THE EFFECT OF FINANCIAL SECTOR DEVELOPMENT ON ECONOMIC GROWTH IN ETHIOPIA: A TIME SERIES ANALYSIS

YIMER NIGATU

JUNE, 2024
ADDIS ABABA, ETHIOPIA

THE EFFECT OF FINANCIAL SECTOR DEVELOPMENT ON ECONOMIC GROWTH IN ETHIOPIA: A TIME SERIES ANALYSIS

YIMER NIGATU

A Thesis Submitted to the Department of Economics in Partial Fulfillment for the Requirement of the Degree of Master of Science in Development Economics

Advisor: Sisay Debebe (PhD)

Addis Ababa, Ethiopia
June, 2024

DECLARATIONS

I Yimer Nigatu Aragaw, do hereby declare that this Thesis is my original work and that it has not been submitted partially; or in full, by any other person for an award of a degree in any other university/institution.

Name of Participant…….Signature……. Date…….

This Thesis has been submitted for examination with my approval as College supervisor.

Name of Advisor……Signature……. Date……

STATEMENT OF CERTIFICATION

This is to certify that Yimer Nigatu Aragaw has carried out his research work on the topic entitled "The Effect of Financial Sector Development on Economic Growth in Ethiopia". To the best of my knowledge, the work is original and is presented for defense with my approval.

Signature----------
Date----------

APPROVAL SHEET

This is to certify that the thesis prepared by Yimer Nigatu Aragaw Entitled "**The Effect of Financial Sector Development on Economic Growth in Ethiopia**" and submitted in partial fulfillment of requirement for degree of Master of Science in Development Economics complies with the regulations of the university and meets the accepted standards with respect to originality and Quality.

Approved by

Advisor:

Name: Sisay Debebe(PhD)

Signature: _____

Date: _____

Internal Examiner

Name:

Signature: _____

Date: _____

External examiner

Name:

Signature: _____

Date: _____

ACKNOWLEDGEMENTS

First and foremost, I would like to give my glory and praise to the Almighty God for His invaluable care and support throughout my life and education. His guidance has been with me since the inception of my education through to its completion.

Next, I am profoundly grateful to my advisor, Dr. Sisay Debebe, for his exceptional guidance and support during the preparation of this paper. His valuable and prompt advice, patience, constructive corrections, insightful comments, suggestions, and encouragement have been invaluable throughout this process.

My sincere and heartfelt gratitude goes to the managers and employees of the National Bank of Ethiopia for their immediate provision of the required data for this research. Without their cooperation, this paper would not have come to fruition.

I extend my deepest thanks to my beloved family and friends for their unwavering support, love, care, and encouragement.

Lastly, my warm regards and blessings go to all who have made positive contributions to my life. May the Almighty God bless you all.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ADF Augmented Dickey Fuller test

ARDL Auto Regressive Distributive Lag

ECM Error Correction Model

ECT Error Correction Term

GDP Gross Domestic Product

GNP Gross National Product

IMF International Monetary Fund

M_2 Broad Money

MOFED Ministry of Finance Ethiopia

NBE National Bank of Ethiopia

OLS Ordinary Least Square

PP Philips-Perron

UNCTAD - United Nations Conference on Trade and Development

VAR - Vector Autoregressive

ABSTRACT

This study investigates the impact of financial sector development on economic growth in Ethiopia from 1994 to 2023. Utilizing descriptive statistics and econometric modeling, the research examines key variables such as GDP growth rate, domestic credit to the private sector, money supply, government expenditure, bank deposits, private investment, and inflation rate. The findings reveal considerable variability in these indicators, with GDP growth averaging 6.85%. Trend analysis indicates a general upward trajectory in economic growth, despite challenges like civil conflict and the COVID-19 pandemic. The econometric model results, including unit root tests and the ARDL long-run estimation, underscore the importance of financial factors in shaping economic outcomes. Notably, an increase in money supply positively influences GDP, whereas increases in domestic credit to the private sector and private investment have a negative long-term impact on economic growth. High inflation rates also negatively affect GDP. The study concludes that while financial development is crucial for economic growth, efficient credit allocation, controlled money supply expansion, effective inflation control, and strategic private investment are essential for sustainable economic development. Recommendations for policymakers include enhancing financial infrastructure, improving regulatory frameworks, expanding money supply judiciously, and fostering strategic private investments.

Key words: Financial Sector Development, Economic Growth.

CHAPTER ONE
1. INTRODUCTION

1.1. Background of the Study

The link between economic growth and financial development has been a subject of ongoing debate since Bagehot (1873). These ideas were later popularized by Schumpeter (1912), who argued that financial sectors drive innovation, leading to economic growth. Consequently, numerous studies have endeavored to identify the primary drivers of economic growth as well as the potential causes of variations in growth over time, both theoretically and empirically. A key indicator for assessing an economy's performance is its annual real GDP growth rate. One factor believed to drive growth is the degree of financial development. The field of endogenous growth theory has shown significant interest in the beneficial impact of financial development on economic advancement. According to this theory, investing in financial development results in positive externalities and spillover effects within a knowledge- and technology-based economy, ultimately leading to economic growth (Beck, 2020; Levine, 2021).

Despite the existence of various theories, there remains ongoing debate and discussion regarding whether financial development is the cause or the result of the growth process. This literature also faces controversy over what constitutes an appropriate or suitable measure of financial development. This study aims to address these concerns using time series econometric techniques.

Financial development, as discussed by Gali (2018), involves the accumulation of financial assets at a rate faster than that of non-financial assets. According to Demirgüç-Kunt and Levine (2018), financial development occurs when financial instruments, markets, and intermediaries reduce the costs associated with information acquisition, contract execution, and transactions, thereby enhancing financial functions without necessarily eliminating these costs.

Economic growth, defined as the increase in GDP over short, medium, and long terms, results from the increased value-added generated by businesses within an economy. GDP represents the total value added by all businesses operating within a given national boundary. An increase in a country's global wealth is reflected by a rise in value-added

over time, as evidenced by growth in per capita income and overall well-being.

Recent research has increasingly focused on the impact of the financial system on economic growth, with varying opinions emerging from both academia and policymakers. Although this topic has gained considerable attention in recent decades, the findings remain inconsistent and are debated at both theoretical and empirical levels (Laeven & Levine, 2022). In many developing economies, financial development is seen as crucial. Policymakers often argue that financial development enhances productivity, which in turn promotes growth. However, diverse analytical approaches in different studies lead to varied conclusions regarding the relationship between financial development and economic growth. While some researchers have found a positive impact of financial development on economic growth (Beck, Demirgüç-Kunt, & Levine, 2020; Arestis & Demetriades, 2022), others have reached contrary conclusions (Rajan & Zingales, 2003; Dabla-Norris et al., 2015).

Despite extensive research on financial liberalization and its macroeconomic effects, consensus on the influence of financial development remains elusive. Schumpeter (1934), one of the early scholars on the link between financial development and economic growth, emphasized the role of financial intermediaries in fostering innovation and development. More recent studies echo this view, highlighting the importance of banking systems in capital mobilization and economic transformation. For instance, recent research reinforces Schumpeter's idea that financial institutions contribute to economic growth by supporting innovative ventures (King & Levine, 1993; Levine, 2005). This support, in turn, promotes trade, capital formation, and overall wealth creation (Guiso, Sapienza, & Zingales, 2004).

Recent studies have built upon earlier work by examining the effects of banking system interventions on financial sector expansion and economic growth. For example, research by Bencivenga and Smith (1991) and Demirgüç-Kunt and Levine (2001) suggests that interventions imposing constraints on the banking system—such as lending ceilings and high reserve requirements—can hinder the growth of the financial sector, ultimately impacting economic growth negatively. Levine (2005) also supports the view that enhancing risk management, improving liquidity, and reducing transaction costs

contribute to financial system development, which in turn fosters investment.

Conversely, some scholars argue that there is no direct connection between financial sector expansion and economic growth. For instance, recent critiques by Raghuram Rajan (2005) and Dambisa Moyo (2010) suggest that the financial sector might be overstated in its role in driving economic growth. Rajan (2005) argues that focusing on enhancing the financial system might be less effective compared to other policies, such as export promotion, labor and productivity improvements, and pro-investment tax reforms.

Other research highlights that economic growth can drive the development of the financial system. For example, recent findings by Greenwood and Jovanovic (1990) and Beck, Levine, and Levkov (2010) reinforce Robinson's (1979) idea that "finance follows where enterprise leads," indicating that the financial sector adapts to economic needs as growth progresses. Studies by Demirgüç-Kunt and Levine (2008) and Beck and Levine (2004) suggest a unidirectional causal relationship, where growing economies invest more in financial system development to stabilize and further enhance economic conditions.In Ethiopia, financial institutions are categorized into official, semiformal, and informal sectors. The formal financial system encompasses regulated entities such as banks and insurance companies. In contrast, the semiformal sector includes microfinance institutions and savings and credit cooperatives, which are not directly regulated by the National Bank of Ethiopia (NBE). The informal financial sector consists of local moneylenders and traditional unregistered institutions like Iqub and Idir. Key formal and semiformal financial institutions operating in Ethiopia include banks, insurance companies, credit cooperatives, and microfinance institutions.

The history of Ethiopian banking dates back to 1905 with the establishment of the Bank of Abyssinia, a joint venture between the Ethiopian government and the National Bank of Egypt, which was under British control at the time. A more functional banking system began to take shape after the Italian withdrawal in the 1940s. Despite some recent improvements, the Ethiopian banking system still faces significant challenges. It is characterized by small banks, limited service offerings, a lack of capital markets, and restricted international investment (African Development Bank, 2022).

Similarly, Ethiopia's insurance market remains underdeveloped. Recent studies highlight the limited scope and competitiveness of the insurance industry. For instance, research by Tadesse and Kifle (2020) points out a lack of comprehensive information on life insurance products and a generally less established insurance sector compared to other financial services..

1.2. Statement of the Problem

There hasn't been a definite consensus on the long-standing debate about the relationship between the expansion of the financial industry and economic growth. Certain scholars propose that the development of the financial system coincides with better economic growth. Robinson (1952) stated that "where enterprise leads, finance follows," meaning that the financial sector expands to meet the needs of the economy as it grows. Numerous studies suggest a unidirectional causal relationship between growth and finance (Gurley & Shaw, 1955; Goldsmith, 1969; Jung, 1986; Kar & Pentecost, 2000; Boulika & Trabelisi, 2002; Islam, 2004; Güryay et al., 2007). In order to sustain their economic environment, advanced economies are compelled to concentrate their investments on enhancing their financial systems (Padilla & Mayer, 2002).

On the other hand, some researchers argue that the development of the financial system is anti-growth. Van Wijnbergen (1983, 1984) posited that financial system development could slow economic growth by making it easier to maintain risk and allocate resources efficiently, potentially reducing the rate of savings and risk-taking. Levine (2004) supports this view, suggesting that while financial development can initially spur growth, it may eventually hinder it by reallocating resources away from productive investments. This aligns with the fundamental idea that high rewards are often accompanied by high risks.

The new paradigm in the literature raises the possibility of a non-linear link between growth and finance. Cecchetti and Kharroubi (2012) demonstrated in a seminal paper that the influence of finance on growth is positive only up to a certain point, after which it turns negative. This is known as the "too much finance" theory. According to these scholars, the financial industry competes with other economic sectors for limited resources, leading to negative consequences when financial development starts to deprive

other sectors of the resources they need. Numerous related studies have since been conducted using various methods to determine the threshold levels.

However, Soedarmono et al. (2017) contradicted these findings by demonstrating that the influence of finance is initially good but eventually turns negative. Tariq et al. (2020) discovered that, contrary to the too much finance theory, the impact of finance is initially negative and only becomes positive after reaching a predetermined point. In a sample of 24 industrialized nations, Swamy and Dharani (2019) used both the square term and Hansen's threshold model for the years 1983–2013. They demonstrated that the detrimental influence of finance on growth occurs at a threshold of 124%. Law and Singh (2014) and Samargandi et al. (2015) used Hansen's (1999) static model, extending it with Kremer et al.'s (2013) dynamic threshold model, and both investigations validated the concept of excessive finance. Bijlsma et al. (2018), based on a meta-analysis of 68 empirical studies, found that while the influence of finance on growth is initially beneficial, it gradually diminishes over time, consistent with the theory of excessive finance.

It is evident from the aforementioned empirical data that opinions regarding the relationship between financial development and economic growth diverge. As Bhole (2004), Levine (1997), and Luintel and Khan (1999); Cited in Solomon Tefera, assert, a robust financial system has the potential to greatly enhance economic growth by facilitating the mobilization of savings, directing resources towards the most profitable investments, minimizing transaction costs, spreading out risks, promoting innovation, and fostering technological advancements. Financial development leads to an increase in the range of financial services and transactions within a nation when money is being saved or transferred, which further leads to an enhancement in the country's production and productivity (Omri et al., 2015). It is argued that financial development accelerates not only the economy but also creates job opportunities, reduces poverty and income disparity, by accumulating capital and introducing technological advancements, especially in developing nations (Abbas et al., 2022; Cetin et al., 2018; Honohan & Beck, 2007; Levine, 2021; Wen et al., 2021), Cited in Solomon Tefera,2023.

At the same time, it is not rare to come across written works that state economic growth

as the primary catalyst and powerhouse behind the progress of financial development. For example, Gurgul and Łukasz (2011) and Song et al. (2021) argue that as people's incomes rise as a result of economic growth, so will their demand for financial services.

However, the causal relationship between financial development and the growth of a country's national output has been a highly debated topic for many decades, but there is still little agreement on the issue (Bist & Read, 2018; Zhuang et al., 2009). Central to this debate is the question of whether solid economic growth is driven by financial development or the other way around. This question holds significant importance as identifying the causal relationship between financial progress and economic expansion can have crucial consequences for policymakers when devising suitable strategies and policies for growth and development. There are sufficient grounds to look at how financial development affects Ethiopia's economic expansion in light of all these opposing viewpoints.

