Financial Development and Economic Growth: Evidence from Lesotho, 1981 - 2022

By

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Abstract

This research explores the significant impact of financial development on Lesotho's economic growth over the period 1981–2022, employing a methodology inspired by the endogenous growth model proposed by King and Levine (1993). The study utilizes the Autoregressive Distributed Lag (ARDL) approach to cointegration, specifically applying the ARDL bounds-testing methodology. To capture the multifaceted aspects of financial development, four distinct proxy variables are used: ratio of liquid liabilities to GDP, private credit by deposit money banks and other financial institutions as a percentage of GDP, deposit money bank assets to deposit money bank assets and central bank assets and domestic credit to private sector as a percentage of GDP divided by domestic credit to private sector as a percentage of GDP plus credit to government and state-owned enterprises as a percentage of GDP.

Initially, this study explores the influence of financial development on economic growth using all four proxy variables. Interestingly, only one variable - the ratio of liquid liabilities to GDP - emerges as statistically significant. However, its impact is negative in both the short and long run. Consistent with King and Levine's (1993) suggestions about the channels through which financial development affects economic growth, this research further explores the impact of the ratio of liquid liabilities to GDP on two crucial growth components: total productivity growth and the accumulation of physical capital.

The results present a convincing narrative, revealing that the log of ratio of liquid liabilities to GDP has a negative impact on Lesotho's growth while having no significant effect on either total factor productivity growth or physical capital accumulation. This paper contends that financial liberalization in a poorly regulated environment may have contributed to this outcome. Consequently, the evidence suggests that the country may not be fully leveraging the potential benefits of financial development to drive economic prosperity.

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Chapter 1: Introduction

1.1 Introduction and Background

The impact of financial development on economic growth has been a topic of significant scholarly interest since the early 20th century. Foundational theories from Schumpeter (1911), Gurley et al. (1955), and Bagehot (1973) have been pivotal in establishing the integral link between these two variables. Their insights lay the groundwork for understanding how improvements in financial instruments, markets, and intermediaries can mitigate the effects of asymmetry of information, enforcement of contracts, and transaction costs, thereby enhancing economic growth.

The subsequent literature further elaborated that the advancement of financial systems is crucial for the effective execution of key financial functions that facilitate economic growth. For example, Levine (2005) expands upon the idea that financial systems not only facilitate economic growth but also drive technological innovation. This process is achieved through several key functions, including the mobilization of funds, reduction of monitoring costs, and efficient risk management (Schumpeter, 1911; King & Levine, 1993b; Aghion et al., 2018). These functions are instrumental in promoting activities that improve production, thereby encouraging the adoption of new technologies and addressing issues like income inequality.

Financial systems play a pivotal role in facilitating the accumulation of physical and human capital. One of the critical challenges in this process is the presence of credit market frictions, which can significantly hinder growth by preventing certain segments of the population, especially those from lower income brackets, from investing in education and physical capital. According to Galor and Zeira (1993), in environments plagued by credit market frictions, individuals with higher initial incomes continue to invest in human capital across generations, thereby perpetuating their wealth status. Conversely, those with lower initial incomes, constrained by these market frictions, often find themselves unable to invest in human capital, resulting in a continued state of poverty.

This disparity in investment opportunities not only impedes effective resource distribution and economic growth but also exacerbates income inequalities. It restricts the economic potential of individuals with limited financial resources, thereby narrowing the scope for overall societal advancement. Financial systems that effectively address these credit market frictions can thus play a crucial role in diminishing income disparities and expanding economic opportunities.

Echoing this sentiment, Aghion et al. (2018) argue that the alleviation of credit restrictions can lead to an increased availability of credit. Such an improvement in the credit market would open up better economic opportunities, particularly for individuals with promising entrepreneurial ideas but limited access to financial resources. This paradigm shifts in credit allocation, focusing on merit and potential rather than solely on the availability of collateral, can be instrumental in addressing income inequality. By prioritizing merit-based access to credit, financial systems can ensure a more equitable distribution of resources, fostering a growth environment where entrepreneurial talent and innovative ideas are not hindered by financial constraints. This approach is not only vital for reducing income disparities but also for stimulating a more inclusive and dynamic economic growth.

However, the existing body of literature presents a fragmented view, often yielding mixed results due to varying methodologies, time frames, and proxies used to measure financial development. This diversity in findings underscores the necessity of employing a range of proxy variables to accurately capture financial development, considering each country's specific financial structure and data availability.

While the majority of economic literature acknowledges the positive influence of financial development on economic growth, there remains a divergence of opinions among economists on this matter. Notably, Lucas (1988) expressed scepticism, asserting that the significance of financial development in fostering growth is often exaggerated within the economic community. This perspective challenges the conventional wisdom that places substantial emphasis on the role of financial systems in driving economic progress.

Boot (2014) contributes to this discourse by suggesting that advancements in information technology have led to the creation of complex financial securities. These innovations have transformed the financial landscape into one that is highly opportunistic, characterized by increased risk-taking behaviours. The development of such financial instruments (such as derivative, debt and foreign exchange instruments etc), while innovative, has inadvertently resulted in an industry that is not only prone to high risks but also harbours systemic instability.

This situation underscores the double-edged nature of financial development: on one hand, it can fuel economic growth through improved efficiency and expanded access to capital, but on the other hand, it can lead to an unstable financial system, vulnerable to crises and disruptions. For example, the benefits of derivatives include risk management, price discovery, and enhancement of liquidity (Acharya et al, 2009). On the other hand, Boot (2014) argues that

making mortgages tradable could weaken the originator's motivation to scrutinize borrower quality, leading to an industry characterized by elevated risks and systemic instability.

Notably, this study examines the unique financial growth nexus within Lesotho, acknowledging that past research, while insightful, has been somewhat narrow in focus. Previous studies on Lesotho primarily centred on Granger causality tests and employed a limited range of proxy variables and data. This paper aims to address these limitations by employing a more comprehensive approach, utilizing extended time series data, multiple proxies for financial development, and a robust theoretical framework adopted from King and Levine (1993). It employs a growth model and estimates it within the Autoregressive Distributed Lag (ARDL) approach to cointegration to explore the long-run and short-run impact of financial development on economic growth in Lesotho. Furthermore, the study, apart from examining how financial development influences economic growth, also considers how financial development affects two crucial components of economic growth, namely the accumulation of physical capital and total factor productivity growth.

By utilizing a diverse set of financial development proxies, this study offers a comprehensive perspective of the finance-growth nexus. To investigate the specific impacts of financial development, the paper aims to shed light on the mechanisms through which financial systems influence economic growth. This exploration is vital, as it extends beyond a general assessment of the impact of financial development on economic growth, to uncover the underlying drivers of this relationship.

The results reveal that, among the financial development proxies considered, only the log of ratio of liquid liabilities to GDP has a significant and negative impact on economic growth. Furthermore, the results demonstrate that this proxy variable does not have any impact on either the total factor productivity growth or the accumulation of physical capital.

These findings are poised to significantly enhance our understanding of the role of financial development in economic growth, particularly in Lesotho. The implications for policymaking are substantial, potentially influencing how policymakers prioritize financial sector reforms. These reforms are crucial given the negative role of financial development on the growth of real GDP per capita.

1.2 Organisation of the Thesis

The remainder of this thesis is organized as follows:

Chapter 2 provides a comprehensive literature review. This chapter presents an extensive review of the existing literature, delving into the basic functions of financial systems and their impact on the accumulation of physical and human capital. It further explores how financial development contributes to addressing income inequality. Additionally, this chapter engages with the ongoing debates surrounding bank-based versus market-based financial systems and weighs the pros and cons of financial development.

Chapter 3 offers an in-depth overview of Lesotho's economic landscape and its financial sector. Initially, it provides a detailed discussion on the overall economy of Lesotho, followed by an examination of the country's financial sector, thereby setting the stage for a more focused analysis of financial development within this specific context.

Chapter 4 is dedicated to a detailed description of the data, theoretical models, and empirical methodologies utilized in this study. It outlines the nature of the data employed, the theoretical framework guiding the analysis, the specific empirical model estimated, and the estimation techniques applied, ensuring a clear understanding of the methodological foundations of the study.

In Chapter 5, the paper presents the empirical findings. Initially, it explores the general impact of financial development on economic growth in Lesotho, utilizing four distinct indicators to capture various aspects of financial development. These include metrics such as private credit by deposit money banks and other financial institutions as a percentage of GDP, the ratio of liquid liabilities to GDP, deposit money bank assets to deposit money bank assets and central bank assets and the domestic credit to private sector as a percentage of GDP divided by domestic credit to private sector as a percentage of GDP plus credit to government and state-owned enterprises as a percentage of GDP. Subsequently, the chapter narrows its focus to examine how financial development influences key components of economic growth, specifically total factor productivity growth and the accumulation of physical capital. This detailed analysis aims to reveal the specific channels through which financial development impacts economic growth, providing a deeper understanding of the underlying mechanisms at play.

Chapter 6 provides the conclusion. This chapter synthesizes the findings of the study, drawing together the key insights and implications derived from the analysis. It reflects on the

comprehensive understanding gained about the role of financial development in Lesotho's economic growth and offers concluding remarks on the broader implications of this research. It does not only present the study's limitations but also offers essential policy recommendations and makes suggestions for future research.

Chapter 2: Literature Review

2.1 Theoretical literature Review

Since the pioneering works of Schumpeter (1911), Gurley, et al. (1955), and Begehot (1973) extensive efforts have been made to enhance our comprehension of the relationship between finance and economic growth through both theoretical and empirical means. These early works emphasize the inextricable connections between finance and economic growth. For instance, Schumpeter (1911) draws a comparison to highlight the multifaceted and influential role that bankers play in the modern economy. He compares the responsibilities of bankers and those of "ephors", who were high-ranking officials in ancient Sparta responsible for both civil and criminal justice administration. Entrepreneurial innovation generates "creative destruction" which is one of the key concepts in driving innovation and economic growth. Schumpeter (1911) emphasizes that bankers lie at the heart of this process as they play a critical role in distributing funds from savers to innovators.

The standard neoclassical theories posit that investment and savings constitute a pivotal driving force for economic development. These models assume the absence of market frictions, thus omitting explicit modelling of financial intermediation. They also assume a direct linkage between savings and investment, suggesting that finance primarily influences growth through capital deepening.

According to the neoclassical theory, a regulatory environment with less oversight can foster greater financial competition and efficiency, leading to innovative and diverse financial products and processes that enhance agents' wealth. The prevailing consensus primarily rests on the belief in a self-regulating free market ideology and assumes that any instabilities in the economy arise from external shocks or incoherent government policies. In the context of the finance-growth nexus, the two highly influential books, authored by McKinnon (1973) and Shaw (1973), advocate for financial liberalization to facilitate the efficient allocation of capital, thereby promoting economic growth. The Mckinnon/Shaw models may promote blind faith in the efficacy of free markets without considering the potential downsides or limitations of such an approach. They fail to acknowledge that profit-driven bankers may engage in short-sighted and risky speculative practices that have negative effects on the economy and financial stability.

The emergence and apparent acceptance of this neoclassical theory was soon accompanied by a subsequent conflict between different variants of the same credo. The alternative body of research has been inspired by the recurring financial crisis and therefore calls for a re-

evaluation of this belief. It calls for a more critical and nuanced approach, one that takes into account the complexity of financial development in the absence of regulations and the potential risks and challenges that come with them see (Breitenlechner, Gächter, & Sindermann, 2015; Beck, Georgiadis, & Straub, 2014; Demetriades & Rousseau, 2016).

The development of financial instruments, markets, and intermediaries has been a central focus of theoretical models (Boyd & Prescott, 1986; Ramakrishnan, 1984; King & Levine , 1993b). These models aim to elucidate how these financial components can efficiently allocate resources, stimulate technological innovation, and ultimately propel economic growth. Researchers demonstrate the ways in which financial systems can facilitate technological innovation and ultimately economic growth through the following basic functions (see Aghion et al., 2018; Levine, 2005). Firstly, financial systems mobilize funds from savers to creditors with the highest potential of engaging in activities aimed at improving production (King & Levine, 1993; Schumpeter, 1911). A developed financial system increases the likelihood of successful innovation because they diversify the risks associated with these innovative activities and provide insight into the anticipated profits derived from engaging in innovation rather than producing existing goods through conventional methods (King & Levine, 1993).

Secondly, developed financial systems reduce the costs of monitoring projects (Williamson, 1986; Fuente & Marin, 1996). Innovation entails risk, and due to information asymmetry, efficiently mobilizing capital from lenders to entrepreneurs can be costly (Diamond, 1984). However, financial intermediaries can mitigate or minimize these costs by absorbing them through the returns generated from their own diversified portfolios.

Thirdly, financial intermediaries match savers and entrepreneurs, enabling them to trade, hedge, and pool risks (Aghion, Levine, & Howitt, 2018). Fourthly, financial systems facilitate the accumulation of physical and human capital. Growth is hindered by credit market frictions, as they prevent some people from investing in education. In the presence of credit market frictions, economic agents with high initial income constantly invest in human capital across generations and maintain their wealth while those with low initial income, in the presence of market frictions, will never invest in human capital and remain poor (Galor & Zeira, 1993). Not only does this imply a more effective distribution of resources and accelerated economic growth, but it also diminishes income disparities and broadens the economic prospects for individuals with fewer financial resources. In the same manner (Aghion, Levine, & Howitt, 2018) contend that alleviation of credit restrictions will increase the availability of credit, thus

providing better economic opportunities for individuals with the most deserving entrepreneurial concepts. This approach aims to prioritize merit-based access to credit rather than favouring those with the highest amount of collateral, ultimately addressing concerns related to income inequality.

On income inequality, theoretical models suggest that even though financial deepening is integral to the process of growth, the association between financial deepening and growth is not linear (Townsend & Ueda, 2006; Greenwood & Jovanovic, 1990). During the early stages of development, financial exclusion affects individuals with lower socioeconomic status, while a limited number of relatively affluent individuals benefit from the returns generated by utilizing financial market services. Consequently, this dynamic contributes to economic inequality. Nevertheless, as the economy expands, the issue of financial inclusion gradually improves, encompassing a broader segment of the population. With sustained economic growth, universal participation in the financial system becomes a reality, offering equal access to the comprehensive range of benefits it provides. Consequently, while the distributional impact of financial deepening initially disadvantages the poor during the early stages, it turns positive after a critical turning point is reached. Financial development that reduces credit market frictions enable firms to borrow and invest during economic downturns when investment costs and collateral values are low. By facilitating the financing of productive investments in such periods, well-developed financial innovations not only enhance economic growth but also encourage counter-cyclical investments that mitigate the severity of fluctuations in the business cycle (Aghion, Levine, & Howitt, 2018).

Lastly, financial innovations reduce transaction and monitoring costs, leading to adoption of certain technologies. The transaction costs in financial markets affect the selection of adopted technologies and they have intricate implications for the equilibrium rate of growth experienced by an economy (Bencivenga, Smith, & Starr, 1995). Economies characterized by elevated transaction costs tend to depend on short gestation capital production technologies that minimize reliance on financial market activity. Conversely, decreased transaction costs can result in the adoption of longer gestation (transaction-intensive) technologies, leading to an increase in the real return on savings.

These basic functions of financial intermediation affect growth in two channels: capital accumulation and technological innovation. The Solow growth model, for instance, aims to demonstrate the interplay between capital stock growth, labor force growth, and technological

advancements in an economy, illustrating their collective impact on the total output of goods and services within a nation. Capital stock is a crucial factor influencing an economy's output, and its changes over time can drive economic growth. Policymakers' goal is to establish developed financial systems in order to affect the savings rate or the reallocation of savings among different capital-producing technologies to reach a golden rule level of capital.

