



**ADDIS ABABA UNIVERSITY  
COLLEGE OF BUSINESS AND ECONOMICS  
SCHOOL OF GRADUATE STUDIES**

**THE IMPACT OF FINANCIAL DEVELOPMENT ON POVERTY,  
GROWTH AND INEQUALITY IN ETHIOPIA**

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**THE IMPACT OF FINANCIAL DEVELOPMENT ON  
POVERTY, GROWTH AND INEQUALITY IN ETHIOPIA**

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This Thesis Submitted to Addis Ababa University College of Business and Economics School of  
Commerce in Partial Fulfillment of the Requirements for MSC in Development Economics

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**AUGUST, 2021**

**AAU, Ethiopia**

## **DECLARATION**

I declare that the thesis entitled “the impact of financial development on poverty, growth and inequality” is the outcome of my own original work and all source materials used for this study have been acknowledged. I have produced it independently with the guidance and suggestion of my research advisor.

Therefore, this research work has not been submitted for a degree at this or any other University and I submitted this paper for the partial fulfillment of the degree in Masters of Science in Development Economics.

By: Amanuel Della

Signature .....

## STATEMENT OF CERTIFICATION

This is to certify that Amanuel Della has carried out this research work on the topic entitled “the impact of financial development on poverty, growth and inequality.” This work is original in nature and apt for submission with the expected standards in partial fulfillment of the requirement for the award of Master of Science in Development Economics.

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## ABBREVIATIONS

ADB - Asian Development Bank

ADL - Autoregressive Distributed Lag

GDPg - Growth of Gross Domestic Product

GGDP<sup>2</sup>- the Square of the growth rate of GDP

GoEx - Government expenditure

FD - An index measuring financial development

IMF - International Monetary Fund

INF - An indicator of inflation which is consumer price index

INQ - Income inequality measured by the Gini index

INST- An index measuring the institutional quality

LDCs –Least developed countries

MFI- Microfinance Institutions

OPEN - Trade openness

PDC- Planning and development commission

Pov - Poverty which is measured by national head count ratio

PPg - Growth rate of population

HK - Secondary schooling in the total population which measures human capital

SME - Small and Medium Size Enterprise

TEL - An indicator of quality of infrastructure

WB – World Bank

## ABSTRACT

*In fighting to eradicate poverty from the world, examining the factors that are determining growth, poverty and inequality is one of critical steps. As a result of this, during the past decades, the research on the impact of financial development on welfare has got a lot of attention. Thus, this study deals with assessing the direct and indirect effect of financial development in reducing poverty by considering the simultaneous effects of economic growth and inequality in Ethiopia. In order to investigate this, the time series data has been used with simultaneous equation model for the period of 1991 to 2019. Based on the econometric analysis results, first, the finding shows that through the direct channel, financial development increases the proportion of population living below the national poverty line. This is due to the financial intermediaries are not adequately channeling finance to the pro-poor sectors and SMEs. Second, financial development enhances poverty reduction and lift up the poor through indirect channels of economic growth and income distribution. Third, institutional quality plays a crucial role in poverty reduction. Finally, the inverted “U” shape of Kuznets curve that is explaining the average income and inequality in the long run is not robust and the model is unverified. In the addition, another interesting finding is that there is a long run cointegration relationship between financial development and poverty eradication. Therefore, it is concluded that finance plays a significant role on poverty reduction, growth and income distribution. So the government shall design a policy which is pro-poor and SMEs to assure access of financial services to enhance entrepreneur innovation, productivity, human capital and industrial development.*

**Key words:** *Financial development, Economic growth, Poverty and Inequality*

## Chapter One

### 1. Introduction

#### 1.1 Back Ground of the Study

A key objective in development economics is to work out ways to lift people out of poverty. In order to enhance development, WB (2020) is concerned with the poverty reduction in developing regions which is slowing because of the prevailing nature of extreme income inequality and it is considered a powerful threat to economic progress. Despite of decades of rapid progress in reducing poverty, a large portion of the world's poorer population are still struggling to attain a minimum standard of living across the least developed regions. Because of geographical and country specific factors, the progress in reducing extreme poverty seems uneven in these regions. Now, the COVID-19 (coronavirus) pandemic has reversed the gains in global poverty for the first time in a generation.

In reducing poverty, financial development disproportionately boosts incomes of the poorest quintile and reduces income inequality (Beck et al., 2007). Financial institutions (i.e. banks and insurance companies) and financial markets (i.e. stock markets, bond markets, and derivative markets) exert a powerful influence on economic development, poverty alleviation, and economic stability (Levine, 2005). Financial development is defined as a combination of depth (i.e. size and liquidity of markets), access (like ability of individuals and companies to access financial services), and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues, and the level of activity of capital markets) (Čihák et al., 2013).

A large body of literature exists that assess the impact of financial development on economic growth, inequality, and poverty reduction (Quartey, 2005; Demirgüç-Kunt and Levine, 2009; Dhrifi, 2015; Abosedra et al., 2015; Ho and Iyke 2018; Tekin and Cin, 2020 among the others). Although literatures finds that financial development enhances average growth, but the previous research findings have not yet conclusive on whether financial development can benefit and improve welfare of the poor and the rich people equally or not. The income distribution effects either mitigate or negate the benefit that would be gained by the poor as financial development reinforces inequality. The financial service development involves welfare developments in the functions provided by the financial systems like pooling of savings, capital allocation to

productive investments, investment monitoring, risk diversification and exchange of goods and services (Demirgüç-Kunt and Levine, 2009).

However, there is conflicting view on distribution of income and poverty reduction and advocate that financial development. But by directly creating access to credit, saving and insurance and the indirect channel through economic growth and income distribution, financial development can contribute to poverty reduction. First, by improving opportunity for the poor to invest in new technologies, education and other social issues, the development of financial system can boost the productivity of assets the poor and can help them in having access to formal finance. Second, to achieve a level of sustainable gains by the poor households, the financial system can enable the poor to access financial services which are basically credit, saving and insurance risk. This in turn can enhance the productive assets, and increasing the potential of the poor people to achieve sustainable ways. Accordingly, the availability of quality institutions and financial instruments for the poor plays a significant role on the impact financial development make on poverty reduction (Jalilian and Kirkpatrick, 2001).

An inclusive and trustworthy financial system is essential for poverty reduction. But (WB, 2020) report that there are about 1.7 billion adults lack access to formal financial services. As a result, in financial sector the World Bank Group has engaged in three global orders: an emphasis on financial stability and integrity, attention to financial access and inclusion of households and small and medium size enterprises (SME), and effort on development of long-term finance and risk management. In spite of that, there is an impoverishing impact of COVID-19, conflict, and climate change converges in Sub-Saharan Africa (SSA). As a result, for the first time since 1998, poverty and income inequality remain a stubborn challenge in Ethiopia and poverty as measured by the international poverty line is expected to rise in 2020.

According to WB country profile of (2018), Ethiopia is the second most populous country in Africa with the total population number of 109.22 million and the population annual growth rate is declining for the last three decades i.e. 3.4% in 1990, 2.9% in 2000, 2.8% in 2010 and 2.6% in 2018 in the respective years. But population density (people per sq.km of land area) is increasing throughout these decades. It is 47.9, 66.2, 87.6 and 109.2 in 1990, 2000, 2010 and 2018 respectively. In addition, poverty head count ratio at national poverty lines (%of population) is declining. It was 44.2, 29.6 and 23.5 in 2000, 2010 and 2018 respectively. In relation to

inequality, income share held by the lowest 20% is declining i.e. 9.1, 8.0 and 7.3 in 2000, 2010 and 2018. These all still refers to poverty and inequality which remain an obstinate challenge in Ethiopia.

The Ethiopian economy has recorded 9 percent growth in 2018/19, faster than the 7.7 percent expansion in the previous year. Although it is still challenging, the sustained economic growth recorded over the last 15 years has led to improvements in income inequality and poverty reduction. Accordingly, per capita income has continuously increased and reached USD 985 in 2018/19. Poverty has declined from 38.7% in 2004/05 to 22 percent in 2018/19. Investment to GDP ratio has increased to 35.2% while that of domestic savings stood at 22.3%; industrial sector showed 12.6 % growth; secondary education enrolment shows improvements by 5.8 percent relative to previous year; total telecom subscribers reached 43.6 million depicting 5.6 percent growth over compared to year; inflation at the end of the fiscal year was 12.6 percent, depicting 2.0 percentage points decrease over the previous year and Small and Medium Enterprise development has shown improvement with total loan disbursed Birr 7.3 billion (National Bank of Ethiopia, 2018/19 ).

As a country, Ethiopia is a small and open but rapidly growing economy which is experiencing a shallow financial sector development and low coverage of the service of financial development. In addition, there is a lack of more sophisticated financing mechanisms such as leasing, equity funds, etc. On top of that, the financial sector which is highly regulated and closed from foreign competition is lacking financial soundness; however, the indicators have revealed that the financial sector in Ethiopia is still profitable and stable. In relation to this, the link among financial inclusion, its regulation and inclusive economic growth is still low despite a reasonably huge progress experienced in the last years. One of the major problems in enhancing financial inclusion is lack of physical access (Getnet, 2014).

The year 1992 is marked as policy turning point for financial sector, as well as the whole Ethiopia's economic policy change at large. It was the period in which a shift from a controlled to market friendly policy regime to start and continue. However, there is a relationship between the liberalization of the financial system and the inevitable poverty that is tenacious in the country had been ignored for long time, but now, it is imperative that the association between

finance and poverty reduction needs to be focused on as the level of an absolute poverty is deep rooted (Alemayehu et al., 2006).

But recently, poverty has declined substantially between 2011 and 2016. Taking a longer term view, poverty has declined even more since 1995. The rate of poverty remains higher in rural areas than urban areas, almost half of all people living in rural areas were poor. The proportion of population below the poverty line in Ethiopia is estimated to be 23.5% in 2015/16, with marked differences between urban (14.8%) and rural (25.6%) areas of the country. As measured by Gini Coefficient, consumption inequality has shown a considerable increase from 0.298 in 2010/11 to 0.328 in 2015/16. The rise in inequality was also seen in both urban (from 0.37 to 0.38) and rural (from 0.27 to 0.28) areas of the country. Literacy continues to increase over time. On average, about half the population is literate and this breaks down into 62.1 % of males and 37.4 % of females in 2016 (PDC, 2018).

Consequently, in reviewing the empirical literatures in relation to financial development and poverty reduction, there are a few comprehensive studies in assessing multidimensional impact of finance. Most of the researchers have assessed to study the effects of financial development on poverty reduction through the channel of indirect effects i.e. growth. But most of these studies have neglected the direct effect of finance that would have an impact on poverty eradication through the channel of credit, savings, and insurance services. But to have a complete picture of the multidimensional effect of finance, the treatment of it with the triangle of "growth-inequality-poverty" is the interest of this paper.

Therefore, if this study does not take into account simultaneously both direct and indirect effects, the total effect of financial development cannot be understood in full extent. Actually, there are a few studies (like Dhrifi, 2015) have gone the full distance to examine empirically the impact of financial development on the effective policy goal of income distribution and poverty reduction besides economic growth. As a result, it seems crucial to study these links to reap benefits of financial development on poverty reduction and social welfare improvement.

## **1.2 Problem Statement**

The world we are living is dynamically changing and the time is puzzling with increasing poverty, inequality, political conflict, climate change and pandemic. Tita and Aziakpono (2017)

stated that there is a trend called “Africa rising” in the literature but this robust economic growth seems to have benefited only a minority of elite individuals as poverty in the region remains high. Contrary to expectations, Africa’s growth story has not been pro-poor, and subsequently little impact felt on poverty reduction and the income inequality has also remains stubbornly high, suggesting that the strong growth has largely been enjoyed by a few elite and rich. However, Appiah, M. et al. (2020) argue that in considering poverty, one echoes the bone-dry population, the poor health care system, sanitation and the needy for foods but not finance.