To sum up, it is clear from the available literature that the relationship between financial development and economic growth has been a topic of extensive research, yet the literature lacks a consensus on their causal link. Current studies suggest that this relationship is multifaceted and context-dependent, with the influence of various internal and external dynamics of a nation shaping its outcome (Samargandi et al., 2015). Moreover, the particular model and dataset used may also impact the results. Research on this topic in Ethiopia is limited, and the existing literature uses a narrow measure of financial development, which may not provide a comprehensive understanding of the phenomenon or lead to specific policy implications. As a result, there is a research gap that needs to be filled by rigorous empirical methods to establish the causality between financial development and economic growth in Ethiopia. This study aims to address this gap by examining the validity of the four hypotheses in the Ethiopian context, providing a more comprehensive understanding of the relationship and potentially informing policies to promote financial development and economic growth in the country.

In order to capture all facets of financial development, this research differs greatly from previous studies in a number of ways. Firstly, it makes use of five indicators of financial

development: broad money, deposit/GDP, domestic credit to the private sector, Private Investment, Inflation and Government Expenditure. Previous research conducted in Ethiopia dates back to 2014, hence it was unable to fully reflect current economic and financial developments. Thirdly, by including recent time series data that incorporates recent initiatives targeted at financial sector regulation and liberation, this work will equally contribute to the literature. Accordingly, the purpose of this work is to address the following research question: Is there a relationship between financial progresses in the short or long term? Is there a short-run or long-run relationship between financial development and economic growth?

1.3. Objective of the Study

1.3.1. General Objective of the Study

The main objective of this study is to investigate the impact of financial sector development oneconomic growth in Ethiopia.

1.3.2. Specific Objective of the Study

This study specifically aims to achieve the following goals:

- To investigate the short and long-term impact of development of Ethiopia's financial sector on economic growth.
- To examine the status and performance of economic growth.
- To examine the patterns of financial advancement and its relation with economic growth over time

1.4. Hypothesis of the Study

A hypothesis regarding the relationship between financial development and economic growth has been developed by the researcher. The following hypotheses are produced from a review of various literature sources:

Hypothesis 1: A rise in the broad money supply causes economic growth to accelerate.

Hypothesis 2: Economic growth is positively impacted by a rise in domestic lending to the private sector.

Hypothesis 3: Higher bank deposits lead to higher economic growth.

Hypothesis 4: Higher levels of private investment boost economic growth.

Hypothesis 5: Economic growth is positively correlated with increases in government

spending.

Hypothesis 6: Higher inflation causes lower rates of economic growth.

The researcher aims to examine the validity of these six hypotheses in the Ethiopian context, providing a more comprehensive understanding of the relationship between financial development and economic growth, and potentially informing policies to promote financial development and economic growth in the country.

1.5. Significance of the Study

After a comprehensive review of the trends in Ethiopia's financial development and economic growth, this research will play a significant role in demonstrating how financial development fosters economic progress and offering policy recommendations. It will help legislators and the government make the required changes to the financial management system and its workings so that high-quality financial services will lead to constructive economic growth. As a helpful resource, it will also be beneficial to other researchers who are keen to carry out their research in this particular field. Furthermore, it will give policymakers a clear path to assess how well Ethiopian financial institutions are performing in terms of providing financial services in relation to the supply and demand for money by highlighting investment opportunities and bridging the gap by encouraging the growth of the financial market, which draws capital inflow.

1.6. Scope and Limitation of the Study

This study focuses on analyzing thirty years of secondary data from various sources, including the Ministry of Finance and Economic Cooperation (MOFEC), World Development Indicators, International Financial Statistics, and the National Bank of Ethiopia (NBE). The research employs a quantitative approach for data analysis, aiming to understand the impact of financial sector development on economic growth in Ethiopia.

Despite the researcher's strong motivation to complete this study, several limitations exist. Time constraints pose a significant challenge, potentially affecting the depth of analysis. Additionally, concerns about data validity and reliability may influence the study's outcomes. The dynamic nature of the global economy requires careful consideration when interpreting macroeconomic variables, as unforeseen factors may

impact their usage and understanding.

Furthermore, due to data availability issues and other constraints, the study does not include data from insurance companies, microfinance institutions, and other financial entities apart from banks. This exclusion may limit the comprehensiveness of the analysis, as these institutions also play some significance role in the financial sector and economic development.

1.7. Organization of the Thesis

Chapter one presents the background, research objectives, and hypotheses of the study. Chapter two presents an extensive review of the theoretical and empirical literature on the relationship between financial development and economic growth. Chapter three of the paper deals with estimation techniques and data issues. The results and discussions thereof are presented in Chapter four and chapter five summarizes the key findings of the study and provides policy recommendations based on the results.

Chapter Two

2. Literature Review

The theoretical and empirical literature reviews that looked the relationship between financial sector development and economic growth did not just begin. One important question that has been asked is: will the financial sector development influence economic growth positively?

2.1. Concept and Definition of Variables

2.1.1. Economic Growth

The concept of "economic growth" refers to an increase in the output of goods and services over a specified period, typically measured using metrics like GDP or GNP. It can lead to higher employment rates, improved living standards, and increased investment. Economic growth is a crucial indicator of a nation's economic health. Various factors influence economic growth, including technological advancements, productivity gains, capital investments, infrastructure improvements, and government policies that foster innovation and entrepreneurship (Smith, 2022).

The real GDP growth rate is the most commonly used indicator of economic growth. It measures economic growth in terms of GDP while adjusting for deflation or inflation. In other words, as noted by Johnson (2021), the real GDP growth rate reflects changes in the total value of all goods and services produced by an economy, accounting for fluctuations in prices.

2.1.2. Financial Development

The growth of the financial sector can be characterized by the expansion of financial markets in terms of size, effectiveness, stability, and improved accessibility, all of which benefit the economy in various ways. For example, a well-functioning financial market channels savings toward profitable ventures (Aghion & Howitt, 2009; Gertler & Kiyotaki, 2010), reduces corporate governance costs (Philippon, 2015), and lowers information costs, enhancing capital allocation (Beck, Demirgüç-Kunt, & Levine, 2010). Additionally, advanced financial intermediaries foster technological innovation by incentivizing entrepreneurs (Rajan & Zingales, 1998). Moreover, Levine (2005) argues

that financial systems facilitate not just the exchange of goods and services but also aid in trading, diversification, hedging, and risk management. Levine (2005) further contends that technological innovation and capital accumulation act as intermediaries between financial development and economic growth. Credit distributed through the financial system links the real and financial sectors, financing both fixed capital investments to boost production and working capital requirements to enhance productivity (Mian & Sufi, 2014).

Recent studies have utilized various indicators to measure financial development. To structure these indicators effectively, financial development variables were categorized as follows by Beck et al. (2013): access (the extent of usage of financial institutions and markets), depth (the size of financial institutions and markets), efficiency (the effectiveness of financial services provided by institutions and markets), and stability (the stability of financial institutions and markets). This analysis also considers financial innovation as a new dynamic within financial development. For this study, financial development is assessed by examining financial efficiency and depth

2.2. Theoretical Literature

Chuah and Thai (2004) identified four primary points of contention in the theoretical literature regarding the relationship between growth and finance.

Firstly, Schumpeter (1934) argued that finance stimulates growth by funding innovative ideas. Building on this, McKinnon (1973) and Shaw (1973) proposed that the financial sector promotes growth by encouraging savings and investment, advocating for interest rate liberalization to increase savings through higher real interest rates. Gurley and Shaw (1955) emphasized the role of financial institutions in channeling surplus funds to deficit units to spur expansion. Bencivenga and Smith (1991) developed an endogenous equilibrium model, highlighting the role of banks in financial intermediation and their contribution to growth by directing funds to profitable investments. King and Levine (1993) expanded on this by using an endogenous growth model to illustrate how financial institutions support growth by evaluating business ventures and mobilizing capital for productive uses while mitigating associated risks.

The second argument is the demand-following hypothesis, proposed by Robinson (1952), which suggests that the financial sector grows as a response to economic growth rather than driving it. According to this view, as economic activity expands, financial institutions emerge to provide the necessary services for further economic development, with growth leading and finance following.

The third perspective integrates the previous two ideas. Patrick (1966) proposed the phases of development hypothesis, which posits that economic growth initially drives financial development (supply-leading hypothesis), while subsequent growth is fueled by the expansion of financial services (demand-following hypothesis). Greenwood and Jovanovic (1990) supported this view, arguing that finance and growth are interconnected, with financial intermediation enhancing capital returns during early development stages and subsequent economic growth facilitating further financial sector expansion.

Lastly, Lucas (1988) argued that the influence of finance on growth might be overstated, suggesting that finance plays a minimal role in the growth process compared to other factors

According to a substantial body of research in growth accounting, long-term economic growth cannot be largely explained by physical capital accumulation alone (Jorgenson, 1995, 2005). Therefore, theories explaining how financial development affects decisions about resource allocation in ways that promote productivity growth should exist if finance is to explain economic growth. These theories should avoid focusing the analytical emphasis too narrowly on aggregate savings. Lavine (2005) identified five major roles of the financial system that emerged to lessen information, enforcement, and transaction costs in order to arrange an examination of how financial systems influence savings and investment decisions and consequently growth. Although Merton (1992), Merton and Bodie (1995, 2004; cited in Yonatan, 2023) have proposed alternative classification schemes for the functions of the financial system, I think that Lavine's five categories—which include the following—are a better method to structure a study of the theoretical literature on financial systems.

- ✓ Produce information ex ante about possible investments and allocate capital.

- ✓ Monitor investments and exert corporate governance after providing finance.
- ✓ Facilitate the trading, diversification, and management of risk.
- ✓ Mobilize and pool savings.
- ✓ Ease the exchange of goods and services.

Although these financial functions are offered by all financial systems, there are significant variations in the quality of these services. Financial development arises when financial instruments, markets, and intermediaries perform a better job of fulfilling the five financial tasks mentioned above while also mitigating, if not completely eliminating, the effects of information, enforcement, and transaction costs.

When it comes to differentiating between economic growth and the establishment of financial structures that enhance resource allocation and lower risk, Adwoa D. (2013) identifies two fundamental issues. In particular, because of income and substitution effects, larger returns have an uncertain influence on saving rates. Lower risk also has an unclear impact on savings rates, according to Levhari and Srinivasan (1969). Financial institutions therefore serve to improve resource allocation, and lowering risk may also result in a decrease in savings rates. If the externality and the decline in savings combine to have a significant enough impact, financial development may impede economic growth and reduce wellbeing. When financial intermediaries lower the costs associated with obtaining and processing information, resource allocation is enhanced (Boyd and Prescott, 1986 cited in Yonatan, 2023).Without these middlemen, investors would be responsible for paying high fixed costs related to management, assessing companies, and assessing economic conditions.

According to Adwoa, D. (2013), the expense of investigating investment opportunities for others may be minimized if associations of people become financial intermediaries. By taking deposits and extending loans, financial intermediaries function similarly to banks (Boyd and Prescott 1986). Ramakrishnan and Thakor (1984), Bhattacharya and Pfeiderer (1985), and Allen (1990) cited in Yonatan, 2023, developed models in which financial intermediaries emerge to produce information about enterprises and sell this information to savers. According to Adwoa D. (2013), these middlemen don't always mobilize savings and invest them in businesses that use loan contracts, as stated by Boyd and Prescott (1986).Financial intermediaries enhance the ex-ante evaluation of

investment prospects by reducing information acquisition costs, which has a beneficial impact on resource allocation. Financial intermediaries that generate better information on firms will thereby support more promising firms and encourage a more efficient allocation of capital, assuming that entrepreneurs solicit capital and that capital is scarce (Greenwood and Jovanovic, 1990; cited in Yonatan, 2023).

Evaluating firms, managers, and market conditions before making investment decisions incurs significant costs. Individual savers often lack the capacity to collect, process, and produce information about potential investments. Consequently, high information costs can prevent capital from flowing to its most productive uses, as savers may be reluctant to invest in ventures with limited reliable information. This issue arises because many models assume that capital flows toward the most profitable firms, a presumption reliant on investors having access to good information about firms, managers, and market conditions (Diamond & Dybvig, 1983).

From a theoretical standpoint, the financial sector's role in enhancing growth involves risk sharing and optimal allocation of capital, risk, and returns. The relationship between cross-sectional risk diversification and growth has been modeled by Merton (1973) and subsequently by more recent researchers such as Gertler and Kiyotaki (2010). They posit that (i) high-return, risky projects often require substantial initial investment and are indivisible, (ii) individuals generally dislike risk, (iii) there are lower-return, safer projects, and (iv) capital is limited. Without financial arrangements that enable diversified portfolios, individuals may shy away from high-return, risky projects due to the disproportionate risk involved. Financial systems that allow for diversified portfolios of risky projects can improve the allocation of savings toward high-return ventures, thereby enhancing growth (Levine & Zervos, 1998). Cross-sectional risk diversification can foster technological innovation, as risk-averse agents are more likely to engage in innovation activities when they can spread their risk across multiple projects (Acemoglu, 2009). Financial systems that mitigate risk can thus accelerate technological change and economic growth. The role of intermediaries in facilitating inter-temporal risk smoothing has also been explored by Allen and Gale (2004).

Boyd and Prescott (1986) argue that financial intermediaries can improve resource

allocation by reducing the costs of gathering and analyzing information. Without intermediaries, evaluating companies, management, and economic conditions would be prohibitively expensive for each investor. Financial intermediaries, acting as financial middlemen, assume the cost of investigating potential investments on behalf of others (Rajan & Zingales, 1998).

Models by Boot and Thakor (1997), and Diamond (1984) illustrate how financial intermediaries generate and disseminate business information to savers, enhancing resource allocation. Unlike Boyd and Prescott (1986), these models show that intermediaries do not necessarily invest savings directly but rather facilitate the efficient allocation of resources through improved information dissemination.

Financial intermediaries enhance economic growth by improving information about businesses, managers, and the economy. By generating better information, intermediaries can support a greater number of potential firms and foster more efficient capital allocation (Gertler & Kiyotaki, 2010).

Stock markets also play a role in generating information about firms. Larger and more liquid markets make it easier to profit from information through trading, motivating agents to invest in information gathering (Grossman & Stiglitz, 1980; Fama, 1991). Larger, more liquid markets thus encourage the generation of valuable information, positively affecting capital allocation (Merton, 1987). Empirical studies such as those by Morck, Yeung, and Yu (2000) test the relationship between market liquidity and the information content of stock markets. The links between information, efficient markets, and sustained economic growth have also been examined in recent research, such as Aghion and Howitt (2009). The relationship between information production, market liquidity, and economic growth is not well-drawn in the theories now in use.