Two contrasting theoretical perspectives exist regarding the effectiveness of bank-based and market-based financial systems in fostering long-term economic growth. Understanding the relative merits of each financial system enables policymakers to implement suitable financial sector reforms.

In a bank-based financial system, banks are the primary institutions that perform the role of financial intermediation. This means they act as the middlemen between savers, who deposit their funds with the bank, and borrowers, who receive loans from the bank. This view stresses the crucial role banks play in the economy. According to this view, at the early stages of economic development and weak institutional frameworks, a bank-based financial system is deemed more favourable (Levine, 2002).

Banks gather information on firms and managers, facilitating effective capital allocation and enhancing corporate governance (Diamond, 1984; Ramakrishnan & Thakor, 1984). They are also involved in the effective management of cross-sectional, intertemporal, and liquidity risk management (Bessis, 2010; Van Greuning & Bratonovic, 2020). Banks establish risk departments that serve as centralized, independent entities responsible for overseeing and mitigating risks. These departments have the authority to challenge decisions put forth by the firms and ensure that risk aligns with the bank's policies. Banks provide capital to entrepreneurs, enabling them to leverage economies of scale (Schumpeter, 1911). The supporters of the bank-based approach contend that coordinated coalitions of investors, such as banks, possess superior monitoring capabilities compared to uncoordinated markets (Thakor, 2020). This enhanced monitoring capability helps mitigate post-lending moral hazards effectively.

Conversely, market-based financial systems stress the positive impact of well-functioning markets in fostering innovation and promoting long-term economic growth (Levine, 2002). In a market-based financial system, financial markets (like stock exchanges and bond markets) enable direct interaction between savers and borrowers. A market-based systems effectively addresses information asymmetry, enabling firms to capitalize on the opportunities provided

by trading in large, highly liquid markets. That is an important feature because banks, unlike marked-based systems, can contribute to information asymmetry by selectively safeguarding certain firms from competition, thus creating an uneven playing field. Market-based financial systems also facilitate and streamline the process of mergers and acquisitions, making it more accessible and efficient for organizations.

However, Levine (1997) downplays the significance of the dichotomy between market-based and bank-based financial systems. He advocates for a functional approach to the roles performed by a financial system, emphasizing the need for creating an environment where market-based and bank-based systems complement each other harmoniously.

The direction of causality between finance-growth nexus remains unclear in the literature. Is financial development a driver of economic growth, or is economic growth a driver of financial development? Patrick (1966) referred to these potential causal relationships as the supply-leading and demand-following hypotheses. According to the supply-leading hypothesis, the planned development of financial institutions and markets improves the supply of financial services, which in turn causes actual economic growth. Many theoretical and empirical studies on this topic have demonstrated that financial development is crucial, and it causes economic growth (Greenwood & Jovanovic, 1990; King & Levine, 1993; Levine, 1997). Conversely, the demand following hypothesis proposes a causal link from economic growth to financial innovation. It argues that when the real economy expands, rising demand for financial services could lead to a financial sector expansion.

Despite the widespread acceptance of the benefits of financial development on economic growth in the literature, economists still hold different opinions on this topic. For example, Lucas, (1988) believes that economists wrongly over-emphasize the significance of financial development on growth. Recently, an excessive presence of finance has been criticized for its detrimental impact on economic growth. This backlash against the financial sector was triggered by the financial crises of 2007/2008. For example, Boot (2014) suggests that the advances in information technology led to innovative securities that created a financial landscape that is highly opportunistic, resulting in an industry prone to high risks and contains a systematic risk and hence is fundamentally unstable.

2.2 Empirical literature review

The literature on the finance-growth relationship encompasses various studies and research methodologies. Due to variations in the proxies of financial development employed, the time frames considered, and the types of studies (panel and time series studies) conducted, the findings in this body of research are diverse and often conflicting.

Researchers commonly use various proxy variables since there is no consensus on a precise method for measuring financial development. The choice of proxy variables depends on the specific research question, the availability of data for a particular country, and whether the country has a bank-based or market-based financial system. Economists often use a combination of several proxy indicators, such as the liquid liabilities-to-GDP ratio, private sector credit-to-GDP ratio, stock market capitalization-to-GDP ratio, and stock market total value traded-to-GDP ratio, to provide a more thorough assessment of financial development.

Over the years, global financial sectors have developed and transformed, giving rise to complicated contemporary financial systems (Sahay, et al., 2015). Because financial systems vary widely around the world, it is crucial to utilize a variety of indicators when assessing financial development. As a result, researchers have created indices to summarize the extent, availability, and effectiveness of both financial institutions and markets (Sahay, et al., 2015; Svirydzenka, 2016).

A significant corpus of economic literature employs cross-country regression analyses to investigate the intricacies of the finance-growth interconnection, typically within the framework of growth models. This methodology involves averaging out variables over long time periods and employing them in cross-sectional regression analyses. Hence, in theory, the researcher has the capacity to calculate the mean impact of the factors influencing economic growth. However, these studies are not without reservations. Firstly, pooling data on nations at varying stages of development evokes concerns of heterogeneity. Furthermore, the task of interpreting the disparities in results amongst various nations poses a significant hurdle. Quah (1993), utilizing data from 118 countries, discovered inherent fluctuations within the long-term growth patterns of each individual nation. Therefore, the assumption of stable growth trajectories for each nation, followed by an analysis of their cross-sectional disparities, results in findings that are complex to interpret.

Secondly, a considerable number of studies often exclude African nations due to the relatively weak, and at times statistically insignificant, relationship between finance and growth, as well

as data limitations. Nevertheless, discerning whether the statistical insignificance arises from the limited number of observations available for these countries or from the lack of discernible effects by rudimentary indicators of financial development remains challenging. The growth regressions employed in cross-country studies often exhibit a high degree of sensitivity to minor alterations in the data (Levine & Renelt, 1992; Levine & Zervos, 1996). For instance, Ciccone & Jarociński (2010) discovered that employing GDP data from various sources or incorporating updated series could lead to substantial disparities in both the statistical and economic significance of the estimates.

Thirdly, considering that several countries within the group are unlikely to be on a balanced growth trajectory, concerns arise regarding the validity of pooled regressions (Luintel K. , Khan, Arestis, & Theodoridis, 2008). Nations that exhibit strong performance often possess not only well-established financial systems but also educated workforces, political stability, uncorrupted governance, and favorable institutional quality indicators, etc. These circumstances give rise to concerns regarding potential multicollinearity issues and pose challenges in establishing causal relationships (Levine, 2005). Fourthly, according to Arestis & Demetriades (1997), addressing the issue of causality adequately within a cross-sectional framework is challenging. This is due to the fact that cross-country regressions solely focus on the average impact of a variable across nations, overlooking the potential variations in causality patterns among different countries.

Another set of empirical studies adopts panel data techniques to explore the relationship between finance and growth e.g (Levine, Loayza, & Beck, 2000; Beck & Levine, 2004). Panel data analysis offers increased variability and reduced collinearity among variables, as it combines time series of cross-sectional observations. Furthermore, panel techniques, unlike pure cross-sectional methods, facilitate the straightforward utilization of instrumental variables for all explanatory variables, resulting in more accurate estimations of the relationship between finance and growth. Consequently, panel studies are less susceptible to endogeneity issues.

For example, Fufa & Kim (2018) utilize the dynamic panel GMM approach to estimate Barro growth regressions. Focusing on relatively more homogeneous groups of countries, they employed data for the period 1989-2012. The variables that they used are as follows: the value of the traded shares in the domestic stock market divided by the total value of listed shares, the value of all domestic shares traded in the stock market divided by GDP and the total value of listed shares in the stock market divided by GDP. Their findings indicate that in the case of

middle-income countries (MICs), both the magnitude of credit extended to the private sector and stock market liquidity have significant positive effects on economic growth. However, for high-income countries (HICs), only stock market liquidity demonstrates a robust positive influence on economic growth. Additionally, their research uncovered that while bank credit stimulates growth in both upper-middle-income countries (upper-MICs) and lower-middle income countries (lower-MICs), the impact of stock market liquidity on growth is pronounced exclusively in upper-MICs.

Numerous other panel studies employ time series techniques to explore the interplay between finance and growth. These studies often employ Granger-type causality tests and vector autoregressive (VAR) procedures as analytical tools to investigate and understand the intricacies of the finance-growth relationship over extended periods. By doing so, they provide deeper insights into the dynamic interplay between financial systems and economic development.

Yang (2019) examines the influence of financial system development on a nation's economic progress by employing measures of financial development from trapped middle-income economies, middle-income economies with per capita GDP lower than $14,439 but higher than $12,476, and high-income economies. The findings indicate that economies experiencing higher growth in broad money (M3), credit to the private sector, and possessing larger and more liquid stock markets achieve growth through both physical capital accumulation and total factor productivity.

Levine & Zervos (1996) employ pooled cross-country, time-series growth regressions to propose a positive association between stock market development and economic growth. To tackle the issue of endogeneity, they include variables such as the logarithm of initial real per capita GDP and the logarithm of the initial secondary school enrolment rate. Additionally, they utilize indicators related to the size, liquidity, and risk diversification of the stock market. The underlying assumption behind incorporating indicators of stock market size is that it correlates positively with the capacity to mobilize capital and mitigate risk through diversification.

Nevertheless, the results must be interpreted cautiously as they provide suggestive partial correlations that warrant further investigation. Levine (2005) highlights the challenges of using these indicators. The act of being listed on a national stock exchange does not inherently promote efficient resource allocation. Furthermore, the relationship between trading activity

and future economic growth may not necessarily reflect a direct connection between liquidity and growth.

The estimates derived from panel data and country-specific analyses may not be equivalent, thus limiting the economic relevance of cross-country estimates (Luintel et al. 2008). As a result, the presence of country specific time series studies becomes pivotal as they afford researchers the opportunity to formulate country-specific measures of financial development, enhancing the precision and applicability of their analyses.

Having highlighted the advantages of time series approach above and considering the specific focus of this study on a particular country, it is noteworthy that the majority of empirical literature discussed below places a strong emphasis on country-specific studies. These studies delve into the unique dynamics and factors at play within individual countries, shedding light on the intricacies of their financial systems and their impact on economic growth. By focusing extensively on these country-specific contexts, the aim is to provide a comprehensive understanding of the diverse and often complex relationships between finance and economic development across the globe. Many of these studies investigate the existence of a causal relationship by utilizing Granger causality tests or employing formal growth models to explore the intricate relationship between finance and economic development. These research efforts can be broadly categorized into three groups: studies conducted in developed economies, studies conducted in developing economies (excluding Africa), and studies specifically focused on African countries. This categorization allows for a more structured analysis of the diverse finance-growth dynamics across different types of economies and regions.

For example, there are studies that suggest that financial structure matters for economic growth because the finance growth nexus does not follow a straightforward path; rather, it takes the form of an inverted U-shaped curve, signifying a turning point in the impact of financial development (see Cecchetti & Kharoubi, 2012; Arcand, et al., 2015; Law & Singh, 2014). Huang and Lin (2009) suggest several reasons for the development of financial intermediation, which tends to occur at a particular stage of economic development. Firstly, there may be a minimum size requirement or a high cost associated with establishing and maintaining a complex financial infrastructure. Secondly, the impact of financial intermediation on growth varies according to the stage of economic development. They also note that the beneficial effects of financial intermediation are more pronounced in low-income countries compared to high-income countries (Huang & Lin, 2009).

The examination of the interplay between financial development and economic growth in developed countries has yielded insightful findings demonstrating varied dynamics across different countries and financial indicators, as evidenced by various studies. For example, Rahman, et al. (2015) focuses on Australia between 1965 and 2010, applying the Autoregressive Distributed Lag (ARDL) bounds testing approach for cointegration to assess long-term relationships. Utilizing the Cobb-Douglas production function, they analyse the long-run nexus between financial development, trade openness, and economic growth, using real domestic credit to the private sector as a financial development proxy. Their research reveals that financial development, coupled with international trade and capital, significantly influences economic growth in both short-term and long-term perspectives. Notably, their findings corroborate the supply-leading hypothesis, indicating that financial development is a precursor to economic growth.

In a similar vein, Dritsakis & Adamopoulos (2004) investigated the issue focusing on Greece from 1960 to 2000, employing a multivariate autoregressive causality model based on error correction. They utilize the ratio of money supply (M2) to GDP and the ratio of domestic bank credit to nominal GDP as proxies for financial development. The research revealed a strong reciprocal causal relationship between financial development and economic growth, as well as between economic openness and growth, indicating that these factors mutually reinforce each other.

Ogren (2009) explores the Swedish context, emphasizing the impact of financial and monetary development on economic growth. The study uses several indicators, including commercial bank assets, equity capital in commercial banks, and monetary base. The findings underscore a positive causality from financial and monetary variables to general economic growth and sector-specific growth. The study highlights that Sweden's growth was predominantly finance-driven, with monetary variables like liquidity and broad money supply being critical for sectoral and overall GDP growth. This study highlights the role of the financial system in fostering both economic growth and modern sector growth.

Finally, Adamopoulos (2010) analyses Ireland from 1965 to 2007 using a Vector Error Correction Model (VECM). This study assesses financial market development through the lens of credit market development, measured by domestic bank credits to the private sector as a percentage of GDP, and stock market development. Applying Johansen cointegration analysis, the study finds a reciprocal causal relationship between stock market development and

economic growth, and a one directional causality from economic growth to credit market development. The findings suggest that, in Ireland, stock market development plays a more significant role in driving economic growth compared to credit market development.

The empirical evidence from developing countries further illustrates the intricate and diverse nature of the finance-growth relationship, highlighting how results vary significantly across different individual nations due to their unique economic contexts. Chang & Caudill (2005) use the ratio of M2 to GDP as a proxy for financial development to examine finance-growth nexus in Taiwan from 1962 to 1998 when Taiwan was still regarded as a small developing nation. The findings from Granger causality tests using vector error-correction models (VECM) indicate a one-way causality from financial development to economic growth. Thus, supporting the supply leading hypothesis for Taiwan. These results highlight the importance of financial development in Taiwan's growth, and they align with endogenous growth models and various studies that highlight the significant role of financial development in driving economic growth. (see Greenwood & Jovanovic, 1990; King & Levine, 1993; Levine, 1997).

Contrary to the earlier findings, Singh (2008) identified bidirectional Granger-causality between financial development and economic growth in India from 1951 to 1996. Singh (2008) quantified financial development using the financial interrelations ratio and the new issue ratio. The study highlights the possible problems of endogeneity and simultaneity bias in growth models exploring the effects of financial development on economic growth. Similarly, Liang & Teng (2006) adopting an endogenous model from Luintel and Khan (1999), finds that there is unidirectional causation from economic growth to financial development in China. They used bank credit ratio and deposit liabilities ratio as proxies for financial development over the period 1952-2001.

This contradiction emphasizes that the relationship between financial development and economic growth cannot be universally applied to all countries. Economic policies are crafted specifically for each country, and their effectiveness hinges largely on the competency of the institutions tasked with their execution (see Al-Yousif, 2002). For example, Demetriades and Luintel (1996) found that, in general, banking sector controls had a detrimental effect on financial development in India. Demetriades and Luintel (1996) used dynamic models of financial deepening and economic growth in the case of India. Their results indicate that financial sector policies can impact financial deepening by influencing bank behavior, particularly in terms of banks' efforts to attract deposits. The study assessed banking sector

controls by gathering data on interest restrictions, reserve and liquidity requirements, as well as directed and concessionary lending programs. These findings align with the McKinnon and Shaw school of thought, which suggests that government restrictions on financial systems - such as interest rate ceilings, targeted lending initiatives, and high reserve requirements - can impede financial deepening. However, the other study conducted by Demetriades and Luintel (2001) find evidence that the direct effects of financial restraints on financial deepening were positive. The authors suggest that the success of such interventionist policies is intrinsically linked to the ability of the Korean institutions to formulate, implement, and sustain the interventions effectively.