But large bodies of literatures have shown that the financial development has a significant impact on enhancing growth and poverty reduction. But, the issue was whether the main focus of development strategies should be placed on direct or indirect effect of finance on growth, or poverty, and/or on inequality; and directions of causations. However, there are inconsistent predictions and findings on some empirical studies that have assessed the association between financial development and the growth-inequality-poverty. The first prediction show a positive linkage between financial development on growth and poverty reduction (eg, Beck et al., 2007; Odhiambo 2009; Honohan 2004; Quartey 2005; Ho et al., 2011; Dhrifi, 2015; Ho et al., 2018; Bist, 2018) which support the view and conclude that financial development and economic growth are pro-poor. It means that the trickle-down hypothesis is firmly supported.

The second view is that due to inadequate distribution of the gain of economic growth, the positive effects of financial development are weakened by the presence of growing inequalities (Alemayehu et al, 2006; Menyahet al., 2014; Seven and Coskun 2016; Ho and Iyke 2018). These studies show that lack of access to finance can be the main cause of the pervasive generation of income inequality and extreme poverty and it impacts the consumption pattern of the households. Hence, in some situations, the positive effects of finance and the rising inequality happen at a time and ultimately, the benefit of growth that is expected to be gained by the poor get offset.

Furthermore, where institutional quality is strong, financial development may reduce inequality by allowing the low income group of people to get access to invest in human and physical capital. Otherwise, weak institutions neither improve economic welfare nor decrease inequality due to discriminatory lending, skewed distribution of credits and lack of legal protection for the poor and high corruption which opens door for oligarchy and establish interests to sway finance away from the poor (Demirguc-Kunt and Levine 2008).

Consequently, theories and empirical findings show that the effect of financial development on income distribution again is inconsistent. The first proposition is an inverted-U association between finance and income inequality, while the other predicts a linear relationship. For instance, the study of Greenwood and Jovanovic (1990) has predicted a nonlinear relationship between finance and inequality. On contrary, based on the prediction of Galor and Zeira (1993), income distribution has a linear association with financial development. Still, some studies have argued that financial depth is at the core of growth, in other words, financial repression hinders economic growth and, withdrawal of the government from interest rate regulations and bank ownership (King and Levine, 1993; McKinnon, 1973 and Shaw, 1973).

In relation to this, in Ethiopia, the domestic credit market is dominated by lending to state owned enterprises (SOEs). The domestic credit as a percentage of GDP increased from 28.3% in 2014 to 32.1 in 2016. The financial repression is used by the government for managing its monetary and foreign exchange policy, financing of large infrastructure projects and (SOEs). Central bank is financing the government, administer interest rates, a captive domestic market for government debt, high liquidity and capital requirements, and strict foreign exchange controls. Over time, the framework has led to the build-up of large macro-financial imbalances; include: a system of fiscal dominance, pressures on inflation, the overvaluation of the Birr, a chronic shortage of foreign exchange, the lack of development of the financial system, a credit allocation skewed toward the public sector, and an overall risk of mal-investment (WB, 2016).

On other hand, Kirkpatrick et al., (2001) argue in favor of regulated rather than liberal financial markets to avoid financial crises and also to be instrumental in poverty reduction in the LDCs. The financial liberalization has led to an increase in financial fragility and systematic crises in developing countries' financial sector. Thus, strict adherence to prudential regulations will reduce the incidence of failure of the financial institutions and eliminate the instability and political repercussions. Ultimately, financial development contributes to economic growth provided that financial sector supports capital accumulation and technological innovation.

However, financial development has a multidimensional impact on poverty reduction; most of the literatures have failed to evaluate these effects. Dhrifi (2015) examines the impact of financial development on poverty reduction through direct and indirect channel. Hence, this type of assessment of finance on the "growth-inequality-poverty" triangle can give a full picture. So

understanding these simultaneous interactions is a challenge to propose an effective development policy which could be backbone of poverty reduction.

But still, researchers have not yet determined whether finance benefits the whole population equally, or it benefits the rich or the poor directly or indirectly. Nevertheless, three main issues motivate this paper and considered as a research gap. First, the previous studies have produced conflicting findings, leaving the impact of finance on growth-inequality-poverty debate open for further research. Second, to my knowledge, there are a few existing literatures and SSA countries (like Ethiopia) are largely excluded. Third, the existing literatures failed to show the multidimensional impact of finance on poverty reduction by simultaneously evaluating the direct and indirect impacts. In this context, searching for the financial dynamics on the wellbeing of the poor which has social, political and economic consequences has an increasing importance. Therefore, this study tries to assess the effect of financial development on growth, inequality and poverty debate by specifically focusing on Ethiopia.

### **1.3 Research Question**

To achieve the main objective of the study, the author has developed the following research questions and attempts to answer:

- What is the direct and indirect effect of financial development on poverty alleviation?
- How significantly is finance improves the livelihood of the poor and reduce inequality?
- Does financial development lead to economic growth in Ethiopia?
- Is the poor benefited from financial development?
- What is the role of institution on finance in improving the wellbeing of the poor?
- Is there Kuznets' inverted-U shape relationship between financial development and inequality?

### **1.4 Research Objective**

#### **1.4.1 General Objective**

The main objective of this study is to assess the direct and indirect effects of financial development on growth, inequality and poverty in Ethiopia.

#### **1.4.2 Specific Objectives**

- Assess the direct and indirect links between finance and poverty reduction in Ethiopia

- Examine the impact of finance development on economic growth and inequality
- Evaluate the role of institutional quality on poverty alleviation

### **1.5 Research Hypothesis**

Based on the theoretical and empirical literatures, a number of hypotheses are developed.

- H1: Financial development reduces poverty through the direct channel of credit, saving and insurance
- H2: Financial development improves the wellbeing of the poor indirectly through growth and income distribution
- H3: Financial development reduces inequality
- H4: Financial system development is pro-growth and it would enhance poverty reduction by promoting economic growth
- H5: Institutional quality plays a significant role for financial development in reducing inequality and poverty alleviation
- H6: There is Kuznets' inverted-U shape relationship between finance and income inequality

### **1.6 Significance of the Study**

The measurement and analysis of finance, economic growth, poverty and inequality reduction is crucial for understanding peoples' situations of well-being and factors determining their poverty levels. The outcomes of the analysis are often used to inform policy making as well as in designing appropriate interventions and for assessing effective policies and strategies.

Significantly, this paper focuses on the multidimensional impact of finance on growth, inequality and poverty reduction in Ethiopia. In developing countries, economic growth enhancing and poverty reduction is a strategic goal of the government and the income inequality has also remains stubbornly high. In relation to growth, inequality and poverty reduction, finance plays a significant role but still the depth and access of finance for the poor is limited. In addition, to the knowledge of the author, this study is the first in kind in assessing the direct and indirect impact of financial development on growth, inequality and poverty on Ethiopia. Therefore, the findings of this study is hoped to shed some lights for the planers to strategically design an effective economic policy to fight the poverty and inequality bottleneck in Ethiopia and also to encourage entrepreneur innovation and enhance industrial development.

### **1.7 Scope of the study**

The study covers the time period of 1991-2019 and assesses the impact of financial development on poverty reduction in Ethiopia.

### **1.8 Limitation of the Study**

In Ethiopia, there are only few previous studies in the area of the effect of financial development on poverty reduction. To the knowledge of the author, there is few related previous studies which are compressive and examine the multidimensional impact of financial development on poverty through direct and indirect effects. Therefore, the literature review focuses on the Sub-Saharan African regions and other developing countries.

### **1.9 Organization of the Study**

The paper is organized in five chapters. Chapter one includes: introduction and back ground of the study, statement of the problem, research question, objectives of the study, hypothesis of the study, significance of the study, scope and limitation of the study. Following that, Chapter two includes a review of theoretical and empirical literatures. Then, Chapter three is about methodology of the research including: research design, type and sources of data, the econometric model specification, definition of variables, method of data analysis; assumptions and research ethics. Chapter four, in turn, includes the data analysis and data presentation of the research, main findings, result and discussion. Finally, chapter five includes summery, conclusion and recommendations of the research.

## Chapter 2

### 2. Review of the Related Literature

#### 2.1 Basic Concepts, Definitions and Key Terms

**Finance** is a broad term that describes activities associated with financial institutions, capital market, investment etc. It means the ability of financial contracts, markets, and intermediaries to facilitate the screening of investment opportunities; monitoring of investments after providing funding; and pooling, trading, and management of risk. Accordingly, the World Bank measures of financial development by the total amount of credit banks and financial markets extended to the households and firms as a percentage of GDP (Čihák et al., (2013)).

**Economic Growth** is the increases in the total quantity of goods and services produced per person in an economy over a period of time (Todaro, 1997). To measure economic growth, real GDP per capita growth has been used in this study. It can be the percentage change in mean welfare level (e.g. income or consumption).

**Inequality** (or “distribution”) refers to disparities in relative income across the whole population, i.e., disparities in income after normalizing all observations by the population mean so as to make them independent of the scale of incomes. It means the income distribution both to proxy for equality of opportunity and because income distribution is an independently worthwhile focus of inquiry, as relative income directly affects welfare (World Bank, 2016).

Inequality has to do with differences in the share of something between/among two or more persons where the share of one/some is greater than that of the others. According to Ray (1998), economic inequality occurs when one individual is given some material choice/resources and another is denied the same thing. Inequality can be in income, consumption, wealth, gender, employment, health variables and many more. But for this study we are interested in income inequality. Income inequality is defined as the inequitable distribution of income among the members of a particular group, an economy or society. Income inequality can be measured generally using the Lorenz curve or the Gini coefficient.

**Poverty** is general scarcity or the state lacking a certain amount of income/material possessions. It could be social exclusion, inequitable social relationships, facet of asymmetrical social status, diminished capacity to participate or to develop significant associates with other people in

society. Also the World Bank defines poverty in absolute terms. The World Bank defines extreme poverty as living on less than US\$1.90/day and PPP and moderate poverty as less than \$3.10/day. In 2008, it has been estimated that 1.4 billion people had consumption levels below US\$1.25/day and 2.7 billion lived on less than \$2/day (World Bank, 2016).

## **2.2 Theoretical Literature Review**

### **2.2.1 Financial Sector development**

Financial sector development in developing countries and emerging markets is part of the private sector development strategy to stimulate economic growth and reduce poverty. The financial sector is the set of institutions, instruments, markets. The law and finance theory stresses that the legal traditions differ in terms of their emphasis on the rights of property owners in the relation with the state and their ability to adapt to changing commercial and financial conditions, so that historically determined legal traditions shape the financial development. The financial institutions (such as banks and insurance companies) and financial markets (including stock markets, bond markets, and derivative markets) exert a powerful influence on economic development, poverty alleviation, and economic stability (Levine, 2005).

For example, when banks screen borrowers and identify firms with the most promising prospects, this is a key step that helps allocate resources efficiently, expand economic opportunities, and foster growth. When banks and securities markets mobilize savings from households to invest in promising projects, this is another crucial step in fostering economic development. When financial institutions monitor the use of investments and scrutinize managerial performance, this is an additional ingredient in boosting the efficiency of corporations and reducing waste and fraud by corporate insiders. But, when financial systems perform these functions poorly, they tend to hinder economic growth, curtail economic opportunities, and destabilize economies. If financial systems simply collect funds with one hand and pass them along to cronies, the wealthy, and the politically connected with the other hand, this slows economic growth and prohibits many potential entrepreneurs from even attempting to realize their economic dreams (Barth, Caprio, and Levine, 2012).

To capture the key features of financial systems, Čihák et al., (2013) directly measures of how well financial institutions and financial markets: mobilize and pool savings; produce information

which is ex-ante about likely investments and capital allocation; creating access to finance, then, monitoring the investments and exercise corporate governance; facilitation of business transaction, diversifying investment for managing of risk and facilitate business transaction.