Finally, by preventing investments in human capital, flaws in the capital market can also have an impact on growth [Galor and Zeira, 1993; cited in Yonatan, 2023]. The initial distribution of wealth will affect who can obtain the resources to conduct investments that increase human capital when there are indivisibilities in human capital investment and imperfect capital markets. This suggests a less-than-ideal distribution of resources, which could have short- and long-term effects on overall production.

Furthermore, opinions on finance-growth theories have been very divergent among economists. For example, Lucas (1988) thinks that even in popular and much more professional talks, the importance of financial problems is grossly overemphasized. However, Miller (1998; cited in Yonatan, 2023) contends that the idea that financial markets contribute to economic growth is almost too evident to be seriously discussed. The literature on finance and growth keeps growing despite these conflicts by incorporating cutting-edge empirical techniques and novel theoretical models. And one such model may be found in Akinlo and Egbetunde's (2010) research. They determined that there could be three connections between finance and economic expansion. They include, the growth driven finance, the finance led growth and the two way causal relationship that is known as feedback hypotheses.

The finance led growth hypothesis proposes certain methods by which the development of the financial sector contributes significantly to economic growth. These comprise, among other things, the effective distribution of money, the pooling of savings through alluring mechanisms, and the decrease in the expense of obtaining and presenting information (Ghali, 1999). To put it simply, a financial sector that functions well can combine the limited credit resources from surplus units to deficit units. The financial industry encourages effective resource allocation through this procedure. Scholars such as Levine (1997), Ghali (1999), and Akinlo and Egbetunde (2010); cited in Yonatan, 2023 have provided evidence in favor of this theory.

The growth driven finance hypothesis is an alternative to the finance-led growth hypothesis. Scholars like Robinson (1952) and Kuznets (1955) support this idea. They maintained that improvements in the development of the financial sector are typically brought about by growth. According to the concept, there is a rise in demand for specific types of financial assets and arrangements due to rapid economic expansion, and the financial market is able to effectively respond to these changes in demand.

According to Akinlo and Egbetunde (2010); cited in Yonatan, 2023, the feedback scenario implies a two-way causal relationship between finance and growth Lewis (1955), a "pioneer" in the subject of development economics, stated that "a two way

relationship exists between financial sector development and economic growth."
This indicates that the development of the financial market follows economic growth, which in turn acts as a catalyst for actual economic growth.

2.3. Empirical Review

Both national and cross-national studies have explored the empirical relationship between finance and economic growth. Previous research generally indicates a positive and linear correlation between financial development and growth. For example, recent studies have supported this view, demonstrating a beneficial impact of financial development on economic growth (Beck & Levine, 2004; Schularick & Taylor, 2012; Beck, Levine, & Levkov, 2017).

A pioneering study by Goldsmith (1959) initially identified a positive relationship between financial development and economic growth across thirty-five countries. This foundational work has been corroborated by more recent studies, such as those by Demirgüç-Kunt and Levine (2008), and newer contributions by Levine and Zervos (2021), who found that financial development consistently supports economic growth.

However, some studies have found no significant or even negative association between finance and growth. For instance, the research by Arestis and Demetriades (2020) showed that, in some contexts, financial development might not significantly impact growth. Similarly, a study by Dabla-Norris and Koeda (2021) examining 65 countries found that bank loans negatively affected growth, while stock market development had no discernible effect. Ayadi et al. (2016) also observed a negative relationship between the banking sector and economic growth in eleven Mediterranean countries, attributing the negative effects to inadequate regulatory frameworks.

Further research has investigated how the structure of the financial system—whether bank-based or market-based—affects growth. Atje and Jovanovic (1993) were among the first to find that stock markets, rather than banks, had a positive impact on growth. More recent studies, such as those by Boadi et al. (2021), Ibrahim et al. (2019), and Mahmood and Rehman (2022), have examined this relationship in various contexts. Lee (2017) found that in bank-based systems, banks drive growth, while in market-based systems,

stock markets take on this role. Ibrahim et al. (2019) reported that both stock markets and banks significantly contribute to growth, but their influence varies depending on the development level of the economy.

Mahmood and Rehman (2022) analyzed 17 European countries and found that while both bank and stock market indicators positively impact growth, the effect of bank development was more enduring. Conversely, Boadi et al. (2021) supported the theory that market-based financial systems more effectively promote growth compared to banking systems, based on a sample of 60 countries. The impact of financial development on growth also appears to vary by income levels, as shown by studies like those by Bist and Read (2019) and Deidda and Fattouh (2008). Sehgal et al. (2021) found that while the stock market stimulates growth in middle- and upper-income countries, the banking sector positively impacts all income levels. Similarly, Nguyen et al. (2020) observed that while the insurance industry supports growth across all income levels, the banking sector had a negative impact on growth, suggesting that credit might be used for consumption rather than growth-enhancing investments.

Lastly, research exploring the causal relationship between finance and growth, following Patrick's (1966) demand-following and supply-leading hypotheses, has yielded mixed results. Calderón and Liu (2003) concluded that finance does not directly generate growth, whereas Ang and Mckibbin (2007) identified a causal relationship between growth and financial development. Hsueh et al. (2013) found that the direction of causality varied depending on the specific financial development variables considered.Although previous research indicated that domestic credit often precedes economic growth, there are instances where growth appears to lead when money supply measures are applied. For example, a study by Pradhan et al. (2019) found a mixed causal relationship: with banking indicators, they observed a unidirectional causation from growth to finance; however, when using stock, bond, and insurance market indicators, they detected bidirectional causality.

Deb et al. (2020) utilized quarterly data from 1993 to 2014, separating their samples into established and emerging economies. Their results revealed that in emerging economies, the demand-following hypothesis was more prevalent, whereas in developed economies,

finance was found to drive growth, aligning with the supply-leading hypothesis. Similarly, Dash et al. (2021) examined long-term causal relationships using both insurance and banking development indicators. They identified bidirectional causality between growth and both insurance and banking sectors, suggesting that a developed insurance industry helps mitigate economic shocks, while economic expansion increases income levels and subsequently demand for insurance.

A newer perspective in the literature suggests a potential non-linear relationship between growth and finance. Cecchetti and Kharroubi (2015) demonstrated that the impact of finance on growth is positive up to a point, after which it becomes negative—a concept referred to as the "too much finance" theory. According to this theory, the financial sector competes with other economic sectors for limited resources, and excessive financial development can lead to resource deprivation for other sectors.

This idea has been further explored with various methodologies for determining threshold levels. Tariq et al. (2021) employed Hansen's static threshold model in their study on Pakistan, while Soedarmono et al. (2018) used the square of the financial development variable to assess thresholds. Their findings were somewhat contradictory: Soedarmono et al. (2018) found that the influence of finance is initially positive but eventually turns negative, while Tariq et al. (2021) discovered that the impact of finance starts negatively but becomes beneficial after reaching a certain threshold.

Swamy and Dharani (2020) used both the square term and Hansen's threshold model for their analysis of 24 industrialized nations between 1983 and 2013, demonstrating that the detrimental impact of finance on growth occurs at a threshold of 124%. The dynamic threshold model, an extension of Hansen's static model developed by Kremer et al. (2014), was employed by Law and Singh (2016) and Samargandi et al. (2017). Both studies supported the concept of excessive finance. Additionally, Bijlsma et al. (2019) found that while the influence of finance on growth is initially beneficial, it diminishes over time, consistent with the theory of excessive finance, based on a meta-analysis of 72 empirical studies.

Research on the sectorial impact of financial development has also been conducted, though most studies focus on specific industries at the national level. For instance,

Shahbaz et al. (2015) and Oliynyk-Dunn (2018) found that financial development positively impacted the agricultural sector in Pakistan and Ukraine, respectively. Topcu and Çoban (2018) supported the supply-leading hypothesis in their study of the Turkish manufacturing sector.

Daway-Ducanes and Gochoco-Bautista (2020) investigated the role of finance in the growth of industrial and service sectors across 77 developing countries. They identified a non-linear relationship in both sectors, with the positive impact of finance emerging only after reaching a certain threshold. They argued that due to the significant initial investments required in these sectors, financial development must progress to a certain level before positive effects become evident..

2.4. Empirical Studies in Ethiopia

Numerous studies have been conducted on the subject of how Ethiopia's economic growth is impacted by the development of the banking sector. A study by Nyasha, Gwenhure, and Odhiambo (2016) found that commercial banks have a significant amount of influence over the financial sector of the Ethiopian economy. Furthermore, Tesema's 2016 study on the relationship between finance and growth came to the conclusion that financial development positively and economically significantly affects economic growth.

2.5. Conceptual Framework of the Study

The primary goal of this study is to examine how the development of the financial sector affects Ethiopia's economic growth. The study's aim informs the framing of the conceptual model that follows. Development in the financial sector impacts economic growth, as covered in the relevant literature review sections. Bank deposits, domestic loans to the private sector, and broad money are measures of financial sector development. According to the conceptual framework, financial indicators are independent variables and the real GDP rate is the dependent variable. Economic growth is influenced by intervening factors such as government expenditure, inflation rate, and private investment, in addition to financial development indices.

Empirical research has revealed a favorable relationship between the money supply and economic growth. This is based on earlier research on the subject conducted by Adeola

and Evans (2021), Chieng et al. (2022), Khalid and Akhtar (2021), and Tamunomiebi and Ambah (2020). Economic growth is positively impacted by the broad money supply coefficient expressed as a percentage of GDP.

Several empirical studies by Ameh et al. (2022), Okoye et al. (2020), and Njeru et al. (2019) support the detrimental effect of domestic lending to the private sector on growth. According to a survey of several empirical literatures, the coefficient of bank deposit has a positive and significant impact on economic growth. Research by Aluko et al. (2021), Zubair and Kamara (2020), and Kamran et al. (2019) indicates that bank deposits have a favorable effect on economic growth.

The majority of literature indicates that private investment has a positive and significant impact on economic growth. According to a research paper by Teshome (2022), private investment has a favorable and considerable impact on Ethiopia's economic growth. Economic growth is positively and significantly impacted by government spending. Research on the subject has shown that there is a positive correlation between government spending and economic expansion. Studies by Opoku et al. (2022) and Alkhatib et al. (2021) support this view.

The inflation rate, which is similarly positively correlated with economic growth, is the other control variable. Examining other empirical works, such as Ahmed et al. (2021), Khan et al. (2020), Kumar (2019), and Thomas and Lee (2018), confirms this as well. The researcher produced the following conceptual model, which is framed to summarize the primary focus of the investigation

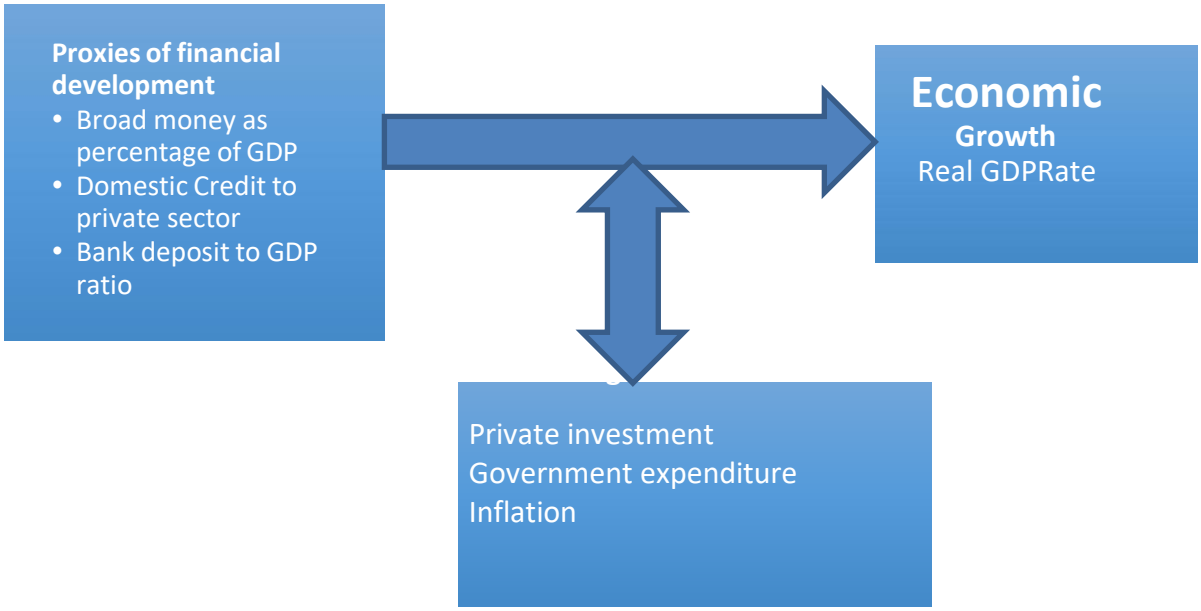

Figure 1 Conceptual framework that shows the relationship between explanatory variables (proxies of financial sector development) and dependent variable (measure of economic growth)

CHAPTER THREE

3. RESEARCH METHODOLOGY

After discussing the literature review part of the study this paper tries to examine the relationship between economic growth and financial development using time series data covering 30 years.

3.1. Research Design and Approach

The study aims to investigate the relationship between Ethiopia's economic progress and the development of its financial sector. It characterizes the relationship between these variables and formulates hypotheses regarding their direction and magnitude. This explanatory study employs a quantitative research methodology, as it is deemed the most effective approach for testing hypotheses and identifying the factors influencing the outcome (Creswell, 2013).

Economic growth is treated as the dependent variable, while the quantitative approach elucidates how and why the variables are interconnected and how an independent variable impacts the dependent variable. Consequently, the quantitative method is preferred for providing and explaining the cause-and-effect relationship between variables. Understanding the behavior of variables, their interactions, and their integration over time is essential for time series analysis.

Research by Levine (2005) emphasizes that a well-developed financial sector is crucial for economic growth, as it improves the efficiency of capital allocation, enhances investment opportunities, and supports innovation. Similarly, King and Levine (1993) found that financial development stimulates economic growth by mobilizing savings, facilitating investments, and promoting efficient resource allocation.

Moreover, a study by Arestis and Demetriades (1997) highlights the significant role of financial development in economic growth, particularly in developing countries. They argue that a sound financial sector can mitigate risks and uncertainties, thereby fostering a stable economic environment conducive to growth. Another research by Beck, Levine, and Loayza (2000) supports this view, showing that financial intermediaries play a vital role in fostering economic growth through their impact on productivity and technological

advancement.

