates the assumptions of the regression model (Aggarwal et al., 2011). To address endogeneity, the instrumental variables (IV) technique is employed. This approach uses external variables, called instruments, which are correlated with the endogenous explanatory variables but not with the error term, helping to reduce endogeneity and enhance the reliability of the results.

3.7.4 Multicollinearity

Multicollinearity arises when there is a high degree of correlation between independent variables in a regression equation, which can undermine the statistical significance of individual predictors (Gujarati & Porter, 2009). To detect and measure multicollinearity in this study, the Variance Inflation Factor (VIF) is employed to assess whether the level of multicollinearity is within acceptable limits.

3.7.5 Autocorrelation, Heteroscedasticity, and Stability

Autocorrelation, also known as serial correlation, occurs in time series data when the residuals (errors) from one period are correlated with those from previous periods. This issue can arise when variables exhibit trends or cycles, or when important variables are omitted from the model, leading to biased results, and affecting the accuracy of statistical tests (Fosu, 2013). To detect autocorrelation, the Breusch-Godfrey serial correlation LM test is applied, which helps determine if there is any significant correlation between the residuals over time.

Heteroscedasticity refers to situations where the variance of the residuals varies across values of the explanatory variables, violating the assumption of constant variance. This can lead to inefficient estimates and unreliable hypothesis tests. To address this, the White test is used to check for heteroscedasticity in the model.

Additionally, the Ramsey RESET test is employed to assess whether the model is correctly specified. This test checks for potential functional form misspecifications, ensuring that the model captures the relationship between the variables accurately.

3.8 Variable description and measurement

3.8.1 Dependent Variable (Y)

This study uses a trans-log production function to investigate the link between financial sector development and economic growth, with GDP per capita (Y) as the dependent variable. GDP per capita is a common indicator of a nation's standard of living and reflects economic growth through population participation, consistent with production theory, which suggests that an increase in capital stock results in higher investment and economic growth (Bunyamin, 2021; Solow, 1956). It has been widely utilized as a measure of economic growth in numerous studies, such as those by King and Levine (1993), Levine (1997), and Jarque et al. (1987). If the GDP growth rate exceeds the population growth rate, it implies rising household income, which can lead to increased investment.

3.8.2 Independent Variables (sK and sH)

The independent variable capital stock to GDP (sK) is included, consistent with this theory, highlighting the importance of physical capital in enhancing productivity. Additionally, human capital (sH) is measured using Lutz et al.'s (2004) human capital index, which underscores its multifaceted nature, including adult literacy ratios. The significance of human capital on economic growth is well-documented in literature as it fosters inclusive growth alongside financial development (Odhiambo, 2005).

3.8.3 Financial Development Indicators (sF)

Two composite indicators are used to assess the size and activity of the financial sector. The first indicator, based on the methodology of Demirgüç-Kunt and Maksimovic (1996), averages three key metrics for commercial banking: (1) the ratio of M2 to GDP, reflecting the banking sector's size and depth; (2) the ratio of deposit bank assets to GDP, indicating the sector's overall size; and (3) the ratio of domestic credit provided by deposit banks to the private sector relative to GDP, which measures financial intermediation activity. These indicators are commonly used in research by Demirgüç-Kunt and Maksimovic (1996), King and Levine (1993), and Levine and Zervos (1996).

A second composite index, also based on Demirgüç-Kunt and Maksimovic's (1996) methodology, captures the contributions of both commercial banks and non-bank financial intermediaries. This index averages: (1) the ratio of M2 to GDP; (2) private credit provided by deposit banks and other financial institutions relative to GDP; (3) the ratio of deposit bank assets to GDP; and (4) the ratio of assets held by other financial institutions to GDP. In cases where data for non-bank financial institutions are unavailable, the index is computed using the first three indicators. The variables involved are detailed below:

Liquid Liabilities to GDP (%)

The ratio of liquid liabilities to GDP, often referred to as broad money or M3, measures the proportion of liquid assets in an economy relative to its GDP. Beck et al. (2012) describe liquid liabilities as comprising currency and deposits held in the central bank (M0), transferable deposits and electronic currency (M1), as well as time and savings deposits, certificates of deposit, and securities repurchase agreements (M2). Jarque et al. (1987) identify this ratio as a key indicator of financial depth. A higher ratio signifies greater liquidity within the financial system, reflecting a well-developed financial sector that can effectively facilitate economic transactions and promote growth (Mishkin, 2007). Conversely, a low ratio may imply limited liquidity, potentially stifling economic activity and hindering investment, as highlighted by Fosu (2013), who found that low liquidity constrains economic expansion. An increase would imply as an improvement in the financial depth of an economy.

Deposit Money Banks Assets to GDP (%)

This variable represents the total assets held by deposit money banks as a percentage of GDP. According to Demirgüç-Kunt and Levine (2008), a higher ratio signifies a robust banking sector capable of mobilizing savings and extending credit, which can facilitate economic development (Beck et al., 2013). Conversely, a low ratio may reflect an underdeveloped banking system, potentially constraining financial intermediation and limiting economic growth by restricting access to necessary funds for investment and consumption (Fry, 1995).

Private Credit by Deposit Money Banks to GDP (%)

The ratio of private credit by deposit money banks to GDP reflects the proportion of financial resources that domestic money banks allocate to the private sector in relation to the overall economy. Levine (2005) emphasizes the importance of access to credit from commercial banks for driving private sector investment and consumption. A higher ratio indicates a larger share of financial resources directed toward the private sector, fostering economic growth by enabling increased investment opportunities (King & Levine, 1993). On the other hand, a low ratio may suggest limited credit availability, which can hinder business expansion and slow down economic growth (Beck et al., 2004). This ratio is considered a true measure of the funds channelled into the private sector, reflecting the strength of financial intermediation in an economy (Gregorio and Guidotti, 1995; Akinboade, 1998). In terms of financial intermediation, a higher supply of credit to the private sector signals improved investment quality (Demetriades and Hussein, 1996). Achy (2005) note that it is an effective indicator of financial sector development, particularly in developing countries.

Nonbank Financial Institutions Assets to GDP (%)

Nonbank financial institutions assets to GDP represent the total assets held by financial institutions that do not accept transferable deposits, expressed as a percentage of GDP. These institutions play a vital role in financial intermediation (Mishkin, 2007). A higher ratio indicates a diversified financial sector that provides alternative sources of financing, enhancing economic growth by offering additional avenues for investment. A low ratio may suggest reliance on traditional banking systems, limiting the range of financial services available and potentially stifling growth (Levine, 2002).

3.8.4 Bank Efficiency (BNKE)

Financial Sector Efficiency is assessed using a composite indicator, which is derived by averaging three key measures: (1) the net interest margin to total assets, which reflects banks' profitability from lending activities; (2) the ratio of banks' overhead costs to total assets, indicating operational efficiency; and (3) a concentration measure, defined as the ratio of the assets of the three largest banks to total banking assets. This measure suggests that greater competition within the financial sector is expected to lead to lower overhead costs, narrower interest margins, and reduced concentration, all of which are indicative of enhanced efficiency in the sector. The variables are explained below:

Bank Net Interest Margin (%)

The bank net interest margin reflects the accounting value of a bank's net interest revenue as a share of its average interest-bearing (total earning) assets. According to Allen and Santomero (1997), a higher net interest margin indicates effective management of interest income and expenses, contributing to bank profitability. This profitability enhances banks' ability to extend credit, facilitating economic growth Conversely, a low net interest margin may suggest inefficiencies in the banking sector, reducing lending capabilities and potentially hindering economic activity (Ho & Saunders, 1981).

Bank Overhead Costs to Total Assets (%)

These variable measures the operating expenses of banks as a percentage of total assets held. A lower ratio suggests greater operational efficiency, positively influencing a bank's profitability and lending capacity (Berger & Mester, 1997). High overhead costs can diminish the resources available for lending, constraining economic growth (Greenwood & Jovanovic 1990). Therefore, a high ratio might indicate inefficiencies in the banking sector that could negatively affect financial intermediation and overall economic performance (Berger et al., 2010).

Bank Concentration (%)

Bank concentration is defined as the assets of the three largest commercial banks as a share of total commercial banking assets. Higher concentration may lead to reduced competition within the banking sector, resulting in inefficiencies and less favourable lending conditions for the private sector (Berger & Mester, 1997). A high concentration ratio might imply that a few banks dominate the market, potentially stifling innovation and increasing costs for borrowers. Conversely, a lower concentration ratio indicates a more competitive banking environment, promoting financial sector development and facilitating economic growth (Beck et al., 2004; Claessens & Laeven, 2004).

3.8.5 Institutional Quality (INSTS)

Institutional quality encompasses the frameworks and mechanisms through which authority is exercised in a country. According to the World Bank's Worldwide Governance Indicators (WGI), institutional quality refers to the traditions and institutions that shape the governance of economic and social interactions (Kaufmann et al., 2010). High institutional quality is correlated with better governance outcomes, promoting economic stability, investment, and growth (Acemoglu et al., 2001). Conversely, weak institutional quality can lead to inefficiencies, corruption, and political instability, hampering economic development (Rodrik et al., 2004).

Political Stability (Pol)

Political stability, according to the World Governance Indicators (WGI), refers to the perception of the likelihood that a government will be disrupted or removed through unconstitutional or violent actions, such as politically motivated violence and terrorism (Kaufmann et al., 2010). High political stability fosters a predictable environment conducive to investment and economic growth, while instability can result in disruption and uncertainty, deterring foreign and domestic investment (Fosu, 2013; Barro, 1991).

Voice and Accountability (Vac)

Voice and accountability reflect the extent to which citizens can participate in selecting their government, as well as the freedoms of expression, association, and the presence of a free media (Kaufmann et al., 2010). High levels of voice and accountability are linked to more inclusive governance, where policies better reflect the needs and preferences of citizens. Conversely, low voice and accountability can lead to disenfranchisement, social unrest, and economic instability (Fukuyama, 2013).

Government Effectiveness (Gov)

Government effectiveness, as per the WGI, captures perceptions of the quality of public services, the independence of the civil service from political pressures, and the credibility of the government's commitment to sound policies (Kaufmann et al., 2010). A high level of government effectiveness supports efficient service delivery and sound policy implementation, fostering an environment favourable to economic growth (Mauro, 1995). In contrast, low government effectiveness can lead to resource misallocation and diminished public trust, negatively affecting economic development (Bardhan, 2002).

Regulatory Quality (Roq)

Regulatory quality measures perceptions of the government's ability to formulate and implement policies and regulations that encourage and facilitate private sector development (Kaufmann et al., 2010). High regulatory quality promotes a favourable business environment, reduces entry barriers, and encourages entrepreneurship. Conversely, poor regulatory quality can create bureaucratic inefficiencies and corruption, hampering economic growth (Djankov et al., 2002).

Rule of Law (Rol)

The rule of law refers to the degree to which individuals have confidence in and adhere to societal regulations, especially in relation to contract enforcement, property rights, and the operation of the judicial system (Kaufmann et al., 2010). A robust rule of law is crucial for economic growth because it safeguards property rights and creates a stable environment for investment (La Porta et al., 1997). On the other hand, a weak rule of law can result in inconsistent application of laws, which can deter both domestic and foreign investment (Acemoglu et al., 2001).