The characteristics of financial systems:

- **Depth:** the variable that has received much attention in the empirical literature on financial development is private credit to GDP. More specifically, the variable is defined as domestic private credit to the real sector by deposit money banks as percentage of local currency GDP. The private credit disbursed by government, government agencies and public enterprise would be omitted. It also excludes credit issued by central banks (Čihák et al., 2013). The financial depth, approximated by private credit to GDP, has a strong statistical link to long-term economic growth; it is also closely linked to poverty reduction (Demirgüç-Kunt and Levine, 2008).
- **Access:** Better functioning financial systems allocate capital based more on the expected quality of the project and entrepreneur and based less on the accumulated wealth and social connections of the entrepreneur. As regards access to financial institutions, a common proxy variable is the number of bank accounts per 1,000 adults. Other variables in this category include the number of bank branches per 100,000 adults (commercial banks), the percentage of firms with line of credit (all firms), and the percentage of firms with line of credit (small firms) (Čihák et al., 2013).
- **Efficiency:** For intermediaries, efficiency is primarily constructed to measure the cost of intermediating credit. The efficiency measures for institutions include indicators such as overhead costs to total assets, the net interest margin, the lending-deposits spread, non-interest income to total income, and cost to income ratio. Closely related variables include measures such as return on assets and return on equity (Aizenman et al., 2015).
- **Stability:** a common measure of financial stability is the z-score. It explicitly compares buffers (capitalization and returns) with risk (volatility of returns) to measure a bank's solvency risk. The z-score is defined as  $z = (k + \mu) / \sigma$ , where  $k$  is equity capital as percent of assets,  $\mu$  is return as percent of assets, and  $\sigma$  is standard deviation of return on assets as a proxy for return volatility (Čihák et al., 2013). A higher z-score therefore implies a

lower probability of insolvency. These financial system characteristics are proxies of the services provided by the financial system (Beck et al., 2007).

Each of these characteristics captures both financial institutions and financial markets. It also provides other useful indicators such as measures of concentration and competition in banking sector. Accordingly, the main role of financial development is to improve the living standard of the people. Thus, Khan et al. (2012) stated that financial deepening is an engine of economic prosperity. Sound finance is necessary to open investment opportunities as higher level of savings are associated with high incomes which will further lead to poverty alleviation. Finance plays main role in development process as the ultimate fruit of sound finance is economic growth.

Financial development is a multidimensional process. But Aizenman et al. (2015) reported that an important feature of financial systems is their access and efficiency. Large financial systems are of limited use if they are not accessible to a sufficiently large proportion of the poor population and firms. Even if financial systems are sizeable and have a broad reach, their contribution to economic development would be limited if they were wasteful and inefficient.

As Svirydzenka (2016) stated there is empirical literature since the 1970s approximates financial development by two measures of financial depth which is the ratio of private credit to GDP and, to a lesser extent, by stock market capitalization, also as a ratio to GDP. However, these indicators do not take into account the complex multidimensional nature of financial development. With the passage of time, financial sectors have evolved across the globe and modern financial systems have become multifaceted. But the modern financial systems have become multifaceted and with the passage of time, financial sectors have evolved across the globe. For example, while banks are typically the largest and most important, investment banks, insurance companies, mutual funds, pension funds, venture capital firms, and many other types of nonbank financial institutions now play substantive roles. Similarly, financial markets have developed in ways that allow individuals and firms to diversify their savings, and firms can now raise money through stocks, bonds.

Jalilian and Kirkpatrick (2005) also assessed that the objective of poverty reduction in many poor and rich countries to see the effect of finance on it and in analyzing this relationship, they include three research components. These are: the association between financial development and

growth, the relationship between economic growth and poverty; and the association between financial development and inequality. The estimation result of the three links separately find out that the ratio of private credit to GDP (which is a proxy measure of financial development) leads to economic growth especially in developing countries. In addition, as average income changes, the income of the poor change and the link between financial development and income inequality has an inverted U-shaped relationship.

### **2.2.2 Financial Development and Economic Growth**

The argument of financial development and economic growth of which theoretical foundations were established by Joseph Schumpeter which is Schumpeterian creative destruction process, financial intermediaries materialize technological innovation and contribute to economic development. It continues with McKinnon-Shaw financial development approach and has been expanded for more countries by King and Levine (1993) as a representative study in the empirical literature. They argue that financial depth is at the core of growth, in other words, financial repression hinders economic growth. According to McKinnon (1973) and Shaw (1973), in the financial development approach, the government withdrawal from interest rate regulations and bank ownership will enhance more saving. In relation to a macroeconomic perspective, this approach will enable higher growth and more rational use of savings in the long term.

In the analytical overview of financial intermediation and economic growth, the production function is assumed to depend only on the capital stock. Which is:  $y_t=f(k_t)$ , where  $y_t$  and  $k_t$  denote output and the stock of capital at time  $t$ , respectively. By totally differentiating the equation and denoting the rate of growth of output by  $\hat{y}$  the saving rate ( $dk/y$ ) by  $s$ , and the marginal productivity of capital by  $\theta$ ,  $\hat{y}_t=dk_t/y_t f'(k_t) = s_t \theta_t$ . In this equation, the rate of output growth is the product of saving rate and the marginal productivity of capital. But the traditional literature of growth has placed emphasis on dynamic process of that would lead the economy to a steady state equilibrium in which per capita output growth would eventually cease (Romer, 1986). The assumption of decreasing marginal productivity plays a crucial role in ensuring convergence of such a steady state equilibrium. The decreasing marginal productivity of capital implies that  $\theta_t$  (and hence the output growth) goes to zero as  $k_t$ , grows over time. In relation to this, financial development has a dual effect on economic growth. The development of domestic financial market may enhance the efficiency of capital accumulation (hence increasing  $\theta_t$ ). On

other hand, financial intermediation can contribute to raising the saving rate and, thus, the investment rate (hence increasing  $s_t$ ). The first effect is emphasized by Goldsmith (1969) who also finds some positive correlation between financial development and the level of real per capital GNP and encourage efficient use of the capital stock.

In Saharan African countries, the direction of causality has been emphasized between financial development and economic growth. Odhiambo (2009) argued that for a very long time it has been assumed that financial development is very important for economic growth and therefore, it leads to economic growth (which is supply leading phenomenon). But little discussed on the converse, where economic growth can also drive development of the financial sector, i.e. demand-following effect. However, in practice, there is likely to be an interaction between supply-leading and demand-following phenomenon.

Based on the premise, the economic growth plays a pivotal role on the goal of poverty reduction. But there is a debate on the type of growth and how much does it benefit the poor. (Beck et al., 2007) stated that depending on the level of inequality, economic growth could have a positive impact on poverty reduction. As it is specified in the Kuznets hypothesis, in the case of inequitable growth in developing countries, there would be limited impact of growth in poverty reduction. Based on the Kuznets theory, at the first stage of economic development, inequality of income rises (positive) and later fall (negative) when the economy becomes industrialized (Kuznets, 1955).

Accordingly, financial development shows divergent views on the link between financial sector development and economic growth. Schumpeter's (1911) pioneering work on finance–growth nexus argues that a well-developed financial system spur growth in technological innovations by redistributing resources from less productive to more productive sectors. Kuznets (1955) proposes that financial markets only begin to grow as the economy approaches the intermediate stage of the growth process and develop once the economy matures. These divergent views can be grouped into the so-called “supply-leading” and “demand-following” hypotheses. As noted by Patrick (1966), the supply-leading view hypothesizes that the development of a robust financial sector contributes to economic growth. On the other hand, the demand-following approach contends that the growth of real economic activities increases demand for financial services and consequently the development of the financial sector.

In relation to the above, the findings of the literature show that there is contradicting prediction of financial development and economic growth. In this regard, there are three views. The first view argues that financial development leads to growth. This view is consistent with (Levine 2005; Beck et al., 2007; Ho and Iyke 2018; Ho et al., 2018; Bist, 2018) and conclude that financial development and economic growth are pro-poor. It means that the trickle-down hypothesis is firmly supported. But Beck, et al., (2007) argues that this does not necessarily imply that financial development helps the poor. The second view stated that it is economic growth that leads to the development of the financial sector (demand following approach).

The main emphasis of the debate on the role of financial development is its link with economic growth. It is assumed that once economic growth has happened, unambiguously, it would lead to the reduction of poverty. Some of the research done in this issues point out that the progress in formal financial system development have no direct effect on income of the people who are poor and these group of the population have only limited or no access to financial service because the credit supposed to be accessed through financial institutions are slowed down and hampered by high unit costs of loans that are small. But the poor can reap a benefit through growth effect. In addition, only the wealthiest and higher class of the population can have access to borrow and get better off (Greenwood and Jovanovic, 1990).

The improvement in financial system tackle the credit constraint and so that the poor can have an access to borrow. Ultimately, as Kuznets (1955) prediction it will reduce inequality. Thus, the indirect effect of financial development can have impact on income distribution through the channel of economic growth and technology advancement that can benefit some group of workers. But still this argument would be sound depending on the structure of the economy.

Furthermore, finance affects the factors of production that determine economic growth (Levine, 2005). These factors are the accumulation of physical and human capital and total factor productivity that result from improvements in functions provided by the financial systems like the mobilization of saving, fair capital allocation to the projects which are productive. Then, there is question of proper monitoring of these investments and risk diversification for exchange of goods and services. Therefore, financial development improves information flow, encourage risk sharing and that would improve the capacity to absorb shocks and reduces informational

asymmetries, constraints and promotes risk sharing, reduce the volatility of macroeconomics and finally enhance distributional effect of income and reduce inequality.

Generally, in both cross country and country specific studies, there are considerable empirical and theoretical predictions that support the undeniable impact of financial sector development on facilitating economic growth and poverty reduction (Zhuang, Juzhong et al., 2009). However, there are some disagreements on how to prioritize the development of financial sector in least developed countries specifically relative significance of banks, microfinances, insurances, opening up the economy for the capital markets and expanding the access to finance for the poor and also small and medium-sized enterprises (SMEs).

If the poor are to benefit from the financial system, Honohan and Beck (2007) advances that Africa's financial development must focus on two key issues i.e. economic growth, and improving access to financial services. Similarly, many studies have shown that economic growth is pro-poor but it needs appropriate policies. This economic growth affects the poor in two ways: first, growth increases income and welfare of the poor. Second, growth increases demand for and provision of financial services enhance development of the financial system. A developed financial sector can then provide essential services to the poor. On the second point, if poor households and SMEs have better and improved access to financial services, consumption and investment can increase thereby improving their welfare.

### **2.2.3 Financial Development and Inequality**

However, theory provides conflicting predictions about the impact of financial development on the distribution of income and the incomes of the poor. But Banerjee and Newman (1993) have hypothesized that the initial endowment and access to financial service are determinants of inequality. There is considerable evidence that financial deepening contributes to reduce poverty and inequality (Claessens and Perotti, 2007). A number of models imply that financial development enhances growth and reduces inequality. It has been argued that financial imperfections, such as information and transactions costs, affect particularly the poor who lack collateral and credit histories.

Thus, it is likely that abating credit constraints will benefit the less-privileged, enhance the efficient allocation of capital and reduce income inequality through increased credit availability

of poor individuals with productive investments (Galor and Zeira, 1993). In other words, financial development should benefit the poor both by improving the efficiency of capital and economic allocation by alleviating credit constraints which disproportionately restrain the poorer parts of society, thereby reducing income inequality. Conversely, other theories predict that financial development primarily benefits the wealthier parts of society. The poorer individuals rely on informal and family connections for raising fund, which means that a larger formal financial sector more extensively benefits the privileged.

For instance, the model developed by Greenwood and Jovanovic (1990) predicts a nonlinear relationship between financial development and income inequality that depends on the level of economic advancement. In this model financial development helps to improve the allocation of capital, generates economic growth, and helps the poor independent of the stage of economic development. The distributional effect of financial development, however, depends on the level of economic development. At low levels of prosperity, only the wealthier parts of society can afford to access and directly benefit from financial development. Only after a certain threshold of economic development, more individuals can access financial markets and thus a larger proportion of society benefits from financial deepening. It is worth stressing that the positive correlation between finance and inequality for very low level of income is difficult to detect, which has very limited coverage of countries at the early stage of financial development.