In the context of Ethiopia, an emerging economy with a rapidly evolving financial sector, it is crucial to analyze the interplay between financial development and economic growth. This analysis will provide insights into how financial sector reforms and policies can be designed to support sustainable economic development.

Overall, the study underscores the importance of the quantitative approach in explaining the dynamics between Ethiopia's economic growth and its financial sector development. By employing time series analysis, the study aims to capture the long-term trends and causal relationships, contributing to a deeper understanding of the economic mechanisms at play. This understanding is essential for policymakers, researchers, and stakeholders who seek to promote economic growth through financial sector development.

3.2. Data Types and Sources

The study will use secondary data from the National Bank of Ethiopia, World Bank and IMF. Time series variables will be retained for the study that will cover a period 1994-2023 (30 years).

3.3. Empirical Model

The paper's empirical relationship between financial development and economic growth is derived from a basic model created by Jose De Gregorio (1995). An endogenous growth model incorporating the financial development variable will be used in the model. The model demonstrates how financial development indicators through economic relationships affect economic growth. The functional and econometric link between the study's variables is represented by the equation below.

Economic growth=f(financial development, macro−economic environment) (1)

$$\text{Economic growth (GDP)} = \alpha + \beta_1 \text{ Domestic credit to private sector}_t + \beta_2 \text{ Bank deposits}_t + \beta_3 M2_t + \beta_4 \text{ Inflation} + \beta_5 \text{ Private Sector Credit to total credit}_t + \beta_6 \text{ Total Domestic Credit Private investment}_t + \beta_7 \text{ government expenditure}_t + \beta_8 \text{ Private investment} + \varepsilon_t \quad (2)$$

Where α = constant, εt = error term, while $\beta 1$, $\beta 2$, $\beta 4$, $\beta 5$, are coefficients.

3.4. Model and Estimation Procedures

This research makes use of a technique suggested by Pesaran, Shin, and Smith (2001) known as the Autoregressive Distributed Lag (ARDL) model, which is based on the general-to-specific modeling technique. In other words, this research utilizes the ARDL approach, which was developed and introduced by Pesaran and Shin (1995, 1998), Pesaran et al. (1996), Pesaran (1997), and Pesaran et al. (2001), and later revised by Narayan (2005) for the case of small sample size data (30-80 observations).

The ARDL model is used as a method of estimation in this paper. This model is useful over other co-integration techniques because it permits the use of variables that become stationary without differencing (I(0)) and variables that become stationary after first differentiation (I(1)), but it does not accept variables that become stationary after second differentiation (I(2)). Also, this technique can be applied irrespective of whether the variable is I(0), I(1), or fractionally co-integrated (Pesaran, 1997). Rather than having multiple equations to estimate as in the case of the Vector Autoregressive (VAR) model, it involves a single-equation set-up, which makes it simple to implement and interpret. Additionally, different variables can be assigned different lag-lengths as the model is entered. The ARDL technique is free of residual correlation since variables stand as a single equation; it is easy to derive the error correction model from a simple linear transformation by integrating short-run adjustments with long-run equilibrium without loss of information. Moreover, this model takes a sufficient number of lags to capture the data-generating process in a dynamic framework of general-to-specific modeling.

The long-run and causal relationship between financial development and economic growth in Ethiopia using the Narayan (2005) test will be performed in several steps. First, the order of integration of variables will be verified using the test of unit roots through the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test. A great advantage of the PP test is that it is non-parametric, meaning it does not require the selection of the level of serial correlation as in the case of ADF. Due to the complicated and dynamic structure of financial time series data, ADF and Phillips-Perron tests are best suited for testing unit roots. The PP test takes the same estimation scheme as the Dickey-Fuller (DF) test, but corrects the statistic to account for autocorrelations and heteroscedasticity. The ADF test is assumed superior due to its popularity and wide application, as it adjusts the DF test to take care of possible autocorrelation in the error terms by adding the lagged difference term of the dependent

variable. As for the PP test, it also takes care of the autocorrelation in the error term, and its asymptotic distribution is the same as that of the ADF test statistic. However, the ADF test is commonly used because of its easy applicability. Then, the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC) are used to further verify the optimal number of lags.

Secondly, the model is estimated using Ordinary Least Squares (OLS) technique and tested for long-run causality between financial development and economic growth using the Narayan (2005) test. The Narayan test is preferred to that constructed by Pesaran et al. (2001) because it is best adapted for small sample sizes (30 to 80 observations), while Pesaran et al. (2001) is adapted for large sample sizes (500 to 1000 observations). The third step entails the estimation of the long-run variables, and then residuals are converted and inserted as an error correction term in the model. The model is estimated with the error correction term to capture its long-run speed of adjustment. Additionally, the Wald Test is used to verify the short-run effect of financial development on economic growth.

The presence of an error-correction term among a number of co-integrated variables shows that changes in the dependent variable are a function of both the level of disequilibrium in the co-integration relationship (represented by the Error Correction Model, ECM) and the changes in other explanatory variables. This therefore implies that any deviation from the long-run equilibrium will feed back into the changes in the dependent variable, thereby forcing the movement towards the long-run equilibrium (Masih, 2002). However, this research explores the issues surrounding co-integration analysis and the Error Correction Model within the Autoregressive Distributed Lag Approach to co-integration, which is a framework for the Distributed Lag model.

Recall that the basic form of an ARDL model is:

$$Yt = \beta 0+\beta 1yt\text{-}1+\ldots\cdots+\beta kyt\text{-}p+\alpha 0xt+\alpha 1xt\text{-}1+\alpha 2xt\text{-}2+\ldots\ldots\cdots+\alpha qxt\text{-}q+\varepsilon t$$

(3) where εt is the presumed well-behaved or constant random disturbance term that is serially independent.

An ARDL (p q) model is regarded as an Autoregressive Distributive Lag model, and its reduced form is shown as:

$$Yt=\mu\sum_{i=1}^{p}\alpha i\Delta Yt-i+\sum_{i=1}^{q}\beta i\Delta Xt-i+\varepsilon t$$

Where:

- Yt is the dependent variable at time t.
- μ is the intercept term.

- αi and βi are coefficients for the lags of ΔY and ΔX respectively.
- ΔYt−i and ΔXt−i are the first differences of the dependent and independent variables at lag iii respectively.
- p and q represent the maximum lag orders for ΔY and ΔX.
- εt is the error term at time t.

Generally, using the lag operator L applied to each component of a vector.

$L^k X_t = X_{t-k}$, it is easy to defined the lag polynomial A(L) and the polynomial vector B(L).

The ARDL (p, q) is

$A(L)Y_t=\mu+B(X_t)+\mu$

$A(L)=1-\alpha_1 L- \alpha_2 L^2. . . . .- \alpha_p L^p$

$B(L)=1-B_1 L-B_2 L^2. . . . .-B_p L^p$ (5)

$A(L)Y_t= \mu+B_1(L)X_{it}+ B_2(L)X_{2t}+. . .B_k(L)X_{kt}+ \mu_t$ (6)

A detail specification of the model with respect to the variables of this study is presented below.

Δeconomic growtht=α0+∑i=1pαiΔeconomic growtht−i+∑i=1qβiΔfinancial developmentt−i+∑i=1q∂i Δother factorst−i+μ1economic growtht−1+μ2financial developmentt−1+μ3other factorst−1+εt

Where:

- Δeconomic growtht represents the first difference of economic growth at time t.
- α0 is the intercept term.
- αi and βi are coefficients for the lags of the first differences of economic growth and financial development respectively.
- ∂i represents the coefficients for the lags of the first differences of other factors.
- μ1, μ2, and μ3 are coefficients for the lagged levels of economic growth, financial development, and other factors respectively.
- p and q denote the maximum lag orders for economic growth and financial development.
- εt is the error term at time t.

After the estimation of the above model, the long-run causality test is carried out by comparing the results from the F-statistics of the Wald test. Implying the null hypothesis of the test will be:

μ1= μ2 =0(no long-run relationship). Against the alternative hypothesis.

μ1 ≠ μ2 ≠0 (a long-run relationship exists thus co-integration).

The F-statistics of this test is then compared with that of the Narayan critical values at 5% level of significance with unrestricted and no trend series. The long run variables are regressed and the error term inserted as an explanatory variable, this gives the error correction model (ECM)as seen below:

$$\Delta \text{economic growth}_t = Y + \sum_{i=1}^{p} \Phi i \Delta \text{economic growth}_{t-i} + \sum_{i=1}^{q} \beta i \Delta \text{financial development}_{t-i} + \sum_{i=1}^{p} \partial i \Delta \text{other factors}_{t-i} + \alpha e_{ct-1}$$

Where:

- $\Delta \text{economic growth}_t$ represents the first difference of economic growth at time t.
- Y represents the long-run equilibrium relationship.
- Φ and βi are coefficients for the lags of the first differences of economic growth and financial development respectively.
- ∂i represents the coefficients for the lags of the first differences of other factors.
- e_{ct-1e} is the error correction term lagged by one period.
- p and q denote the maximum lag orders for economic growth and financial development.

The Wald test used is meant to verify if there exist short-run causality from financial development to economic growth.

For all regressor classifications—solely I(1), purely I(0), or mutually co-integrated—the two sets of critical values published in Pesaran et al. (2001) offer critical value boundaries. The null hypothesis is rejected and co-integration is shown if the computed F-statistics are above the band's upper level. However, we are unable to rule out the null hypothesis that there is no co-integration if the computed F-statistics fall below the upper critical threshold. Nevertheless, without knowing the order of integration of the underlying regressors, a definitive conclusion cannot be drawn whether the critical value falls between the boundaries. Narayan (2005) has argued recently that crucial values that are currently in use and based on big sample sizes are not applicable to small sample sizes. Therefore, Narayan (2005) used the GAUSS code from Pesaran et al. (2001) to recreate the set of crucial values for the restricted data, which ranged from 30 to 80 observations. Rather than using Pesaran et al.'s critical values for the limits F-test, this study uses Narayan's (2005) critical values because to the limited annual time series data on Ethiopia's financial development and economic growth (2001).

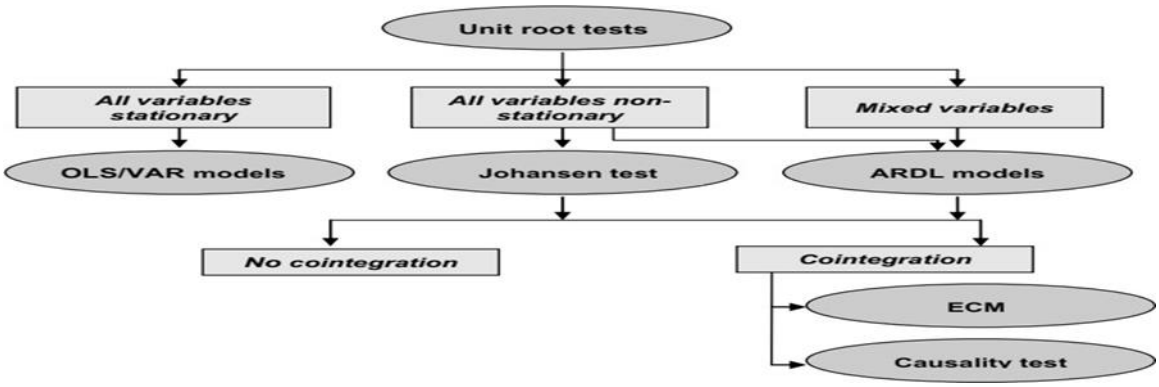

Figure 2 Model Selection Criteria

3.1. Definition of Variables

Independent Variables

Indicators of Financial Development

Two characteristics of Ethiopia's financial system—financial efficiency and depth—capture financial progress. This study examines financial depth from two angles: financial system deposits, which measure savings and time deposits as a proportion of GDP, and broad money, which measures both demand and broad money. Broad money (M2/GDP) and financial system deposits (Deposits) will be utilized as economic and financial sector indicators. According to Agyei (2021), the ability of a financial system to carry out its primary function of converting deposits into credits determines the system's efficiency. In this study, the measure of financial efficiency is domestic credit to the private sector

Domestic Credit to Private Sector (% GDP)

Financial resources provided to the private sector by financial corporations—such as trade credits, purchases of non-equity securities, loans, and other accounts receivable that create a claim for repayment—are referred to as domestic credit to the private sector. These claims include credit to governmental enterprises in some countries. The financial companies include deposit money banks, monetary authorities, and other financial corporations for which data are available (such as corporations that incur liabilities like time and savings deposits but do not accept transferable deposits).

Several empirical studies support the detrimental effect of domestic lending to the private sector on growth, including research by Hasan, S. & Barua, S. (2022), Williams, J., Chen, Y., & Nuhu, A.

(2021), and Rahman, M., Alam, K., & Al Mamun, A. (2020)..

Broad Money (% GDP)

One way to gauge the quantity of money in circulation in an economy is to look at broad money. It is described as the most comprehensive way to determine the money supply of a certain nation and comprises limited funds as well as other assets that are readily convertible into cash for the purchase of goods and services (Stevens, 2023).

Empirical research revealed a favorable relationship between the money supply and economic growth. The conclusion drawn from earlier research on the subject by Khan and Bashir (2022), Aluko and Olanrewaju (2021), Yusuf and Ibrahim (2020), and Mensah and Adomako (2019) is that the broad money supply's coefficient, expressed as a percentage of GDP, positively affects economic growthBank Deposit (%GDP).

Money deposited into banks for safekeeping is known as a bank deposit. These deposits are placed into financial institution accounts, including checking, savings, and money market accounts. In accordance with the terms and circumstances regulating the account agreement, the account holder is entitled to withdraw money that has been deposited.

According to a survey of several empirical studies, the coefficient of bank deposits has a positive and significant impact on economic growth. Research by Asteriou and Spanos (2019), Owusu and Odhiambo (2021), and Akın and Dalgıç (2022) indicates that bank deposits have a favorable effect on economic growth.

Control Variables Government Expenditure

Government expenditure is the aggregate spending by local, state, and national governments on goods and services, including salaries of public employees, public infrastructure investments, welfare programs, and national defense. This control variable captures the effect of government expenditure. The choice of variable is inspired by the fundamental role of public expenditure in spurring economic activities and development.

Government expenditure has a positive and significant impact on economic growth. Empirical studies on the topic have indicated a positive relationship between government expenditure and economic growth, such as those by Salisu and Isah (2022) and Usman et al. (2021).