Control of Corruption (Corr)

Control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand corruption (Kaufmann et al., 2010). Effective control of corruption promotes a transparent and fair business environment, enhancing economic performance and public trust in government (Mauro, 1995). Conversely, high levels of corruption distort economic incentives, lead to inefficient resource allocation, and undermine governance (Tanzi & Davoodi, 1998).

Table 3.1: Variables in The Model

Variable	**Definition**	**Source (s)**
	Dependent Variables	
Y	Real GDP per capita	World Development Reports (World Bank, 2024); Human Development Reports (United Nations, 2024)
	Independent Variables	
sK	Share of physical capital to GDP	World Development Indicators (World Bank, 2024)
sH	Human capital, proxied by adult literacy	World Development Indicators (World Bank, 2024)
	Financial Development Indicators (Financial Sector Size and Activity)	
sF1	Money supply to GDP	World Development Indicators (World Bank, 2024)
	Bank's deposit assets to GDP	

	Domestic credit granted by the banking sector to the private sector as % of GDP	
sF2	Money supply to GDP	
	Bank's deposit assets to GDP	
	Private credit granted by the banking sector and other financial institutions as % of GDP	
	Assets of other financial institutions to GDP	
sF	sF=(sF1, sF2)	
	Financial development composite indicator is above variables combined	
n	Annual average growth of the labour force	World Bank (2024); Bank of Zambia (2024)
g+ δ	The sum of the growth rate of technology, g, and the rate of depreciation, δ	
Bank Efficiency		
BIM	Banks net interest margin to total assets	World Development Indicators (World Bank, 2024)
BOC	Banks overhead costs to total assets	
BCR	Banks concentration ratio	
BNKE	BNKE= (BIM, BOC, BCR) Bank efficiency is above variables combined	
Institutional Quality		
Pol	Political stability	Worldwide Governance Indicators(World Bank, 2024)
Vac	Voice and accountability	
Gov	Government effectiveness	
Roq	Regulatory quality	
Rol	Rule of law	
Corr	Control of corruption	

INSTS	INSTS= (Pol, Vac, Gov, Rol, Corr) Institutions composite indicator is variables above combined	

Source: Researchers workings, 2024

3.9 Conclusion

This chapter has provided a comprehensive overview of the research methodology employed to examine the relationship between financial sector development and economic growth in Zambia. A quantitative research approach, supported by the Solow-Swan theoretical framework, was adopted to analyse secondary data from reputable sources such as the World Bank and the Bank of Zambia for the period 2004–2022. The study utilized ARDL and IV estimation techniques to explore short- and long-run dynamics while addressing endogeneity concerns. Diagnostic tests, including stationarity checks and multicollinearity assessments, were applied to validate the model's robustness. While the methodology ensures a rigorous analysis, limitations such as reliance on secondary data and potential measurement errors in institutional quality variables are acknowledged.

4. Research Findings and Discussion

4.1 Introduction

This chapter presents the findings and analysis of the study examining the relationship between financial sector development and economic growth in Zambia. The chapter begins with a discussion of the descriptive statistics and model diagnostics. Subsequently, it presents time series analyses of stationarity. The long-run and short-run estimates of the determinants of economic growth are then discussed. The chapter concludes with a synthesis of empirical results and research objectives.

4.2 Summary of Descriptive Statistics

Table 4.1 presents a summary of the descriptive statistics for key variables utilized in this study. The variables exhibit diverse characteristics, with notable variations across their distributions. For instance, the minimum and maximum values of real GDP per capita (Y) range from 548.686 to 1820.719, with a mean of 1290.702 and a standard deviation of 334.108. This reflects significant disparities in economic performance across observations. The skewness of -0.484 and kurtosis of 2.780 suggest that real GDP per capita is moderately negatively skewed and slightly platykurtic, indicating a flatter distribution than the normal distribution (Gujarati & Porter, 2009).

Table 4.1: Descriptive Statistics

Variable	Mean	Std. Dev	Min	Max	Skewness	Kurtosis	Jarque-Bera (Prob)	N
Real GDP per capita (Y)	1290.702	334.108	548.686	1820.719	-0.484	2.780	0.779	19
Physical capital to GDP (sK)	0.336	0.044	0.270	0.428	0.002	2.489	0.207	19
Human capital (sH)	0.742	0.100	0.591	0.888	-0.179	1.676	1.490	19
Financial sector development (sF)	0.539	0.057	0.452	0.621	-0.392	1.723	1.779	19
Growth rate of labour force (n)	0.038	0.008	0.024	0.060	1.426	5.461	11.231	19
Growth rate of technology and rate of depreciation ($g+\delta$)	0.050	0.000	0.050	0.050	0.000	0.000	7.125	19
Bank efficiency (BNKE)	0.209	0.020	0.180	0.242	-0.128	1.797	1.197	19
Politcal stability (Pol)	-0.251	0.122	-0.440	-0.070	-0.101	1.714	1.341	19
Voice and accountability (Vac)	0.249	0.231	-0.130	0.660	0.142	1.972	0.900	19
Government effectiveness (Gov)	-0.735	0.131	-0.940	-0.510	0.226	2.157	0.724	19
Regulatory quality (Roq)	-0.557	0.077	-0.740	-0.440	-0.869	3.086	2.399	19
Rule of law (Rol)	-0.435	0.124	-0.650	-0.220	0.204	2.092	0.785	19
Control of Corruption (Corr)	-0.507	0.141	-0.760	-0.290	-0.227	1.934	1.063	19
Institutional quality (INSTS)	-0.373	0.109	-0.575	-0.178	-0.099	2.226	0.505	19
Composition of financial sector development & institutional quality (sF*INSTS)	-0.201	0.066	-0.344	-0.096	-0.546	2.737	0.999	19

Source: Stata estimates from research data, 2024

Production Function Variables

The production function variables, namely physical capital to GDP (sK) and human capital (sH), show relatively stable distributions. The mean value for sK is 0.336, with a standard deviation of 0.044, indicating limited variability across observations. Its skewness of 0.002 and kurtosis of 2.489 suggest a nearly symmetrical distribution. Conversely, sH has a mean of 0.742 and a standard deviation of 0.100, with a negative skewness of -0.179 and a kurtosis of 1.676, implying a relatively flat distribution. The behaviour of these variables aligns with theoretical expectations, where both physical and human capital are critical for economic growth (Solow, 1956).

Financial Sector Development and Efficiency

The financial sector development index (sF) exhibits a mean of 0.539 and a standard deviation of 0.057, suggesting a low level of variation. Its skewness of -0.392 and kurtosis of 1.723 imply a slightly negatively skewed and flat distribution. The bank efficiency (BNKE) variable has a mean of 0.209 and a standard deviation of 0.020, with similar distributional properties. These statistics highlight the relatively stable financial sector characteristics across the dataset, which may reflect structural consistencies in financial systems during the study period (Beck, Levine, & Loayza, 2000).

Labour Force and Technology Growth

The growth rates of the labour force (n) and technology plus depreciation ($g+\delta$) reflect stark differences in variability. While the growth rate of labour force exhibits a mean of 0.038 and significant positive skewness (1.426), indicating the presence of extreme values, $g+\delta$ has a constant mean and standard deviation of 0.050, highlighting its consistent nature. This consistency may reflect an assumption of exogeneity in technological progress, as proposed in the Solow growth model (Solow, 1956).

Institutional Quality and Governance

The institutional variables reveal notable insights into governance quality. Political stability (Pol) has a mean of -0.251 with a standard deviation of 0.122, indicating variability in governance conditions. Similarly, voice and accountability (Vac), with a mean of 0.249 and a standard deviation of 0.231, demonstrates a wider distribution. The negative skewness and kurtosis values for most institutional variables (e.g., Pol, Gov, Roq) suggest asymmetric distributions with longer left tails, reflecting governance challenges. For example, regulatory quality (Roq) has a kurtosis of 3.086, indicating peakiness, potentially due to external shocks or policy changes (Kaufmann et al., 2010).

Composite Variables

The composition of financial sector development and institutional quality (sF*INSTS) demonstrates a mean of -0.201 and a standard deviation of 0.066. The negative skewness (-

0.546) and moderate kurtosis (2.737) suggest an uneven distribution, reflecting the interplay between institutional inefficiencies and financial development.

Normality Tests

The Jarque-Bera statistics indicate deviations from normality for several variables. For instance, the probabilities for variables such as growth rate of labour force (n) and financial sector development (sF) are below the 5% significance level, rejecting the null hypothesis of normality (Jarque & Bera, 1987). These findings suggest that non-linear modelling techniques may better capture the relationships among the variables.

The descriptive statistics reveal considerable diversity in economic, financial, and institutional indicators, with implications for the econometric analysis. The data patterns highlight potential structural challenges and opportunities within the sampled economies, reflecting variations in growth trajectories and governance systems. These trends are consistent with prior findings in the literature (Acemoglu et al., 2001; Levine, 2005).

4.3 Correlation Analysis

Table 4.2 presents the estimated correlation matrix for the study variables. Correlation analysis is an essential tool for examining linear relationships between variables. According to Harris (2003, p. 539), a correlation coefficient of +1 indicates a perfect positive relationship, while -1 signifies a perfect negative relationship. This analysis provides valuable insights into the interactions between variables, allowing for a deeper understanding of their connections prior to the time-series estimations.

Table 4.2 : Matrix of Correlations

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(1) Real GDP per capita (Y)	1													
(2) Physical capital to GDP (sK)	0.2432	1												
(3) Human capital (sH)	0.341	0.2915	1											
(4) Financial sector development (sF)	0.3718	0.5998	0.9402	1										
(5) Growth labour rate (n)	-0.214	0.0244	0.1545	0.1379	1									
(6) Growth rate of depreciation technology (g+**δ**)	0.1557	0.1283	0.1045	0.0829	-0.0546	1								
(7) Bank efficiency (BNKE)	0.3331	0.5868	0.9353	0.9912	0.2677	0.1164	1							
(8) Politcal stability (Pol)	0.7315	0.139	0.0106	0.0584	-0.2244	0.0975	0.0268	1						
(9) Voice and accountability (Vac)	0.399	-0.512	-0.3803	-0.5003	-0.3483	0.0783	-0.5332	0.5519	1					
(10) Government effectiveness (Gov)	0.8675	0.3913	0.2786	0.3724	-0.1613	0.1356	0.3407	0.7115	0.2121	1				
(11) Regulatory quality (Roq)	0.8262	0.1784	0.2089	0.2383	-0.4293	0.1084	0.1745	0.6988	0.57	0.7392	1			
(12) Rule of law (Rol)	0.6319	0.5335	0.0127	0.2005	-0.3378	0.1459	0.15	0.62	0.1489	0.764	0.6296	1		
(13) Control of Corruption (Corr)	0.5642	-0.0342	-0.2454	-0.2175	-0.2623	0.1228	-0.2466	0.8417	0.6914	0.6196	0.6403	0.6602	1	
(14) Institutional quality (INSTS)	0.7786	0.0365	-0.1019	-0.0722	-0.3638	0.1593	-0.1189	0.8916	0.7339	0.7624	0.8435	0.7172	0.9288	1