The relationship between finance and income inequality and poverty might be a case of reverse causation. As Naceur and Zhang (2016) stated several dimensions of financial development are considered: financial access, efficiency, stability, and liberalization and conclude that it reduce inequality as financial deepening does in other studies. A lower level of poverty implies that financial services are already more affordable and accessible to the poor, and thus, stimulating the development of the financial sector. Similarly, the lesser income inequality can promote economic growth according to the inverted-U pattern for the impact of income distribution on economic growth. Therefore, controlling for the possible reverse causation and simultaneity bias, it is essential for studying the impact of finance on inequality and poverty.

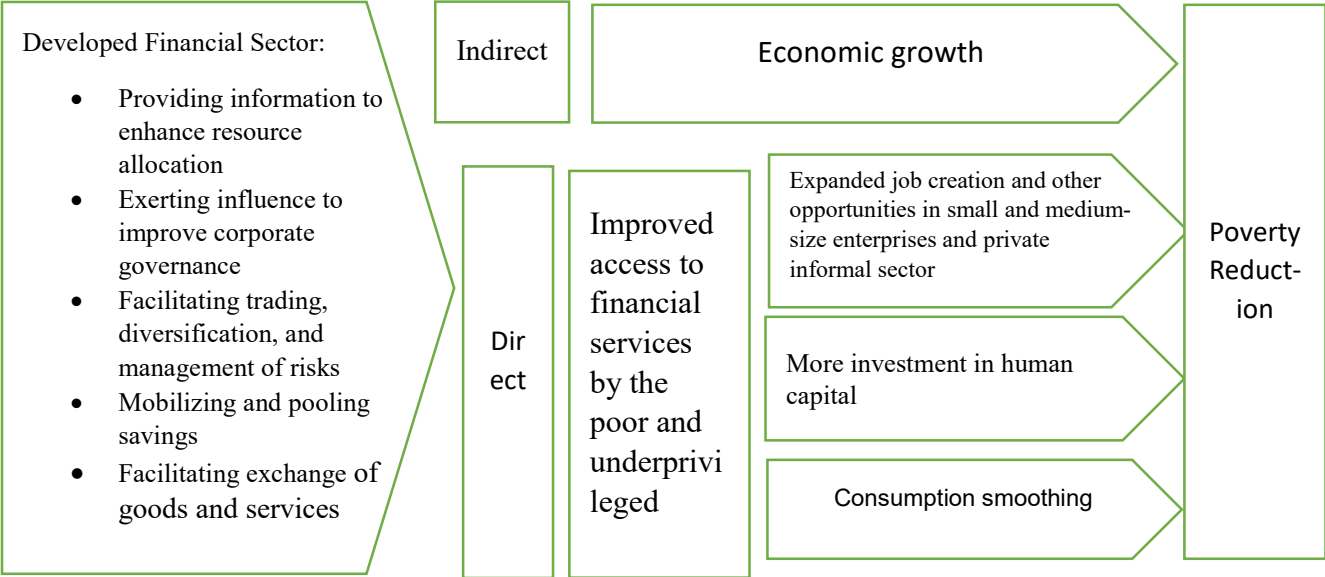
#### **2.2.4 Financial Development and Poverty**

It is theorized that there is an association between poverty and financial development. Zhuang et al. (2009) conclude that financial sector development can impact poverty through two channels,

indirect and direct. The first is that financial development contributes to poverty reduction through the channel of economic growth is the key one and impactful. This is what is stated as trickledown theory which indicates that economic growth trickles down to the poor through job creation and other economic opportunities like income distribution effect. The second direct channel is that financial development can allow the poor to access and expand the access to financial services such as saving, credit and insurance services.

Furthermore, there are a lot of other theoretical views that predicts financial development plays a critical role in enabling economic growth and poverty reduction. These views tend to substantiate that a well-developed efficient financial system tends to facilitate the process of capital accumulation which increases the level of economic growth which in turn assist in reducing poverty. This will reinforce the productive assets of the poor which will enhance their productivity and boost economic potential (Jalilian and Kirkpatrick, 2002). In this regards, credit constraints produced by informational irregularities are seen as obligatory on the poor who are unable to finance their projects or use collateral to obtain bank credit (Galor and Zeira 1993).

**Figure 2.1: Financial Sector Development and Poverty Reduction**



Source: Adapted from Claessens and Feijen (2006).

The relationship between financial development and poverty can be either direct or indirect. The direct link refers to how the benefits of financial sector development are transferred to reducing poverty and income inequality while the indirect link shows how financial deepening exerts a

positive effect on economic growth, and how the gains from growth are channeled to the poor. Accordingly, financial development may affect the poor households through two channels which are aggregate growth and changes in the distribution of income. Firstly, the development of the financial system can ease the credit constraints. The implication of the increased access to credit is that the poor population can spend extra money on consumption expense and improve their welfare. Secondly, the market competition will rise as new firms enter to the sector between financial institutions can be the result of broadening of the financial sector (Beck et al., 2007).

Furthermore, in considering poverty, one considers the bone-dry population, the poor health care system, sanitation and the needy for foods but not banking and finance. In any case, financial services development, it turns out, are a critical means of poverty reduction. In previous studies have demonstrated that financial development can enhance economic growth, reduce income inequality, and promote poverty reduction. In relation to this, individuals in many nations are having a limited access to the finance, particularly in Africa and Asia. Thus, the world's banking system shall expand and incorporate those at the base of the economic and social pyramid (Appiah, M. et al. 2020).

### **2.2.5 The Indirect Channel of the Financial Development**

Economic growth is the main channel through which financial development unequivocally backing poverty reduction. Most of the literatures conclude that growth supports to reduce absolute poverty. There are different alternative dimensions that show an impact of growth on poverty eradication. For instance, first, (Galor and Tsiddon 1996) argue that through job creation to the poor households. Second, through wage differentials that creates deviation between skilled and unskilled labor as the economy is advancing. Thirdly, through increased tax revenue that resulted from the economic growth that gives an opportunity to the government organ to allocate and distribute more fiscal resources for the socioeconomic expenditure like education, health and for different programs of social protection which can benefit the poor population. As a result, the poor households can invest in their future more in the development of human capital. Finally, (Aghion and Bolton 1997) conclude that the economic growth leads to the availability of more public funds through the capital accumulation. As a result of this effect, the income of the poor will increase.

In the earlier literatures, there were conflicting predictions on the growth and poverty reduction nexus. The Kuznets' (1955) hypothesis of inverted-U proposes that as the economy grows, inequality increases at the early stage of the economic development. But as the economy matures and industrialization taking place, income inequality decreases. In the early stage of development, financial development favors more the wealthy and higher class of the society. Therefore, the rich reap more benefits and the early harvest of industrialization by controlling the major share of the economic pie and ignoring the underprivileged poor below the poverty line. But Todaro (1997) argues that economic growth can trickle down to the poor households either through new job creations or through other income distribution effect for social and economic development.

In most studies, there is agreement on the economic growth that it can reduce poverty. Datt and Ravallion (1992) have tried to answer the changes in poverty as a result of growth effect, changes in average income and the income distribution effect which is resulted from the shifts in Lorenz curve but holding the average income unchanged. Ultimately, this study concluded that the growth effect explains the much of the changes in poverty that had been observed.

According to Fields (2001), the level of inequality and the rate of economic growth are determining the extent of impact of growth in poverty eradication. In relation to this, there is an agreement among economists on the importance growth for fighting poverty and the impact of growth shall not be understated. It means that "growth is all that matters." Actually, this doesn't mean growth alone is sufficient for poverty alleviation although it is necessary condition. In addition to growth, additional elements needed to poverty alleviation. In order to harvest the benefits of growth, the poor households shall build up and expand their asset base.

### **2.2.6 The Direct Channel of Financial Development**

Most of the theoretical and empirical results of the previous studies (like Galor and Zeira 1993) show that financial development contribute to poverty reduction directly by expanding the opportunity for the poor to access finance adequately. Economists have reached to consensus on the significant impact of finance on the welfare of the poor. This is because of the removal of credit constraints and information asymmetries. Unarguably, the poor don't have resource to finance the productive projects and collateral is a basic challenge to access finance from financial intermediaries. This in turn slows the aggregate growth of the economy by diverting away the

flow of fund to lesser ranked projects. If the financial system fail to function properly, it will lead to higher income inequality by giving the opportunity to wealthiest group of the people to take away capital flowing only by rich. But the well-functioning financial system has the power to reduce transaction costs and it can allow the less well-off entrepreneurs to obtain external finance. Besides to that also the allocation of capital could be improved and the impact of it on the lives of the poor would be very significant (Aghion and Bolton 1997).

Based on Fields (2001) statement, when the credit and financial market is underdeveloped, the gain supposed to be harvested by the poor will be lost and it will result in high poverty and inequality, and also the growth of the economy would be slower than expected. The implication is that creating better opportunity for the poor to access financial service and increased entrepreneur participation through productive projects in turn expands the income of the poor. The sound argument in the case of the developing countries is that for poverty eradication strategy, the focus shall be given to the poor to finance the small and medium-sized enterprises (SME) and informal sector small businesses. It is because the SME and microenterprises are labor intensive in employment and creates job for the poor household to reduce poverty. Thus, allowing credit access to the poor has important policy implication to reduce the likelihood of sinking in poverty trap and lift up millions from poverty by smoothening the consumption, easily managing the shocks of health related ones.

Generally, the growth in financial system might not spontaneously result in greater access of finance and removal of credit constraint. Therefore, the government intervention in form of microfinance and SME credit programs are much needed. In some theoretical sense, in the absence of public sector inclusive policy and lenders perspective, lenders prefer to give huge amount of loans to the few rich than small amounts of loan to many poor due to high unit coast, lack of collateral and fear of default. As a result of this, the government of both developed and developing countries usually support the policy which is pro-poor sectors like MFIs and SME to help the segment of poor population (ADB, 2009).

For instance, Muhammad Yunus who was the winner of 2006 Noble Peace Prize, his dedication for the poor by establishing MFIs, Grameen Bank in Bangladesh believed that his contribution to the microfinance is significant. He suggests MFIs and SMEs credit program for the wellbeing of the poor and for the development assistance. Consequently, he conclude that for potential

reduction of poverty, facilitating greater access of SMEs and microenterprises is very important, however, it is still open for the debate that the access to finance for microenterprise and SMEs is the only constraint and thus it is a panacea to lift up the poor from absolute poverty.

In direct linking of finance and poverty reduction, effective micro-finance plays a significant role in poverty reduction. Micro-finance institutions can both alleviate poverty and financial sustainable could be translated into best practice technologies directly linking finance and poverty reduction. Thus, providing effective micro-finance services to poor people is part of a poverty-reduction strategy - but only a small number of the population (Kirkpatrick et al., 2001).

Still ADB (2009) argues that the main bottle neck for growth of SMEs is often access to finance. The other constraint is that in the rapidly changing market situation, the access to new technologies is very limited. Hence, government shall support SMEs to adopt the technology and to get empowered technically through training and facilitate linkages between small and medium enterprise and the experienced large enterprises that they adopt new technology and diversify their investment into new markets. In this process technological transfer, finance can encourage innovation and entrepreneur ability through human and physical capital investment; it will ultimately enhance the distribution of income and reduce poverty. Thus, financial inclusion would end up in inclusive economic development.

### **2.2.7 Growth, Poverty and Inequality Linkage**

Poverty and income inequality have theoretically been identified to be inextricably linked and that the existence of one often implies the existence of the other (Bourguignon, 2004). A better income distribution helps people of the lowest income group to increase their income so that they can exit from their poverty. Basic economic theories that try to explain income and consumption are the life cycle analysis and permanent-income hypothesis but they fail to explain inequalities in income which affects the consumption pattern of the individuals.