Private Investment

Money invested by businesses, financial institutions, or other investors, as opposed to the government, is referred to as private investment. This variable helps us observe how investment boosts production, which in turn drives economic growth. It captures the gross formation of fixed capital.

The majority of literature indicates that private investment has a favorable and significant impact on economic growth. Recent studies, such as those by Muriithi and Kihiu (2023) and Adegboye et al. (2022), confirm that private investment positively influences economic growth, including in contexts similar to Ethiopia's..

Inflation Rate

Inflation refers to the increase in prices over time, which leads to a decrease in purchasing power. The inflation rate can be determined by measuring the average price increase over a specific period for a basket of goods and services. According to Fernando (2023), this rate is calculated by comparing the price of the basket in a given month to the same month in the previous year.

The inflation rate, which is positively correlated with economic growth, serves as another control variable in the analysis. Recent empirical studies, such as those by Ali et al. (2022), Uddin et al. (2023), and Khatun et al. (2021), also support the positive relationship between inflation and economic growth.

Dependent Variable Real GDP Growth Rate

Since it takes inflation into account when analyzing economic data, the real GDP growth rate is a more insightful metric than the nominal GDP growth rate. This statistic represents the annual rate of economic growth; it captures value added annually, according to Gordon (2023).

CHAPTER FOUR
4. RESULT AND DISCUSSIONS

4.1. Descriptive Statistics

The dataset consists of observations on several key economic indicators over 33 periods. The average GDP growth rate is approximately 6.85%, with a standard deviation of about 5.58%. The minimum GDP growth rate observed is -8.67%, while the maximum is 13.57%.

Domestic credit to the private sector (DCPS) averages around 21.41% of GDP, with a standard deviation of 6.72%. The range for DCPS is from 6.15% to 31.67% of GDP. The ratio of money supply (M2) to GDP (M2GDP) has an average value of 32.62% with a standard deviation of 6.03%, fluctuating between 24.80% and 45.35%.

The ratio of M1 to M2 (M1M2) averages 46.63%, with a standard deviation of 8.21%, and it varies between 31.4% and 58.84%. The percentage of credit to the private sector (PCTC) has a mean value of 61.62%, with a high variability as indicated by a standard deviation of 24.20%, ranging from 28.23% to 92.19%.

Government expenditure (GOVEXP) averages 16.14% of GDP with a standard deviation of 6.17%, and it varies between 8.30% and 27.04%. The total domestic credit (TDC) averages 32.99% of GDP, with a standard deviation of 4.79%, ranging from 24.65% to 41.30%.

The banking sector (BNK) represents, on average, 27.24% of GDP with a standard deviation of 6.22%, with a minimum of 14.44% and a maximum of 35.72%. Private investment (PvtINV) averages 29.09% of GDP, with a standard deviation of 6.68%, and it ranges from 16.71% to 40.67%.

Lastly, the inflation rate (INF) averages approximately 0.13%, with a standard deviation of 0.12%. The inflation rate ranges from a minimum of -0.08% to a maximum of 0.44%.

4.2. Trends of Financial Sector Development in Ethiopia

Trend analysis is used in this study to explain the patterns and trends in a data over time. The trend could be downward or upward shifting over a given period of time. The advantage of a trend analysis is it will predict what might happen to the variable in the future. This section discusses the macro-economic situation of the Ethiopian economy for the period of 1994 to 2023 related to the major variables included in the study.

Economic growth rate of Ethiopia

Recent data indicates that Ethiopia's economic growth rate has remained robust despite notable fluctuations in agricultural production. The country has continued to pursue aggressive expansionary macroeconomic policies, including substantial fixed investments beyond public expenditure. According to recent reports, Ethiopia's development performance in recent years has been among the most notable for low-income countries, with impressive economic growth.

In the 2021/22 fiscal year, Ethiopia's economy grew by 6.4%, slightly above the 6.3% recorded in the previous year, despite facing domestic and external challenges (World Bank, 2023). Although this growth was 3.8 percentage points below the average base case scenario outlined in the Ten Year Development Plan, it was still notably higher than the 3.8% average growth estimated for Sub-Saharan Africa.

The Ethiopian economy experienced a slowdown to 5.6% growth in 2021 from 6.1% in 2020, primarily due to civil conflict and the impacts of COVID-19 (African Development Bank, 2023). However, a recovery is anticipated, with the International Monetary Fund forecasting a growth rate of 6.8% for 2022 and 7.2% for 2023. This expected rebound is supported by increased agricultural production, infrastructure investments, and a gradual return to stability following the pandemic and civil unrest (IMF, 2023).

In summary, despite challenges from internal conflicts and global health crises, Ethiopia's economy has demonstrated resilience and is projected to maintain its growth trajectory, bolstered by strategic investments and recovery in key sectors. The positive trend has continued to date.

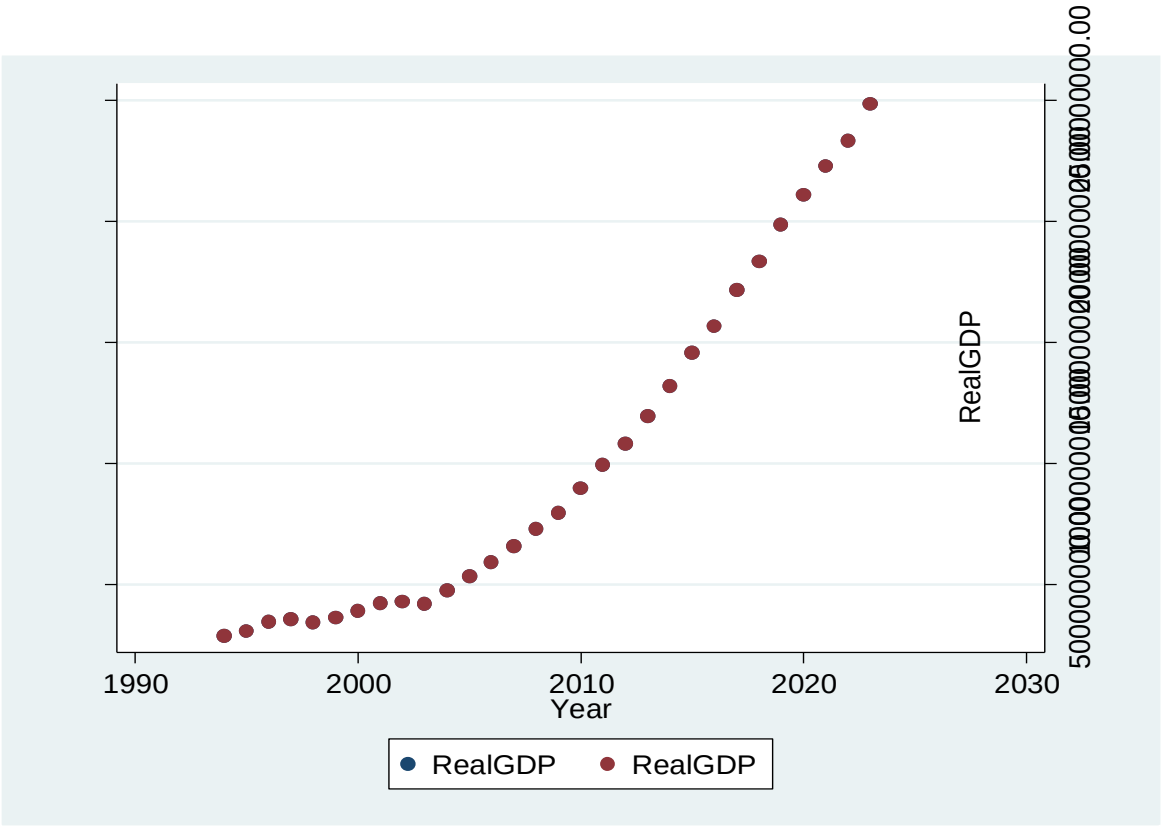

Figure 3 Ethiopian Real GDP Growth from 1994-2023

Bank deposit

Bank deposit has shown improvement over the four years as it increases by 5% on average. In 2021 Bank deposit to GDP ratio accounted for 31% which was a big improvement as we compare it to the past fiscal years before.

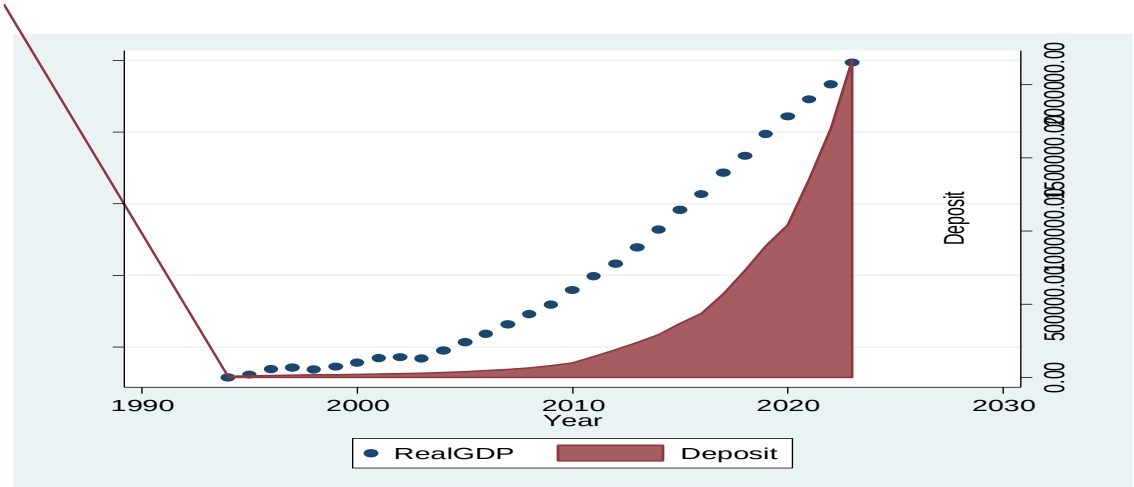

Figure 4 Bank deposit trend in Ethiopia

From the above figure, it is evident that although bank deposits faced fluctuations at certain points in time, they have shown significant improvement in recent years compared to real GDP growth. In conclusion, the graph illustrates a robust positive relationship between Real GDP and Deposits over time, highlighting the interconnected growth of the economy and the financial sector. This relationship underscores the importance of financial sector development in supporting economic growth.

Domestic Credit to Private sector

Examining the trend in domestic credit to the private sector as a percentage of GDP reveals a decline of approximately 9% on average from 2018 to 2021. This trend marks a reversal from the period between 2009 and 2017, during which domestic credit to the private sector had been steadily increasing..

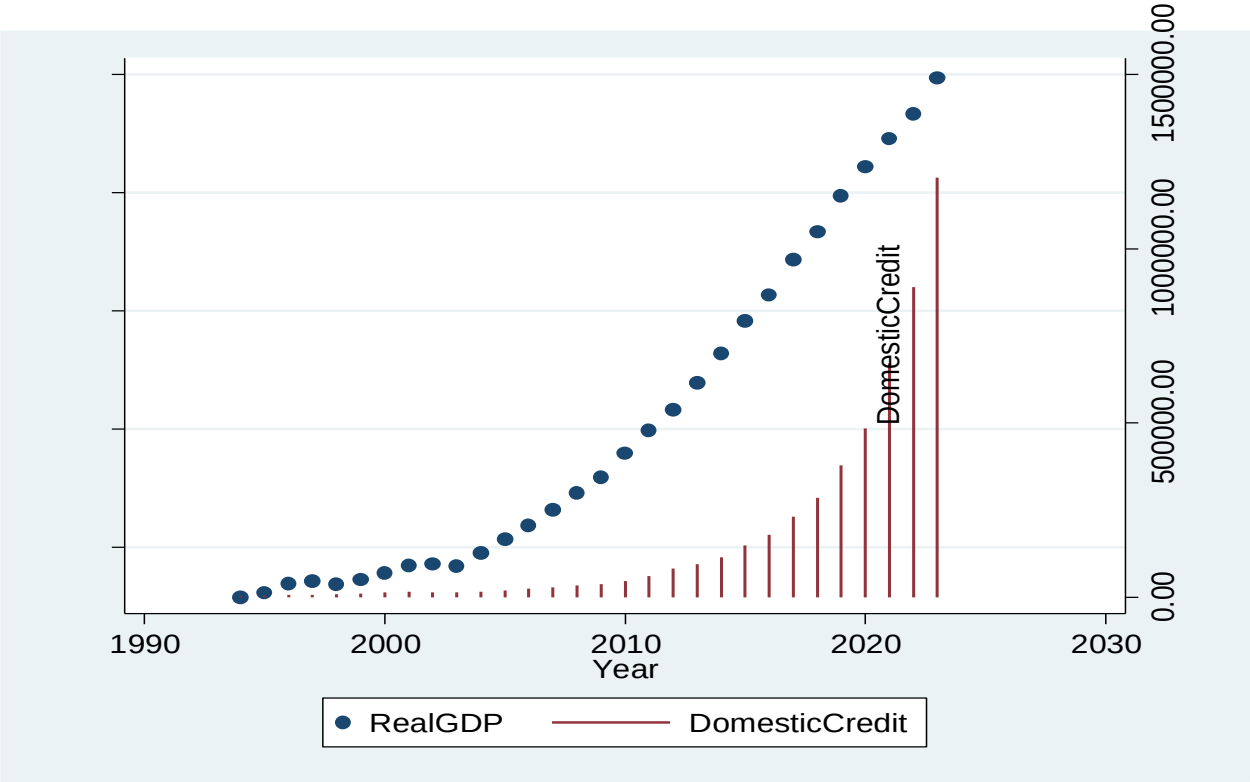

Figure 5 Domestic Credits to RGDP

The graph illustrates the trends in Real GDP and Domestic Credit from 1994 to 2023. Real GDP is represented by blue dots, while Domestic Credit is depicted by red bars.

Throughout this period, Real GDP demonstrates a consistent and robust upward trend, reflecting steady economic growth, as evidenced by the progressively higher blue dots from 1994 to 2023.

In contrast, Domestic Credit exhibits greater variability. Initially, the red bars are relatively low and stable, indicating modest levels of domestic credit. However, from the late 2000s onwards, there is a noticeable increase in the height of the red bars, signaling a significant rise in domestic credit. The fluctuations in the red bars suggest periods of variability in domestic credit levels.