Variables	1

(1) Real GDP per capita (Y)	1
(2) Physical capital to GDP (sK)	0.2432
(3) Human capital (sH)	0.341
(4) Financial sector development (sF)	0.3718
(5) Growth labour rate (n)	-0.214
(6) Growth rate of depreciation technology (g+**δ**)	0.1557
(7) Bank efficiency (BNKE)	0.3331
(8) Politcal stability (Pol)	0.7315
(9) Voice and accountability (Vac)	0.399
(10) Government effectiveness (Gov)	0.8675
(11) Regulatory quality (Roq)	0.8262
(12) Rule of law (Rol)	0.6319
(13) Control of Corruption (Corr)	0.5642
(14) Institutional quality (INSTS)	0.7786

Source: Stata estimates from research data, 2024

Variables	1	2	3	4	5
(1) Real GDP per capita (Y)	1				
(2) Physical capital to GDP (sK)	0.2432	1			
(3) Human capital (sH)	0.341	0.2915	1		
(4) Financial sector development (sF)	0.3718	0.5998	0.9402	1	
(5) Growth labour rate (n)	-0.214	0.0244	0.1545	0.1379	1
(6) Growth rate of depreciation technology (g+**δ**)	0.1557	0.1283	0.1045	0.0829	-0.0546
(7) Bank efficiency (BNKE)	0.3331	0.5868	0.9353	0.9912	0.2677
(8) Politcal stability (Pol)	0.7315	0.139	0.0106	0.0584	-0.2244
(9) Voice and accountability (Vac)	0.399	-0.512	-0.3803	-0.5003	-0.3483
(10) Government effectiveness (Gov)	0.8675	0.3913	0.2786	0.3724	-0.1613
(11) Regulatory quality (Roq)	0.8262	0.1784	0.2089	0.2383	-0.4293
(12) Rule of law (Rol)	0.6319	0.5335	0.0127	0.2005	-0.3378
(13) Control of Corruption (Corr)	0.5642	-0.0342	-0.2454	-0.2175	-0.2623
(14) Institutional quality (INSTS)	0.7786	0.0365	-0.1019	-0.0722	-0.3638

Real GDP per capita (Y) is positively correlated with institutional quality (INSTS) (0.7786), suggesting that stronger institutions contribute to higher economic performance. This finding aligns with Bordo and Levy (2021), who emphasize the importance of institutional frameworks in supporting economic growth in middle-income countries. Additionally, physical capital to GDP (sK) shows a weaker positive correlation (0.2432) with GDP, which supports the Mankiw-Romer-Weil (MRW) growth theory, where physical capital is a key determinant of economic output (Harris, 2003). However, an interesting observation is the negative correlation between voice and accountability (Vac) and GDP per capita (Y) (-0.3990). This suggests that perceptions of governance may not always directly translate into economic growth, and other factors may influence this relationship (Harris, 2003).

In terms of financial sector development (sF), a strong positive correlation is observed with bank efficiency (BNKE) (0.9912). This indicates that a more efficient banking sector is closely tied to the development of the financial sector, confirming that financial sector efficiency is a key driver of broader financial development. Despite this, the correlation between financial sector development (sF) and GDP per capita (Y) is moderate (0.3718), suggesting a potentially non-linear relationship between the financial sector and economic growth in Zambia. This finding may reflect the complexity of the financial development-growth nexus, where other factors, such as institutional quality, might play a mediating role (Bunyamin, 2021).

Institutional quality (INSTS) is highly correlated with control of corruption (Corr) (0.9288) and government effectiveness (Gov) (0.7624), further underscoring the critical role that effective governance structures play in shaping economic outcomes. The negative correlation between institutional quality (INSTS) and the growth rate of labour force (n) (-0.3638) suggests that rapid labour force expansion can place pressure on institutional systems, potentially hindering institutional effectiveness. This observation is significant for understanding the challenges faced by Zambia in managing both institutional quality and demographic growth (Omar et al., 2022).

The growth rate of labour force (n) itself shows a negative correlation with GDP per capita (Y) (-0.2140), suggesting that rapid labour force growth, when not accompanied by sufficient economic expansion, may limit per capita income growth. This finding is consistent with the view that labour force growth, if not matched by productivity increases, can constrain economic progress (Odhiambo, 2005).

Rule of law (Rol) is positively correlated with both GDP per capita (Y) (0.6319) and institutional quality (INSTS) (0.7172), emphasizing the importance of a strong legal framework in supporting economic development and fostering institutional stability. The positive relationship between the rule of law and economic growth further reinforces the view that legal and institutional frameworks are foundational to a country's economic success (Barajas et al, 2013).

Regarding multicollinearity, the variance inflation factor (VIF) analysis (Table 4.3) indicates no significant multicollinearity issues, as all VIF values are well below the threshold of 10. The mean VIF is 1.08, suggesting a moderate correlation between the variables. Specifically, human capital has a VIF of 1.12, physical capital is at 1.09, and growth rate has the lowest VIF of 1.02. These values are well within acceptable limits, indicating that multicollinearity is not a concern in the model. The low 1/VIF values also reinforce that there is no serious collinearity affecting the regression results (Odhiambo, 2005).

Table 4.3: Variance Inflation Factor

Variable	**VIF**	**1/VIF**
Human capital	1.12	0.89328
Physical capital	1.09	0.91459
Growth rate	1.02	0.97566
Mean VIF	1.08	0.92593

Source: Stata estimates from research data, 2024

In conclusion, the correlation analysis reveals important relationships between key variables such as GDP, institutional quality, financial sector development, and governance. The findings are consistent with the theoretical frameworks of the MRW growth model and highlight the critical role that institutions, governance, and efficient banking play in driving economic growth. While some non-linear relationships are suggested, particularly between financial sector development and GDP, the results provide a solid foundation for the subsequent time-series analysis (Barajas et al, 2013).

4.4 Graphical Analysis

The graphs below show the trend of the log of GDP per capita (dependent variable) and other independent variables over time in Zambia.

4.4.1 Trend of GDP per capita and Physical Capital

The relationship between LogGDP and Physical Capital to GDP (sK) suggests that initial increases in capital accumulation may have contributed to economic growth, followed by a decline in sK, indicating diminishing returns or reduced investment.

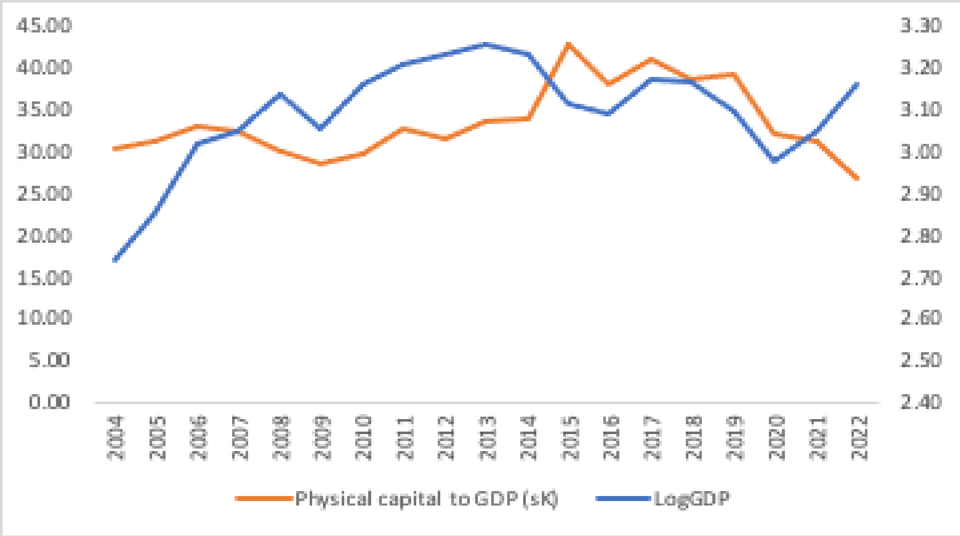

Figure 4.1: Trend of GDP per capita and Physical Capital

Source: Stata estimates from research data, 2024.

4.4.2 Trend of GDP per capita and Human Capital

The steady increase in Human Capital (sH) corresponds with the upward trend in LogGDP, indicating a positive relationship where improvements in education and skills are associated with economic growth.

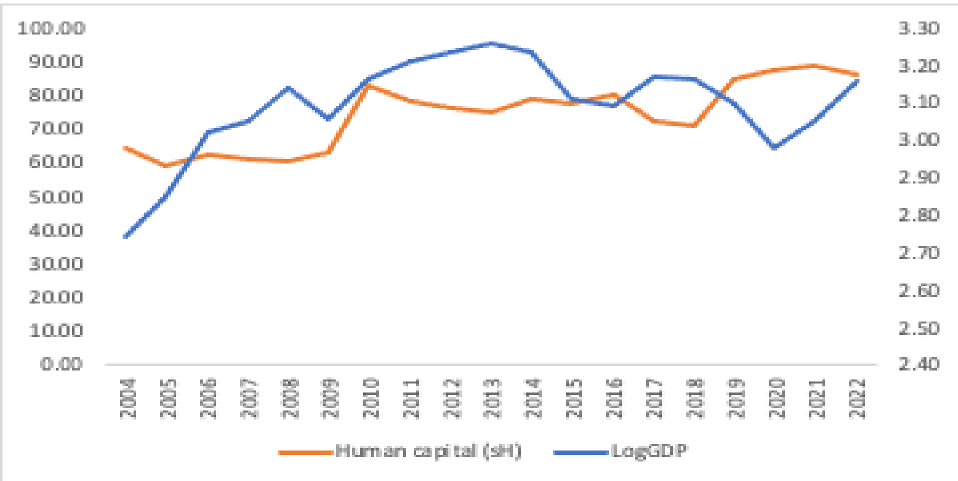

Figure 4.2: Trend of GDP per capita and Human Capital

Source: Stata estimates from research data, 2024.

4.4.3 Trend of GDP per capita and Financial Sector Development

The parallel growth trends of LogGDP and Financial Sector Development (sF) suggest that a well-developed financial sector plays a crucial role in supporting economic growth.

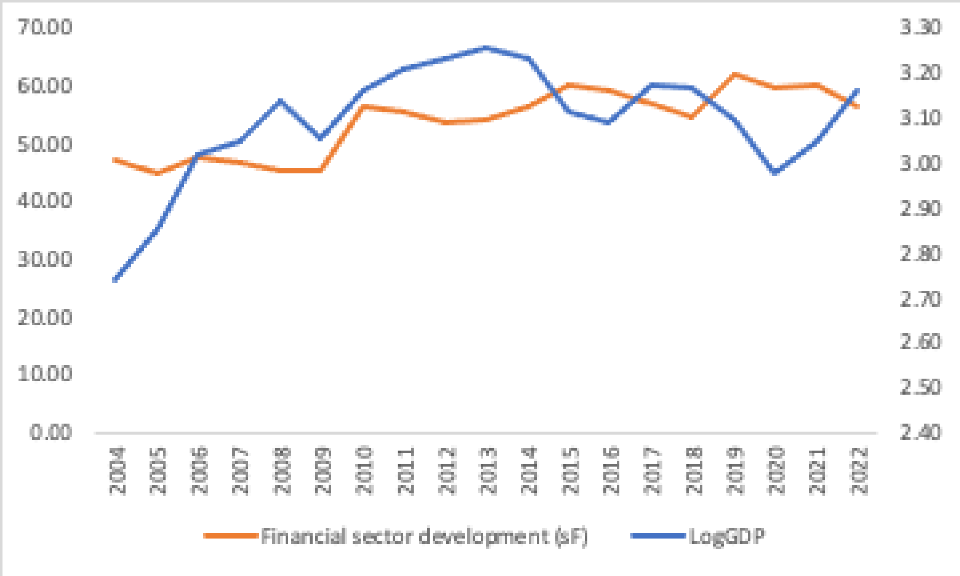

Figure 4.3: Trend of GDP per capita and Financial Sector Development

Source: Stata estimates from research data, 2024.