Inequality can have a direct and indirect link with poverty. The direct link is more obvious when we look at the individual. Inequitable distribution of resources in the society hinders the person or group of persons affected negatively so that they will not have enough to take care of the basic needs of life as well as care for their children in terms of human capital development (education and health) thus they are classified as being poor. The indirect link between inequality and

poverty are through growth, employment among others. The link through growth is based on the notable Kuznets's theory of the "inverted U shaped" relationship between inequality and growth (although not generally accepted empirically). At the early period of economic development where the economy is growing and increase in inequality, those affected by the rising inequality are classified as poor hence the negative impact of growth on inequality also leads to an increase in poverty given that there is a positive relationship between the level of inequality and poverty affecting an individual or in a country as a whole (Ogbeide and Agu, 2015).

Generally, the literature shows that the relationship between finance, growth and poverty reduction is done widely on comprehensive way. In least developed countries, the effect of finance on poverty is inconsistent and ambiguous. The reform on financial sector and economic growth reduces poverty. The improvement of economic progress enhances growth but it does not necessarily change the lives of the poor. The impact of finance on poverty has been largely inconclusive and unclear from empirical front due to the change in the level of income which results from financial sector reforms, really leads to poverty reduction in developing countries. Poverty reduction strategy will take more importance in comparison to the growth model for the developing countries. As a result, economic progress lead to increase in growth, but does not necessarily advance the live status of poor (Todaro, 1997).

### **2.2.8 Financial development and Poverty Reduction in sub-Saharan Africa**

Poverty and income inequality remain a stubborn challenge in Africa despite the economic growth in recent decade. Regarding Sub-Saharan African (SSA) countries, very few studies have been made to examine the finance and poverty reduction nexus theoretically and empirically. The studies by Alemayehu et al. (2006) in Ethiopia; Odhiambo (2009) for South Africa, Odhiambo (2010) for Kenya, Odhiambo (2010) for Zambia provided support that financial development would lead to poverty reduction. Aye (2013) found evidence of causality from poverty to financial deepening in the case of Nigeria. Hence, the financial functions can influence saving and investment decisions and the efficiency with which funds are allocated. As a result, finance affects the accumulation of physical and human capital and total factor productivity.

But Kaho (2016) examined causal relationship between financial development and poverty reduction for six African countries and conclude that financial development reduces poverty does

not hold for most Sub-Saharan African countries. In short, the expansion in private credit might not necessarily bring change and economic advancement for the poor. This is attributed to the attitude of banks that do not sufficiently channel savings to the poor mainly due to government deficit financing and high default rate among the poor. Finally, the study is suggesting that therefore, it is useful to encourage the development of micro-finance institutions specially committed to loans to the poor. To avoid crowding out the real sector, governments should minimize their borrowing activities most especially from domestic financial market.

In SSA region, inequality is persistent in the region. But financial development does not significantly reduce income inequality; and the control of corruption and its interaction with domestic credit exhibit an inverted-U relation with income inequality. Thus, policies that will reduce income inequality require that corruption be controlled given increase in domestic credit Adeleye et al. (2017) and conclude that financial development does not significantly reduce income inequality. In Nigeria, a high level of unequal income distribution is due to the high rate of corruption and poor governance. The critical determinants of income inequality as revealed by the study are economic growth, education level and real GDP per capita (Ogbeide and Agu, 2015).

However, the sector continues to grow in recent times, financial sector development in SSA remain relatively underdeveloped. The relative backwardness of the region's financial sector has been attributed to lack of institutional quality (Ibrahim and Alagidede 2018), informality, weak governance, political and economic instability (Beck and Honohan, 2007) and sparse population density (Allen et al., 2012). More recently, David et al. (2014) suggest financial integration as an important conduit to financial development especially in countries with better institutional quality.

### **2.2.9 Financial Development in Ethiopia**

The history of financial sector development in Ethiopia is origin's date back to the beginning of last century when the first commercial bank established in 1905. However, the financial market has gone through different stages of growing and relapsing in the last 100 years, in the post of First World War (WW1), the financial market had been opened international banks and insurance companies until 1936 when the country got colonized by Italy and changed this policy to allow only the Italian banks to operate. After gaining independence in 1943, the State Bank of

Ethiopia has been established and dominated all the commercial and banking activities in the following two decades. Then, the first financial sector reform towards liberalization had been taken place in 1963. During this period private and specialized banks established and allowed to start joint ventures with foreign banks, but this liberalization was not lasted long due to military coup took over power 1974, where all banks and financial companies were nationalized and all the banking activities were dominated by state National Bank of Ethiopia (NBE). However, in 1991, which considered the 2nd financial sector reform, the new government achieved significant progress in the financial sector. NBE is established as a central bank and financial market regulator. The government has developed the monetary and insurance supervision laws, and opened the financial market to the domestic private investments (Abachi, 2007).

But still, Ethiopia's financial sector has, over the past decade, been operating under a financial repression framework used by the government for managing its monetary and foreign exchange policy, and financing of large infrastructure projects and state-owned-enterprises (SOEs). Instruments used under this framework include the central bank financing of the government, a state-dominated banking sector, mandatory financing of priority projects and directed credit, administered interest rates, a captive domestic market for government debt, high liquidity and capital requirements, and strict foreign exchange controls. Over time, the framework has led to the build-up of large macro-financial imbalances; these include a system of fiscal dominance, pressures on inflation, the overvaluation of the Birr, a chronic shortage of foreign exchange, the lack of development of the financial system, a credit allocation skewed toward the public sector, and an overall risk of mal-investment. The NBE roadmap framework is aligned across three pillars: (i) financial stability and safety net; (ii) long-term finance and financial markets; and (iii) access to finance and financial inclusion. Opening of the financial sector constitutes a cross-cutting theme (WB, 2016).

Ethiopian firms appear to be more constrained in terms of access to credit compared to infrastructure. In Ethiopia, firms that are fully credit constrained exhibit poorer performance and productivity. According to World Bank (2014), firms in Ethiopia are more likely to be fully credit constrained than global comparators, including SSA countries. Nearly half of firms in Ethiopia are fully credit constrained. Fully credit constrained firms are those without external financing and which were either rejected for a loan or did not apply even though they needed

additional capital. For firms, being credit constrained means poorer performance and less productivity. In Ethiopia, a credit constrained firm has 15 %lower sales growth, 5%lower employment growth, and 11 % lower labor productivity growth than firms who are not credit constrained. Instead, investment decisions of manufacturing and services firms in Ethiopia are heavily dependent on cash flows. This is indicative that the economy would benefit from a shift of domestic credit towards private firms.

### **2.2.9.1 Banking Sector in Ethiopia**

The structure of the financial sector has barely changed over more than a decade and is dominated by state-owned financial institutions. The financial sector in Ethiopia currently consists of 18 banks, 17 insurance companies, 35 microfinance institutions, and five capital goods finance companies. Banking is the dominant subsector, accounting for 78 percent of total financial sector assets, followed by insurance companies, representing 15 percent. The two state-owned banks (Commercial Bank of Ethiopia and Development Bank of Ethiopia) account for 65.7 percent of total deposits, 62.4 percent of outstanding credit, 35.9 percent of total branch networks, 64 percent of total banking sector assets, and 48.9 percent of total banking sector capital as of December 2016; the remaining 16 private banks cover the balance. The state-owned insurance company accounts for 23 percent of the total capital of the industry. Micro finance institutions, which mainly serve the rural population, represent only about 6 percent of the financial sector capital. New additions to the financial sector are five capital finance companies that started operation in the past few years. There is no foreign bank or foreign financial institution in Ethiopia. Currently, there are 35 micro finance institutions, with total capital of US\$419 million, a total network of 1,647 branches, and total outstanding credit of US\$1.2 billion as of December 2016 (WB, 2016).

However, King and Levine (1993) argue that financial depth is at the core of growth, in other words, financial repression hinders economic growth and again McKinnon (1973) support the argument that financial development approach, withdrawal of the government from interest rate regulations and bank ownership. But in Ethiopia, the domestic credit market is dominated by lending to State Owned Enterprises (SOE) mainly to finance infrastructure investment contributing to weak financial intermediation. Domestic credit as a percentage of GDP increased from 28.3 percent in 2014 to 32.1 in 2016, while private credit increased from 8.7 to 11.7

percent. A large part of domestic credit was credit for SOEs 17 percent between 2014 and 2016. However, with a policy preference for financing SOEs at low cost, the credit market tended to crowd out the private sector. The 2017 Doing Business report ranks Ethiopia at the 170th place of 190 economies in ease of getting credit which is one of the lowest ranks in the world and two ranks down from Ethiopia's position in 2016. Enterprise Survey 2015 also reveals that the proportion of enterprise investment in Ethiopia financed by banks is only 7.8 percent, while a large proportion (83.3 percent) of investment is self-financed which is an indication of financial disintermediation.

Despite significant improvements in outreach led by the expansion of bank branches, penetration of formal financial institutions remains very limited in rural areas. The number of bank branches in Ethiopia has more than tripled in the past five years, from 970 branches in 2011 to 3,187 branches in 2016. Access to banks remains concentrated in the capital city and other urban centers. Of the total nationwide, 34.4 percent of branches and more than 50 percent of ATMs are in Addis Ababa. However, there is a large untapped market of borrowers and savers who are not using formal financial services. According to Findex (2014), 48 percent of Ethiopian adults reported saving or setting money aside, yet only 14 percent saved formally at financial institutions. During the same period, 44 percent of Ethiopian adults reported that they borrowed money, but only 7 percent borrowed from financial institutions. The Government of Ethiopia has recognized financial inclusion as a priority area in its Growth and Transformation Plan (GTP II), and has approved the National Financial Inclusion Strategy (WB, 2017).

Theoretically, financial liberalization underpinned by McKinnon (1973) who emphasized the influence of real interest rates on savings, investment and hence growth. However, ex-post assessment of financial liberalization suggests that the expected economic growth, increased financial depth and access to credit, have not happened. Similarly, Kirkpatrick et al., (2001) argued that the hypothesis that financial liberalization has led to an increase in financial fragility and systemic crises in developing countries' financial sector. The financial repression and liberalization approaches had a common concern with economic growth and resource allocation, with little consideration of impact on poverty except an implicit assumption that the benefits of economic growth would trickle-down to the poor.

### 2.2.9.2 Microfinance Institutions

Microfinance institutions (MFIs) have started in Ethiopia in 1994/95, but have not been able to meet demand and aims to meet the need of small-scale borrowers in income. Unlike mainstream financial banks, microfinance companies offer a smaller loan amount. Currently, according to Association of Ethiopian Microfinance Institutions (AEMFI) (2018), there are 34 licensed MFIs with total capital of close ETB 12 billion serving around 4.5 million clients in Ethiopia. Nationwide, there are 3.8 million active savers. On other hand, to network MFIs, AEMFI was established in 1991 with the goal of being the network body of the microfinance sector. AEMFI is a non-profit and non-governmental association formed to serve the MF sector and strengthening the MF business environment. In Addition, AEMFI has a social goal of working with public and private financial institutions to reinforce the microfinance environment and to provide MF services to the economically and socially disadvantaged social groups.

Institutionally, microfinance has emerged in Bangladesh with Grameen Bank, which established in 1976 by Mohammad Yunus., Historically MF exists as an informal financial service with small operations such as savings and small credits since the 18th century. In recent times, the term microfinance became a buzz word in the every corner of the world. After hearing success stories in microfinance across the developing countries particularly Bangladesh has started to give more importance to MFs. As banks failed to reach the poorest class of the society, MF is emerged as a critical tool to fill the gap between the financial institutions and the needy poor people (Moharram, 2020).

Developing nations need huge financial recourses for rapid and sustainable development and reduce gap between haves and have-nots. However, in 21st century where science and technology plays a vital role on the development of many countries across Africa which suffered from hunger, poor health condition, illiteracy and poverty. To curb all these challenges, there is a need of financial recourses. In relation to this, banks have many limitations and have high profit motives and they used to put many restrictions to sanctions loans to the poor. In this juncture, MF is said to be an effective instrument discovered to mitigate rural poverty (Gashaw, 2015).