Most case studies evidence from African nations are consistent with studies based on panel analysis (see Fewowe, 2011; Aluko, et al., 2020; Walle, 2014) and studies based on pure time series analysis (see Ghirmay, 2004; Agbesatafia, 2004) that found the bidirectional finance-growth nexus in Sub-Saharan Africa.

Abu-Bader and Abu-Qarn (2005) utilize four distinct measures of financial development and conduct Granger causality tests employing cointegration and vector error-correction (VEC) methodologies on data from Egypt spanning the years 1960 to 2001. They find that the financial development and economic growth are mutually causal. Furthermore, their findings indicate that financial development Granger-causes economic growth by both increasing funding for investments and enhancing overall efficiency. The proxy variables for financial development that they used are the ratio of money stock to nominal GDP, the ratio of M2 minus currency to GDP and the ratio of bank credit to the private sector to nominal GDP.

Similar to Abu-Bader and Abu-Qarn (2005), Odhiambo (2010) includes investment in the bivariate model in the investigation of finance-growth nexus. The study uses three proxies for financial development: M2/GDP, the ratio of private sector credit to GDP, and the log of the ratio of liquid liabilities to GDP. The results from the ARDL-Bounds testing procedure reveal a one-directional causal flow from economic growth to financial development.

Seetanah (2008) investigates the relationship between financial development and economic performance in the small island state of Mauritius, utilizing data from 1952 to 2004. The paper employs two different proxies for financial development, namely, the ratio of liquid liabilities to the country's GDP and the value of credits by financial intermediaries to the private sector divided by GDP in an ARDL framework. Following the standard finance-growth nexus

literature, Seetanah (2008) uses a theoretical model to find that financial development has been facilitating the improvement of economic growth in both short and long run.

Studies focusing on the financial development and economic growth nexus in Lesotho are relatively sparse. The majority of existing research primarily employs Granger causality and Vector Error Correction Model (VECM) techniques, probing into the existence of causality between financial development and growth. There is a notable lack of research employing time series data extending beyond 25 years, with Aziakpono (2015) being the only study known to the author that is grounded in the theoretical framework of the endogenous growth model.

Aziakpono (2015) methodology diverged from other studies on Lesotho by incorporating additional control variables and indicators of macroeconomic stability. The research is grounded in the theoretical framework of endogenous growth model. Employing cointegration and vector error correction methods, the study analyzed data from 1980: Q1 to 2001: Q4. The investigation found no reciprocal causality between financial intermediation and per capita GDP in Lesotho. However, it is important to note that the years under consideration for the study span from 1980 to 2001. While this timeframe provides valuable insights, it is important to highlight a significant limitation: the period under analysis concludes just three years after the implementation of major reforms in the financial sector. This relatively short post-reform observation window may not adequately capture the long-term effects and full impact of these reforms on the financial-growth nexus. Consequently, the findings could underestimate or fail to reflect the structural changes and adjustments that typically occur over a more extended period following such significant policy interventions.

Ijeoma, et al. (2011) examine the dynamic causal relationships between financial development and economic growth in Lesotho, considering savings as an intermediary variable. Utilizing time series data from 1983 to 2007, the researchers adopt a trivariate regression model with two financial development proxies: the ratio of broad money to GDP and private sector credit. The VECM based causality tests reveals that financial development does not spur economic growth in Lesotho.

Mohapi & Motelle (2007) expand the scope of financial proxies, including, the ratio of broad money to GDP, the ratio of bank deposit liabilities to GDP, the ratio of domestic credit to GDP, the ratio of private sector credit to GDP, the ratio of private sector credit to domestic credit. The study employed Granger causality tests and VECM-based causality tests on data from

1980: Q4 to 2003: Q4. The findings suggested that only the ratio of private sector credit to total credit showed a Granger-causal relationship with economic growth.

From the extensive review of literature on the finance-growth nexus, it is evident that there is no consensus regarding the impact of financial development on economic growth. This divergence in views largely stems from the considerable variation in research methodologies, approaches, and choice of proxy variables for financial development, as well as differing country-specific factors.

This body of literature encompasses a wide range of studies, including cross-country studies, panel data analyses, and pure time series investigations. Each of these methods offers unique insights but also comes with specific limitations and considerations. The use of varied econometric techniques in these studies is particularly noteworthy.

Techniques range from Ordinary Least Squares (OLS) regression analyses to more complex methods like Vector Error-Correction Models (VECM) and Autoregressive Distributed Lag (ARDL) models. These methodologies are chosen based on the specific research questions and the nature of the data available. For instance, VECM and ARDL techniques are often utilized to capture the dynamic relationship between financial development and economic growth over time to assess the long-run equilibrium relationship between these two factors. While OLS assesses the strength and the direction of the linear relationship of finance-growth nexus. Moreover, the literature reveals the challenges faced by researchers in employing these diverse econometric methods. A prominent challenge is the issue of endogeneity. Researchers have employed various strategies to address endogeneity, such as the use of instrumental variables, difference-in-differences techniques, and Granger causality tests.

This study contributes to the empirical literature by exploring the nexus between financial development and growth within a single country. One key benefit is the avoidance of heterogeneity concerns that frequently emerge in cross-country studies, where data is pooled from nations at different stages of development. Studies focused on a single country allow for easier interpretation of findings, as heterogeneity is absent. Consequently, analysing financial development within the specific context of a single country can yield more accurate and meaningful estimates.

Furthermore, this study employs a theoretically grounded model and estimates it within the Autoregressive Distributed Lag (ARDL) approach to cointegraiton to investigate both the short-run and long-run impacts of financial development on economic growth in Lesotho. It

specifically examines the influence of financial development on key components of economic growth, including GDP per capita growth, physical capital accumulation, and total productivity growth. This analysis is conducted by estimating four distinct proxy variables representing financial development.

Chapter 3: An Overview of Lesotho's Economy and Financial System

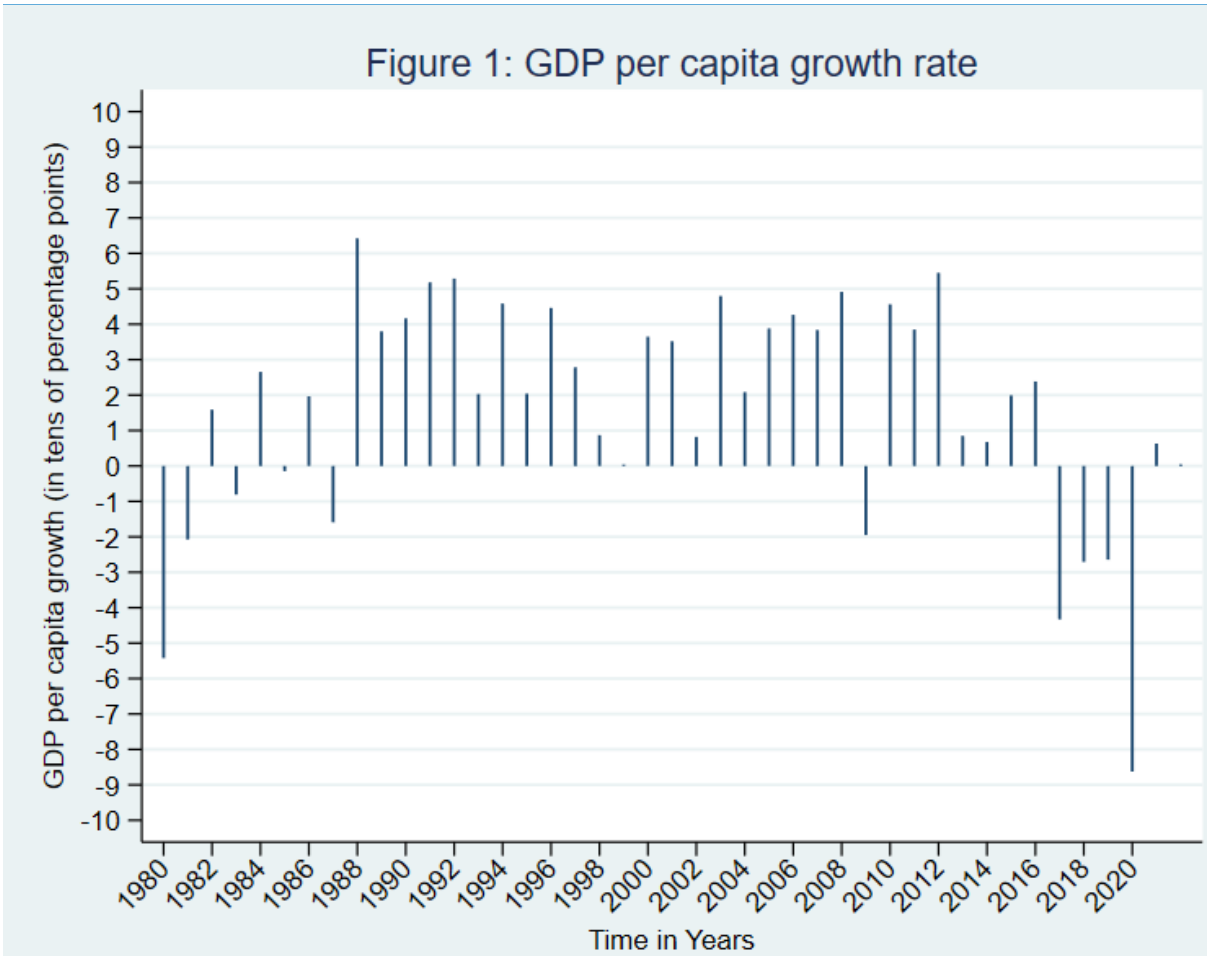
3.1 An Overview of Lesotho's Economy

Lesotho's economic landscape is characterized by a distinctive interplay of challenges and prospects, greatly shaped by its geographic position as a landlocked nation completely encircled by South Africa. The country is renowned for its rugged mountainous terrain, with Lesotho encompassing a land area of approximately 30,355 square kilometres. Lesotho experiences one of the highest levels of poverty in the Sub-Saharan African (SSA) region. A substantial portion of its populace lives below the poverty threshold, facing difficulties in meeting basic needs like food, housing, and medical care (Paramaiah, Sakoane, Machema, & Gomo, 2020). Poverty is especially pronounced in rural areas, where the majority of the population lives. Rural areas in Lesotho frequently rely on subsistence agriculture, which is susceptible to issues like unpredictable weather conditions, soil erosion, and limited availability of modern farming methods (see Smith, Mistiaen, Guven, & Morojele, 2013).

Figure 1 presents the growth rate of GDP per capita for Lesotho from 1980 to 2022. During this period, the average growth rate was recorded at 1.62%. The figure indicates an overall increasing trend in the growth rate since 1980. The peak growth rate occurred in 1988, reaching a high of 6.42%. Notably, the longest stretch of positive growth was from 1988 to 2008, marking two decades of economic expansion. The remarkable surge in economic growth experienced during the early 1990s can be partially credited to two pivotal developments. Initially, this growth was partly fuelled by the commencement of phase 1A of the Lesotho Highlands Water Project which extended from 1991 to 1998 (see Haas, Mazzei, & O'Leary, 2010). Subsequently, the African Growth and Opportunity Act (AGOA) in 2001 further catalysed this upward trajectory by attracting substantial foreign direct investment, predominantly from East Asian investors in Lesotho's apparel industry. According to Lall (2005), this sector constituted over 90% of Lesotho's FDI during the early 2000s.

The aftermath of the 2008/2009 global financial crisis witnessed a downturn, marked by a decrease in Southern African Customs Union (SACU) receipts. According to Koatsa, Paramaiah, and Scona (2021), the 2009/2010 period saw a decline in growth rare, evidenced by a drop in the growth rate into negative territory, as illustrated in Figure 1. The Covid-19 pandemic had a drastic impact, with a record low growth rate of negative 8.62% in 2020, highlighting the vulnerability of Lesotho's economy to global shocks.

Figure 1: GDP per capita growth rate.



Source: Authors own data visualization. Data from the World Bank Indicators (2023).

The government of Lesotho stands as one of the largest employers in the nation, holding a pivotal position in shaping the country's economic landscape (Damane & Sekantsi, 2018). Its impact on the labour market goes beyond job creation, as it actively contributes to driving economic activity through the disbursement of public sector salaries and government expenditure. According to Thabane and Lebina (2016), the public sector wage bill, accounting for 23% of GDP from 2009 to 2014, stands as the highest across sub-Saharan Africa.

Lesotho's economy is intricately linked with South Africa's, with a strong dependence on its neighbour's economic activities for trade, job opportunities, and remittance (Mokoena & Balkaran, 2018). Lesotho and South Africa engage in substantial cross-border trade related to financial services. As the majority of commercial banks in Lesotho have roots in South Africa,

they engage in significant transactions with their parent companies (Nielsen, Uanguta, & Ikhide, 2005).

Lesotho is a founding member of the Southern African Customs Union (SACU). This enduring partnership has established a lasting alliance that has strengthened the country's economy with its neighbouring countries, including South Africa, Botswana, Namibia, and Eswatini. Lesotho's membership in SACU constitutes a noteworthy element of its economic framework, exerting a substantial impact on its trade policies, revenue structure, and engagement in regional collaboration (Mabote, 2018).

Lesotho enjoys a notable position as a member of the Common Monetary Area (CMA) in Southern Africa, a regional alliance that also includes South Africa, Namibia, and Eswatini as members. Consequently, Lesotho's financial system operates within a dual currency framework, utilizing both the South African rand and the local currency, the Maloti. These two currencies maintain an equivalent value, as they are linked at an exchange rate of one-to-one. Lesotho, as well as other members of the Area CMA, face a challenge because they relinquish their ability to independently make monetary policy decisions tailored to their unique economic circumstances (Nielsen, Uanguta, & Ikhide, 2005). This situation arises because South Africa, being the dominant and larger economy within the arrangement, plays a leading role in determining the direction and conditions of any changes within the arrangement.

3.2 An Overview of Lesotho Financial System

Many African nations, especially those in Sub-Saharan Africa, embarked on substantial financial sector reforms in the late 1980s (Lemma & Otchere, 2006). These reforms encompassed a range of measures, such as the liberalization of interest rates, the elimination of credit limits, the restructuring and privatization of government-owned banks, the implementation of various initiatives to stimulate the growth of financial markets, including money and stock markets, and the establishment of private banking systems alongside regulatory and supervisory frameworks for banks (Lemma & Otchere, 2006).

The initiation of structural reforms in Lesotho's financial sector began in 1998, marking a delayed start compared to other SSA nations, yet these reforms were completed within a year (Motelle & Masenyetse, 2012). Two prominent state-owned banks, namely the Lesotho Agricultural Development Bank (LADB) and Lesotho Bank, underwent closure and liquidation, respectively (Motelle & Masenyetse, 2012). This marked a transition in market control from state-owned banks to private institutions. Presently, all commercial banks

operating in the country are privately owned and of foreign origin, with the exception of the Lesotho Post Bank.