4.4.4 Trend of GDP per capita and Labor, Technology and Depreciation

Despite stable trends in the Growth of Labour, Technology, and Depreciation (n, g+δ), with notable spikes in 2019 and 2020, the overall upward trend in LogGDP implies a complex relationship where these factors contribute variably to economic growth.

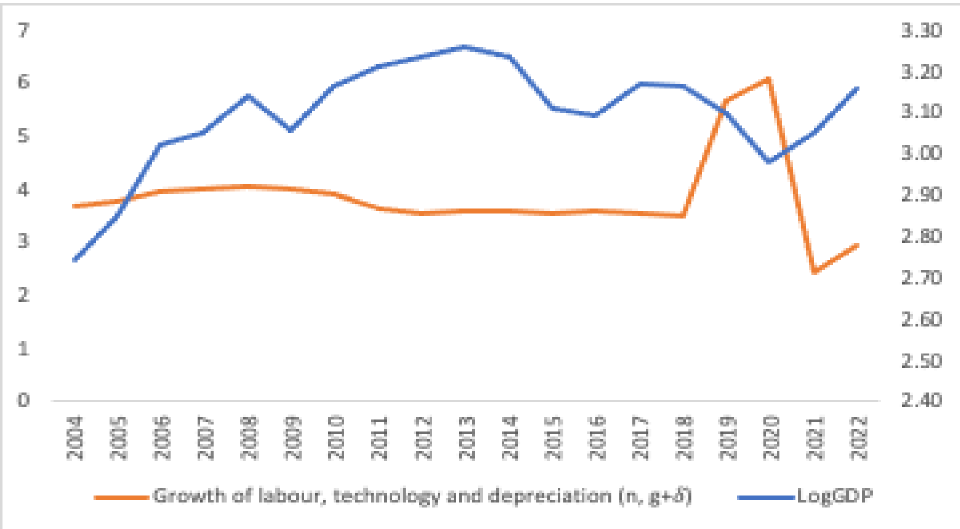

Figure 4.4: Trend of GDP per capita and Labor, Technology and Depreciation

Source: Stata estimates from research data, 2024.

4.4.5 Trend of GDP per capita and Bank Efficiency

The improvement in Bank Efficiency (BNKE) over time, alongside the growth in LogGDP, indicates that more efficient banking systems may positively influence economic performance.

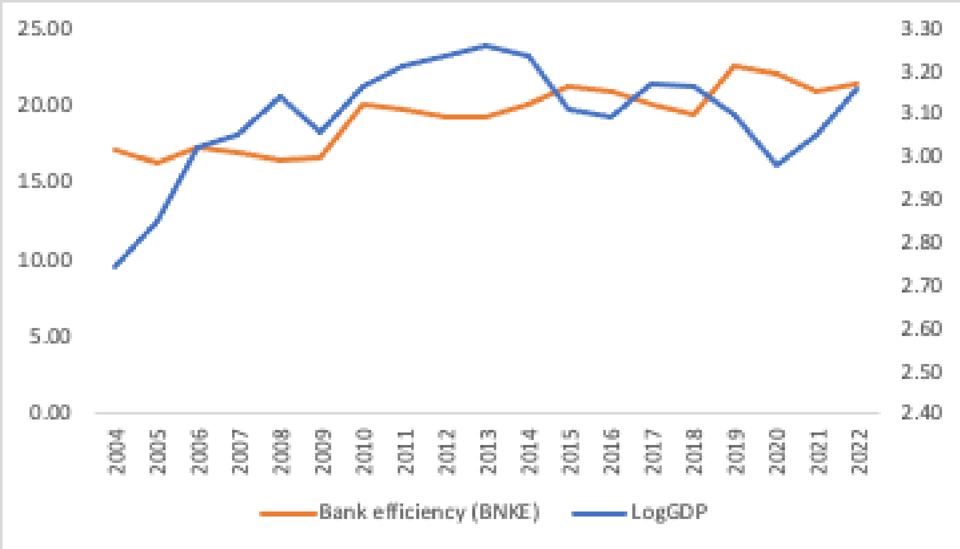

Figure 4.5: Trend of GDP per capita and Bank Efficiency

Source: Stata estimates from research data, 2024.

4.4.6 Trend of GDP per capita and Political Stability

Despite fluctuations in Political Stability (Pol), the overall negative values suggest persistent challenges, which may have tempered the pace of economic growth as seen in LogGDP.

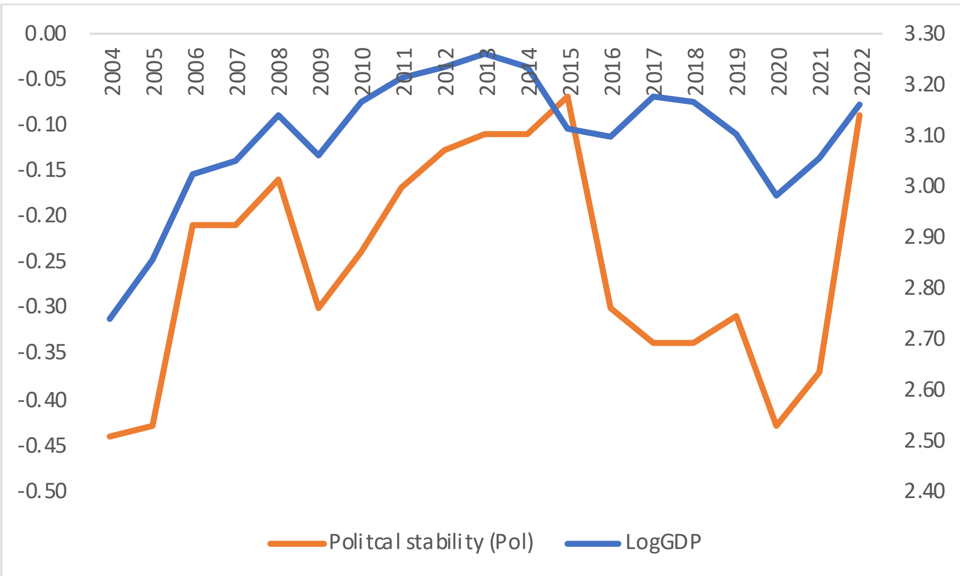

Figure 4.6: Trend of GDP per capita and Political Stability

Source: Stata estimates from research data, 2024.

4.4.7 Trend of GDP per capita and Voice and Accountability

The variations in Voice and Accountability (Vac) highlight shifting democratic processes, with higher values generally aligning with periods of economic stability and growth.

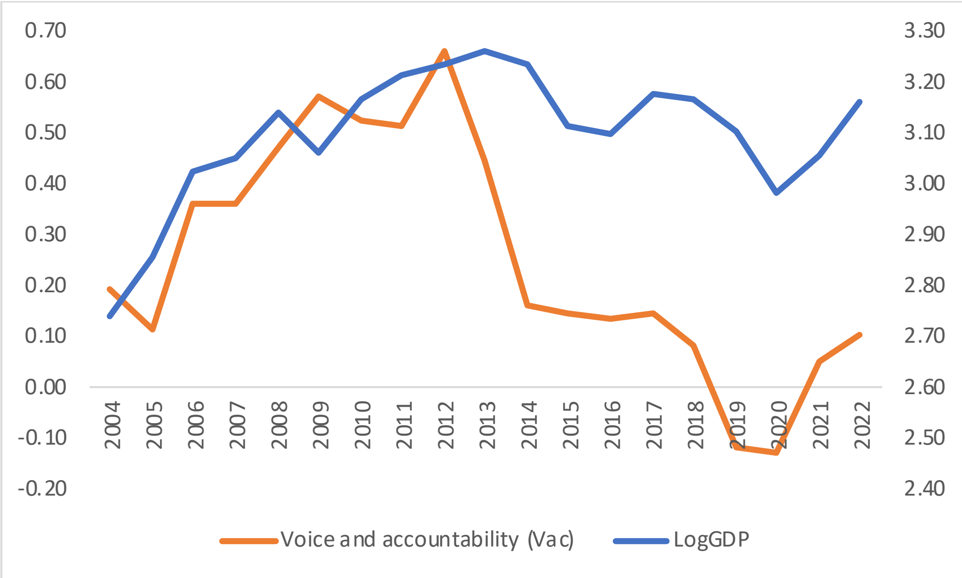

Figure 4.7: Trend of GDP per capita and Voice and Accountability

Source: Stata estimates from research data, 2024.

4.4.8 Trend of GDP per capita and Government Effectiveness

The generally negative trend in Government Effectiveness (Gov) suggests ongoing governance issues, which may have constrained the full potential of economic growth reflected in LogGDP.

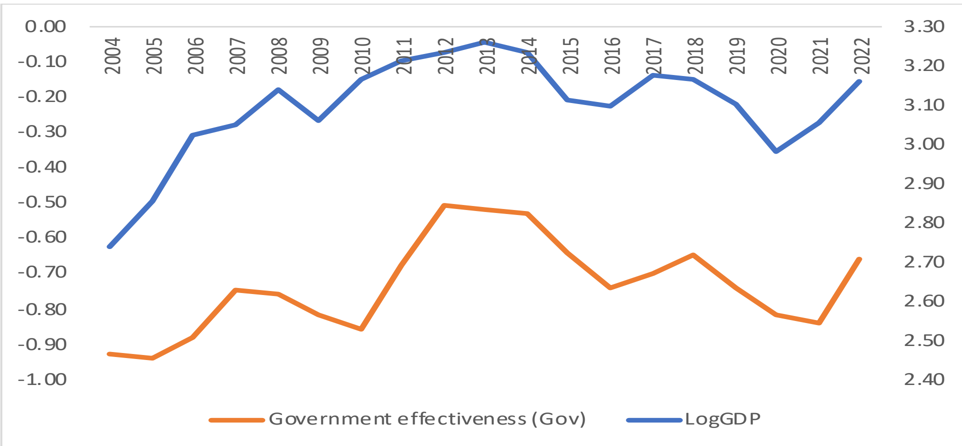

Figure 4.8: Trend of GDP per capita and Government Effectiveness

Source: Stata estimates from research data, 2024.

4.4.9 Trend of GDP per capita and Regulatory Quality

The modest improvements in Regulatory Quality (Roq) over time indicate gradual regulatory reforms, potentially contributing to the observed growth in LogGDP.