Furthermore, to develop an inclusive financial system in the Ethiopia, there is a need to have well-functioning financial system and institutions in place. In order to increase outreach, expansion of branches, efficiency, inclusiveness, appropriateness, innovations and sustainability,

there is a need for interventions/support by banks and microfinance providers. Microfinance refers to a broad range of financial services made available to low-income clients, particularly women. The services include loans, saving, insurance, and remittance. The clients of microfinance institutions (MFI), largely belonging to low income households, have limited access to formal financial services. MFIs serve a market segment that is considered ‘high-risk’ by formal banks. Small households have fluctuating incomes, few assets and require very small loans, a high degree of close follow-up and business appraisal. Financial transactions with this client base calls for careful appraisal and close post-disbursement follow-up. MFIs offer much needed financial service mainly to the informal sector which would otherwise depend on exploitative moneylenders (Esayas and Jane, 2019).

In relation to MF regulation, national bank of Ethiopia authorized to license, regulate, and supervise the MFIs by a law enacted in 1996 which allows the establishment of microfinance institutions. To attract investors to this emerging sector, new regulations developed. Accordingly, conditions and obligations were simplified; capital required to establish new MFI is ETB 200,000. As result of this, many domestic firms and non-governmental organizations are investing and establishing new MFIs (Abachi, 2007).

### **2.2.9.3 Insurance Sector**

Insurance penetration in Ethiopia is very low and products are concentrated in general insurance lines of business. In 2015, the ratio of total insurance premiums to GDP was 1.15 percent, which is much lower than the Sub-Saharan Africa average of 3.5 percent. Most of the insurance business in Ethiopia is targeted at the corporate market and focused on general insurance. The corporate focus implies that, to date, insurers have had little experience in intermediating products to individuals, and cost margins have not yet been tested against the more cost-sensitive retail business. Premiums from the retail sector are almost entirely derived from motor insurance. As of December 2016, there were 17 insurance companies in Ethiopia with 465 branches. About 54.4 percent of the insurance branches were in Addis Ababa and 85 percent of the total branches were private.

### **2.2.9.3 Capital Market**

Capital markets in Ethiopia mainly comprise Treasury bills (T-bills) and government bonds. T-bills are transacted on a weekly basis and government bonds are occasionally issued. The

maturities of T-bills are 28, 91, 182, and 364 days; 91 and 364 days are the most demanded terms. The total outstanding T-bills as of December 2016, was US\$2.9 billion. The Public Servants Social Security Agency, Development Bank of Ethiopia and Private Organization Employees Social Security Agency are the three major buyers of T-bills in Ethiopia. Outstanding corporate bond holdings reached US\$9 billion as of December 2016, of which about 94 percent was held by two state-owned institutions: Ethiopia Electric Power (85.4 percent) and Railways Corporation (8.7 percent). The Commercial Bank of Ethiopia is the sole purchaser of these bonds, making the bank susceptible to the financial performance of SOEs and single-borrower risk. Ethiopia has yet to develop a secondary capital market (WB, 2017).

### **2.3 Empirical Review**

The empirical review deals with country specific and cross-country studies. The former refers to data using for a country. But the latter indicates that the study using from many country which is cross sectional or panel data (i.e. cross section and time series data combined). The empirical literature studies mostly apply multivariate. This sub section assesses the existing empirical evidence on relationship between financial development and poverty alleviation, economic growth and inequality reduction.

#### **2.3.1 Country specific**

A large body of empirical literature assesses whether financial sector development leads to poverty reduction directly or indirectly. There are previous studies which are country-specific have tried to assess the association between financial development and poverty reduction are Ho, et al., (2017), Abosedra et al. (2016), Uddin et al. (2014), Ho and Odhiambo (2011), Alemayehu et al. (2006), Quartey (2005) are among the others.

In China, for example, Ho et al., (2017) assess the impact of financial development on poverty reduction. For the period of 1985 to 2014, this study has empirically assessed the causal association concerning the impact of finance on poverty. By avoiding pretesting bias using Toda-Yamamoto test which makes this study unique, for as a proxy measure of financial development, it has used money supply, M2 as %of GDP and private credit as %of GDP; the proxy for poverty reduction is the final consumption expenditure of the household (annual % of per capita growth). The finding of the research shows that the relationship between the financial development and the reduction of poverty conclude that there is bidirectional causal flow.

In Egypt, Abosedra et al. (2016) assess the relationship between financial system development and poverty reduction just by employing data of the period 1975Q1 to 2011Q4. They find out that financial development to reduce poverty.

In Bangladesh, Uddin et al. (2013) have assessed the link between financial system development, economic growth and improving the livelihood of the poor by using the data over the period of 1975-2011. In this study, mobilizing savings and allocating it to productive sector is getting due attentions for economic development. Augmented Dicky-Fuller (ADF) unit root test and Zivot-Andrews structural break tests made for all variables under study. Then, to test long run relationship, a model constructed on ARDL approach to cointegration test used by combining structural breaks slowing in the time series. The findings show that there is a long run association between finance, economic progress and poverty alleviation.

Similarly, in India, Sehrawat and Giri (2016) examined the link between financial development and livelihood improvement of the poor households for the period of 1970 to 2012. The finding result shows that finance system growth and economic progress through growth of GDP can reduce poverty in both long run and short run.

In China, Ding et al. (2011) examined the panel data of the period 2000 to 2008 pm the impact of rural finance on lifting up the poor population who are living below poverty line. The findings conclude that there is a direct and indirect impact of finance on reducing poverty. In addition, the results suggest that the impact through indirect channel is more significant than the indirect channel. Ho and Odhiambo (2011) stated that financial development Granger cause poverty alleviation in long run where as a feedback effect exists in short run.

In Ethiopia, Alemayehu et al. (2006) have studied the link between finance and the life improvement of poor households. Using a household panel data for the period 1994 to 2000, they examined access to finance and find out that finance is a determinant for consumption smoothing and to reduce the poverty level for the people who are living below poverty line. In this country, other empirical evidence suggest inequality is playing a crucial role in determining poverty. As a result of inequality that worsens poverty level, some of the gain harvested from economic growth will be wasted in the middle (Alemayehu et al., 2003).

In Kenya, Odhiambo (2009) investigated the relationship between finance-growth nexus and inflation dynamics. The study uses both bivariate and a trivariate causality test to assess the causal link between finance and the progress in economic development. The study proceeds by first conducting a dynamic Granger-causality test within a bivariate framework and, thereafter, adding inflation variable as a third explanatory variable in a trivariate framework. In addition, there are three proxies used for financial development, i.e. the monetization variable ( $M2/GDP$ ), the currency ratio ( $CC/M1$ ), and the ratio of the claims of financial institutions on the private sector to nominal GDP ( $DCP/GDP$ ). The finding shows that economic growth Granger-causes inflation in Kenya both in the short run and in the long run. Therefore, concludes that the financial sector development in Kenya is largely dependent on the demand for, rather than the supply of, financial services

Quartey (2005) stated that financial sector development to induce poverty reduction in Ghana. Similarly, Jalilian and Kirkpatrick (2005) conclude that financial system development plays a significant role in reducing poverty and that is resulted from the implication of empirical findings that indicate a unit of change in financial development enlarges the income growth predictions of the poor by about 0.3 percentages.

Odhiambo (2013) applied the bounds testing to examine the relationship between financial development and reduction in poverty for Tanzanian economy. They found that poverty is reduced by an increase in financial development. Dhrifi and Maktouf, (2013) applied Generalized Method of Moments (GMM) to investigate the relationship between financial liberalization and poverty reduction. They found that financial liberalization leads financial development which in turn, reduces poverty after a threshold level of financial development.

Furthermore, Odhiambo (2010) noted that the link between the progress in financial development and poverty reduction is changing with proxy indicator used to measure financial development. An interesting research finding is that, for example, author reported that poverty reduction not Granger causes financial development when it is measured by  $M2/GDP$  as a proxy instrument. But when domestic credit to private sector as percentage of GDP is used as a proxy measure of financial development, then, poverty reduction is Granger cause of financial development.

Shahbaz et al. (2015) reported that financial development improves income distribution which is result in reducing poverty in Iran. Ayyagari et al. (2010) use firm level data to investigate the relationship between the financing pattern and growth at firm level. They find that formal financial system fosters the growth of firm.

In contrast, some studies find a negative relationship between finance and growth. For instance, Hasan et al. (2009) examine the relationship between financial development and growth in provincial level covering the period of 1986 to 2002. They find that financial sector has a negative impact on economic growth in China. Guariglia and Poncet (2008), while examining the link between financial development and the growth of the economy in China covering the period of 1989 to 2003, conclude that indicators of banking development are negatively associated with economic growth.

Not unequivocally, in China, some studies still show that there is no relationship between financial development and the growth of the economy. For example, Chang et al. (2010) while using provincial level data for the period of 1991 to 2005, find that fund reallocation of the big four state-owned banks has no impact on provincial economic growth.

Finally, Burgess and Pande (2003) stated In India, lack of access to finance is often cited as a fundamental reason for why poor people remain poor. This paper employed panel data on the rural branch expansion programme to provide empirical evidence on this issue between 1977 and 1990, and the central bank mandated that a commercial bank could open a branch in a location with no branches. As a result of this rule, banks to open relatively more rural branches in Indian states with lower initial financial development. The impact of opening a rural bank on poverty and output estimates suggest that the Indian rural branch expansion programme significantly lowered rural poverty, and increased non-agricultural output.

However, most studies in the last two decades do not support the Kuznets's hypothesis mostly on country specific factors while some found no methodical relationship between growth and inequality (Bourguignon 2003). Similarly, Ravallion (1997) concluded that in the presence of high inequality, poverty may still rise irrespective of the high growth.

### 2.3.2 Evidence from Cross-Country and Panel Studies

In addition to the above country-specific studies, there are a lot of cross-country and panel studies that have examined the relationship between financial development and poverty reduction.

Tekin and Cin (2020) primarily assess the direct and growth-based or indirect effects of financial capitalism on income inequality. Secondly, it investigated the possible effects of finance upon income distribution for the period of 1996-2016 through linear and nonlinear panel data models for an aggregate sample of 52 developed and developing countries. For this purpose, financial liberalization, and financial development as its outcome are used as indicators of finance and also Gini coefficient is used for a measure of inequality in income distribution. The findings provide strong evidence that an increase in financial development does not improve income distribution. The finance-inequality linkage is affected by economic growth as a significant mediator indicator, but not as an intermediary for inequality mitigating.

Dhrifi (2015) has noted that the impact of financial development in reducing poverty by increasing the household consumption. In order to achieve the research objective, the author has built a simultaneous equations model on a sample eighty nine countries through the period 1990-2011. Accordingly, the findings noted that indirect effect of financial development on poverty is not robust and which is ambiguous, while the direct effect of financial development through the channels of insurance, access to credit services and savings, is robust for reducing poverty. In addition, the effect of the institutional quality is an important determinant of the relationship between financial development and in the progress of poverty reduction strategy.

In the case of eleven South Asian developing countries by employing the panel data over the period of 1990 to 2012, Sehrawat and Giri (2016) stated the influence of financial development on poverty alleviation. Consequently, the empirical results confirm that there is a long-run association between financial development and on the effect of poverty reduction in these countries. The finding suggest that there is a positive link between financial development, trade openness, the effect of consumer price index measuring inflation and in the process of poverty alleviation. In addition, the finding noted that there is a unidirectional causality running from the improvement of financial service to poverty reduction.

On contrast, Fowowe and Abidoeye, (2012) have investigated the impact of financial development, inflation and trade openness on poverty reduction in a sample of African countries. The result indicated that however, trade openness for import and export and low inflation of consumer price reduce poverty, financial development does not reduce poverty. Similarly, in a study made on more than 70 developing countries, Honohan (2004) has stated that association between financial depth and poverty and found out that financial depth is negatively linked with poverty.

In some late study of Beck et al. (2007) noted that there is a link between financial system development and in the progress of poverty reduction. This study used the data on 52 developing and developed countries over the period 1960-1999 find that the income of the lowest quintile of the population to grow faster than the average GDP per capita, and income inequality to fall more rapidly. To promote the progress of economic advancement and poverty reduction by improving social service like health and education, Claessens and Feijen (2006) noted that financial development which is related with improved access to financial services is demanded.