The process of interest rate liberalization in Lesotho aimed at nurturing the expansion of money markets and removing pricing limitations. To achieve these objectives, the Central Bank of Lesotho (CBL) pursued a deliberate and phased strategy to develop the country's financial markets. The phases consisted of restructuring the treasury bill market, creating the treasury bond market, and advancing the development of the stock market (Sebutsoe, 2011). The establishment of the auction market for treasury bills in 1992 marked a significant step in the liberalization of interest rates. This move led to a notable shift, where real interest rates for non-savings deposits became positive (Motelle & Masenyetse, 2012)

Lesotho's banking industry is characterized by its relatively modest size, consisting of only a handful of commercial banks that operate within the country. Notably, these commercial banks are predominantly subsidiaries or affiliates of international financial institutions. In accordance with the Financial Institutional Act of 2012, the Central Bank of Lesotho (CBL) holds the sole responsibility for granting authorization, overseeing, and regulating both banking and non-banking financial institutions. A fundamental goal of banking regulations is to make certain that the individuals or entities responsible for bank failures bear the costs or repercussions, rather than burdening the broader society (see Brunnermeier, et al., 2009).

Lesotho has progressed in its financial regulatory framework by implementing Basel II standards and incorporating selected aspects of Basel III see (IMF, 2020). The International Monetary Fund (IMF) has played a pivotal role in supporting the CBL to finalize the Draft Guidelines for banks under Basel II's Pillar 1. This effort extends to the execution of Pillar 2.

The liquidity risk within Lesotho's banking sector remains comfortably low (Central Bank of Lesotho, 2018). This stability was attributed to the diligent adherence of banks to established regulatory standards, wherein both their liquid cash reserves and asset holdings exceeded the prescribed benchmarks, underscoring their robust financial positions (Central Bank of Lesotho, 2018). In line with the Financial Institutions Regulations of 2016, banks that hold a license to operate in Lesotho are mandated to uphold local assets equivalent to no less than 10 percent of their total liabilities to the public within Lesotho. The objective is to incentivize banks to participate in financial intermediation within Lesotho and guarantee that funds acquired locally contribute to the growth of the domestic economy. The establishment of well-structured deposit

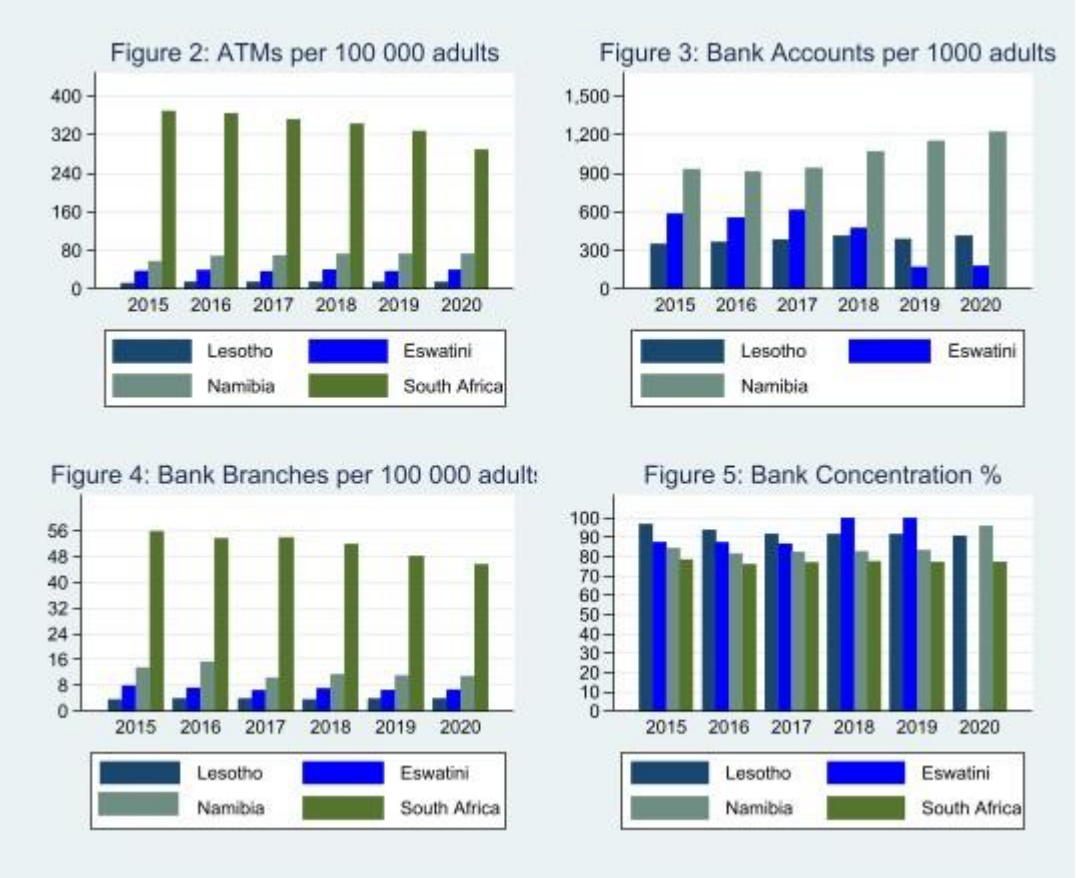
insurance programs serves to safeguard depositors and mitigate the risk of a financial crisis by upholding public trust in the banking system.

The traditional banking system, typically relying on physical branch networks and conventional operational methods, has encountered considerable difficulties in offering financial services to populations with low income and poverty, especially in remote rural areas in Lesotho. This has led to a significant portion of the population being underserved or excluded from formal financial services, contributing to the broader challenge of financial inclusion.

The presented group of figures below describe the metrics pertaining to financial access within Lesotho in comparison to fellow members of the Common Monetary Area (CMA) during the period spanning 2015 to 2020[1]. Lesotho emerges with the lowest figures in terms of automated teller machines (ATMs) per 100,000 adults (Figure 2), bank accounts per 1,000 adults (Figure 3), and bank branches per 100,000 (Figure 4)[2]. This implies that Lesotho exhibits comparatively inferior levels of bank access vis-à-vis its CMA counterparts.

[1] The author was unable to find data on the number of bank accounts per 1,000 adults in South Africa.
[2] Lesotho only takes the second place on the number of bank accounts per 1,000 adults in 2019 and 2020.

Figures 2 to 5: Measures of Financial Access in CMA.



Source: Authors own data visualization. Data from the World Bank Global Financial Development Database (2023).

However, Lesotho demonstrates an elevated standing on the bank concentration metric from 2015 to 2017 in Figure 5, surpassing its CMA peers. Notably, Lesotho maintains the second position from 2018 to 2020. The bank concentration metric is defined as the proportion of assets held by the three largest commercial banks relative to total commercial banking assets and records an average of 92.8% for Lesotho over the observed period. This suggests a discernible lack of competition within Lesotho's banking sector, a circumstance that may precipitate monopolistic tendencies among banks, potentially resulting in the imposition of elevated profit margins.

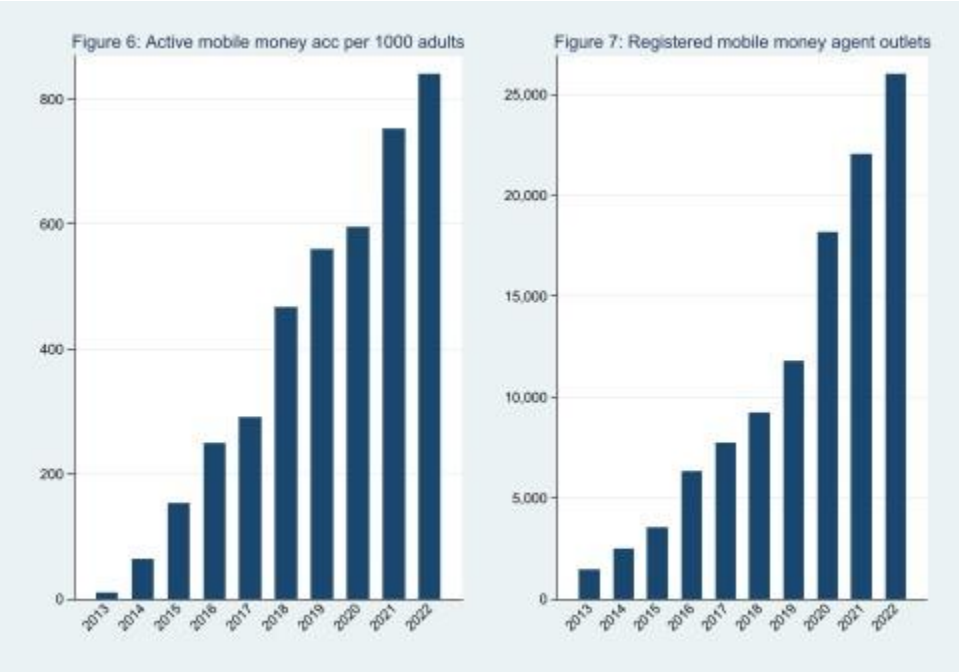
However, the emergence and extensive uptake of information and communication technologies (ICT) along with mobile telephones are creating new pathways to tackle the issues of financial exclusion, especially for populations that have historically been left out of the conventional financial system. This technological breakthrough offers the promise of greatly reducing the obstacles that have previously limited access to financial services, allowing a greater number

of individuals to participate in financial activities in a way that is both economically viable and secure through the use of Mobile Banking systems.

According to Donner and Tellez (2008), mobile banking encompasses a variety of applications that empower individuals to efficiently manage their banking activities using their mobile phones. These applications enable users to perform various financial activities, including accessing and managing bank accounts, storing funds on mobile devices, conducting money transfers, and accessing credit and insurance services. In essence, mobile banking revolutionizes the way people engage with financial institutions, providing a convenient and effective way to conduct a wide range of financial transactions directly through their mobile phones.

In Lesotho, the landscape of mobile banking services is primarily shaped by two telecommunications providers, namely Vodacom Lesotho and Econet Telecom Lesotho. These companies offer mobile financial services known as Mpesa and Ecocash, respectively, which have become integral to the country's financial ecosystem. Ecocash was the pioneer in this domain, launching its operations in October 2012. Subsequently, Mpesa entered the scene a year later, further expanding the accessibility and reach of mobile banking services within the country. Figure 6 and 7 below shows that the active mobile money accounts per 1 000 adults and the registered number of mobile money agents' outlets have been increasing exponentially since 2013.

Figure 6 and 7: The number of mobile money accounts and agents' outlets.



Source: Authors own data visualization. Data from IMF (2023).

Between 2014 and 2018, Lesotho's domestic commercial banks responded to the evolving financial landscape by introducing and launching mobile and internet banking services. These innovations empowered bank clients to remotely access a wide array of financial services (Damane, 2020). This progressive integration of technology into the banking sector not only bolstered convenience for customers but also played a vital role in advancing financial inclusion and modernizing the financial services industry in Lesotho.

While at the micro level, mobile banking can offer credit access and facilitate cost-effective, secure long-distance remittances, thereby promoting social inclusion, empowerment, and innovation within diverse communities; it is important to note that the various pathways through which mobile money can influence the economy are numerous and intricate, often lacking comprehensive understanding see (Aron, 2018).

To streamline proceedings pertaining to banking matters, a Commercial Court was instituted in the early 2000s to expedite such cases (Motelle & Masenyetse, 2012). The introduction of this court strengthened credit accountability, lending practices, and the overall framework for loan recovery (Damane, 2020; Motelle & Masenyetse, 2012). The credit bureau was also

established to improve intermediation by providing a database on borrowers' creditworthiness (Central Bank of Lesotho, 2005).

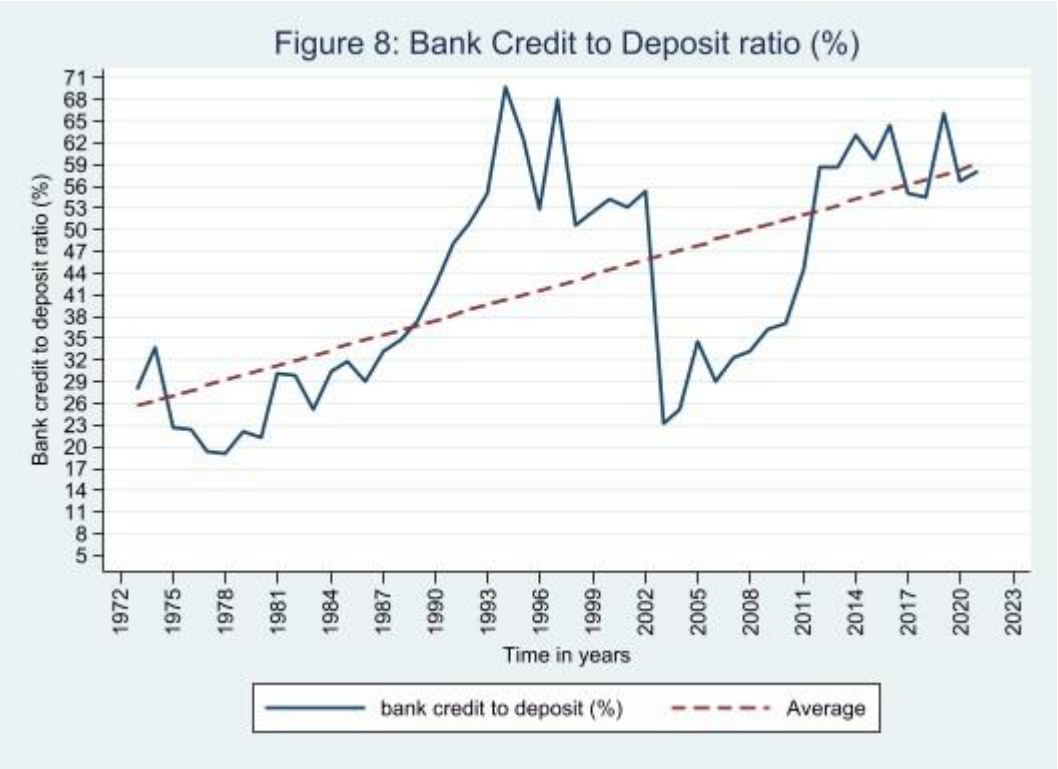
The increase in credit extended to the private sector, particularly to households and small businesses, has been facilitated by various civil law reforms. These reforms encompass the creation of a commercial court, the implementation of a credit guarantee scheme, the establishment of a national identity system, and the introduction of a credit bureau (Anchang, 2016). Additionally, the effective implementation of new land and leasing laws, which permit land to be used as collateral, has been crucial. Moreover, significant efforts have been made to improve the legal framework and operations of the commercial court, thereby strengthening contract enforcement mechanisms (see Damane, 2020).

Figure 8 depicts the bank credit-to-deposit ratio trend over time. This is a measure of how much of the bank's deposits are lent out as loans. The dotted line signifies the average ratio, demonstrating a gradual rise from 1972 to 2020. This suggests a consistent pattern of Lesotho's commercial banks extending more credit compared to deposits during this period. The mean ratio is 42.37%, with maximum and minimum values of 69.76% and 19.14%, respectively.

The bank credit-to-deposit ratio increased sharply in 1987, reaching its peak in 1994. This rise can be attributed to the fact that lending interest rates reached their highest level during this period (see Figure 9). These elevated rates likely discouraged borrowers from taking out loans. Simultaneously, the deposit rates were relatively high, encouraging savers to increase their deposits. The combination of these two factors likely contributed to the sharp rise in the credit-to-deposit ratio.