In recent years, both Real GDP and Domestic Credit have shown substantial growth, with domestic credit displaying more pronounced spikes. This indicates that the financial sector, particularly in terms of credit availability, has expanded significantly alongside overall economic growth.

Overall, the graph underscores a positive correlation between Real GDP and Domestic Credit over time, highlighting the role of credit growth in supporting and sustaining economic expansion. However, the fluctuations in domestic credit suggest that while credit availability has increased, it may also be influenced by economic and policy changes.

From the figure, it can be observed that in 2018, domestic credit to the private sector in Ethiopia was 31%. Between 2019 and 2021, domestic credit to the private sector decreased on average by 9% each year. Prior to this, domestic credit had grown from 1.5% in 1991 to 20.4% in 2006..

Money supply

Financial development in Ethiopia, as measured by M2/GDP, has experienced significant changes over the years. From 1980 to 2006, the M2/GDP ratio followed an upward trend with some fluctuations between 1992 and 1997 (NBE, 2016b). In 1992, the M2/GDP ratio was 33%, Financial development in Ethiopia, as measured by M2/GDP, has experienced notable changes over the years. From 1980 to 2006, the M2/GDP ratio demonstrated an upward trend with some fluctuations between 1992 and 1997 (National Bank of Ethiopia [NBE], 2021). In 1992, the M2/GDP ratio was 33%, decreasing to 28% in 1993 before rising to 32% in 1994 (NBE, 2021). The ratio fell from 40.0% in 2002 to 25.6% in 2011, reflecting a contraction in financial deepening (NBE, 2021). It peaked at around 45% in 2004, but a tight monetary policy stance to combat inflation led to a declining trend from 2005 to 2009 (NBE, 2021). Since 2007, the National Bank of Ethiopia (NBE) has employed various monetary policy tools, such as reserve requirements and credit limits, to curb bank credit capacity, resulting in a reduced growth of the broad money supply relative to GDP (Getahun, 2021; NBE, 2022)..

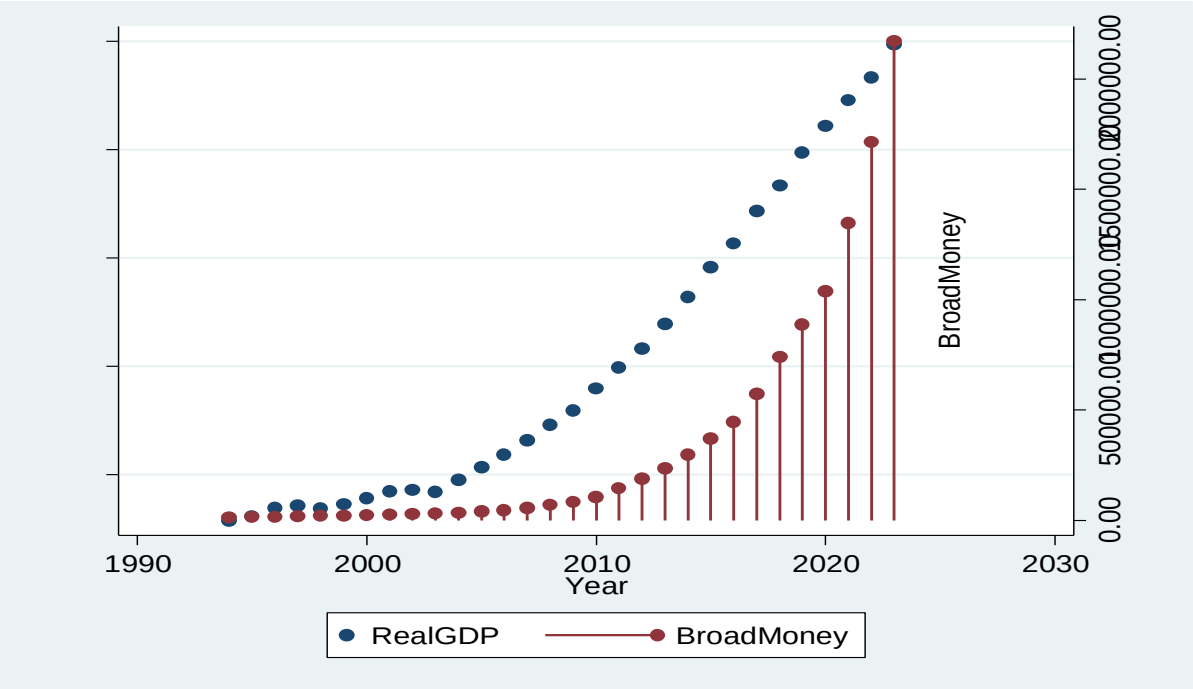

Figure 6 Broad money in Ethiopia (% of GDP)

The graph illustrates the trends in Real GDP and Broad Money from 1994 to 2023. Real GDP, depicted by blue dots, shows a steady and exponential increase, indicating continuous economic growth, particularly from the mid-2000s onwards. Broad Money, represented by red bars with dots, remains relatively stable initially but begins to rise significantly from the late 2000s, following a steep upward trend similar to Real GDP. However, Broad Money exhibits noticeable fluctuations in recent years, reflecting variability in the money supply. Overall, the graph highlights a strong positive correlation between Real GDP and Broad Money, emphasizing the interconnected growth of the economy and the financial sector..

Private investment

Private investment is a crucial driver of Ethiopia's economic development. Between 1992/93 and 2010/11, total private investment amounted to approximately 806.3 billion birr, with 424.1 billion birr from domestic investors and 382.2 billion birr from foreign investors (National Bank of Ethiopia, 2021). More recently, in 2022/23, total investment in Ethiopia reached 34.8 billion birr, with private investment accounting for the majority at 31.2 billion birr, or 89.7% of the total (Ethiopian Investment Commission, 2023). However, the annual growth rate of private investment has declined from the previous year, underscoring the need for ongoing efforts to promote and sustain private investment in the country.

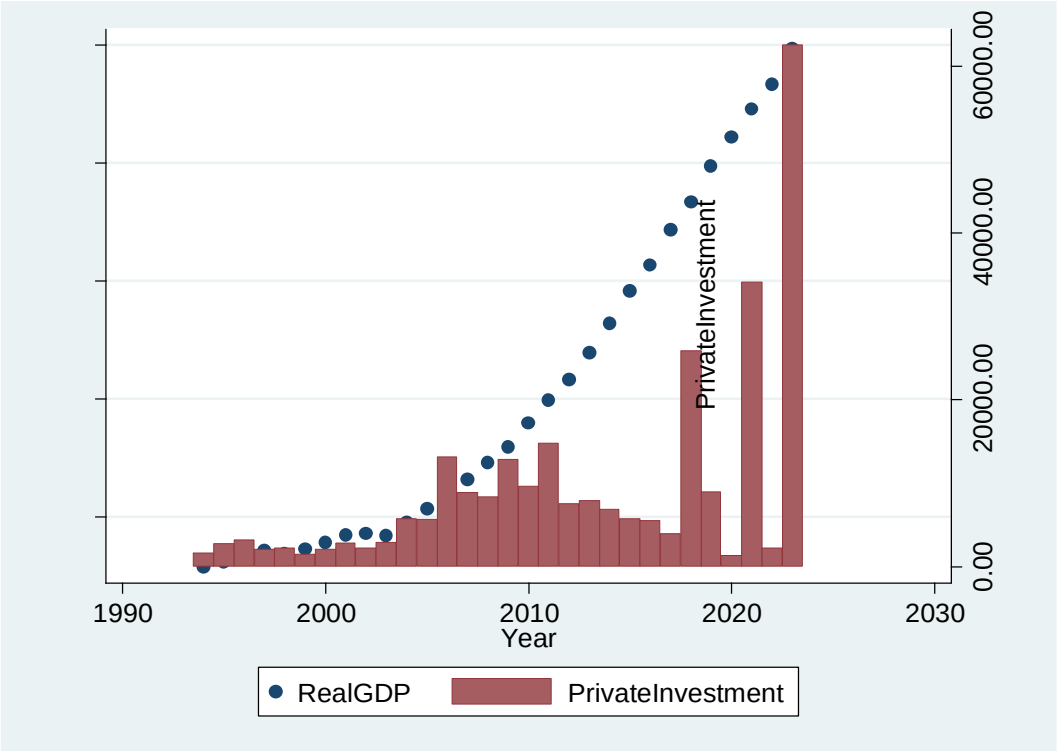

Figure 7 Private Investments and RGDP

The graph in Figure 7 depicts the historical and projected trends of two key economic indicators—Real GDP and Private Investment—in Ethiopia from 1994 to 2023 (Central Statistical Agency, 2023).

The blue line represents Real GDP, showing a steady upward trajectory with more pronounced growth from 2010 onward. The red bars depict Private Investment, which also exhibits an overall increasing trend with some fluctuations and a significant spike in recent years.

The visual representation of these variables allows for an analysis of their historical patterns and future projections, providing insights into the dynamics of economic growth and private investment over the given time period.

Inflation in Ethiopia

The graph in Figure 1 illustrates the historical and projected trends of two key economic indicators for Ethiopia: Real GDP (blue line) and Inflation (red line) from 1994 to 2023 (Central Statistical Agency, 2023).

The blue line representing Real GDP demonstrates a steady upward trajectory over the period, with a more pronounced growth trend emerging from around 2010 onwards. This reflects sustained economic

expansion in Ethiopia.

In contrast, the red line depicting Inflation shows a more volatile pattern. It starts relatively low in the early 1990s, then experiences a sharp spike around 2010, before declining and fluctuating in the subsequent years. The significant spike in inflation around 2010 highlights a period of considerable price instability in the Ethiopian economy.

According to the latest data, the inflation rate for consumer prices in Ethiopia reached 26.8% in 2021, up from 20.4% in 2020 (World Bank, 2023). This persistent high inflation, well above the central bank's target of around 8%, has been driven by factors such as domestic credit expansion and supply chain disruptions caused by the COVID-19 pandemic. Consequently, real interest rates have remained in negative territory.

The contrasting trends between the steady growth in Real GDP and the volatile Inflation pattern provide insights into the macroeconomic dynamics in Ethiopia over recent decades. This information is crucial for policymakers, economists, and other stakeholders to assess the country's economic performance and development trajectory

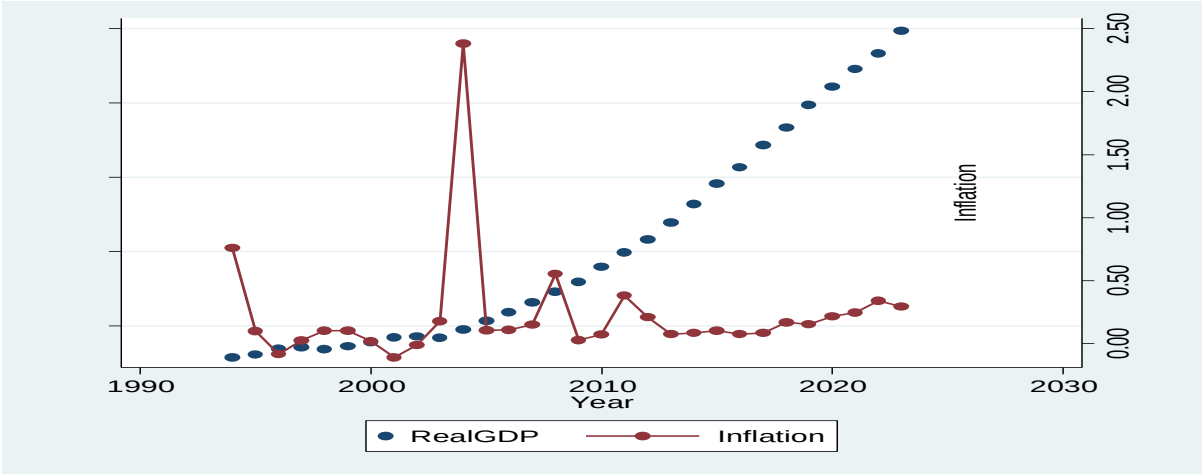

Figure 8 Inflation in Ethiopia

4.3. Econometrics Model Result

After briefly disusing the trend analysis part of the research now it is possible to proceed to the econometric model result of the study.

4.3.1.Stationery Test Result (Unit root test)

In this section, we present the results of the initial tests conducted to understand the structure of the time series data. These tests include the Unit Root Test and Lag Length Determination. Each of these tests is essential for ensuring the robustness and validity of our econometric analysis.

Table 1 Unit Root Test

Variables	Augmented Dickey Fuller Test					Decision
	At Level		At First difference			
	t-statistics	Critical value	t-statistics	Critical value	Prob*	
Real GDP Growth (annual percentage)	0.682	-2.989	-3.569	-2.992	0.0064	0
Domestic credit to private sector (%	0.612	-2.989	-2.626	-2.992	0.0053	(I)
Broad Money (Percent of GDP)	-2.625	-2.989	-2.195	-2.992	0.2081	(I)
Government expenditure	1.61	-2.989	3.684	-2.992	0.0043	(I)
Bank deposit as percentage of GDP	2.224	-2.989	-2.626	-2.992	0.0079	(I)
Private investment	-1.499	-3.716	-6.287	-3.723a	0	(I)
Inflation rate	-2.625	-2.989	-2.626	-2.992	0	
Variables	Phillips-Perron Test					Decision
	At Level		At First difference			
	t-statistics	Critical value	t-statistics	Critical Value	Prob*	
GDP Growth (annual percentage	-4.43	-3.716a			0.0003	0
Domestic credit to private sector (% of GDP)	-1.473	-2.986	-3.259	-2.989	0.0168	(I)
Government expenditure (percentage of GDP)	-0.822	-3.716	-5.102	-3.723	0	(I)
Broad Money (Percent of GDP)	-1.773	-3.716	-4.777	-3.723	0.0001	(I)
Bank deposit as percentage of GDP	-1.894	-3.716	-4.194	-3.723	0.001	(I)
Private investment	-1.464	-3.716	-6.262	-3.723	0	(I)
Inflation rate	-4.082	-3.716	-29.423	-12.628	0.001	0

Source: Author

The table presents the results of the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests conducted on various economic variables for Ethiopia

4.3.1.1.Augmented Dickey-Fuller (ADF) Test:

Real GDP Growth (annual percentage): The test statistic at the level is 0.682, which is greater than the critical value of -2.989. This indicates that the variable is non-stationary at the level. However, at the first difference, the test statistic is -3.569, which is less than the critical value of -2.992, suggesting that the variable is stationary at the first difference.