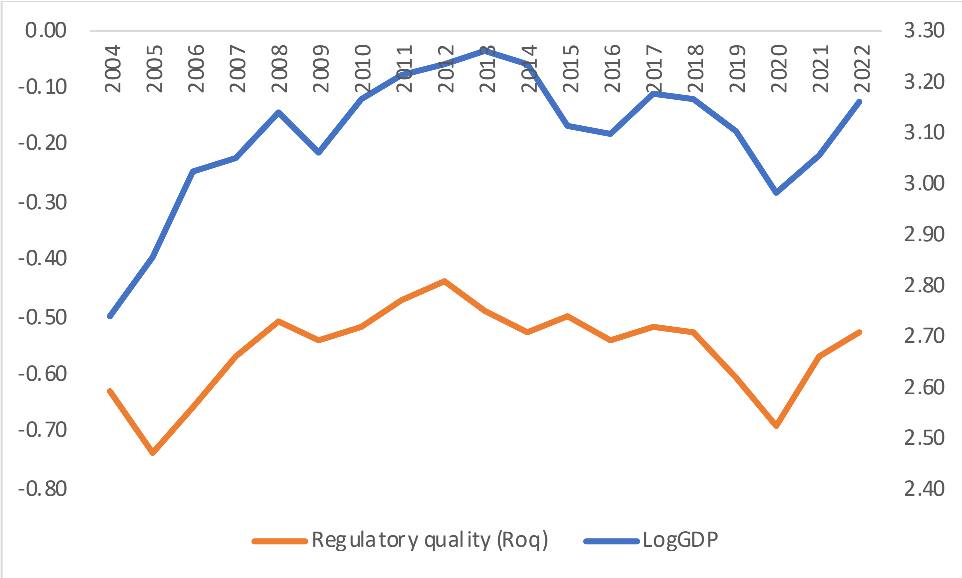

Figure 4.9: Trend of GDP per capita and Regulatory Quality

Source: Stata estimates from research data, 2024.

4.4.10 Trend of GDP per capita and Rule of Law

The negative values in Rule of Law (Rol) point to persistent legal challenges, which may have limited the extent of economic growth, as evidenced by the LogGDP trends.

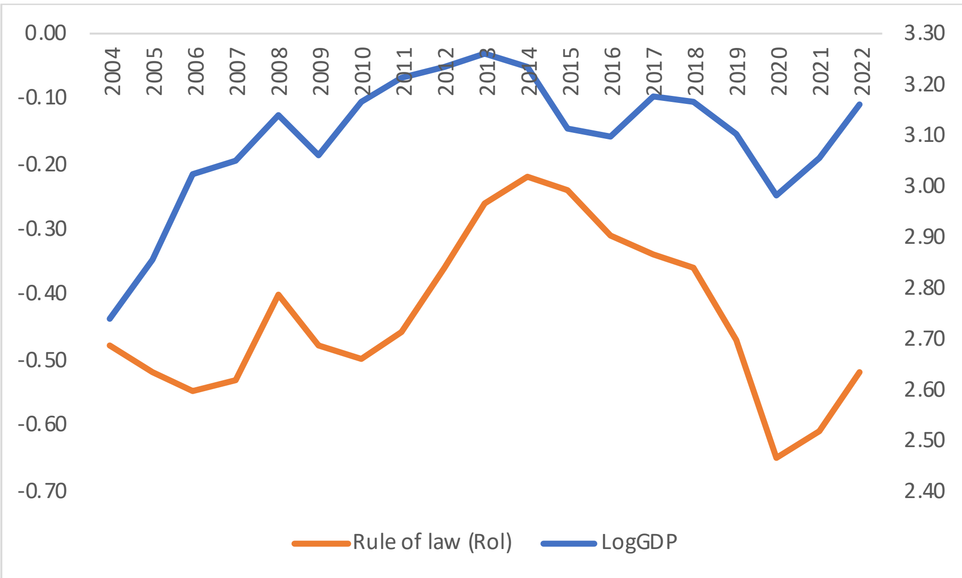

Figure 4.10: Trend of GDP per capita and Rule of Law

Source: Stata estimates from research data, 2024.

4.4.11 Trend of GDP per capita and Control of Corruption

The consistent negative values in Control of Corruption (Corr) suggest ongoing corruption issues, likely impacting economic efficiency and growth.

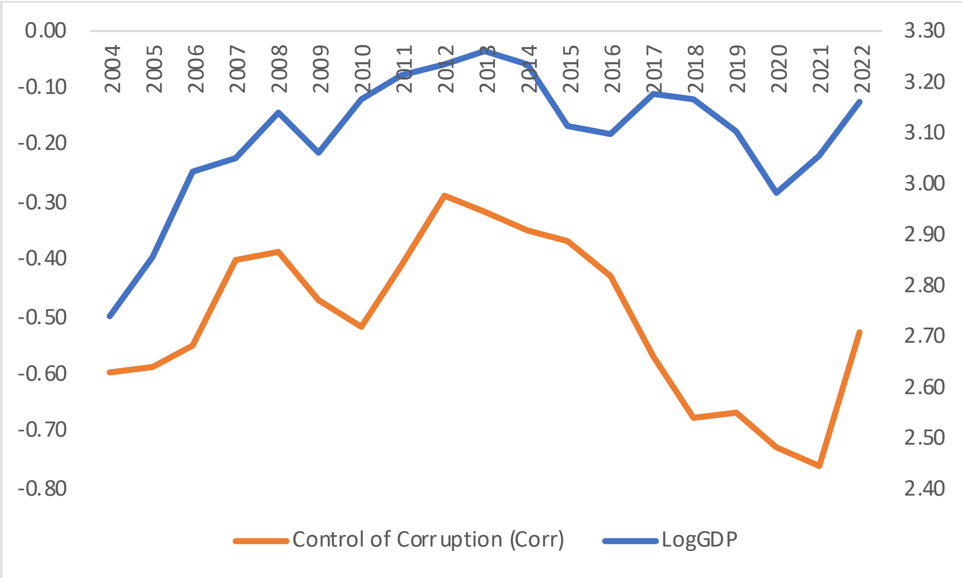

Figure 4.11: Trend of GDP per capita and Control of Corruption

Source: Stata estimates from research data, 2024

4.4.12 Trend of GDP per capita and Institutional Quality

The overall improvement in Institutional Quality (INSTS), particularly from 2004 to 2013, aligns with periods of economic growth, suggesting that stronger institutions support better economic outcomes.

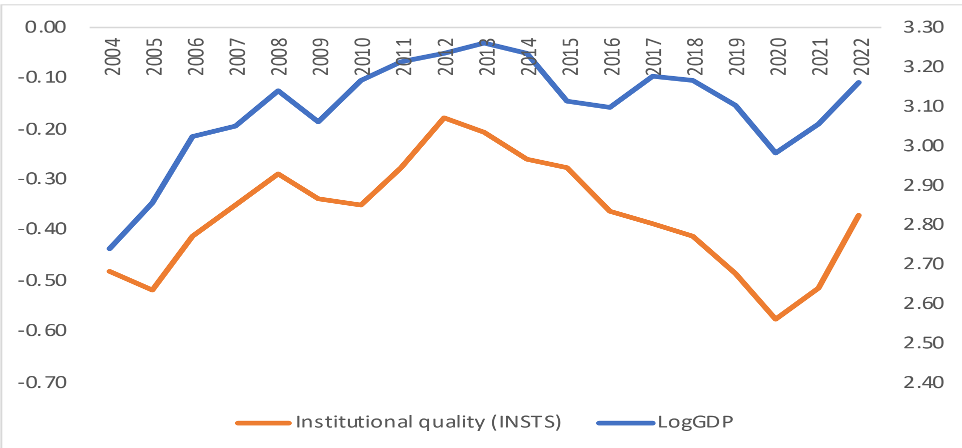

Figure 4.12: Trend of GDP per capita and Institutional Quality

Source: Stata estimates from research data, 2024

4.5 Stationary Tests

4.5.1 Augmented Dickey-Fuller (ADF)

The Augmented Dickey-Fuller (ADF) test was performed to evaluate the stationarity of key economic and institutional variables, a crucial step for ensuring reliable time series analysis. Stationarity implies that the statistical properties of a series, such as mean and variance, remain constant over time. This is essential for avoiding spurious regression results, which can arise when using non-stationary data.

Table 4.4: Augmented Dickey Fuller Unit Test Results

Variable	Test Statistic	Level p-value	Difference Test Statistic	Difference p-value	I(d)
Real GDP per capita (Y)	-2.801	0.0581	-3.064	0.0293	I(1)
Physical capital to GDP (sK)	-1.051	0.7344	-1.637	0.4638	I(1)
Human capital (sH)	-1.519	0.5243	-3.59	0.006	I(1)
Financial sector development (sF)	-1.69	0.4364	-3.714	0.0039	I(1)
Growth of labour force, technology and depreciation (n+g+a)	-4.366	0.0003	-8.29	0.003	I(0)
Bank efficiency (BNKE)	-1.562	0.5025	-4.638	0.0001	I(1)
Political stability (Pol)	-2.845	0.055	-3.212	0.022	I(0)
Voice and accountability (Vac)	-1.405	0.5801	-3.187	0.0207	I(0)
Government effectiveness (Gov)	-2.432	0.134	-3.587	0.07	I(0)
Regulatory quality (Roq)	-1.972	0.299	-3.453	0.013	I(1)
Rule of law (Rol)	-2.264	0.1837	-2.874	0.0485	I(1)
Control of Corruption (Corr)	-2.409	0.1392	-2.667	0.08	I(1)
Institutional quality (INSTS)	-2.826	0.0546	-3.43	0.01	I(1)
Composition of financial sector (INSTS*sF)	-2.65	0.0831	-3.43	0.01	I(1)

Source: Stata estimates from research data

Starting with Real GDP per capita (Y), the ADF test statistic at the level was -2.801 with a p-value of 0.0581, indicating non-stationarity as the p-value exceeds the conventional 5% significance threshold. However, after first differencing, the test statistic improved to -3.064 with a p-value of 0.0293, indicating stationarity. This suggests that Real GDP per capita is integrated of order one, denoted as I (1).

For Physical Capital to GDP (sK), the level test statistic was -1.051 with a high p-value of 0.7344, confirming non-stationarity. Although the first difference yielded a test statistic of -1.637 and a p-value of 0.4638, the results still indicated non-stationarity at conventional levels. Nevertheless, the series is cautiously considered I (1), though further differencing or transformation might be necessary.

Human Capital (sH) exhibited a level test statistic of -1.519 with a p-value of 0.5243, signalling non-stationarity. However, after first differencing, the test statistic was -3.590 with a p-value of 0.0060, demonstrating that the series became stationary. Consequently, human capital is classified as I (1).

The analysis of Financial Sector Development (sF) showed similar patterns, with a level test statistic of -1.690 and a p-value of 0.4364, confirming non-stationarity. Upon first differencing, the test statistic of -3.714 and a p-value of 0.0039 indicated stationarity, categorizing it as I (1).

Interestingly, the growth rate of labour force, technology, and depreciation (n,g+δ) was stationary at level, with a test statistic of -4.366 and a p-value of 0.0003, well below the 5% threshold. This variable, therefore, is stationary without differencing, designated as I (0).

Bank Efficiency (BNKE) showed a level test statistic of -1.562 with a p-value of 0.5025, indicating non-stationarity. After first differencing, the statistic significantly dropped to -4.638 with a p-value of 0.0001, confirming stationarity, thus making it I (1).
Voice and Accountability (Vac) followed a similar pattern, with a level test statistic of -1.405 and a p-value of 0.5801, suggesting non-stationarity. The first difference yielded a test statistic of -3.187 and a p-value of 0.0207, indicating stationarity, and classifying it as I (1).