A sharp decline in 2000 followed the implementation of the 1998 financial sector reforms, which led to the closure of two state-owned banks. This suggests that these two banks may have been offering loans at rates below the prevailing market rates, and their closure left borrowers facing relatively higher lending rates, further discouraging borrowing.

Figure 8: Bank Credit to Deposit ratio (%)



Source: Authors own data visualisation. Data from World Bank Indicators (2023).

Commercial banks have a crucial role in providing funding both individuals and businesses, especially given the underdeveloped state of the capital market in Lesotho. In order to stimulate economic growth, it is imperative that banks offer intermediary services at the most competitive rates possible. Consequently, Lesotho has been eager to adopt financially liberalized interest rates.

The process of financial liberalization encourages both investment and savings by making affordable credit accessible to borrowers while ensuring attractive returns for depositors. One method to assess the effectiveness of commercial banks is by examining the magnitude of the interest rate spread. This spread, referred to as the difference between the interest rates applied to loans and those offered on deposits, serves as an indicator of bank efficiency[3]. Interest rates exert influence on various aspects of resource allocation, including deposit rates,

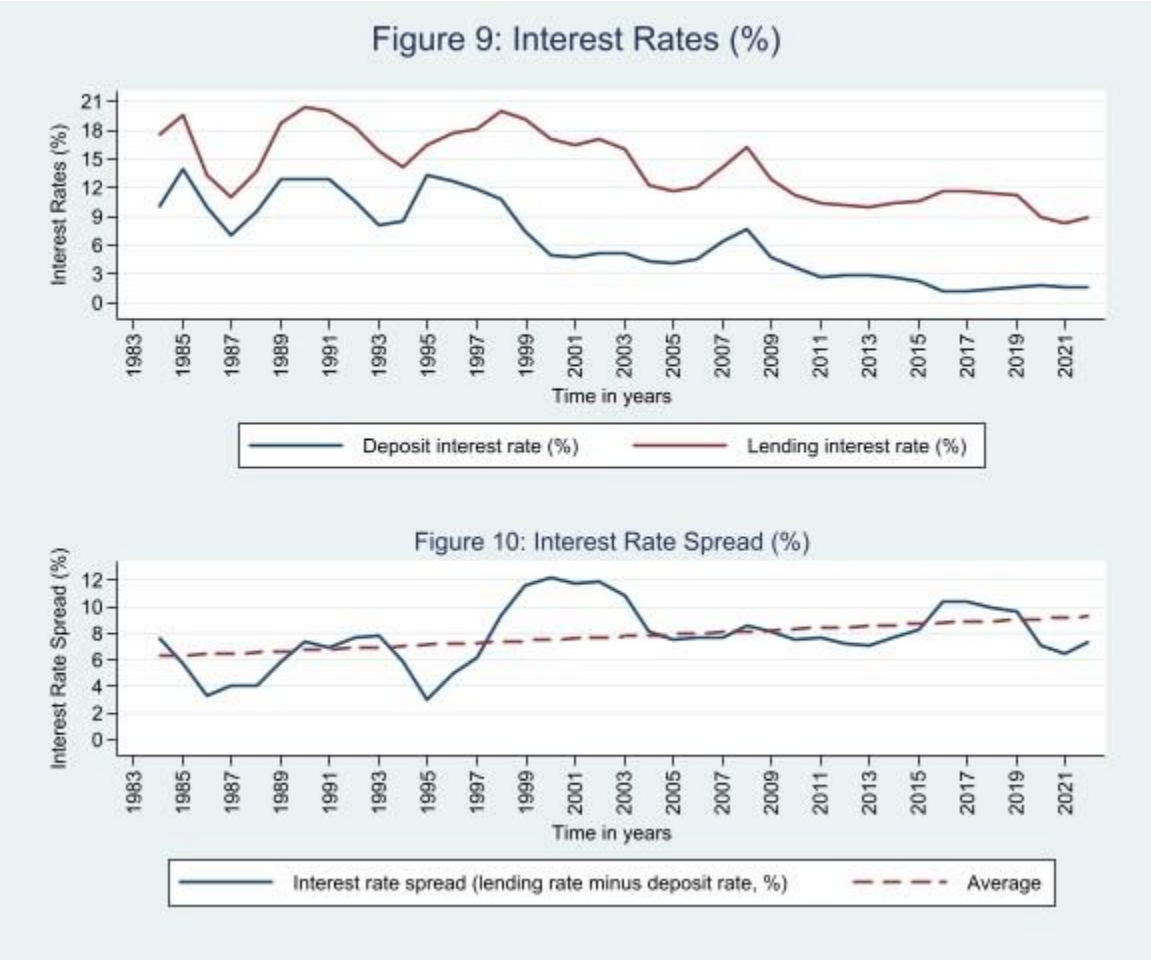
[3] A wider interest rate spread is seen as an indication of inefficiency within the banking sector.

supplementary loan fees, service charges, as well as the dynamics of the interbank money market's growth and development (Villanueva, 1988).

Figure 9 and Figure 10 depict the historical patterns of deposit and lending rates, as well as the interest rate spread over time. During the period from 1983 to 1995, both lending and deposit interest rates appear to exhibit a downward trend over time (see Figure 9).

The interest rate spread reached its lowest point in 1995, marking a minimal value of 3.03% (see Figure 10). On the other hand, starting around 1998, both lending and deposit rates began to decline, while the interest rate spread notably widened. The widening of the interest rate spread, commencing around 1998 and persisting for approximately four years, culminating in a peak of 12.20% in 2000, can be attributed to the structural reforms initiated in Lesotho's financial sector from 1998 onward. As part of these reforms, both state-owned banks underwent closure and liquidation. This suggests that the two prominent state-owned banks might have been offering loans at rates below the prevailing market interest rates while paying depositors interest rates higher than those in the market, possibly as a means to achieve social benefit.

Figure 9 and 10: The Lending and Deposit interest rates (%)



Source: Authors own data visualization. Data from the World Bank Global Financial Development Database (2023).

Subsequently, from the 2000s until 2022, we observed a consistent decline in both lending and deposit interest rates, even though the interest rate spread continued to widen during the same period. Notably, the average interest rate spread, represented by the dashed linear line in Figure 10, has exhibited a fluctuating yet gradual increase throughout the observed period. This persistent widening of the interest rate spread highlights the challenges faced in deepening of financial intermediation in Lesotho.

Lower deposit interest rates can discourage savings, while elevated lending rates can curtail the demand for loans, underscoring the inherent challenges associated with borrowing. This underscores the considerable costs faced by businesses and individuals in obtaining financial resources. Such conditions clarify the banks' desire to maximise profits by extracting higher

returns through interest charges from their clients, thereby exacerbating the financial burden on borrowers.

In summary, the comprehensive review of Lesotho's financial sector highlights the implementation and impact of various financial sector reforms. Additionally, it emphasizes the significant enhancements achieved through the establishment of the commercial court in Lesotho, marking a pivotal development in the nation's financial landscape.

The reforms implemented in the late 1990s were aimed at stimulating both investment and savings by fostering an environment where credit is more accessible, and savings yields are attractive. Evidence of these reforms can be seen in the bank credit-to-deposit ratio, which indicates a consistent trend of commercial banks in Lesotho extending more credit relative to the deposits they hold. This trend signifies increased financial activity and easier access to credit for borrowers.

Furthermore, there has been a significant development in the financial sector brought about by the creation of commercial court, credit guarantee scheme, national identity system, and introduction of credit bureau. The implementation of mobile banking has also been noteworthy. It offers improved credit access and facilitating cost-effective, secure long-distance remittances. These developments promote social inclusion, economic empowerment, and innovation across diverse communities.

Chapter 4: Data, Model Specification, and Estimation Techniques

4.1 Data

This paper utilizes the endogenous growth model developed by King and Levine (1993), which emphasizes the significance of ongoing technological progress as a key driver of sustained long-run growth. This model is grounded in the Schumpeterian perspective that financial institutions are pivotal in assessing and financing entrepreneurs' innovative efforts and introducing new products to the market. It asserts that financial development influences growth through innovation by expanding and enhancing the efficiency of innovative activities, thus accelerating economic growth. This model forecasts that the primary mechanism through which finance exerts its predominant impact is via the avenue of productivity growth (see King & Levine, 1993). This is primarily because productivity growth occupies a central and pivotal role in the process of development.

The model highlights the importance of four fundamental financial services—evaluating entrepreneurs, pooling resources, diversifying risk, and estimating potential profits from innovative activities - in establishing the connection between financial development and economic growth.

Financial development is typically characterized in the finance-growth nexus literature as the enhancement of depth, accessibility, and efficiency within financial system services. This understanding, coupled with the existence of two predominant analytical frameworks for the finance-growth nexus - bank-based and market-based financial systems - highlights the absence of a single unanimously agreed-upon metric for accurately gauging financial development.

The selection of data frequency and proxies in this research is primarily determined by data availability. Consequently, all models, except Model 5, are estimated using data from 1981 to 2017 due to the unavailability of data on variable EDU beyond 2017. Given that Lesotho does not have a stock market, this study does not employ any proxy variables representing stock market measures. All variables used are sourced from the World Bank (2023), with summary statistics outlined in Table 4.1 and a detailed description of variables provided in Table 4.2A of Appendix A.

Table 4.1: Summary Statistics

Variable Name	Mean	Std. dev	Min	Max
GYP	1.623	3.223	-8.625	6.422
LGDPC	6.556	6.556	6.110	7.039
GK	12.206	19.156	-18.617	61.753
TFP	4.413	0.352	-1.571	8.161
LGCON	18.949	1.610	15.847	20.756
LTRO	20.400	1.359	17.874	21.899
EDU	34.258	13.962	16.068	59.820
RER	141.569	49.902	73.901	207.241
INF	9.539	7.758	-6.682	41.460
LLQL	3.581	0.205	3.188	3.961
ASST	82.867	11.552	44.807	99.999
DCRED	0.653	0.174	0.295	0.898
PCRED	14.761	4.436	5.089	22.021

The three dependent variables that are used in the three models are: the logarithm of real Gross Domestic Product per capita, in 2015 constant prices (LGDPC), the total factor productivity growth (TFP) and the growth rate of the real per capita physical capital stock (GK). The growth rate of the real per capita physical capital stock (GK) is proxied by the growth rate of gross fixed capital formation, in 2015 constant prices. The total factor productivity growth reflects quality advancement in technology and improvements in factor input utilization.

The estimation of the Solow residuals forms the basis for the calculation of the total factor productivity. Consider the Solow growth model below:

$$Y = AF(K, L) \tag{1}$$

Where Y is real GDP per capita, in 2015 constant prices, A is technological progress, K is units of capital and L is units of capital. To derive the growth rate of real GDP per capital, equation (1) can be expressed as the following Cobb-Douglas production function:

$$Y = AK^{\alpha}L^{\beta} \tag{2}$$

Where α and β represent the output elasticities with respect to capital and labor, respectively.

Taking the total derivation of equation (2), we get:

$$dY = K^{\alpha}L^{\beta}dA + \alpha AK^{\alpha-1}L^{\beta}dK + (1-\alpha)AK^{\alpha}L^{\beta-1}dL \quad (3)$$

Note: $Y/A = K^{\alpha}L^{\beta}$, $\alpha Y\frac{dK}{K} = \alpha AK^{\alpha-1}L^{\beta}\,dk$, $(1-\alpha)Y\frac{dL}{L} = \beta AK^{\alpha}L^{\beta-1}dL$

With simple algebraic manipulations, equation (3) can be written as:

$$\frac{dY}{Y} = \frac{dA}{Y} + \alpha\frac{dK}{K} + \beta\frac{dL}{L} \quad (4)$$

Equation (4) illustrates that the growth of real GDP per capita is equivalent to the sum of growth in total factor productivity, growth in units of capital and growth in units of labor. However, the growth in total factor productivity is not observable and instead calculated as Solow residuals;

$$\frac{dA}{A} = \frac{dY}{Y} - \alpha\frac{dK}{K} - \beta\frac{dL}{L} \quad (5)$$

Equation (5) shows that total factor productivity growth is the portion of growth that cannot be explained by increases in capital or labor. The output elasticities with respect to capital and labor are estimated by ARDL short-run coefficients (see Table 4.1 in APPENDIX A).

This study employs 4 measures of financial development adopted from different studies. They are as follows:

1. Private credit by deposit money banks and other financial institutions as a percentage of GDP which in Lesotho's case equates to private credit by deposit money banks as a percentage of GDP (PCRED) (Levine, 2005; Michalopoulos, Laeven, & Levine, 2009).
2. Log of liquid liabilities as a percentage of GDP (LLQL) (Levine, 2005).
3. Deposit money bank assets to deposit money bank assets and central bank assets (ASST) (Levine, 1993; Luintel & Khan, 1999).
4. Domestic credit to private sector as a percentage of GDP divided by domestic credit to private sector as a percentage of GDP plus credit to government and state-owned enterprises as a percentage of GDP (DCRED) (Levine, 1993).

The underlying premise for utilizing the measure of private credit by deposit money banks and other financial institutions as a percentage of GDP (PCRED) is based on the belief that financial systems channelling greater credit to private firms are more actively involved in tasks such as

researching firms, mobilizing savings, and facilitating transactions (Levine, 2005). This is in contrast to financial systems that predominantly direct credit to the government or state-owned enterprises. Reducing information and transaction costs enables a broader range of entrepreneurs to access external finance. This improvement in capital allocation has a notably significant impact on impoverished populations, as it facilitates more equitable financial opportunities (Levine, 2005).

The log of ratio of liquid liabilities as a percentage of GDP (LLQL) is commonly used as an indicator of financial depth. This variable reflects the overall magnitude of the financial sector. This measure does not differentiate among various sectors within the financial industry or the specific uses of these liabilities (Beck, Demirguc.-Kunt, & Levine, 2000). A substantial level of liquid liabilities suggests the presence of convenient and efficient mechanisms for executing financial transactions.

The rationale for employing the ratio of deposit money bank assets to the combined assets of deposit money banks and the central (ASST) bank stems from the observation that banks are more inclined to offer risk-sharing and information services, as compared to central banks (King & Levine, 1993).

Elevated ratios of domestic credit to the private sector as a percentage of GDP, divided by the sum of domestic credit to the private sector and credit to government and state-owned enterprises as a percentage of GDP (DCRED), indicate a shift in credit allocation away from public enterprises and government towards private firms (Levine, 1993).

All the control variables included in the regression are adopted from (Levine, 1997). The control variables include variables such as inflation rate, general government consumption expenditure, real exchange rates, trade openness, and secondary school enrolment that aim to control for macroeconomic environment.

4.2 Empirical Model Specification and Estimation Techniques

The empirical model is stated below:

$$G_t = \alpha + \beta FD_t + \gamma X_t + \varepsilon \quad (6)$$

Where G_t represents the following growth variables in the three model specifications: LGDPC, which is the logarithm of real Gross Domestic Product, in 2015 constant prices; GK, the growth rate of the real per capita physical capital stock; and PROD, representing the growth reflecting quality advancement in technology and improvements in factor input utilization.

FD_t represents the time series data of the following proxy variables of financial development: Credit by deposit money banks as a percentage of GDP which in Lesotho's case equates to private credit by deposit money banks and other financial institutions also as a percentage of GDP; log of ratio of liquid liabilities as a percentage of GDP; deposit money bank assets to deposit money bank assets and central bank assets; domestic credit to private sector as a percentage of GDP divided by domestic credit to private sector as a percentage of GDP plus credit to government and state-owned enterprises as a percentage of GDP.

X_t represents a matrix of the following control variables such as inflation, general government consumption expenditure, real exchange rates, trade openness, and secondary school enrollment to control for other factors associated with economic growth.