Jalilian and Kirkpatrick (2005) use a pooled panel data approach to investigate the influence of financial development on reducing poverty in 42 countries of which 26 under developed countries. The finding shows that the growth in financial sector can result in poverty reduction through the channel of growth-enhancing effect. In an earlier similar study, Jalilian and Kirkpatrick (2002) employed a pooled panel data approach to study the relationship between the progress of financial development and poverty using data from a sample of 26 countries of which 18 under developed countries. Again the study results indicate that a percentage change in financial development would result in increase in the incomes of the poor by nearly 0.4% in developing countries.

Table 2.1 Empirical Summery of a Country-Specific Reviews

Study	year	Methods	Results
Alemayehu et al. 2006	<ul style="list-style-type: none"> <li>Ethiopia, 1994–2000</li> </ul>	<ul style="list-style-type: none"> <li>Parsimonious poverty-finance model, Panel data</li> </ul>	<ul style="list-style-type: none"> <li>Financial development is an important factor for poverty reduction.</li> <li>Access to finance is helpful for consumption smoothing and to escape from poverty trap</li> <li>There is a liquidity constraints that lead households to a poverty trap</li> </ul>
Ho and Iyke (2018)	Ghana from 1960–2015	Modified multivariate	<ul style="list-style-type: none"> <li>Financial development to cause economic growth, which in turn causes poverty reduction</li> </ul>

		autoregressive distributed lag (ARDL) Time series data	<ul style="list-style-type: none"> <li>• Indirect effect of financial development on poverty</li> <li>• In other words trickle down hypothesis supported</li> </ul>
Odhiambo (2009)	Kenya 1969-2006	Granger causality, Time series data	<ul style="list-style-type: none"> <li>• Financial development is largely dependent on the demand for rather than the supply of financial services</li> <li>• The estimated results are valid regardless of the causality is in the short run or in the long</li> </ul>
Ho et al., (2017)	China, 1985-2014	Toda-Yamamoto causality test, Time series data	<ul style="list-style-type: none"> <li>• The causal flow is bidirectional between financial development and poverty reduction and also the proxy variable of the financial development doesn't affect the causal flow.</li> </ul>
Uddin, et al. (2013)	Bangladesh 1975-2011	ARDL, Time series data	<ul style="list-style-type: none"> <li>• There is long run relationship between finance, growth and poverty reduction</li> </ul>
Ho et al., 2018	Hong Kong during the period 1990 – 2014	Dickey-Fuller generalized least squares (DF-GLS) & Toda-Yamamoto test	<ul style="list-style-type: none"> <li>• Banking sector has been an important driver of economic growth (which is supply drive growth)</li> </ul>
Quartey (2005)	Ghana 1970-2001	Granger Causality, Johansen cointegration, Time series	<ul style="list-style-type: none"> <li>• Even though financial sector development encourages poverty reduction</li> <li>• The effect of financial sector development on poverty reduction is positive but insignificant</li> <li>• That there is a long-run cointegration relationship between finance and poverty reduction.</li> </ul>
Sehrawat & Giri (2015)	India from 1982 to 2012	ARDL, Time series data	<ul style="list-style-type: none"> <li>• The results support the supply leading Hypothesis</li> <li>• Financial intermediation leads to economic growth</li> </ul>
Dagim (2017)	Ethiopia, 1980- 2013	Ordinary Least Square, Time series data	<ul style="list-style-type: none"> <li>• Financial sector development has positive impact on economic growth of Ethiopia.</li> <li>• To increase positive contribution, favorable institutional environments, internal capacity building and ensuring accessibility to the rural population are important.</li> </ul>
Nyasha et al., (2016)	Ethiopia, 1980-2014	Multivariate Granger-causality, Time series	<ul style="list-style-type: none"> <li>• In short run, both financial development and economic growth Granger-cause each other.</li> <li>• Long run, there is unidirectional Granger-causality from bank-based financial development to economic growth.</li> </ul>

Source: Compiled by the author

Table 2.2: Empirical Summery of Cross-Country Reviews

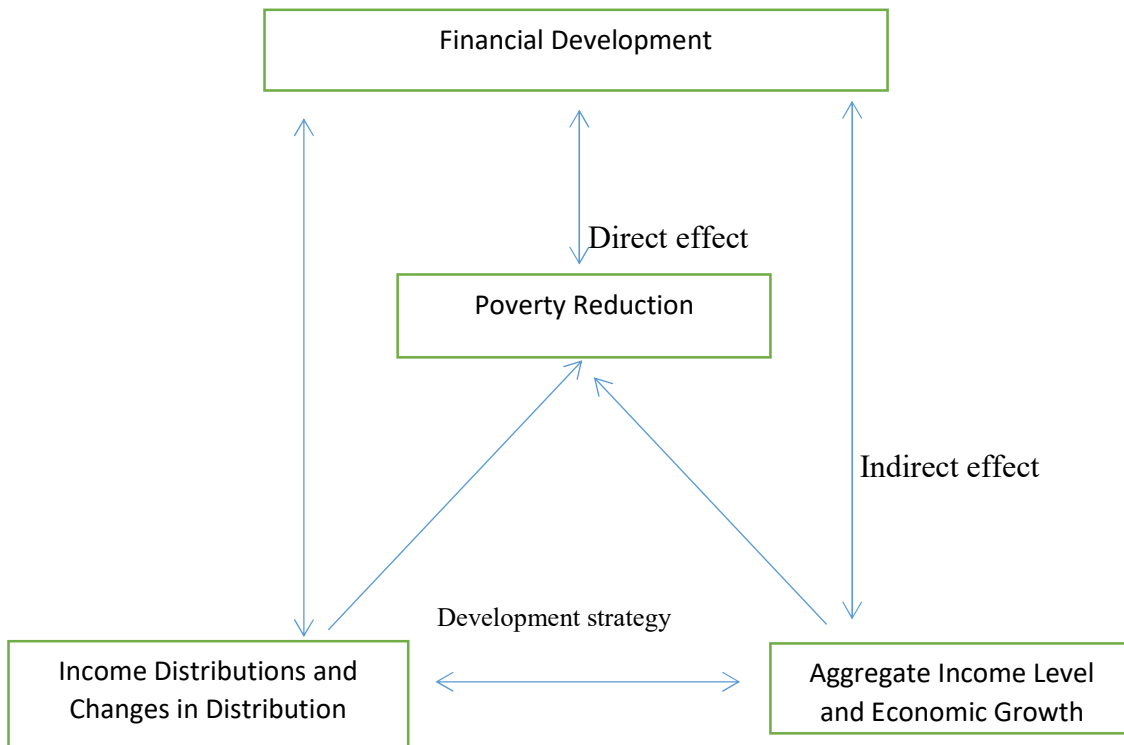
Study	Time	Methods	Results
Bist 2018	16 selected low-income countries for the period of 20 years from 1995-2014.	Simple linear regression model/ modified and dynamic OLS techniques. Panel data	<ul style="list-style-type: none"> <li>• In finance growth nexus: financial development has a positive and significant impact on economic growth.</li> <li>• Financial service supply leading hypothesis which is financial intermediation leads to economic growth.</li> </ul>
Beck et al., 2007	72 developed and developing countries, 1960-2005	Generalized Method of Moments (GMM), Panel data	<ul style="list-style-type: none"> <li>• Financial development improves the income of the poor, thus, reduce inequality</li> <li>• This is an indirect effect which is po-poor and pro-growth. Trickle down hypothesis supported</li> </ul>
Dhrifi (2015)	22 low-income, 37 middle-income, 30 high-income countries, 1990-2010	Simultaneous equations model, Panel Data	<ul style="list-style-type: none"> <li>• Through indirect channel, financial development promotes economic growth and ultimately reduces poverty in middle/high income countries but increases poverty in low income countries.</li> <li>• For the poor, financial services is expensive</li> <li>• Financial development decreases inequality in high-income countries but increases middle/low-income countries</li> </ul>
Li and Yu (2014)	18 Asian countries	Fixed Effect Model, Generalized Methods of Moments(GMM), Panel data	<ul style="list-style-type: none"> <li>• Removal of credit controls, improvement of banking regulation and stock market development are associated with lower inequality</li> <li>• Direct effect is significant</li> </ul>
Jalilian and Kirkpatrick (2005)	42 developed and developing countries	2SLS, Pooled panel data	<ul style="list-style-type: none"> <li>• The effect of financial development on inequality and poverty is inverted U shape and this effect is realized through growth in per capita income</li> </ul>
De Haan, Plening and Sturm (2018)	89 countries, 1975-2005	Fixed Effect Model (FE)	<ul style="list-style-type: none"> <li>• Financial liberalization and financial development increases income inequality</li> </ul>
Furceri and Loungani (2015)	179 developed and developing countries, 1970-2010	Least square method, Impulse response function	<ul style="list-style-type: none"> <li>• Capital account openness increases inequality</li> <li>• Financial development and crisis play a key role in a response of inequality to liberalization</li> </ul>
Seven and Coskun (2016)	45 developing countries, 1987-2011	Generalized method of moments	<ul style="list-style-type: none"> <li>• Developments in banking sector increases inequality</li> </ul>
De Haan, Plening and Sturm (2018)	89 countries, 1975-2005	Fixed Effect Model (FE)	<ul style="list-style-type: none"> <li>• Financial liberalization and financial development increases income inequality</li> </ul>

Source: Compiled by the author

## 2.4 Conceptual Framework

Conceptual framework explains the interrelationship among the phenomena under investigation. It shows interrelated concepts or abstractions assembled in a rational and often explanatory scheme to illuminate relationships among them. It is advisable to indicate conceptual scope especially when the study uses explanatory design.

**Fig. 2.2** Conceptual framework



**Source:** Developed by the author

As we can see the conceptual framework above, financial development can affect poverty reduction through two channels i.e. direct and indirect.

- **The direct effect:** Financial development directly leads to poverty reduction by using the channel of access to finance, saving, credit and insurance.

**The indirect Effect:** Financial development to lead to poverty reduction indirectly through economic growth. This means financial development is a pro-growth and pro-poor and it supports the trickle down hypothesis.

Furthermore, this conceptual framework in right side shows the path of causality between financial development and economic growth. The financial development plays a crucial role in

economic growth and therefore, it leads to economic growth (supply-leading phenomenon). It is directly a down direction from financial development to economic growth. But conversely economic growth can also drive development of the financial sector, i.e. demand-following effect. Thus, there is likely to be an interaction between supply-leading and demand-following phenomenon (Patrick, 1966; Schumpeter, 1911 and Kuznets, 1955).

On other hand, the left side of the framework shows bidirectional causation that finance lead to income distribution and conversely, income distribution can lead to financial development either indirectly through poverty reduction or directly. As Tekin and Cin (2020) stated the source of the neoclassical view regarding indirect mechanisms of finance-inequality nexus may be attributed to the literature analyzing cause and effect relations between developed financial systems and economic growth. The assumption that financial development causes economic growth and growth in turn might reduce inequality by directly benefiting the sectors with low-income groups or the factors of production in these sectors. On the other hand, growth may also indirectly benefit the poor by providing necessary sources to implement through redistribution policies such as taxation, transfers and public expenditures. It is like a trickle-down economics but as a policy, its effectiveness is debatable in low income countries.

In the framework, the arrow arises from redistribution and goes to poverty reduction reveals that the effective method to reduce the poverty rate is to reduce inequalities through income distribution. Economic growth directly reduces inequality through factor payments and indirectly through redistributive policy like tax. Therefore, an inverse U-shaped relationship namely financial Kuznets curve is predicted between financial development and inequality. To put it more clearly, (Kuznets, 1955) at the early stages of economic development, a positive relationship will be observed between growth and inequality. As more people move into the industrial sector, the decrease in supply in the agricultural sector will raise wages in this sector. Those in the industrial sector will have to work harder to reach the income of richer employees. At the later stages of development, inequality will decrease and the positive relationship between economic development and inequality will turn into negative.