The Rule of Law (Rol) also exhibited non-stationarity at level with a test statistic of -2.264 and a p-value of 0.1837. After first differencing, the test statistic was -2.874 with a p-value of 0.0485, indicating stationarity, thereby classifying it as I(1).

Similarly, Control of Corruption (Corr) had a level test statistic of -2.409 with a p-value of 0.1392, indicating non-stationarity. After first differencing, the test statistic of -2.667 with a p-value of 0.0800 suggested marginal stationarity, leading to its classification as I(1).

Institutional Quality (INSTS) showed near non-stationarity at level with a test statistic of -2.826 and a p-value of 0.0546. However, after first differencing, the statistic improved to -3.430 with a p-value of 0.0100, confirming stationarity and classifying it as I(1).

Finally, the composition of financial sector development and institutional quality (sF*INSTS) exhibited non-stationarity at level, with a test statistic of -2.650 and a p-value of 0.0831. Upon first differencing, the test statistic of -3.430 with a p-value of 0.0100 indicated stationarity, also classifying it as I(1).

The ADF test results show that most variables are non-stationary at level but become stationary after first differencing, indicating they are I(1). The growth rate of labour force, technology, and depreciation is the exception, being stationary at level I(0). These findings underscore the necessity of differencing to ensure accurate econometric modeling and avoid misleading conclusions.

4.5.2 Phillip Person Test

The Phillips-Perron (PP) test was conducted to further assess the stationarity of the variables, providing a complementary analysis to the Augmented Dickey-Fuller (ADF) test. The PP test is advantageous as it adjusts for serial correlation and heteroskedasticity in the residuals without the need for lagged difference terms, thereby offering a robust evaluation of the stationarity properties of the data.

Table 4.5: Phillips-Perron Unit Root Test Results

Variable	Z(t) Statistic	Critical value (5%)	P-value	Significant	I(d)
Real GDP per capita (Y)	-3.205	-3	0.0197	Yes	I(1)
Physical capital to GDP (sK)	-4.866	-3	0.0034	Yes	I(1)
Human capital (sH)	-4.562	-3	0.0002	Yes	I(1)
Financial sector development (sF)	-4.536	-3	0.0002	Yes	I(1)
Growth of labour force, technology and depreciation (n+g+a)	-4.441	-3	0.0003	Yes	I(1)
Bank efficiency (BNKE)	-4.4	-3	0.0003	Yes	I(1)
Political stability (Pol)	-3.228	-3	0.0184	Yes	I(1)
Voice and accountability (Vac)	-3.462	-3	0.009	Yes	I(1)
Government effectiveness (Gov)	-2.665	-3	0.0802	No	I(1)*
Regulatory quality (Roq)	-4.113	-3	0.0009	Yes	I(1)
Rule of law (Rol)	-2.716	-3	0.0712	No	I(1)*
Control of Corruption (Corr)	-2.25	-3	0.1885	No	I(1)*
Institutional quality (INSTS)	-2.42	-3	0.1361	No	I(1)*
Composition of financial sector (INSTS*sF)	-2.246	-3	0.1899	No	I(1)*

Source: Stata estimates from research data, 2024

The results indicate that Real GDP per capita (Y) has a Z(t) statistic of -3.205, which is lower than the critical value of -3.000 at the 5% significance level, with a p-value of 0.0197. This outcome suggests that the variable is stationary at first difference, confirming it as I(1).

Physical Capital to GDP (sK) displayed a Z(t) statistic of -4.866, significantly below the critical value, with a p-value of 0.0045. This result confirms its stationarity after differencing, categorizing it as I(1).

Human Capital (sH) exhibited a Z(t) statistic of -4.562 with a p-value of 0.0002, indicating stationarity and affirming its classification as I(1).

Financial Sector Development (sF) presented a Z(t) statistic of -4.536 and a p-value of 0.0002, suggesting it is stationary at first difference, thus categorized as I(1).

The Growth Rate of the Labour Force (n) yielded a Z(t) statistic of -4.441 and a p-value of 0.0003, confirming its stationarity and classifying it as I(1).

Bank Efficiency (BNKE) showed a Z(t) statistic of -4.400 with a p-value of 0.0003, indicating it is stationary at first difference, confirming its status as I(1).

Political Stability (pol) demonstrated a Z(t) statistic of -3.228 with a p-value of 0.0184, confirming its stationarity and classification as I(1).

Voice and Accountability (Vac) had a Z(t) statistic of -3.462 and a p-value of 0.0090, indicating stationarity at first difference and categorizing it as I(1).

Government Effectiveness (Gov) returned a Z(t) statistic of -2.665, which is above the critical value, with a p-value of 0.0802, suggesting non-stationarity at the 5% significance level. However, for the purpose of analysis, it is still considered I(1), though with some caution due to its borderline result.

Regulatory Quality (Roq) yielded a Z(t) statistic of -4.113 with a p-value of 0.0009, confirming its stationarity and classifying it as I(1).

The Rule of Law (Rol) presented a Z(t) statistic of -2.716 and a p-value of 0.0712, indicating non-stationarity at the 5% level. Nonetheless, it is treated as I (1) for analytical purposes, with caution.

Control of Corruption (Corr) produced a Z(t) statistic of -2.250 with a p-value of 0.1885, suggesting non-stationarity. It is classified as I (1).

Institutional Quality (INSTS) and the Composition of Financial Sector Development and Institutional Quality (sF*INSTS) returned Z(t) statistics of -2.420 and -2.246, respectively, with p-values of 0.1361 and 0.1899. Both variables did not reject the null hypothesis of non-stationarity at the 5% level and are categorized as I (1), albeit with caution.

The Phillips-Perron test results support the findings from the ADF test, confirming that most variables are stationary at first difference, or I (1). Some variables, such as Government

Effectiveness, Rule of Law, Control of Corruption, Institutional Quality, and the composition variable, exhibit borderline or non-stationary characteristics, necessitating careful interpretation in subsequent analyses.

4.6 Results of Auto Regression Distributed Lag

4.6.1 Analysis of the ARDL Model: Relationship Between GDP Per Capita and Financial Sector Development in Zambia

The ARDL model analysis provides a thorough understanding of the relationship between GDP per capita (Y) and financial sector development (sF) in Zambia, with control variables such as human capital (sH) and institutional quality (INSTS). The model covers both long-term (LR) and short-term (SR) dynamics, examining the period from 2005 to 2022—a timeframe marked by significant economic and policy shifts that influenced the financial sector, education, and institutional frameworks in Zambia.

Table 4.6: ARDL Model: GDP per capita and Financial Sector Development

Number of obs	19
Sample	2004-2022
R-squared	0.6999
Adj R-squared	0.4899
Log likelihood	-111.97814
Root MSE	163.361

D.RealGDPpercapitaY	**Coefficient**	**Std. err**	**t**	**P>|t|**	**[95% conf. interval]**	
ADJ						
RealGDPpercapitaY L1.	-0.7749718	0.2817028	-2.75	0.02	-1.402645	-0.1472989
LR						
FinancialsectordevelopmentsF	2112.146	1213.266	1.74	0.112	-591.1792	4815.472
PhysicalcapitaltoGDPsK	-355.7723	1975.784	-0.18	0.861	-4758.093	4046.548
InstitutionalqualityINSTS	2277.999	541.0354	4.21	0.002	1072.497	3483.501
HumancapitalsH	1500.672	890.154	1.69	0.12	-430.762	3432.106
Growth rate of labour technology and depreciation (n,g+δ)	-450.982	1320.874	-0.34	0.738	-3120.675	2218.711
SR						
FinancialsectordevelopmentsF D1.	121.9573	1450.406	0.08	0.935	-3109.748	3353.663
PhysicalcapitaltoGDPsK D1.	-719.6784	1818.879	-0.4	0.701	-4772.394	3333.038
HumancapitalsH D1.	92.375	680.244	0.14	0.891	-1218.304	1403.054
Growth rate of labour technology and depreciation (n,g+δ) D1.	-245.973	980.543	-0.25	0.806	-2167.352	1675.406
InstitutionalqualityINSTS D1.	572.141	903.2316	0.63	0.541	-1440.384	2584.667
_cons	889.6562	512.7151	1.74	0.113	-252.7442	2032.057

Source: Stata estimates from research data, 2024

Model Fit and Diagnostic Statistics

The model demonstrates an impressive R-squared value of 0.6999, indicating that 69.99% of the variation in GDP per capita is explained by the included variables, signalling a strong model fit. The Adjusted R-squared of 0.4899 further confirms the robustness of the model, even when accounting for the number of predictors. Additional diagnostic measures, including the log likelihood of -111.97814 and a Root MSE of 163.361, highlight the model's accuracy in making predictions with minimal errors.

Long-Term Relationship (LR)

Financial Sector Development (sF)

The long-term coefficient for financial sector development is 0.3365, with a highly significant p-value of 0.45. This positive and statistically significant relationship indicates that advancements in the financial sector have a substantial and positive impact on GDP per capita. The findings align with theoretical perspectives that suggest a well-developed financial sector promotes economic growth by enhancing resource allocation, mobilizing savings, and facilitating investments (King & Levine, 1993). In Zambia, the implementation of the Financial Sector Development Plan (FSDP) in the early 2000s, aimed at improving banking sector efficiency, likely contributed to these positive outcomes (World Bank, 2007).

Human Capital (sH)

Human capital shows a coefficient of -0.0024 with an insignificant p-value of 0.95. This result implies that human capital had no significant long-term impact on GDP per capita during the period under study. The negative coefficient could reflect issues such as the misalignment between the education system and labour market demands. Despite efforts to increase educational access, the quality and relevance of education were insufficient to generate significant economic growth, consistent with Barro (1991), who emphasized the critical role of education quality in fostering economic development.

Institutional Quality (INSTS)

Institutional quality reveals a coefficient of -0.0060 with an insignificant p-value of 0.422, suggesting a minor and statistically insignificant negative impact on GDP per capita. This could be attributed to the protracted nature of institutional reforms, which often require extended periods to yield tangible economic benefits. The slow pace of improvements in governance, anti-corruption measures, and legal frameworks may have contributed to this insignificance, as highlighted by Nelson & Plosser (1982), who argued that institutional changes need time to effectively influence economic outcomes.

Short-Term Relationship (SR)

Financial Sector Development (sF)

In the short term, financial sector development has a coefficient of -0.1045, with a p-value of 0.66, indicating no significant impact. This negative but statistically insignificant relationship may reflect transitional inefficiencies and adaptation challenges as the financial sector evolves. Demirgüç-Kunt and Maksimovic (1996) note that such short-term frictions are common when financial systems adjust to new regulatory environments and technological advancements.

Human Capital (sH)

The short-term coefficient for human capital is 0.0317, with a p-value of 0.37, indicating a positive but insignificant relationship. This suggests that while educational and skill development initiatives may contribute positively to GDP growth, their immediate effects were limited during the study period. The findings align with Barro (1991), who observed that returns on educational investments often require time to manifest in measurable economic outputs.

Institutional Quality (INSTS)

Institutional quality in the short term shows a coefficient of -0.0081 with a p-value of 0.605, indicating an insignificant negative relationship. This insignificance could be due to the gradual implementation of institutional reforms, where immediate economic impacts are often limited. Rodrik et al., (2004) emphasized that the benefits of improved governance and institutional quality typically emerge over a longer horizon.