This study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration, as developed by (Pesaran, Shin, & Smith, 2001). A significant advantage of the ARDL approach is its flexibility regarding the integration order of variables. Unlike other cointegration methods, ARDL does not require all variables to be integrated of the same order. It is applicable to regressors whether they are integrated of order one, order zero, or even fractionally integrated (Nkoro & Uko, 2016). This approach is noted for its effectiveness even in scenarios with small sample sizes, a feature that sets it apart from other cointegration techniques that are often sensitive to sample size (Nkoro & Uko, 2016). The ARDL technique is particularly beneficial for providing unbiased estimates of long-run models and valid t-statistics. This remains true even in cases where some of the regressors are endogenous, offering a more reliable and robust analysis (Nkoro & Uko, 2016).

To ensure that all variables are integrated of order zero or one, the stationarity of the time series data used in this study is assessed using several renowned tests: the Augmented Dickey & Fuller test by Dickey & Fuller (1979), Dickey-Fuller Generalized Least Squares (DF-GLS) test by Elliot, Rothenberg, & Stock (1992), and the Perron and Phillips (1988) structural-break unit-root test.

The bounds testing approach to cointegration has been used to determine the existence of a long-run relationship between the studied variables. This testing approach is centred on the joint F-statistic. The null hypothesis posits that there is no cointegration relationship between the dependent variable and the regressors. Formally, it is stated as

$$H_0: \alpha_2 = \alpha_3 = \alpha_5 = \alpha_6 = 0$$

$$H_1: \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq \alpha_5 \neq \alpha_6 \neq 0$$

Conversely, the alternative hypothesis suggests the existence of a cointegration relationship. When the computed F-value exceeds the upper critical value, it implies a rejection of the null hypothesis. This indicates the presence of a long-run relationship between the variables, suggesting cointegration. Conversely, an F-value lower than the lower critical value implies the null hypothesis cannot be rejected. That is, it is concluded that a long-run relationship between the variables does not exist, hence no cointegration. In cases where the F-value falls between the upper and lower critical values, the results are deemed inconclusive. This indicates ambiguity regarding the presence or absence of cointegration among the variables.

Several post diagnostic tests have been performed to ensure that there is no violation of the classical regression assumptions, ensuring that the model is statistically sound and its inferences are reliable. The following tests have been utilized: Breusch-Godfrey test for serial correlation, White's test for homoskedasticity, Ramsey RESET test for model specification, Jarque-Bera test for normality of errors.

The ARDL representation of Models 1 - 6 can be expressed as follows:

Model 1-4:

$$\begin{aligned}\Delta LGDPC_t = {} & \alpha_0 + \alpha_1 T_t + \sum_{i=1}^{p} \alpha_2 \Delta LGDPC_{t-1} + \sum_{i=1}^{q_1} \alpha_3 \Delta LGCON_{t-1} \\ & + \sum_{i=1}^{q_2} \alpha_4 \Delta LTRO_{t-1} + \sum_{i=1}^{q_3} \alpha_5 \Delta EDU_{t-1} + \sum_{i=1}^{q_4} \alpha_6 \Delta FD_{t-1} \\ & + \beta_1 LGDPC_{t-1} + \beta_2 LGCON_{t-1} + \beta_3 LTRO_{t-1} + \beta_4 EDU_{t-1} \\ & + \beta_5 FD_{t-1} + \varepsilon_t\end{aligned} \tag{7}$$

Model 5:

$$\Delta PROD_t = \alpha_0 + \alpha_1 T_t + \sum_{i=1}^{p} \alpha_2 \Delta PROD_{t-1} + \sum_{i=1}^{q_1} \alpha_3 \Delta LGCON_{t-1} + \sum_{i=1}^{q_2} \alpha_4 \Delta LGDPC_{t-1} + \sum_{i=1}^{q_3} \alpha_5 \Delta POP_{t-1} + \sum_{i=1}^{q_4} \alpha_5 \Delta LLQl_{t-1} + \beta_2 PROD_{t-1} + \beta_2 LGCON_{t-1} + \beta_3 LGDPC_{t-1} + \beta_4 POP_{t-1} + \beta_1 LLQL_{t-1} + \varepsilon_t \quad (8)$$

Model 6

$$\Delta GK_t = \alpha_0 + \alpha_1 T_t + \sum_{i=1}^{p} \alpha_2 \Delta GK_{t-1} + \sum_{i=1}^{q_1} \alpha_3 \Delta LTRO_{t-1} + \sum_{i=1}^{q_2} \alpha_4 \Delta LGCON_{t-1} + \sum_{i=1}^{q_3} \alpha_5 \Delta EDU_{t-1} + \sum_{i=1}^{q_4} \alpha_5 \Delta LLQL_{t-1} + \beta_1 GK_{t-1} + \beta_1 LTRO_{t-1} + \beta_2 LGCON_{t-1} + \beta_3 EDU_{t-1} + \beta_3 LLQL_{t-1} + \varepsilon_t \quad (9)$$

In Equations 7 - 9, the parameters $\alpha_2, \alpha_3, \dots, \alpha_6$ are designated as the short-run coefficients, and $\beta_1, \beta_2, \dots, \beta_5$ represent the long run coefficients. The constant and trend term are represented by α_0 and T_1, respectfully. The residual term in the equations is represented by ε_t. This term is assumed to be independent and identically distributed (i.i.d.), embodying the concept of white noise. Accompanying Equations 7 - 9 are the corresponding error correction models. These models are vital as they quantify the speed at which the dependent variable adjusts towards its long-run equilibrium path after a change in the independent variables. These models are presented as follows:

Model 1-4:

$$\Delta LGDPC_t = \alpha_0 + \alpha_1 T_t + \sum_{i=1}^{p} \alpha_2 \Delta LGDPC_{t-1} + \sum_{i=1}^{q_2} \alpha_3 \Delta LGCON_{t-1} + \sum_{i=1}^{q_3} \alpha_4 \Delta LTRO_{t-1} + \sum_{i=1}^{q_4} \alpha_5 \Delta EDU_{t-1} + \sum_{i=1}^{q_5} \alpha_6 \Delta FD_{t-1} + \delta ECM_{t-1} + \varepsilon_t \quad (10)$$

Model 5:

$$\Delta PROD_t = \alpha_0 + \alpha_1 T_t + \sum_{i=1}^{p} \alpha_2 \Delta PROD_{t-1} + \sum_{i=1}^{q_1} \alpha_3 \Delta LGCON_{t-1} + \sum_{i=1}^{q_2} \alpha_4 \Delta LGDPC_{t-1} + \sum_{i=1}^{q_3} \alpha_5 \Delta POP_{t-1} + \sum_{i=1}^{q_4} \alpha_5 \Delta LLQl_{t-1} + \delta ECM_{t-1} + \varepsilon_t \quad (11)$$

Model 6:

$$\Delta GK_t = \alpha_0 + \alpha_1 T_t + \sum_{i=1}^{p} \alpha_2 \Delta GK_{t-1} + \sum_{i=1}^{q_1} \alpha_3 \Delta LTRO_{t-1} + \sum_{i=1}^{q_2} \alpha_4 \Delta LGCON_{t-1} + \sum_{i=1}^{q_3} \alpha_5 \Delta EDU_{t-1} + \sum_{i=1}^{q_4} \alpha_5 \Delta LLQL_{t-1} + \delta ECM_{t-1} + \varepsilon_t \quad (12)$$

Chapter 5: Empirical Results

5.1 Stationarity Tests

The stationary test results indicate that all variables in the study are integrated at either order one or order zero. This categorization is crucial for understanding the properties of the time series data and selecting appropriate econometric models (see unit root tests results in Table 5.1 and 5.1.1, and results for critical values of unit root tests in Table 5.2 of APPENDIX A).

Only PROD is found to be strictly integrated at order 0. This implies that it is stationary in its original form without the need for differencing. Other variables, LGDPC, LLQL, RER, EDU and LGCON are strictly integrated at order 1. This suggests that these variables become stationary after a first differencing. Variables like DCRED, LTRO and ASST, the determination of their integration order is zero or one varies depending on the specific stationarity test applied. Given that none of the variables were found to be order 2, the study can employ the ARDL bounds testing approach for cointegrating relationships, as suggested by Pesaran, Shin, & Smith (2001). This method is particularly useful in cases where the variables are of mixed integration orders and allows for a robust analysis of long-run equilibrium relationships among them.

5.2 ARDL Bounds Test for Cointegration

In the bounds tests for cointegration for each model, all computed F-statistics were found to be statistically significant at the 1% significance level (see Table 5.3). This uniformity in statistical significance across all models underscores the robustness of the findings. The results from the bounds tests, utilizing the approach suggested by Pesaran, Shin, and Smith (2001), consistently confirm the existence of long-run level relationships. These relationships are observed between the dependent variables; real GDP per capita; growth rate of investment; total productivity growth; and the set of covariates across all models.

Table 5.3: ARDL Bounds Test for Cointegration

		10%		5%		Cointegration
Model	F-statistic	I(0)	I(1)	I(0)	I(1)	
1	7.53	3.03	4.06	3.47	4.57	Yes
2	5.85	3.03	4.06	3.47	4.57	Yes
3	6.25	3.03	40.6	3.47	4.57	Yes
4	6.52	3.03	4.06	3.47	4.57	Yes
5	16.96	3.03	4.06	3.47	4.57	Yes
6	7.460	3.03	4.06	3.47	4.57	Yes

In all the models studied in this paper, the Akaike Information Criterion (AIC) and the Schwarz-Bayesian Criterion (SBC) were employed to determine the most appropriate maximum lag lengths. These criteria are crucial for optimizing model accuracy and reliability. The optimal lag lengths identified for each model are presented in Table 5.3. The choice of the optimal lag length varied between models. AIC was used as the basis for selecting the optimal lag in Models 1, 2, 4, 6, and 7. While SBC was the guiding criterion for Models 3, 5, 8, and 9.

5.3 Empirical Analysis of the ARDL-Based Error Correction Model

5.3.1. Overview of Models and Methodology:

Employing Autoregressive Distributed Lag (ARDL) approach to cointegration, this study initially explores how financial development affects the overall real GDP per capita. After establishing this understanding, the analysis then shifts to analysing only one proxy of financial development, the impact of the ratio of liquid liability to GDP, on the total productivity growth and the accumulation of physical capital. In total, six ARDL models are estimated, detailed across Tables 5.4 - 5.6.

5.3.2. Model 1 – 4

The R-squared values computed for Models 1 - 4 indicate a robust ability of the independent variables to account for a significant portion of the variations in real income per capita in Lesotho. Notably, the R-squared value surpasses 50% for all models except for Model 2, where it is slightly lower at 49%. Despite this slight decrease, the R-squared in Model 3 still suggests a substantial explanatory power. For Models 1, 3, and 4, the error correction terms are highly significant, evidenced by their statistical significance at the 1% level. In contrast, Model 2 displays a slightly lesser significance, with the error correction term being significant at the 5% level. This still indicates relevance but suggests a marginally lower confidence compared to the other models. The negative values of the error correction terms across all these models imply that each of these models exhibits a consistent tendency to return to a long-run equilibrium following short-run deviations.

In Model 1, the error correction term suggests that about 40% of any deviation from the long-run equilibrium is corrected each year. Furthermore, the coefficient for the LLQL is statistically significant at a 5% level. This signifies a robust and meaningful relationship between LLQL and Lesotho's economic growth. The long run results indicate that a one percent increase in the log of the ratio of liquid liabilities to GDP leads to approximately 0.17%

decrease in real GDP per capita, holding other variables constant. This negative coefficient points to an inverse relationship between financial development, as represented by LLQL, and Lesotho's real GDP per capita in the long run. These findings align with existing literature, where the inverse relationships between financial development and economic growth have been observed (see Ram, 1995; Saci, Giorgioni, & Holden, 2009; Adusei & Nkrumah, 2013).

In the short run, the coefficient for LLQL remains negative and is significant at the 5% level. This underscores the continuing influence of financial development on economic growth, albeit in a negative direction. However, the magnitude of LLQL's impact is somewhat reduced in the short run. A one percent rise in the log of ratio of liquid liabilities to GDP corresponds to a modest decrease in real GDP per capita of about 0.07%, assuming other variables remain constant. This suggests that the short run impact of changes in LLQL is less severe compared to its long-run effect.

The coefficient for ASST itself is found to be insignificant in the long run in Model 2. This suggests that ASST does not serve as a reliable predictor of real GDP per capita in the long-run context of the Lesotho's economy.

In the short run, both EDU and LTRO emerge as significant variables, with EDU showing significance at a 5% level and LTRO at an even more robust 1% level. This underscores the short run impact these factors have on Lesotho's economic growth. The coefficient on ASST in the short run is not only insignificant but also registers as zero. The insignificance of ASST in both the long and short run implies that it does not play a meaningful role in influencing real GDP per capita in either timeframe within the context of Model 2.

The introduction of DCRED (a proxy of financial development) in Model 3, as seen in the results presented in Panel 1 of Table 5.4, leads to a slight decrease in the model's explanatory capability. Specifically, both R-squared and Adjusted R-squared are registered to be equal to 52% and 41% respectively. Despite this decrease, the model still accounts for over 50% of the variation in Lesotho's real income per capita. This indicates that the dependent variables, even with the addition of DCRED, continue to provide a substantial explanation of the economic growth dynamics in Lesotho. The control variables, notably EDU and LTRO, maintain their statistical significance within the model. This reaffirms their consistent role in influencing economic growth. The long and short run coefficients for DCRED turn out to be statistically insignificant. This suggests that DCRED does not have a statistical impact on economic growth both in the long and short run.

In Model 4, presented in Panel 1, another financial development proxy, PCRED (another proxy for financial development), is analysed. The model achieves an R-squared of 54%. Notably, the long-run coefficient for PCRED is zero and statistically insignificant. This finding indicates that PCRED may not be a crucial determinant of long-run economic growth in Lesotho.

In the short-run analysis, the coefficient for PCRED is still zero and statistically insignificant. This lack of impact mirrors the findings from the long-run analysis, suggesting a consistent absence of influence of PCRED on economic growth in Lesotho, regardless of the time frame considered.

Table 5.4: Estimated Results [Dependent Variable: LGDPC]

Panel 1. Long-Run Coefficients [Dependent Variable: $LGDPC_t$, Year 1981 – 2017]

Model	1	2	3	4
$LGCON_t$	-0.01	-0.06	-0.02	0.04
	(0.03)	(0.08)	(0.04)	(0.05)
$LTRO_t$	0.19***	0.33*	0.24***	0.17*
	(0.07)	(1.89)	(0.09)	(0.09)
EDU_t	0.02***	0.01*	0.01*	0.01**
	(0.01)	(0.007)	(0.005)	(0.005)
$LLQL_t$	-0.17*			
	(0.08)			
$ASST_t$		0.00		
		(0.002)		
$DCRED_t$			0.08	
			(0.08)	
$PCRED_t$				0.00
				(0.003)

Panel 2. Short-run Coefficients [Dependent Variable: $LGDPC_t$, Year 1981 – 2017]

Model	1	2	3	4
$\Delta LGCON_t$	0.00	-0.02	-0.01	-0.01
	(0.01)	(0.02)	(0.02)	(0.019)
$\Delta LTRO_t$	0.08***	0.08***	0.09***	0.06**
	(0.03)	(0.03)	(0.03)	(0.03)
ΔEDU_t	0.00	0.003**	0.00	0.00
	(0.003)	(0.001)	(0.002)	(0.003)
$\Delta LLQL_t$	-0.07**			
	(0.03)			
$\Delta ASST_t$		0.00*		
		(0.00)		
$\Delta DCRED_t$			0.03	
			(0.03)	
ΔT_t	-0.01	-0.00	-0.004	0.00

	(0.004)	(0.004)	(0.005)	(0.005)
β_0	13.47*	8.56	8.41	8.91
	(7.98)	(8.07)	(8.68)	(8.52)
ECM_{t-1}	-0.40***	-0.25**	-0.37***	-0.37***
	(0.10)	(0.11)	(0.11)	(0.11)
Sample size	37	37	37	37
R-Squared	0.57	0.49	0.52	0.54
Adjusted R-Squared	0.47	0.39	0.41	0.41

Note: Standard errors in paranthesis. For all p-values: ******1% significance level; **5% significance level; *10% significance level***.