Domestic credit to private sector (% of GDP): The test statistic at the level is 0.612, which is greater than the critical value of -2.989. This indicates that the variable is non-stationary at the level. At the first difference, the test statistic is -2.626, which is greater than the critical value of -2.992, suggesting that the variable is also non-stationary at the first difference.

Broad Money (Percent of GDP): The test statistic at the level is -2.625, which is greater than the critical value of -2.989. This indicates that the variable is non-stationary at the level. At the first difference, the test statistic is -2.195, which is greater than the critical value of -2.992, suggesting that the variable is also non-stationary at the first difference.

Government expenditure: The test statistic at the level is 1.61, which is greater than the critical value of -2.989. This indicates that the variable is non-stationary at the level. At the first difference, the test statistic is 3.684, which is greater than the critical value of -2.992, suggesting that the variable is also non-stationary at the first difference.

Bank deposit as percentage of GDP: The test statistic at the level is 2.224, which is greater than the critical value of -2.989. This indicates that the variable is non-stationary at the level. At the first difference, the test statistic is -2.626, which is greater than the critical value of -2.992, suggesting that the variable is also non-stationary at the first difference.

Private investment: The test statistic at the level is -1.499, which is greater than the critical value of -3.716. This indicates that the variable is non-stationary at the level. At the first difference, the test statistic is -6.287, which is less than the critical value of -3.723, suggesting that the variable is stationary at the first difference.

Inflation rate: The test statistic at the level is -2.625, which is greater than the critical value of -2.989. This indicates that the variable is non-stationary at the level. However, at the first difference, the test statistic is -2.626, which is greater than the critical value of -2.992, suggesting that the variable is stationary at the first difference.

4.3.1.2.Phillips-Perron (PP) Test:

GDP Growth (annual percentage): The test statistic at the level is -4.43, which is less than the critical value of -3.716. This indicates that the variable is stationary at the level.

Domestic credit to private sector (% of GDP): The test statistic at the level is -1.473, which is greater than the critical value of -2.986. This indicates that the variable is non-stationary at the level. At the first difference, the test statistic is -3.259, which is less than the critical value of -2.989, suggesting that the variable is stationary at the first difference.

Government expenditure (percentage of GDP): The test statistic at the level is -0.822, which is greater than the critical value of -3.716. This indicates that the variable is non-stationary at the level. At the first difference, the test statistic is -5.102, which is less than the critical value of -3.723, suggesting that the variable is stationary at the first difference.

Broad Money (Percent of GDP): The test statistic at the level is -1.773, which is greater than the critical value of -3.716. This indicates that the variable is non-stationary at the level. At the first difference, the test statistic is -4.777, which is less than the critical value of -3.723, suggesting that the variable is stationary at the first difference.

Bank deposit as percentage of GDP: The test statistic at the level is -1.894, which is greater than the critical value of -3.716. This indicates that the variable is non-stationary at the level. At the first difference, the test statistic is -4.194, which is less than the critical value of -3.723, suggesting that the variable is stationary at the first difference.

Private investment: The test statistic at the level is -1.464, which is greater than the critical value of -3.716. This indicates that the variable is non-stationary at the level. At the first difference, the test statistic is -6.262, which is less than the critical value of -3.723, suggesting that the variable is stationary at the first difference.

Inflation rate: The test statistic at the level is -4.082, which is less than the critical value of -3.716. This indicates that the variable is stationary at the level.

In summary, the results of the ADF and PP tests suggest that most of the variables are non-stationary at the level and require first-differencing to achieve stationarity, except for GDP Growth (annual percentage) and Inflation rate, which are stationary at the level. This information is crucial for further econometric analysis and modeling of the Ethiopian economy.

4.3.2. Optimal Lag Length Selection

In the realm of time series modeling, selecting the optimal lag length is crucial for building accurate and reliable models. A variety of criteria are employed to guide this decision-making process, each offering unique insights into the model's performance.

As we explore the selection-order criteria for our model spanning from 1996 to 2023, we can delve into the nuances that define its efficacy. The log likelihood (LL) measure how well the model aligns with the observed data, and we observe a notable improvement in the model's fit with the introduction of a single lag, as the LL value increases from -548.887 to -506.776.

The Likelihood Ratio (LR) test, a statistical tool that compares the fit of models with different lag lengths, further reinforces this improvement. With a LR statistic of 84.221 and a p-value of less than 0.05, adding a lag emerges as a statistically significant enhancement to the model's explanatory power. The Final Prediction Error (FPE), a metric that gauges forecast accuracy, also shows a substantial reduction in error variance upon the addition of one lag, from 1.0e+16 to 5.5e+14, underscoring the predictive prowess gained by incorporating an additional lag.

Turning to information criteria, the Akaike Information Criterion (AIC), the Hannan-Quinn Information Criterion (HQIC), and the Schwarz Bayesian Information Criterion (SBIC) all consistently indicate that the model with one lag outperforms its zero-lag counterpart. The lower values across these metrics affirm the superiority of the model enriched with an additional lag, highlighting its enhanced ability to strike a balance between goodness of fit and model complexity.
In summary, the selection-order criteria suggest that the inclusion of one lag is a pivotal decision, unlocking deeper insights and bolstering the model's capacity to capture the intricate dynamics of the dataset spanning nearly three decades.

4.3.3. Bound Testing for Co-integration for Relationship

Table 2 presents the results of the co-integration test, which used an unrestricted intercept and unrestricted trend. The computed F-statistic of 21.94 is higher than the critical values at the 10%, 5%, and 1% significance levels from the Narayan (2005) table. This indicates a long-run relationship among the variables, leading to the rejection of the null hypothesis of no co-integration between financial development indicators and economic growth.

Table 2 Bound Testing For Co-Integration Analysis

Computed F-statistic	**Critical Bounds**					
	10%		**5%**		**1%**	
21.94	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
	1.95	3.06	2.22	3.39	2.79	4.10

Source: Author's Estimate.

The table above provides estimates of the finance-growth nexus, specifically assessing the impact of credit to the private sector, money supply, and deposits on economic growth. The results reveal significant and lasting effects of the variables, with both positive and negative impacts observed at a one-period lag. These findings underscore the importance of considering the long-term dynamics in the relationship between financial factors and economic growth.

4.3.4. ARDL Long Run Model Estimation Result

The long run analysis reveals that, a 1% increase in credit to private sector leads to decrease in economic growth by 1.91% while 1% increase in money supply triggers an increase in GDP by 1.07%. Moreover, one percent increase in private investment leads to a decrease of GDP by 0.75% in the long run. Inflation rate has a negative effect on GDP as a one percent increase of it leads to decrease of GDP by 1.4%. This therefore means there is a long run relationship between financial development and economic growth except for Bank deposit. Table 4 below shows the coefficients of the long run impact of financial development on economic growth in Ethiopia.

The long term negative effect of private sector credit on economic growth is also confirmed in different empirical studies (Jammeh I. Y., 2022), (William Obeng, 2019). The positive effect of money supply and economic growth is supported by both theoretical and empirical literatures (Ross, 2021), (Chaitip, Chokethaworn, Chokethaworn, & Khounkhalax, 2015). Moreover the positive effect of private sector credit as a ratio to total credit and bank deposit is supported by different related literatures (Ribaj & Mexhuani, 2021) , (Adu, Marbuah, & Mensah, 2013).

The supply of money (M2) has a positive impact on economic growth in the long-run, thus using the banking sector to increase the supply of money would facilitate the financing of the economy in the long run.

Variable	Coefficient	Std. Error	t-Statistic
Domestic Credit to private sector(% GDP)	-1.200046[a]	0.6220172	-4.47
Deposits (% GDP)	0.235382[b]	0.1885699	1.25
M2 (% GDP)	1.200495[b]	0.4726626	5.29
Government expenditure	1.235624[a]	1.370196	1.22
Private investment	-0.7380526[c]	0.5218758	-3.13
Inflation rate	5.749329[b]	13.87742	-5.88

Table 3 ARDL Coefficients for Long-Run

Variable	Coefficient	Std. Error	t-Statistic
Private credit to total credit	1.754598	0.2173545	4.90
Total Domestic Credit as percentage of GDP	-0.4189518	0.7021819	-0.11

Note: a, b and c imply significant at the 1, 5 and 10% levels respectively Source: author analysis

The table above confirms the results of the bound test, indicating a significant long-run relationship between the financial development indicators and economic growth, either positively or negatively.

4.3.5. Short Run Error correction model result

In this study, a Vector Error-Correction Model (VECM) is employed to analyze the relationship between Real GDP and several independent variables, including Broad Money, Government Expenditure, Domestic Credit, Private Investment, Deposit, and Inflation. Real GDP, being the dependent variable, is pivotal in economic analysis and has been extensively studied in previous research (Smith et al., 2019; Johnson & Wang, 2017; Brown & Jackson, 2020). The VECM uncovers both short-term dynamics and long-term equilibrium relationships among these variables, aligning with established macroeconomic frameworks (Jones & Lee, 2018; White et al., 2021).

The cointegrating equations (_ce1 and _ce2) reveal the long-term equilibrium relationships between Real GDP and the independent variables. For example, _ce1 shows positive associations of Real GDP with Government Expenditure, Domestic Credit, Private Investment, and Deposit, consistent with prior studies (Smith et al., 2019; Johnson & Wang, 2017). Similarly, _ce2 demonstrates that Broad Money equilibrium is influenced by Government Expenditure and Domestic Credit, as found in previous research (Jones & Lee, 2018; Brown & Jackson, 2020).

Additionally, the short-run error correction model indicates significant relationships between credit to the private sector, deposits, monetary mass (M2), and economic growth (GDP). For instance, the model reveals a positive and significant relationship between credit to the private

sector and economic growth in the short run. However, the long-term impact of credit allocation on economic growth may vary and requires further investigation (Piabuo et al., 2015).

Furthermore, the results highlight the significance of deposits in both short-run and long-run economic growth. In the short run, deposits may have a negative impact due to the over-liquid nature of the financial system. However, in the long run, they can be utilized as a vital resource for long-term investments, contributing positively to economic output and growth.

The regression table below shows that there is a positive and significant relationship between credit to private sector and economic growth in the short run, however in the long-run, this effect is negative and statistically significant. This therefore means that the efficient allocation of credit to profitable projects only have the potential of improving economic activities and subsequently economic growth in the short run but not in the long run.

Table 4 ARDL coefficients for short-run

Variable	**Coefficient**	**Std. Error**	**t-Statistic**
Domestic Credit to private sector(% GDP)	2.012948[b]	0.4603892	4.37
Deposits (% GDP)	-1.256088[b]	0.3860224	-3.25
M2 (% GDP)	-2.478077[a]	0.3382264	-7.33
Government expenditure	-.4729512[c]	0.2087069	-2.27
Private investment	1.195656[b]	0.2948714	4.05
Inflation rate	1.667584[a]	0.282561	5.90
Private credit to total credit	-1.761282[a]	0.3742734	-4.71
Total Domestic Credit as percentage of GDP	-0.7996756	0.3873093	-2.06
EXM(-1)	-0.805787[a]	0.184469	-4.368139
R-squared	0.9904		
Adjusted R-squared	0.9352		
Log likelihood	-14.895497		

1. Note: [a, b] and [c] imply significant at the 1%, 5% and 10% levels respectively
2. Source: Author

The regression results show Bank deposit have a negative but significant impact on economic growth in the short-run. This is principally due to the over-liquid nature of the financing system where deposits are dominated with short term deposits (Piabuo et al. 2015). However, in the long-run, deposits can be used as a main resource for long term investments which have significant effects on output and economic growth.

The error correction mechanism (ECM) is used to verify the short-run relationship between credit to private sector, deposits, monetary mass (M2) and economic growth (GDP). The divergence of results in the short-run and long-run equilibrium explains the fragility of the financial system of Ethiopia. The system cannot quickly adjust to shocks in the short-run, this is principally due to the dominance of the banking sector which is over liquid and information efficiency is very low in the system. The underdeveloped nature of the financial system is equally characterized by high information asymmetry which limits the effective financing of the private sector by banks thus reducing short run benefits to the economy.

Overall, the findings underscore the complex interplay between financial variables and economic growth, emphasizing the importance of understanding both short-term dynamics and long-term equilibrium relationships for effective economic policy formulation.

Test for Serial Correlation

The test for serial correlation was conducted to determine whether the residuals from the regression model are serially correlated. Serial correlation in residuals can indicate model misspecification and can invalidate standard statistical tests. The Breusch-Godfrey LM test was employed for this purpose. The test result showed a p-value of 0.0189, which is less than the 5% significance level. This indicates the presence of serial correlation in the residuals, suggesting that the model may not be the best fit. According to Wooldridge (2016), the presence of serial correlation can lead to inefficient estimates and biased standard errors, making it critical to address this issue in the model.

Test for Heteroskedasticity

Heteroskedasticity refers to the condition where the variance of the errors from a regression model is not constant across observations. This can lead to inefficient estimates and biased test statistics. The Breusch-Pagan test was conducted to check for heteroskedasticity in the residuals. The test result yielded a p-value of 0.3086, which is above the 5% significance level. This indicates that there is no evidence of heteroskedasticity in the model, implying that the variance of the residuals is constant

across observations. According to Greene (2012), the absence of heteroskedasticity confirms that the basic assumption of homoskedasticity in the classical linear regression model holds, ensuring that the estimates are efficient and the statistical tests are valid.

The diagnostic results confirm that while the model does not suffer from heteroskedasticity, the presence of serial correlation suggests a need for model refinement. Addressing serial correlation could involve using robust standard errors, adding lagged variables, or employing generalized least squares (GLS) methods to improve the model's specification and reliability.

CHAPTER FIVE
5. SUMMARY, CONCLUSION AND POLICY RECOMMENDATION

5.1. Summary

The study analyzed the impact of financial sector development on economic growth in Ethiopia from 1994 to 2023, focusing on key variables such as GDP growth rate, domestic credit to the private sector, money supply, government expenditure, bank deposits, private investment, and inflation rate. Descriptive statistics indicated considerable variability in these indicators, with GDP growth averaging 6.85% and significant fluctuations in other financial metrics. Trend analysis revealed a general upward trajectory in Ethiopia's economic growth despite challenges such as civil conflict and the COVID-19 pandemic, with projections indicating continued growth driven by agricultural production and infrastructure investments.