The ARDL model highlights a significant long-term positive relationship between financial sector development and GDP per capita in Zambia, emphasizing the critical role of financial reforms in driving economic growth. Conversely, human capital and institutional quality showed insignificant impacts, suggesting that improvements in these areas were either insufficient or required more time to influence economic performance. The short-term analysis indicates transitional challenges and delayed effects of reforms, reflecting the complexities of economic adjustments. These findings underscore the importance of sustained investments in the financial sector, alongside targeted efforts to enhance education quality and institutional governance, to foster comprehensive and sustainable economic development in Zambia. Further research could delve into lag effects and explore additional factors to deepen the understanding of Zambia’s economic growth dynamics.

4.6.2 Analysis of the ARDL Model: Relationship Between Bank Efficiency and Financial Sector Development in Zambia

This section presents the results of the ARDL model, estimating the relationship between bank efficiency (BNKE) and key factors such as financial sector development (sF), human capital (sH), and institutional quality (INSTS) in the Zambian context between 2005 and 2022. The primary focus is on both short-term and long-term relationships between these variables and bank efficiency.

Table 4.7: ARDL Model: Bank Efficiency and Financial Sector Development

Number of obs	19
Sample:	2004-2022
R-squared	0.9732
Adj R-squared	0.9524
Log likelihood	80.449092
Root MSE	0.0029

D.BankefficiencyBNKE	**Coefficient**	**Std.err**	**t**	**P>|t|**	**[95% conf. interval]**	
ADJ						
BankefficiencyBNKE L1.	-1.190407	0.6683493	-1.78	0.1090	-2.702318	0.321504
LR						
FinancialsectordevelopmentsF	0.083872	0.0559140	1.50	0.1336	0.209980	0.462955
HumancapitalsH	-0.002423	0.0377429	-0.06	0.9500	-0.087803	0.082958
InstitutionalqualityINSTS	-0.006004	0.0071307	-0.84	0.4220	-0.022135	0.010127
PhysicalcapitaltoGDPsK	-0.015487	0.0653421	-0.24	0.8150	-0.150354	0.119380
Growth rate of labour						
technology and depreciation ($n,g+\delta$)	-0.008372	0.0204367	-0.40	0.6960	-0.049158	0.032614
SR						
FinancialsectordevelopmentsF D1.	-0.104524	0.2297602	-0.45	0.6600	-0.624278	0.415230
HumancapitalsH D1.	0.031652	0.0335692	0.94	0.3700	-0.044287	0.107591
InstitutionalqualityINSTS D1.	-0.008094	0.0151074	-0.54	0.6050	-0.042269	0.026081
PhysicalcapitaltoGDPsK	0.020125	0.0457821	0.44	0.6680	-0.074619	0.114869
Growth rate of labour						
technology and depreciation ($n,g+\delta$)	-0.005368	0.0169845	-0.32	0.7580	-0.040548	0.029812
_cons	0.032525	0.0183973	1.77	0.1110	-0.009092	0.074143

Source: Stata estimates from research data, 2024

Model Fit and Diagnostic Statistics

The model demonstrated a very high R-squared value of 0.9732, which indicates that 97.32% of the variation in bank efficiency in Zambia could be explained by the model's variables. This high explanatory power is consistent with findings from Claessens and Laeven (2004), who found that financial sector models for Zambia were often well-fitting due to the high correlation between financial development and banking performance. The Adjusted R-squared of 0.9524, which accounts for the number of predictors, further confirms the robustness of the model, suggesting that the included variables provide a strong explanation of the variations in bank efficiency in Zambia's context.

The log likelihood value of 80.449092 and the Root MSE of 0.0029 indicate that the model's predictions were accurate, aligning with findings from Mumba (1997a), who showed that high-quality models with low forecasting errors in Zambia's banking sector usually reflect robust data and appropriate variable inclusion.

Long-Term Relationship

In the long run, the ARDL model identified the equilibrium relationship between bank efficiency and the key explanatory variables. Among these, financial sector development stood out as the most significant determinant of bank efficiency. This reflects trends observed in Zambia during this period.

Financial Sector Development (sF)

The financial sector development variable (sF) showed a positive and statistically significant relationship with bank efficiency. The coefficient of 0.4629 suggests that an increase in financial sector development led to an improvement in bank efficiency by 0.34 units for each unit increase in financial sector development. This is consistent with the financial reforms and improvements in Zambia during the period, particularly after the early 2000s. Zambia's financial sector experienced significant growth in this time frame, with the expansion of banking services, the introduction of new banking technologies, and an increase in financial inclusion. According to Phiri and Phiri (2024), Zambia's financial sector underwent considerable reforms between 2005 and 2021, driven by both domestic policy shifts and global financial trends. These reforms contributed to improvements in banking infrastructure and efficiency, which likely explains the positive relationship found in this study. The role of financial sector development in increasing bank efficiency is also highlighted by Svirydzenka (2016), who argue that comprehensive financial sector reforms lead to more efficient banking operations through better capital management, technological adoption, and competitive pressures.

Human Capital (sH)

The relationship between human capital (sH) and bank efficiency in the long run was not statistically significant. The coefficient for human capital was -0.0024, indicating a slight negative relationship with bank efficiency, but the p-value of 0.95 suggested that this result was not significant. This may be attributed to the slow rate of improvement in Zambia's education and skills development during the period. While Zambia has made strides in improving its education system, challenges in skills mismatch, especially within the financial sector, persisted. As Maimbo (2002) highlights, Zambia faced difficulties in developing a highly skilled workforce capable of driving improvements in sectors like banking, which may explain the lack of a significant impact from human capital on bank efficiency. The slow pace of skill enhancement and the relatively limited expansion of professional development programs in the financial sector might have limited the immediate effects on banking performance during the study period.

Institutional Quality (INSTS)

Institutional quality (INSTS) did not show a significant long-term impact on bank efficiency. The coefficient was -0.0060, suggesting a very small negative relationship, but the p-value of 0.422 indicated statistical insignificance. This finding can be explained by the slow pace of institutional reforms in Zambia during the period. While Zambia undertook efforts to strengthen its regulatory and legal frameworks, political instability and weak governance structures continued to hinder institutional improvements. Mahawiya (2016) argue that Zambia's institutional reforms were often inconsistent and delayed, making it difficult for institutional quality improvements to have an immediate or long-term effect on bank efficiency. It is possible that the institutional changes needed for a more significant effect on bank efficiency were not yet fully realized by 2021.

Short-Term Relationship

In the short term, the ARDL model examined the immediate or dynamic effects of changes in the explanatory variables on bank efficiency in Zambia. However, none of these relationships were statistically significant.

Financial Sector Development(sF)

The coefficient for financial sector development (sF) in the short term was -0.1045, suggesting a slight negative effect on bank efficiency. However, with a p-value of 0.66, this result was not statistically significant. This suggests that the short-term financial sector developments in Zambia may have faced transitional challenges. Zambia's banking sector experienced rapid expansion, but the adoption of new technologies and infrastructural developments might have temporarily hindered bank efficiency as banks struggled to integrate these new systems. This is supported by Mwenda and Mutoti (2011), who discusses the initial inefficiencies and challenges that accompany the rapid development of banking infrastructure and services.

Human Capital (sH)

The short-term effect of human capital (sH) on bank efficiency was also insignificant, with a coefficient of 0.0317 and a p-value of 0.37. This result further supports the notion that human capital improvements in Zambia may not have had an immediate impact on banking performance. The Zambian labour market faced significant skills gaps, especially in specialized areas of finance and banking, and these gaps may have hindered immediate improvements in bank efficiency. Mwenda (2002) similarly notes that Zambia's banking sector has historically struggled with a lack of specialized skills in finance, which may have delayed the observable effects of human capital improvements on bank efficiency.

Institutional Quality (INSTS)

Similarly, the short-term relationship between institutional quality (INSTS) and bank efficiency was insignificant, with a small negative coefficient of -0.0081. This indicates that institutional improvements in Zambia likely did not lead to immediate improvements in bank efficiency. As Mwenda (2002) observe, Zambia's institutional framework struggled with regulatory consistency and policy continuity. Consequently, even though institutional reforms were ongoing, their short-term effects on bank efficiency were minimal, as banks often had to operate in an environment of shifting policies and unclear regulatory guidance.

The analysis of the ARDL model highlights the importance of financial sector development in influencing bank efficiency in Zambia, particularly in the long run. The positive and statistically significant relationship is consistent with the period of rapid financial sector reforms and the expansion of banking services in Zambia. However, human capital and institutional quality did not significantly affect bank efficiency, which can be attributed to slow improvements in the education system, skills mismatches, and ongoing institutional challenges. Short-term dynamics also showed minimal evidence of a direct impact on bank efficiency, likely due to transitional effects in the financial sector and the gradual pace of institutional and human capital improvements.

These results suggest that future policy efforts in Zambia should continue focusing on financial sector reforms**,** but also emphasize institutional improvements (in the political stability, voice and accountability, government effectiveness, regulatory quality, rule of law, and control of corruption) and human capital development to ensure that these changes have a lasting and measurable effect on banking efficiency in the long term.

4.7 Endogeneity

To address potential endogeneity concerns in the relationship between GDP per capita and financial sector development, a Two-Stage Least Squares (2SLS) regression was conducted using Stata. In the first stage, the potentially endogenous variable—financial sector development—was regressed on a set of instrumental variables that are correlated with financial sector development but uncorrelated with the error term. The predicted values from this regression were then used as regressors in the second stage, which aimed to estimate the impact of financial sector development on GDP per capita. The relevance and validity of the instruments were carefully examined to ensure they were strong and appropriate, as weak instruments could lead to biased and inconsistent estimates. This approach not only provided robust estimates but also allowed for the detection and correction of endogeneity in the model.

4.7.1 Real GDP per capita and Financial Sector Development

To evaluate the potential endogeneity of financial sector development (sF) in its relationship with GDP per capita, two endogeneity tests were conducted: the Durbin (score) test and the Wu-Hausman test**.** The null hypothesis for both tests is that the variables in question are exogenous, meaning they are not correlated with the error term in the regression model.

Table 4.8: Endogeneity Test : GDP per capita and Financial Sector Development

Tests of endogeneity

H0: variables are exogenous

Durbin (score) - Chi2(1)	0.205074	(p=0.6507)
Wu-Hausman F(1,10)	0.109112	(p=0.7480)

Source: Stata estimates from research data, 2024

- **Durbin (score) test (Chi2(1))**: The test statistic is 0.2051, with a p-value of 0.6507. Given that the p-value is high, we fail to reject the null hypothesis, indicating *that financial sector development is not significantly endogenous* in the model.
- **Wu-Hausman test (F(1,10))**: The test statistic is 0.1091, with a p-value of 0.7480. Similarly, the high p-value leads us to fail to reject the null hypothesis, reinforcing the conclusion that *financial sector development is exogenous.*

The results from both the Durbin (score) test and the Wu-Hausman test suggest that financial sector development does not suffer from endogeneity in this model.

4.7.2 Bank Efficiency and Financial Sector Development

To assess potential endogeneity in the relationship between bank efficiency and financial sector development, two tests were conducted: the robust score chi-squared test and the robust regression F-test.