The results above highlight that the log of ratio of liquid liabilities to GDP (LLQL) emerged as the only proxy for financial development that significantly impacts economic growth. However, this impact is found to negative.

These results are consistent with the findings of Shen and Lee (2006) and Gregorio and Guidotti (1995). Shen and Lee (2006) found that banking development had a negative or no effect on growth in a panel of 48 countries. Similarly, Gregorio and Guidotti (1995) observed a negative impact of banking development on growth, attributing this outcome to financial liberalization in a poorly regulated environment. A similar argument can be made for Lesotho. Although structural reforms in Lesotho's financial sector began in 1998 with the aim of, among other things, liberalizing interest rates to foster the expansion of money markets and remove pricing restrictions, civil law reforms to facilitate bank lending to the private sector were only implemented in the 2000s. These reforms included the creation of a commercial court, the implementation of a credit guarantee scheme, the establishment of a national identity system, the introduction of a credit bureau, and the effective implementation of new land and leasing laws that allowed land to be used as collateral.

To further understand how LLQL influences economic growth, our analysis will now pivot to examine its effects specifically on two key areas: total productivity growth and the accumulation of physical capital. This focus will allow for a more detailed exploration of the channels through which LLQL exerts its influence. Models 5 is dedicated to investigating the impact of LLQL on total productivity growth. This model will provide insights into how changes in the log of ratio of liquid liabilities to GDP are associated with total productivity growth, a critical component of economic growth. Furthermore, Model 6 focus on the accumulation of physical capital. This examination will shed light on whether LLQL plays a significant role in accumulation of physical capital, another crucial factor in economic development.

5.3.3. Model 5

The results presented in the Table 5.5 for Model 5 highlight a robust explanatory capability. This is evidenced by the computed R-squared value, which exceeds 70% . This R-squared figure suggest that the variables selected for the regression effectively capture a significant portion of the variations in Lesotho's total factor productivity growth (TFP). The error correction term is statistically significant at a 1% level. Notably, the error correction terms is negative, a critical observation indicating that the model exhibits a consistent tendency to return to a long-run equilibrium.

In Model 5, as detailed in Panel 5, all long-run coefficients are statistically significant at 1% level except for LLQL which is insignificant. LLQL still emerge as statistically insignificant in the short run. The insignificant impact of LLQL on PROD, observed in both long and short-run scenarios, suggests that there is no relationship between the log of the ratio of liquid liabilities and total factor productivity growth.

Table 5.5: Estimated Results [Dependent Variable: PROD].

Panel 5. Long-Run Coefficients [Dependent Variable: $PROD_t$, Year 1981 – 2022]

Model	5
$LGDPC_t$	7.95*** (2.48)
$LGCON_t$	-1.92*** (0.48)
POP_t	-2.47*** (0.48)
$LLQL_t$	-1.06 (1.53)

Panel 6. Short-run Coefficients [Dependent Variable $PROD_t$, Year 1981 – 2022]

Model	5
$\Delta LGDPC_t$	-16.65** (6.51)
$\Delta LGCON_t$	-2.26*** (0.65)
ΔPOP_t	-2.90*** (0.73)
$LLQL_t$	-1.24 (1.76)
ΔT_t	0.02 (0.08)
β_0	-41.38 (141.77)
ECM_{t-1}	-1.18*** (0.14)
Sample size	41
R-Squared	0.7369
Adjusted R-Squared	0.6811

*Note: Standard errors in parenthesis. For all p-values**: ***1% significance level**; **5% significance level**; *10% significance level**.*

The analysis now extends to a detailed examination of how the log of ratio of liquid liabilities to GDP (LLQL) influences the growth rate of accumulation of physical capital (GK). The specific outcomes of this investigation are presented in the Table 5.6 below.

5.3.4. Model 6

Model 6 achieves an R-squared of 62.50%. Importantly, the long-run coefficient for LLQL is statistically insignificant, indicating that LLQL may not play a significant role in capital accumulation in Lesotho. Similarly, in the short-run analysis, the LLQL coefficient remains statistically insignificant, reflecting a consistent lack of influence on capital accumulation across both time frames.

Table 5.6: Estimated Results [Dependent Variable: GK].

Panel 7. Long-Run Coefficients [Dependent Variable: GK_t, Year 1982 – 2017]

Model	6
$LTRO_t$	96.039* (44.70)
$LGCON_t$	18.81* (7.6545)
EDU_t	2.685* (1.447)
$LLQL_t$	11.3848 (30.1844)

Panel 8. Short-run Coefficients [Dependent Variable GK_t, Year 1982 – 2017]

Model	6	
$\Delta LTRO_t$	67.350* (30.5717)	
$\Delta LGCON_t$	20.025* (8.730)	
ΔEDU_t	2.859* (1.595)	
$LLQL_t$	12.120 (32.158)	
ΔT_t	-6.361** (2.848)	
β_0	12194.41**(2.848)	
ECM_{t-1}	-1.06*** (0.177)	-
Sample size	36	
R-Squared	0.6250	
Adjusted R-Squared	0.5313	

Note: Standard errors in paranthesis. For all p-values: ******1% significance level; **5% significance level; *10% significance level.***

Table 5.7: ARDL-VECM Post-Estimation Diagnostic Tests

Test Statistic	**Model**	
	Model 1	**Model 2**
Breusch-Godfrey Test: No Serial Correlation	1.95[0.377]	1.52[0.185]
White's Test: Homoskedasticity	36.85[0.383]	34.58[0.150]
Ramsey RESET Test: Functional Form	0.20[0.984]	0.76[0.40]
Jarque-Bera Test: Normality	0.94[0.625]	5.22[0.073]
Test Statistic	**Model**	
	Model 3	**Model 4**
Breusch-Godfrey Test: No Serial Correlation	0.55[0.457]	0.01[0.911]
White's Test: Homoskedasticity	36.95[0.379]	37.00[0.423]
Ramsey RESET Test: Functional Form	0.74[0.42]	0.39[0.762]
Jarque-Bera Test: Normality	4.08[0.13]	2.42[0.298]
Test Statistic	**Model**	
	Model 5	**Model 6**
Breusch-Godfrey Test: No Serial Correlation	3.33[0.068]	0.01[0.942]
White's Test: Homoskedasticity	33.83[0.524]	36.00[0.422]
Ramsey RESET Test: Functional Form	1.02[0.399]	0.51[0.678]
Jarque-Bera Test: Normality	1.211[0.546]	2.32[0.314]

Note: *For all p-values:* ******1% significance level**; ****5% significance level**; ***10% significance level.***

The results indicate that the null hypothesis of no serial correlation cannot be rejected at the 5% significance level. This implies that the variables in the final ARDL models do not exhibit serial correlation, ensuring the independence of error terms. The absence of heteroskedasticity is confirmed as the null hypothesis for White's test cannot be rejected. This suggests that the error variance is consistent across all levels of the independent variables in the models. The Ramsey RESET test results indicate that the null hypothesis cannot be rejected, suggesting that the functional forms of the ARDL models are correctly specified and appropriate for the data. The Jarque-Bera test results fail to reject the null hypothesis, confirming that the error terms are normally distributed (white noise). These tests are essential for the validity of many statistical inferences in regression analysis.

Figures 11 through 16 present the results for the CUSUM and CUSUMSQ tests, which are designed to assess the stability of the estimated regression parameters and variances,

respectively[4]. All CUSUM and CUSUMSQ tests suggest parameter and variance stability in the ARDL models.

In summary, each model investigates distinct aspects of financial development, providing a nuanced understanding of their respective influences. Overall, the results indicate a negligible or negative finance-growth nexus. LLQL coefficient in Model 1 reveals an inverse relationship with economic growth. This negative impact persists in both the short and long run, albeit with a reduced magnitude in the short run.

In contrast, Model 2 introduces ASST, which demonstrates a lack of impact, thus questioning its relevance in predicting economic growth in this context. Similarly, DCRED and PCRED display insignificant impacts in both long and short run. These findings suggest that these proxies may not be critical factors in driving long-run economic growth in Lesotho. Furthermore, the analysis highlights that LLQL does not have an impact on both total factor productivity growth and growth of physical capital as demonstrated by Model 5 and 6.

[4] See Figure 11 – 19 in APPENDIX A

Chapter 6: Conclusion

The empirical literature examining the finance-growth nexus in Lesotho is relatively scarce. This study aims to enrich this body of work by employing extended time series data, multiple financial development proxies, and an endogenous model adopted from Levine (1993). Unlike previous studies on Lesotho, which primarily focused on the broad impact of financial development on economic growth, this research goes further by also investigating how financial development affects key components of economic growth, such as total productivity growth and physical capital accumulation.

To achieve this, the study utilizes the Autoregressive Distributed Lag (ARDL) approach to cointegration, examining both the short and long-run effects of financial development on Lesotho's economic growth.

Initially, four models are estimated using the same control variables alongside four different proxies representing various aspects of financial development. These proxies include private credit by deposit money banks and other financial institutions as a percentage of GDP, log of liquid liabilities as a percentage of GDP, the ratio of deposit money bank assets to central bank assets, and the ratio of domestic credit to the private sector to GDP. Interestingly, the results indicate that only the log ratio of liquid liabilities to GDP significantly impact economic growth, and this impact is negative.

Following this general analysis, the study makes a more detailed examination of financial development's effects on total factor productivity growth and growth of physical capital. The findings indicate that the logarithm of liquid liabilities does not have a statistically significant effect on total factor productivity growth. This is despite the prediction of King and Levine's (1993) endogenous growth model, which suggests that the primary mechanism through which finance exerts its predominant influence is through total factor productivity growth.

Lastly, the study shifts focus to the impact of the log of ratio of liquid liabilities to GDP on the accumulation of physical capital. The results show that financial development have no statistical influence on the growth of physical capital as well. These findings imply that Lesotho may not be fully leveraging the benefits of financial development to enhance its economic growth.

This research has few limitations. Firstly, it does not investigate the relationship between economic growth and international finance, including aspects such as cross-border capital flows and the importation of financial services. Given Lesotho's close economic ties and reliance on South Africa for trade, the interaction in financial services across borders is significant. Most commercial banks in Lesotho are branches of South African banks, leading to considerable financial transactions with their parent entities. As highlighted by IMF (2018), banks in Lesotho hold a disproportionately large amount of liquid assets, which are often placed in South African banks.

Second, the proxies for financial development employed in this study might not precisely capture the concepts from theoretical models, a challenge not unique to this paper but prevalent in the literature concerning the finance-growth nexus (refer to Levine, 2005). Theoretical discussions often emphasize that proxies should reflect improvements in depth, accessibility, and efficiency of financial services. Due to data limitations and time constraints, this paper could not examine all five functions of financial systems as outlined in the theoretical literature in chapter 2.

Lastly, the study primarily focuses on proxy variables related to banking institutions. Consequently, it does not incorporate variables that assess the influence of other financial entities such as asset managers, insurance companies, micro-finance firms, pension funds, mobile money providers and other non-bank financial institutions, even though they play a significant role in the financial system of Lesotho.

The banking sector in Lesotho, characterized by its small size, high concentration, and limited financial inclusion, requires strategic policy interventions to enhance its efficiency and inclusivity. Lesotho's commercial banks need to actively address financial inclusion issues to extend services to a broader segment of the population. This expansion is crucial for achieving deeper financial intermediation in the country.

Moreover, fostering a competitive environment in the banking sector is essential. Increased competition can lead to narrower interest rate spreads, as banks will be incentivized to offer loans and accept deposits at more competitive rates. This will not only improve financial intermediation efficiency but also make financial services more accessible to a larger population.

Currently, a significant portion of liquid assets is held by Lesotho's banks in South African financial institutions. This practice could be re-evaluated to ensure optimal asset allocation within the country. Given the current trend of high loan-to-deposit ratios, policies should incentivize banks to lend more actively.

The Lesotho government should implement policies that encourage a more balanced distribution of loans. This will not only stimulate economic activities but also ensure that banks are playing their fundamental role in financial intermediation effectively. Notably, according to IMF (2018) only a third of loans in Lesotho are directed towards business enterprises, with the bulk going to personal loans. To foster economic growth and support entrepreneurship, policies should encourage commercial banks to increase lending to businesses.

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APPENDIX A

Table 4.2A: Full Description of Variables.

Variable Name	Variable Transformation	Variable Definition
GYP	In Levels	Annual percentage growth rate of GDP per capita based on constant local currency.
LGDPC	Logarithmic	GDP per capita is gross domestic product divided by midyear population.
GK	In Levels	Average annual growth of gross fixed capital formation expressed in constant local currency.
TFP	In Levels	Total factor productivity growth
LGCON	Logarithmic	General government final consumption expenditure expressed in 2015 USD prices.
LTRO	Logarithmic	The sum of import and exports expressed in 2015 USD prices divided by the real GDP also expressed in 2015 USD prices.
EDU	In Levels	The gross enrollment ratio represents the proportion of total enrollments, irrespective of age, compared to the population within the official age range for the given educational level.
RER	In Levels	The real effective exchange rate is calculated by dividing the nominal effective exchange rate by a price deflator or a cost index.
INF	In Levels	Inflation, indicated by the yearly increase rate of the GDP implicit deflator, reflects the overall economy's rate of price changes.
LLQL	Logarithmic	Ratio of liquid liabilities to GDP.
ASST	In Levels	The ratio of deposit money bank assets to the combined assets of deposit money banks and the central bank.
DCRED	In Levels	Domestic credit to private sector as a percentage of GDP divided by domestic credit to private sector as a percentage of GDP plus credit to government and state-owned enterprises as a percentage of GDP.
PCRED	In Levels	The financial resources provided to the private sector by domestic money banks as a share of GDP.

Table 5.1A: Stationarity Tests for all Variables in Levels.

Stationarity of all Variables in Levels

	ADF		DF-GLS		Philips - Perron	
Variable Name	**Without Trend**	**With Trend**	**Without Trend**	**With Trend**	**Without Trend**	**With Trend**
LGDPC	-	-2.71	-	-1.98	-	-2.86
TFP	-3.50**	-	-1.05	-	-3.47**	-
PCRED	-2.06	-	-1.43	-	-2.27	-
LLQL	-	-1.54	-	-1.51	-	-1.95
ASST	-1.95	-	-1.62*	-	-2.96*	-
DCRED	-	-3.47*	-	-1.99	-	-2.19
INF	-	-7.99***	-	-2.29	-	-8.09***
RER	-	-2.37	-	-2.29	-	-2.36
EDU	-	-1.45		-1.36		-
LGCON	-1.56	-	0.14	-	-1.51	-
LTRO	-3.16**	-	-1.02	-	-3.16**	-

Note: For all p-values: ***1% significance level**; **5% significance level**; *10% significance level.** The appropriate lag length selection is determined by Schwarz information criterion.