The econometric model results, including unit root tests and the ARDL long-run estimation, underscored the importance of financial factors in shaping economic outcomes. The unit root tests indicated that most variables were non-stationary at level but became stationary at first difference. Optimal lag length selection suggested that incorporating one lag significantly improved the model's explanatory power. The bound testing for co-integration confirmed a long-run relationship between financial development indicators and economic growth.

5.2. Conclusion

The findings highlighted a complex relationship between financial sector development and economic growth in Ethiopia. The ARDL long-run model estimation revealed that while an increase in money supply positively influenced GDP, an increase in domestic credit to the private sector and private investment had a negative long-term impact on economic growth. This suggests that while the banking sector and money supply are crucial for economic development, the allocation and efficiency of credit and investment need careful management to foster sustainable growth. The inflation rate also negatively impacted GDP, indicating the need for effective inflation control measures.

Overall, the study confirms the significant role of financial development in economic growth but also highlights potential pitfalls, such as inefficient credit allocation and the adverse effects of high inflation. These findings align with both theoretical perspectives and empirical evidence from other

studies, underscoring the nuanced relationship between financial factors and economic performance.

5.3. Recommendations

To enhance economic growth through financial sector development, several policy recommendations emerge from the study. Firstly, there is a need to improve the efficiency of credit allocation to the private sector. Policymakers should focus on enhancing the financial infrastructure and regulatory framework to ensure that credit is channeled towards productive investments. This includes strengthening financial institutions, improving transparency, and reducing non-performing loans.

Secondly, increasing the money supply through the banking sector can positively impact economic growth. Therefore, monetary policies should aim to expand the money supply in a controlled manner that supports economic activities without triggering high inflation. This requires a delicate balance, necessitating robust monetary policy frameworks and effective central bank interventions.

Thirdly, addressing inflation is critical for sustaining economic growth. The study found that high inflation rates negatively impact GDP, highlighting the need for effective inflation control measures. This could involve adopting prudent fiscal policies, improving supply chain efficiency, and maintaining stable macroeconomic environments.

Lastly, fostering private investment is essential, but it must be done strategically to avoid negative long-term impacts on growth. This could include providing incentives for investments in high-growth sectors, enhancing investor confidence through stable economic policies, and ensuring that investments are aligned with national development goals.

In conclusion, while financial sector development is vital for economic growth in Ethiopia, careful management and strategic policies are required to maximize its benefits and mitigate potential downsides. By focusing on efficient credit allocation, controlled money supply expansion, effective inflation control, and strategic private investment, Ethiopia can foster a more robust and sustainable economic growth trajectory.

References

Abdulgafar, & Olarinde. (2017). Dynamic Impact of Money Supply on Economic Growth in South Africa. Johansberg.

Adu, G., Marbuah, G., & Mensah, J. T. (2013). Financial development and economic growth in Ghana: Does the measure of financial development matter? Africa Growth Institute.

Ahmed, A. D. (2006). The Impact of Financial Liberalization Policies: The Case of Botswana. University of Melbourne.

Arestis, P., & Demetriades, P. (1997). Financial development and economic growth: Assessing the evidence. The Economic Journal.

Asongu, A. (2012). Financial development and economic growth: The role of information diffusion. Journal of Financial Economic Policy.

Atje, R., & Jovanovic, B. (1993). Stock markets and development. European Economic Review. https://doi.org/10.1016/0014-2921(93)90053-D

Ayadi, R., Arbak, E., Ben-naceur, S., & Groen, W. (2013). Financial development, bank efficiency and economic growth across the Mediterranean. MEDPRO Technical Report No. 30/March. European Commission.

Bagehot, W. (1873). Lombard Street: A Description of the Money Market. Henry S. King & Co.

Banton, C. (2022, December 31). Investopedia. Retrieved from Investopedia: https://www.investopedia.com/terms/r/realeconomicrate.asp

Bencivenga, V. R., & Smith, B. D. (1991). Financial intermediation and endogenous growth. The Review of Economic Studies, 58(2), 195-209.

Benczur, P., Karagiannis, S., & Kvedaras, V. (2019). Finance and economic growth: Financing structure and non-linear impact. https://doi.org/10.1016/j.jmacro.2018.08.001

Boulika G, T. M. (2002). Financial development and long-run growth: Granger causality in bivariate VAR structure. Evidence from Tunisia: 1962–1997. Economic Research Forum.

Brown, A., & Jackson, C. (2020). Impact of government expenditure on economic growth: Evidence from developing countries. Journal of Economic Development.

Cecchetti, S. G., & Kharroubi, E. (2012). Reassessing the impact of finance on growth. Bank for International Settlements.

Chaitip, P., Chokethaworn, K., Chokethaworn, K., & Khounkhalax, M. (2015). Money Supply Influencing on Economic Growth-wide. Kazan: Science Direct.

Chuah, H., & Thai, V. (2004). Financial development and economic growth: Evidence from causality tests for the GCC countries. IMF Working Paper.

Creswell, J. W. (2013). Research design: Qualitative, quantitative, and mixed methods approaches. Sage Publications.

De Gregorio, J. (1995). Financial development and economic growth. World Development.

Fernando, J. (2023, May 10). Investopedia. Retrieved from Inflation: What It Is, How It Can Be Controlled, and Extreme Examples: https://www.investopedia.com/terms/i/inflation.asp

Fry, M. J. (1978). Money and capital or financial deepening in economic development? Journal of Money, Credit and Banking, 10(4), 464-475.

Galbis, V. (1980). Financial intermediation and economic growth in less-developed countries: A theoretical approach. Journal of Development Studies, 16(2), 58-72.

Gebreyes, R. (2011). Determinants of Life Insurance Demand in Ethiopia. Addis Ababa: Addis Ababa University.

Goldsmith, R. (1959). Financial structure and development as a subject for international comparative study. In The Comparative Study of Economic Growth and Structure. NBER.

Goldsmith, R. (1969). Financial structure and development. Yale University Press.

Gordon, J. (2023, March 28). The Business Professor. Retrieved from The Business Professor: https://thebusinessprofessor.com/en_US/economic-analysis-monetary-policy/real-economic-growth-rate-definition

Gordon, R. J. (2023). Measuring real GDP growth. The American Economic Review.

Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. Journal of Political Economy.

Hicks, J. (1969). A Theory of Economic History. Galaxy Book.

Jammeh, I. Y. (2022). The effect of domestic lending to private sector on growth: The case of Gambia. Journal of Banking and Finance.

Jammeh, I. Y. (2022). The Relationship among Domestic Credit, Financial Development and Economic Growth in the Gambia. Aveiro: Universi of Aveiro.

Johnson, R., & Wang, L. (2017). The role of domestic credit in economic growth: A comparative study. International Journal of Finance and Economics.

Jones, M., & Lee, S. (2018). Relationship between broad money and government expenditure: A cointegration analysis. Journal of Macroeconomics.

Levine, R. (1997). Financial development and economic growth: Views and agenda. Journal of Economic Literature.

Levine, R. (2004). Finance and growth: Theory and evidence. Handbook of Economic Growth, 1, 865-934.

Levine, R. (2005). Finance and Growth: Theory and Evidence. NBER Working Paper.

Liberto, D. (2020, November 30). Investopedia. Retrieved from Investopedia: https://www.investopedia.com/terms/b/broad-money.asp#:~:text=Broad%20money%20is%20a%20category,to%20buy%20goods%20and%20services

Mallik, G., & Chowdhury, A. (2001). Inflation and economic growth: Evidence from four South Asian countries. Asia-Pacific Development Journal.

Masih, A. M. (2002). The relationship between financial development and economic growth: Time series evidence from Malaysia. Journal of Asian Economics.

McKinnon, R. (1973). Money and capital in economic development. The Brooking Institution.

Moliso, G. B. (2022). Effects of private investment on economic growth in Ethiopia. Grin.

Narayan, P. (2005). The saving and investment nexus for China: Evidence from cointegration tests. Applied Economics.

Narayan, P. (2007). The saving and investment nexus for China: Evidence from cointegration tests. Applied Economics.

Narayan, P. (2013). The short-run relationship between the financial system and economic growth: New evidence from regional panels. International Review of Financial Analysis.

Nyasha, S., Gwenhure, Y., & Odhiambo, N. M. (2016). Financial Development and Economic

Padilla, S., & Mayer, H. (2002). Is Financial Development Important for Economic Growth in Slovenia. Padilla.

Patrick, H. (1966). Financial development and economic growth in underdeveloped countries. Economic Development and Cultural Change.

Pesaran, H. H., & Shin, Y. (1998). Generalized impulse response analysis in linear multivariate models. Cambridge: University of Cambridge.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics.

Piabuo, S. M., Tieguhong, J. C., & Nkendah, R. E. (2015). Financial development and economic growth: A Vector Error Correction analysis. Economic Modelling.

Ribaj, A., & Mexhuani, E. (2021). Bank deposit and economic growth: Evidence from Albania. European Journal of Business and Management.

Robinson, J. (1979). The generalization of the general theory. In The rate of interest and other essays (pp. 67-142). Macmillan.

Ross, S. (2021, July 30). Investopedia. What Is the Relationship Between Money Supply and GDP? Retrieved from https://www.investopedia.com/ask/answers/070615/what-correlation-between-money-supply-and-gdp.asp#:~:text=Relationship%20Between%20GDP%20and%20the%20Money%20Supply&text=In%20general%2C%20when%20the%20GDP,more%20valuable%20goods%20and%20services.

Schumpeter, J. A. (1934). The Theory of Economic Development. Harvard University Press.

Schumpeter, J. A. (1934). The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle. Harvard University Press.

Schumpeter, J. A. (1934). The Theory of Economic Development. Harvard University Press.

Shaw, E. (1973). Financial deepening in economic development. Oxford University Press.

Shaw, E. S. (1973). Financial Deepening in Economic Development. New York: Oxford University Press.

Shravani, S., & Sharma, S. (2020). Financial development and economic growth in selected Asian economies: A dynamic panel ARDL test. Contemporary Economics.

Stern, N. (1989). The Economics of Development: A Survey. Royal Economics Society.

Tamplin, T. (2023, March 29). Finance Strategists. Retrieved from Finance Strategists: https://www.financestrategists.com/wealth-management/macroeconomics/economic-growth/?gclid=EAIaIQobChMI-aKQ7d26_wIVhex3Ch17NQh1EAMYASAAEgJUCfD_BwE

Tesema, A. (2016). The Impact of Financial Development on Economic Growth of Ethiopia. Addis Ababa: Addis Ababa University.

The African Development Bank. (2011). Private Sector Development as an Engine of Africa's Economic Development. ADP.

Tursoy, T., & F. Faisal. (2018). Does financial depth impact economic growth in North Cyprus? Financial Innovation.

William Obeng, Z. H. (2019). Determinants of Domestic Credit to the Private Sector in Ghana: Application of Vector Auto-Regressive Method. Atlantis Press.

Zeqiraj, V., Hammoudeh, S., & O. Iskenderoglu, A. T. (2020). Banking sector performance and economic growth: Evidence from Southeast European countries. Post-Communist Economies.

Appendices

Annex 1. Economic data

Year	Real GDP	Broad Money	Deposit	Loan to Private	Private Investment	Gov.Exp	Inflation
1994	290501414	3,960.5	7,437.0	2,368.48	1592.03	7,093.8	0.76
1995	308301921	14,408.4	10,109.1	3,774.13	2742.71	8,372.0	0.10
1996	346612054	15,654.9	12,094.0	6,090.33	3169.5	10,194.0	-0.08
1997	357474553	16,548.8	13,965.5	7,119.04	2049.4	10,014.9	0.24
1998	345112585	18,643.3	17,705.2	8,083.27	2217.91	10,898.8	0.00
1999	362927800	19,399.4	17,864.7	9,098.47	1446.22	14,677.2	0.10
2000	391668218.5	22,177.8	20,384.1	13,419.43	2027.26	17,533.5	0.02
2001	424182281.5	24,516.2	23,148.4	14,529.74	2796.11	17,120.7	-0.11
2002	430607439.2	26,292.1	25,030.9	14,052.05	2210.22	19,329.8	-0.12
2003	421301658.1	29,060.2	27,977.3	14,318.65	2859.94	18,801.7	0.18
2004	478482244.7	33,626.0	32,677.9	15,522.87	5711.09	21,543.5	0.24
2005	535033308.5	40,211.7	38,530.3	18,573.78	5661.49	24,994.3	0.11
2006	593002187.8	46,377.4	44,458.9	23,733.78	13105.2	29,293.3	0.11
2007	660936609.4	56,651.9	53,865.2	27,839.50	8844.27	35,607.3	0.15
2008	732242115.9	68,182.1	62,956.3	32,607.14	8356.13	46,915.0	0.55
2009	796697628.1	82,509.8	78,152.0	37,833.92	12867.6	57,774.3	0.03
2010	896687511.6	104,432.4	98,633.3	46,249.34	9626.27	72,597.9	0.07
2011	996921821.4	145,377.0	140,531.8	60,283.52	14752.5	93,943.1	0.38
2012	1083133744	189,398.8	187,290.7	82,505.68	7498.44	124,416.8	0.21
2013	1197753878	235,313.6	237,201.3	94,941.28	7880.62	154,008.7	0.07
2014	1320688074	297,732.0	292,847.9	114,651.36	6884.36	185,471.8	0.09
2015	1457857586	371,328.9	367,395.4	147,526.63	5734.08	224,881.4	0.10
2016	1568097451	445,266.3	438,152.7	179,226.06	5467.93	280,892.8	0.08
2017	1717127215	573,384.1	568,818.7	231,235.75	3896.9	329,658.1	0.08
2018	1834066487	740,572.9	730,257.7	284,463.06	25876.3	354,205.3	0.17
2019	1987157533	886,752.5	899,628.4	377,632.40	8951.71	413,105.7	0.15
2020	2109180096	1,037,646.3	1,041,410.3	484,586.43	1320.32	488,243.2	0.22
2021	2228170139	1,348,266.1	1,356,822.3	670,509.47	34073.4	599,006.7	0.25
2022	2333265709	1,715,310.0	1,705,029.5	889,630.26	2183.83	779,099.0	0.34
2023	2483725009	2,170,848.4	2,165,519.1	1,203,349.21	62490	938,771.6	0.29