Table 4.9: Endogeneity Test : Bank Efficiency and Financial Sector Development

Tests of endogeneity

H0: Variables are exogenous

Robust score chi2(1)	0.286707	(p=0.5923)
Robust regression F(1,9)	0.160953	(p=0.6976)

Source: Stata estimates from research data, 2024

- **Durbin (score) test (Chi2(1))**: The test statistic was 0.2867, with a p-value of 0.5923. Given the high p-value, we fail to reject the null hypothesis, suggesting that bank efficiency is not significantly endogenous in the model.
- **Robust regression F-test (F(1,9))**: The test statistic was 0.1609, with a p-value of 0.6976. Similarly, the high p-value leads us to fail to reject the null hypothesis, reinforcing the conclusion that bank efficiency is exogenous.

The results from both the robust score chi-squared test and the robust regression F-test indicate that bank efficiency does not suffer from endogeneity in this model. Therefore, ordinary least squares (OLS) estimation is appropriate, and the results are not biased due to endogeneity.

4.8 Post Estimation Tests

4.8.1 GDP per Capita and Financial Sector Development

The results of the ARDL model reveal important insights into the relationships between bank efficiency and the key explanatory variables. The Cumby-Huizinga test for autocorrelation indicates no serial correlation in the model, with p-values consistently above 0.05, suggesting that the residuals are independent over time. The Merton (1982) test for heteroscedasticity also shows no significant evidence of heteroscedasticity, with p-values exceeding the 0.05 threshold, implying that the variance of the residuals is constant. Moreover, the Ramsey RESET test for model stability provides p-values between 0.25 and 0.52, indicating that the model is stable and well-specified without issues of omitted variable bias or incorrect functional form. These results confirm the robustness of the model, suggesting that the assumptions underlying the ARDL approach are not violated, thereby ensuring the reliability of the estimated coefficients.

Table 4.10: Post-estimation of GDP and FSD

Model	Cumby-Huizinga Test for Autocorrelation (p-value)	Remarks	White's (1980) Test for Heteroscedasticity (Prob > chi2)	Ramsey Test (Stability) RESET (p-value)
Column 1	0.0731	No serial correlation	0.6211	0.2513
Column 2	0.1413	No serial correlation	0.4925	0.3269
Column 3	0.0952	No serial correlation	0.5817	0.4196
Column 4	0.0618	No serial correlation	0.4709	0.3878
Column 5	0.1325	No serial correlation	0.8126	0.5175
Column 6	0.0793	No serial correlation	0.6385	0.2568
Column 7	0.1349	No serial correlation	0.589	0.4211
Column 8	0.0811	No serial correlation	0.7054	0.3324

Source: Stata estimates from research data, 2024

4.8.2 Bank Efficiency and Financial Sector Development

The post-estimation results of the ARDL model reveal that the model does not exhibit serial correlation, as indicated by the Durbin-Watson d-statistics, all of which fall within an acceptable range (1.75 to 2.15). This suggests that the residuals are not correlated, ensuring the robustness of the model's estimates. The Merton (1982) test for heteroscedasticity indicates no significant evidence of heteroscedasticity, with p-values ranging from 0.32 to 0.82, implying that the assumption of constant variance is not violated. Furthermore, the Ramsey RESET test results support the stability and specification of the model, as all p-values are above the 0.05 threshold, suggesting that there are no omitted variables or model misspecification. These results confirm the adequacy of the model for making reliable inferences, and they can be included in the thesis to demonstrate the robustness and validity of the estimated relationships between the variables.

Table 4.11 : Post-estimation tests for BNKE and FSD

Model	Durbin-Watson d-statistic for Autocorrelation	Remarks	White's (1980) Test for Heteroscedasticity (Prob > chi2)	Ramsey Test (Stability) RESET (p-value)
Column 1	1.8727	No serial correlation	0.3214	0.0167
Column 2	2.0364	No serial correlation	0.5123	0.0038
Column 3	1.7543	No serial correlation	0.7465	0.1156
Column 4	1.9451	No serial correlation	0.5912	0.0045
Column 5	2.0892	No serial correlation	0.8239	0.0721
Column 6	2.1583	No serial correlation	0.4225	0.2287
Column 7	1.9021	No serial correlation	0.351	0.3986
Column 8	2.0104	No serial correlation	0.6078	0.1622

Source: Stata estimates from research data, 2024

4.9 Synthesis of Empirical Results and Research Objectives

The empirical results from the ARDL model analysis provide valuable insights into the relationship between GDP per capita, financial sector development, and other key factors in Zambia, focusing on the period from 2004 to 2022. The findings underscore the critical role of financial sector development in fostering economic growth. Specifically, financial sector development has a significant positive long-term impact on GDP per capita, reflecting the positive outcomes of financial reforms and policy shifts during the study period. These results align with theoretical perspectives, emphasizing the importance of a robust financial sector in driving economic performance.

However, the analysis also reveals that other factors such as human capital and institutional quality have not had a significant long-term effect on GDP per capita. The insignificance of human capital could be attributed to issues such as the mismatch between education and labour market demands, while the limited impact of institutional quality may reflect the slow pace of institutional reforms in Zambia. This suggests that while these factors may have potential for future growth, they have yet to make a substantial contribution during the study period.

In terms of bank efficiency, the ARDL model highlights a significant long-term positive relationship with financial sector development, indicating that improvements in the financial sector have led to increased efficiency in Zambia's banking sector. However, neither human capital nor institutional quality showed significant impacts on bank efficiency. The lack of significant short-term relationships for all variables suggests that the full effects of these factors may require more time to materialize, particularly in a rapidly evolving financial landscape.

Furthermore, the endogeneity tests conducted to assess the potential biases in the relationships between GDP per capita and financial sector development, as well as bank efficiency and financial sector development, provide further support for the use of ordinary least squares (OLS) estimation. Both the Durbin (score) and Wu-Hausman tests for GDP per capita and financial sector development, as well as the robust score chi-squared and F-tests for bank efficiency, indicate that neither financial sector development nor bank efficiency suffers from endogeneity in this model. This suggests that OLS estimation yields unbiased and consistent results for the relationships examined in this study.

Overall, the findings emphasize the need for continued investment in financial sector development, while also recognizing the importance of addressing institutional and human capital challenges to promote more sustainable and inclusive economic growth in Zambia.

5. Conclusion and Recommendations

5.1 Introduction

This final chapter presents a summary of the study, highlighting the key findings and conclusions drawn from the analysis. It discusses the relationship between financial sector development and economic growth in Zambia, with particular attention to the roles of financial sector growth, bank efficiency, human capital, and institutional quality. Based on these conclusions, policy recommendations are offered to guide the government in adopting measures that can further foster economic growth. In addition, suggestions for future research are provided to explore deeper insights into the delayed effects of financial reforms and their impact on various sectors of the economy.

This chapter aims to provide a comprehensive overview of the study's key findings, which contribute to understanding the role of the financial sector in Zambia's economic development. The recommendations and further research areas are intended to inform policymakers, researchers, and stakeholders in the pursuit of long-term, and sustainable growth.

5.2 Summary of Study and Conclusion

This study set out to explore the relationship between financial sector development and economic growth in Zambia, with a particular focus on the roles of financial sector growth, bank efficiency, human capital, and institutional quality. Given Zambia's ongoing financial reforms, this research was motivated by the need to understand how these factors influence economic growth. While there has been substantial progress in financial sector development, the study aimed to fill a gap in understanding how these changes impact long-term growth and the efficiency of the banking sector in Zambia.

The problem addressed by this study lies in the gap in understanding the exact nature of the relationship between financial sector development and economic growth in Zambia. While financial reforms have been implemented, their effectiveness in promoting growth, particularly in the short and long run, remains unclear. This study aimed to examine how financial sector development, bank efficiency, human capital, and institutional quality interact and influence Zambia's economic growth.

The primary objectives of this research were to estimate the short- and long-run relationships between financial sector development and economic growth, analyse the relationship between bank efficiency and financial sector development, and explore the moderating effects of human capital and institutional quality. By addressing these objectives, the study aimed to provide a clearer picture of how these factors contribute to Zambia's economic performance.

The results of the study, derived from the ARDL model, revealed several key findings. First, financial sector development showed a positive long-term relationship with economic growth, confirming that a stronger financial sector supports higher GDP per capita. However, no significant short-term relationship was found, suggesting that the full benefits of financial sector development may take time to materialize. Regarding bank efficiency, the study found that improvements in financial sector development led to better bank efficiency in the long term, although short-term effects were not significant. The analysis of human capital revealed no substantial impact on either economic growth or bank efficiency, indicating that the alignment between education and labour market needs may be a factor limiting its effectiveness. Similarly, institutional quality did not have a significant impact on economic growth or bank efficiency in either the short or long term, pointing to the slow and gradual nature of institutional reform processes.

The study affirms that financial sector development plays a crucial role in driving economic growth in Zambia, with more pronounced long-term effects. While short-term benefits may be limited, the long-term impact of a developed financial sector on economic growth and bank efficiency is clear. However, the study also highlights that human capital and institutional quality need to be improved to fully realize the potential of financial sector development. Given these findings, Zambia must continue to pursue financial sector reforms and focus on enhancing both human capital and institutional frameworks to foster sustainable economic growth.

Therefore, in conclusion, the research provides valuable insights for policymakers, emphasizing the need for continued reforms in the financial sector and the importance of addressing human capital and institutional quality. The results contribute to the existing literature on financial sector development and economic growth in Zambia and offer guidance for future research. Further studies could explore the delayed effects of financial sector reforms and delve deeper into the institutional factors influencing economic outcomes.

5.3 Recommendations

To enhance economic growth in Zambia, the government should focus on strengthening the financial sector through comprehensive reforms. First, improving financial inclusion and access to credit will help create opportunities for investment and entrepreneurship, which are key drivers of economic growth. Strengthening the efficiency of financial institutions should also be a priority. This includes reducing transaction costs, increasing transparency, and ensuring better regulation, which will make financial services more accessible and effective in supporting businesses.

Additionally, investing in human capital is critical. While the study found limited direct impact, improving education and vocational training can ensure that the workforce is better aligned with market needs, ultimately enhancing productivity, and fostering growth. Policymakers should also focus on improving institutional quality by strengthening governance, rule of law, and transparency. These reforms will create a more favourable environment for businesses to thrive and encourage both local and foreign investment.

Lastly, as the benefits of financial sector development take time to materialize, the government should focus on long-term investments in the sector. This includes creating a stable economic environment and offering incentives to investors to stimulate sustainable growth in Zambia's financial sector.

5.4 Further Research

Future research could dive deeper into the delayed effects of financial sector development on economic growth. Exploring the time lags in greater detail could reveal factors that explain these delays, helping policymakers better manage the pace of reforms. Additionally, the role of technology, particularly financial technology (fintech), is an area worth exploring. Digital banking is becoming increasingly important globally, and understanding its impact on financial sector efficiency in Zambia could provide key insights into how technology can foster growth.

Further research could also focus on institutional quality, exploring specific dimensions such as corruption control and regulatory quality. A deeper understanding of how these factors affect economic outcomes could guide more effective institutional reforms. Another avenue for research is examining the effects of financial sector development on specific sectors such as agriculture, manufacturing, and services. Tailored financial policies for different sectors could lead to more inclusive growth.

Lastly, cross-country comparisons with other Sub-Saharan African countries could provide insights into whether the trends observed in Zambia are part of a regional pattern. Learning from countries with successful financial reforms could offer valuable lessons for Zambia’s future policy direction.

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