Table 5.1.1A: Stationarity Tests for Variables in 1st Difference

	Stationarity of all Variables in 1st Difference					
	ADF		**DF-GLS**		**Philip Perron**	
Variable Name	**Without Trend**	**With Trend**	**Without Trend**	**With Trend**	**Without Trend**	**With Trend**
LGDPC	-	-5.22***	-	-4.78***	-	-5.27***
TFP	-	-	-	-	-	-
PCRED	-6.44***	-	-1.51	-	-6.43***	-
LLQL	-	-4.12**	-	-4.13***	-	-4.11**
ASST	-7.86***	-	-1.55	-	-7.89***	-
DCRED	-	-5.80***	-	-5.67***	-	-5.80***
INF	-	-	-	-1.46	-	-
RER	-	-5.42***	-	-5.55***	-	-5.39***
EDU	-	-4.16**		-4.24***	-	-4.25***
LGCON	-4.93***	-	-4.93***	-	-4.95***	-
LTRO	-	-	-4.77***	-	-4.79***	-

Note: For all p-values: ***1% significance level; **5% significance level; *10% significance level.** The appropriate lag length selection is determined by Schwarz information criterion.

Table 5.2A: Critical Values of stationarity Tests

Critical Values of Stationarity Tests

Variables name	ADF		DF-GLS		Phillip Perron	
	10%	5%	10%	5%	10%	5%
LGDPC	-3.20	-3.54	-2.89	-3.19	-3.20	-3.54
TFP	-2.60	-2.93	-1.61	-1.95	-2.60	-2.93
PCRED	-2.61	-2.94	-1.61	-1.95	-2.61	-2.94
LLQL	-3.20	-3.54	-2.89	-3.19	-3.20	-3.54
ASST	-2.61	-2.94	-1.61	-1.95	-2.61	-2.94
DCRED	-2.61	-2.94	-1.61	-1.95	-2.61	-2.94
INF	-3.20	-3.54	-2.89	-3.19	-3.20	-3.54
RER	-3.20	-3.54	-2.89	-3.19	-3.20	-3.54
EDU	-3.20	-3.54	-2.89	-3.19	-3.20	-3.54
LGCON	-2.61	-2.94	-1.61	-1.95	-2.61	-2.94
LTRO	-2.61	-2.94	-1.61	-1.95	-2.61	-2.94

Figure 11A: CUSUM and CUSUMSQ Tests for Model 1

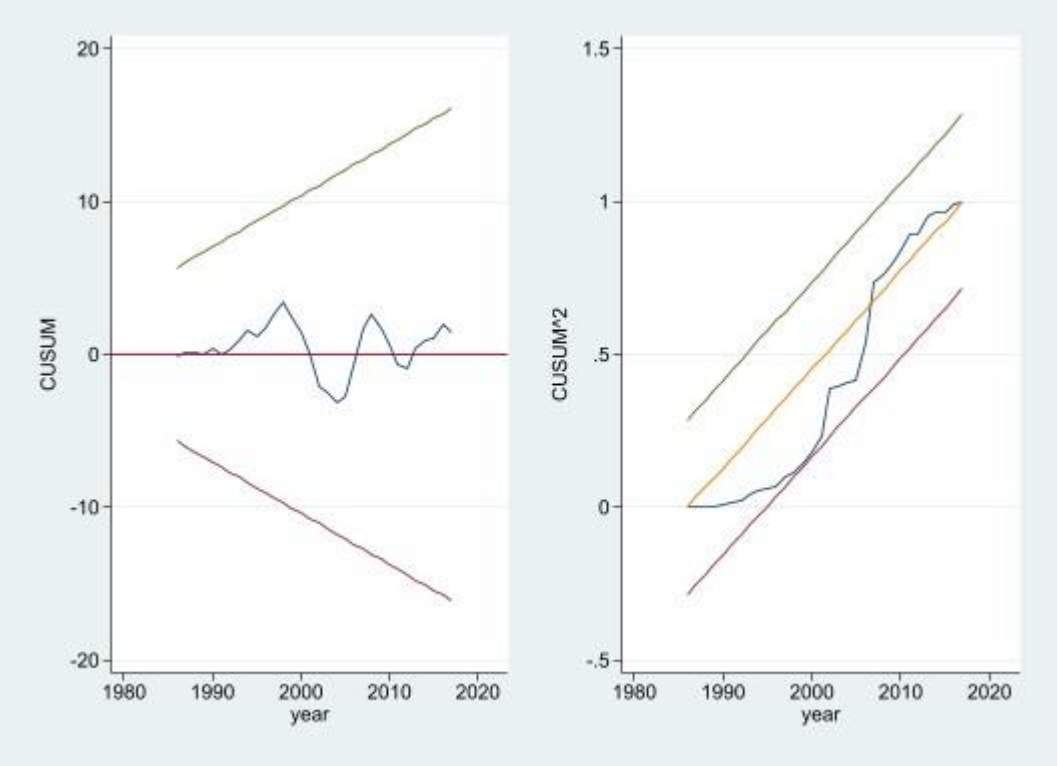

Figure 12A: CUSUM and CUSUMSQ Tests for Model 2

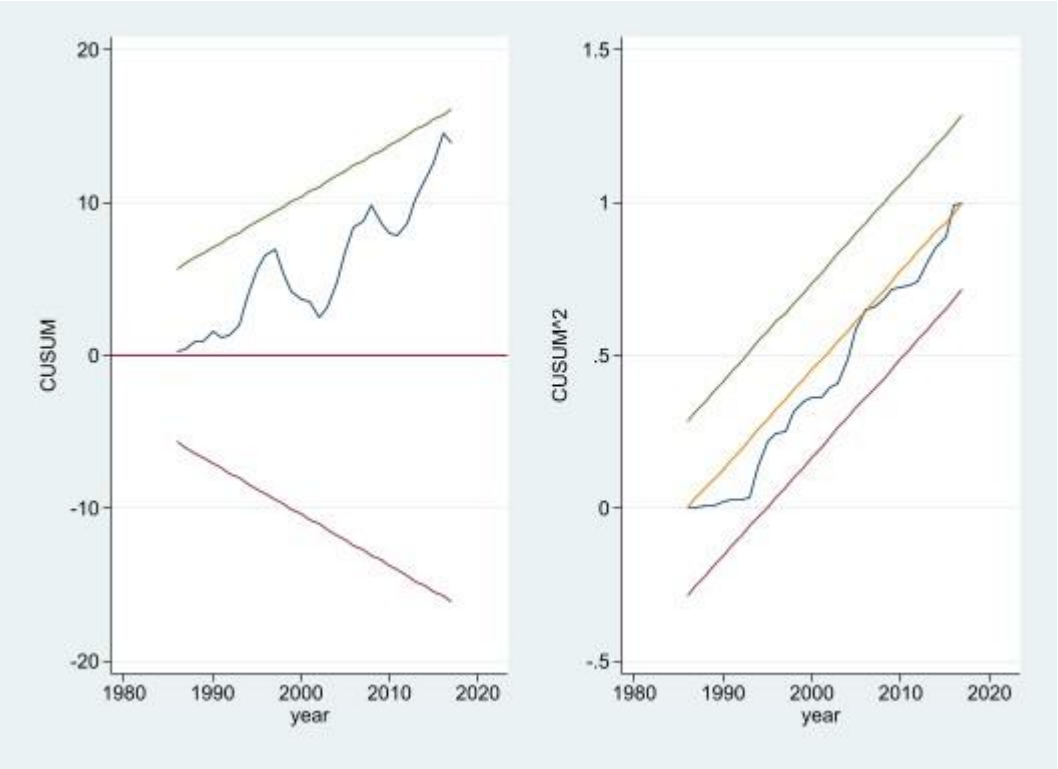

Figure 13A: CUSUM and CUSUMSQ Tests for Model 3

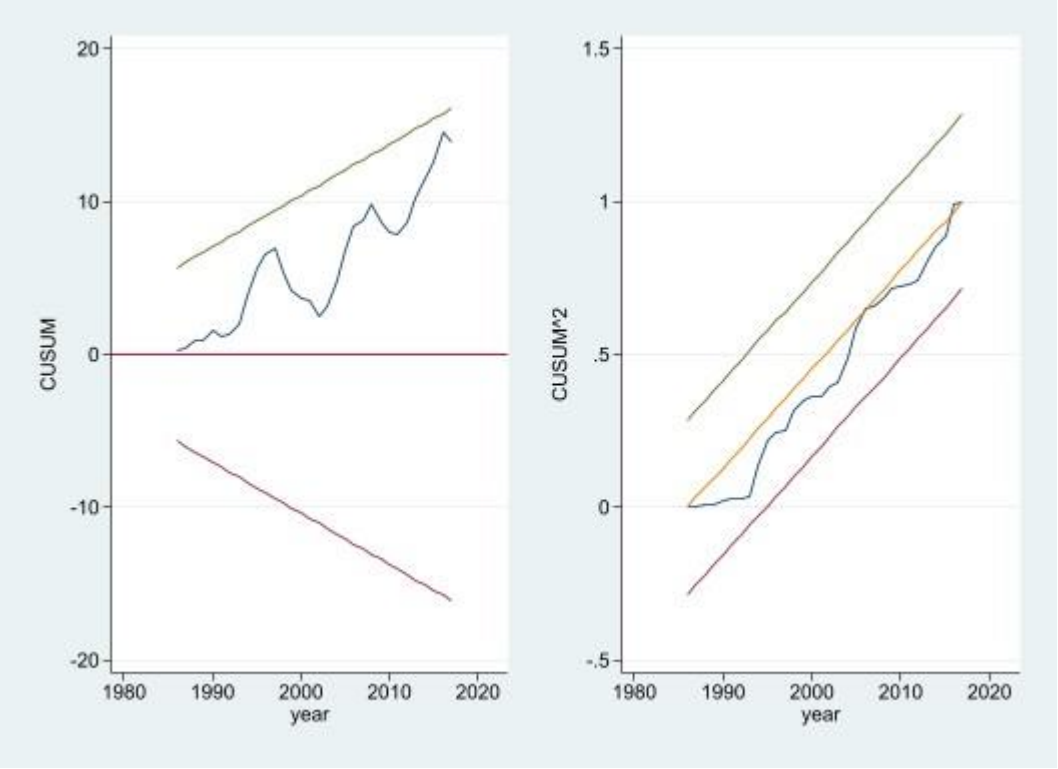

Figure 14A: CUSUM and CUSUMSQ Tests for Model 4

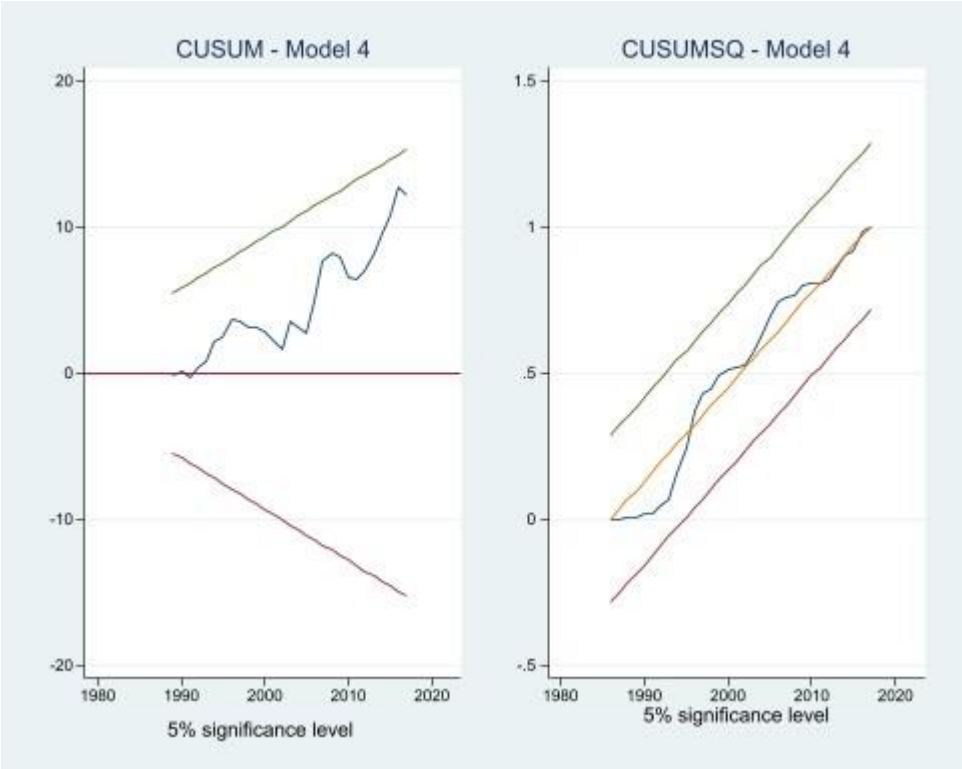

Figure 15A: CUSUM and CUSUMSQ Tests for Model 5

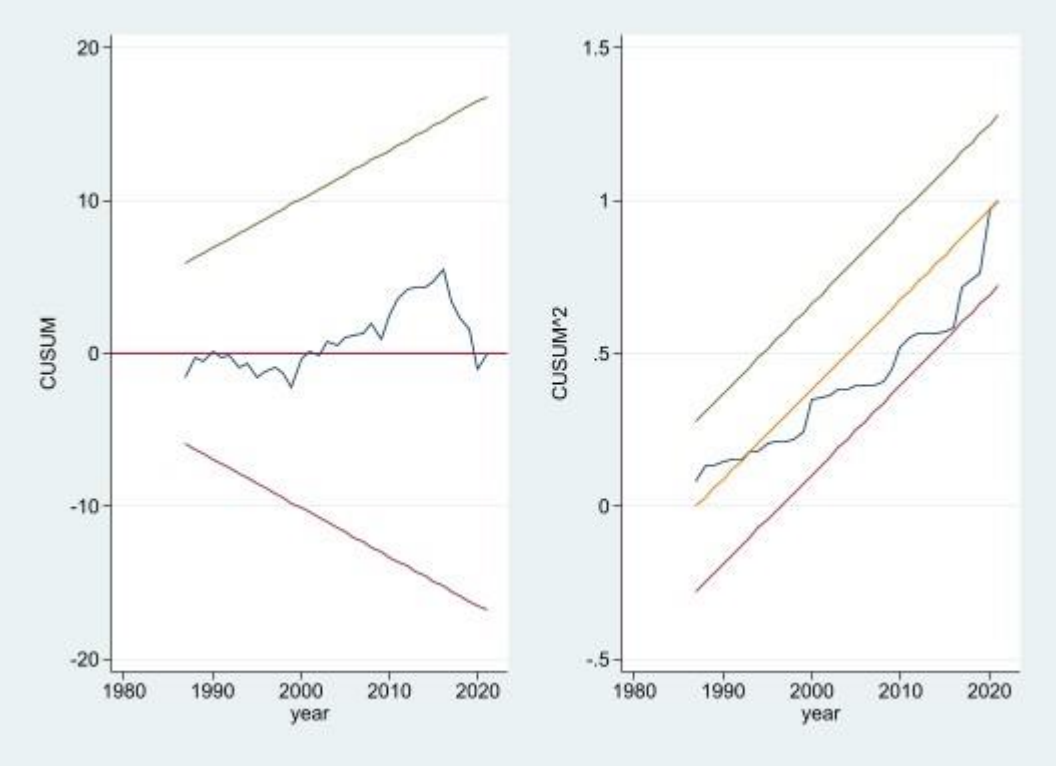

Figure 16A: CUSUM and CUSUMSQ Tests for Model 6