A recurring issue in the above discussions of financial development, the Growth-Poverty-Inequality triangle in the down part of the framework. It shows whether the main focus of development strategies should be placed on growth, or poverty, and/or on inequality. But

Bourguignon (2004) argues that this way of formulating the question of development goals poses a false dilemma. But the answer could be two ways. The first one is to eliminate absolute poverty rapidly, a meaningful goal for development is crucial. Second, to achieve the goal of rapidly reducing absolute poverty requires strong and country-specific combinations of growth and distribution policies.

## **CHAPTER THREE**

### **3. RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This section presents the methodology that has been employed to achieve the study's objectives. This paper examines the direct and indirect effects of financial development on poverty reduction. In addition, the simultaneous effects of growth and inequality have been considered. The elements that are incorporated under this chapter include the research design, source and type of data, method of data analysis, econometric model specification and definitions of variables, measurement and hypothesis.

#### **3.2 Research Design**

By using simultaneous equations model, the study assesses the virtues of financial development in reducing poverty and consider the simultaneous effects of growth and inequality. In doing so, the study adopted explanatory approach by using annual time series data to realize the stated objective.

The research is a longitudinal study which is extended beyond a single moment in a time and able to detect changes in the characteristics of the target population at both the group and individual level. It is a type of correlational research that involves observing variable over an extended period of time. Thus, the research design looks at a long term effect of financial development on other variables in Ethiopia. The independent variable changes with each measurement and dependent variable measures at several time points for each subject over a period.

#### **3.3 Source and Type of Data**

The data will be used in this study is annual time series data and covers the period from 1991 to 2017. Basically, the secondary data collected from World Bank, the World Development Indicators (WDI) database (2019). In addition to world Governance Indicators, other time series data sources used is basically National Bank of Ethiopia.

### 3.4 Econometric Model Specification

Financial development affects poverty reduction directly through saving, credit, insurance and the like and indirectly through the channel of growth (Dhrifi, 2015). In addition, financial development affects growth and inequality. It affects growth by stimulating the rate of capital accumulation, fostering productivity improvement through entrepreneur finance and risk diversification (Beck et al., 2007). On other hand, it affects inequality through distributional effect of growth, by creating access to the poor and financial inclusion.

Hence, to evaluate the impact of financial system development on growth, inequality and poverty, this study uses a simultaneous regression equations model. These equations are: poverty Equation (1), the growth equation (2) and inequality equation (3). To clarify the effects of financial development, the study first questioned the direct effects on the endogenous variables which are poverty, growth and inequality. Then, it focuses on the variables specific to each equation.

Similar to the grouping of variables as explanatory variable and study variable in the linear regression model, the variables in simultaneous equation models are classified as endogenous and exogenous variables.

- **Endogenous variables (Jointly determined variables):** The variables which are explained by the functioning of system. The values of which are determined by the simultaneous interaction of the relations in the model are endogenous.
- **Exogenous variables (Predetermined variables):** The variables that contribute to provide explanations for the endogenous variables. The values of which are determined from outside the model are exogenous variables. The exogenous variables help explaining the variations in endogenous variables.

In order to deal with the simultaneous regression, based on the prediction of Datt and Ravailon (1992), the effects of the progress of financial development had been decomposed into two conflicting effects. These are: the growth effect and a disparity effect. Besides, Dhrifi (2015) noted on examining poverty reduction by taking into account simultaneous effect of financial development on inequality and growth. Hence, introduction of the variable measuring financial system development is taking the form of an exogenous shock. For instance, Ravallion (1997)

used a model as a function of poverty which is a set of control variables that are normally employed as explaining poverty. In this, in the equation of poverty: Gini coefficient, the GDP per capita growth; infrastructure variable and the growth of population are used. Basically, in the equation of inequality: the institutional variables that reflect how the distribution is made would be introduced. Also, add in the same equation the growth rate and its square to test the hypothesis of Kuznets (inequalities reach a maximum level and then from a certain threshold, the curve becomes decreasing corresponding to the third phase of the development process).

The Kuznets curve (1955) tested in this model by considering the effect of growth of GDP per capita and through the introduction of the quadratic effect which is its square (GDPG)<sup>2</sup>. The income growth influence inequality in the long run according to a non-linear or inverted "U" curved. Adjusting, the shape of Kuznets curve, inequality increases in the early stages of economic development and decrease after reaching the maximum threshold but the situation of a country is determined by the presence of quality institution. Indeed, the empirical results show that the institutional side enhances to the prediction of Kuznets.

Moreover, expected to the method of simultaneous equations models is the endogenous variable in one equation becomes exogenous variable in another equation. This method allows us to correctly distinguish the effects of financial development passing through growth and rising inequality. Furthermore, in order to answer the main problem, financial development is the only explanatory variable common to all three equations is assumed. It is likely to affect simultaneously but the three endogenous variables affected in different ways. The overall association of this model is explained in the following way:

$$Pov_t = \alpha_0 + \alpha_1 GDPg_t + \alpha_2 INQ_t + \alpha_3 FD_t + \alpha_4 PPg_t + \alpha_5 TEL_t + \varepsilon_{1t} \dots \dots \dots (1)$$

$$GDPg_t = \beta_0 + \beta_1 INQ_t + \beta_2 FD_t + \beta_3 OPEN_t + \beta_4 GoEx_t + \beta_5 HK_t + \beta_6 INF_t + \varepsilon_{2t} \dots \dots \dots (2)$$

$$INQ_t = \lambda_0 + \lambda_1 GDPG_t + \lambda_2 (GDPg_t)^2 + \lambda_3 FD_t + \lambda_4 INS_t + \varepsilon_{3t} \dots \dots \dots (3)$$

Where Pov is poverty, it is measured by national head count ratio of the percentage of population living below poverty line. GDPg represent growth of GDP per capita. INQ is income inequality measured by the Gini index. FD is measured by domestic private credit as percentage of GDP. TEL is an indicator of quality of infrastructure measured by number of subscriber telephone lines

per 100 inhabitants. PPg is growth rate of population. OPEN is trade openness measured by sum of import and export as % of GDP. INF is an indicator of inflation which is consumer price index. GoEx is government expenditure which is government final consumption. HK is the average years of secondary schooling in the total population which measures human capital, and finally INST is an index measuring the institutional quality by summing up five different institutional variables.

In the simultaneous model, there is a problem of endogeneity (i.e. omitted variable in the model, measurement error in independent variables and endogenous error in relation to reverse causality in which X causes Y and Y causes X) as the variables interact simultaneously in the structural equation. Therefore, these could result in bias on OLS estimator and it could end up on the model inconsistency. Empirical studies on the inequality-development relationship could suffer from endogeneity and reverse-causality problems (Demirgüç-Kunt and Levine, 2009; Bazillier and Hericourt, 2017). On the one hand, simultaneity issues are a concern as factors that influence financial development might also be correlated with income inequality. But there are as well reverse-causality issues. For example, in Kumhof et al. (2015) the impact of higher inequality on bank lending may be caused by an increase in the income of the rich (by increasing loan supply), or it could be associated with a decrease in the income of the poor (by increasing loan demand).

As a result of endogeneity problem among the variable, this Three Stage Least Square (3SLS) model has been used. For solving endogeneity problems, the instrument variables introduced and the endogenous variable is among the explanatory variable. In this model, the endogenous variable in one equation becomes exogenous variable in another equation and which is the method of simultaneous equations models i.e., the endogenous explanatory variables are dependent variables from other equation. The endogenous variable lists identify variables in the system that are not only dependent variables but also are endogenous to the system.

Furthermore, this method helps to differentiate the impact of financial development passing through economic growth and income inequality. To answer basic problem, financial development is the only explanatory variable which is common to all three equations and it is likely to affect the three endogenous variables at the same time but in different ways.

However, the application of STATA simplified the problem inherently exist in the model and a resolution is given using the method of 3SLS and different econometric tests necessary to the

model was made. First of all, the ADF stationarity tests and Johansen cointegration test were made. Then, the autocorrelation test, the multicollinearity test, heterogeneity test, and finally the short run and long run regression results interpreted. Then, post estimation tests were made like endogeneity test, over identification test and weak instrument test.

Under the 3SLS estimation system of structural equations where some equations contain endogenous variables among the explanatory variable (Zeller& Theil, 1962), a dependent variable has its usual interpretation as the left hand side variable in the equation with the associated disturbance term. All dependent variables that are explicitly taken to be endogenous to the system are treated as correlated with the disturbance in the system equation. But in this model, unless specified in an endogeneity option, all other variables in the system are treated exogenous to the system and unrelated with disturbance term. Thus, exogenous variables are taken to be instruments for the endogenous variables.

By using the 3SLS method, the treatment with the STATA 14.2 has simplified and facilitated resolution. Therefore, to analyze data, 3SLS method of estimation has been used. According to Lee (2016), the 2SLS method is a limited information method. On the other hand, the three-stage least squares (3SLS) method is a full information method. It is efficient than 2SLS because it is a full information method that takes into account the information from the complete system. The 3SLS method incorporates information that obtained from the variance-covariance matrix of the system disturbance terms just to estimate structural equation parameters.

Since 3SLS is a full information estimation method, the parameters estimated are asymptotically more efficient than the 2SLS estimates. However, this statement is correct only if the model is correctly specified. In effect, 3SLS is quite vulnerable to model misspecifications. This is because model misspecification in a single equation could easily propagate itself into the entire system. Thus, to minimize this error of the model specification, post estimation tests like endogeneity test weak instrument test, over identification tests have been used.

To sum up, the model is adopted from the same methodology of Lundberg and Squire (2003) to study the impact of financial development on poverty, growth and inequality. But to my knowledge, there are few empirical works (like Dhrifi, 2015) which have treated simultaneously trilateral relationship. Hence, in addition to a specific equation of poverty, the total effect of financial development is tested and an interaction with the triangle is identified.

### 3.5 Definition of Variables, Measurement and Hypothesis

The main variables in this model are the rate of poverty, growth, inequality and financial development. The variables are defined as follows:

**Financial development:** the domestic private credit by banks as percentage of GDP is used proxy measure for financial development; however, financial development is a multidimensional concept which captures a lot of variables. These are: depth, access, efficiency, and stability (World Bank, 2014). Therefore, measurement of financial development has been a subject of debate.

In addition to the proxy mentioned above, some of empirical works (like Beck et al., 2007; Ho and Iyke 2018; Bist 2018 among others) used another measures like M2. Despite the wide usage of M2 in measuring financial development, some studies such as Sin-Yu Ho (2018), point out that it only captures the extent of transaction services provided by the financial system. It fails to reflect the ability of the financial system to channel savings into investment opportunities.

But most of them focus on development of banking sector and the rest on the development of capital market. But due to lack of data on stock markets in some developing countries, like Ethiopia, most of the study used only indicators on the banking system. These bank-based proxies for financial development may be more appropriate because Ethiopia's banking system is considered to be the major source of finance in the economy. For example, Banking is the dominant subsector in Ethiopia, accounting for 78 percent of total financial sector assets, followed by insurance companies, representing 15 percent. But capital markets in Ethiopia mainly comprise Treasury bills (T-bills) and government bonds and the total outstanding T-bills as of December 2016, was US\$2.9 billion (WB, 2017).

That is the reason why this study used Domestic Credit (DC) to measure financial development. By excluding the credit to the public sector, DC is argued to be a better proxy because it reflects the extent of efficient resource allocation made by the private sector in a given economy. Its only limitation is that it does not quantify the degree to which banks ease transaction costs and information (Beck et al., 2004) and the previous studies have been using the variable Jalilian and Kirkpatrick (2005), Beck et al. (2007), Sehrawat and Giri (2016) and Sin-Yu Ho (2018).

**Economic Growth:** measured by the growth rate of real GDP per capita as a proxy for economic growth. Economic growth is the increase in the total quantity of goods and services produced per person in an economy over a period of time. This indicator has been widely used in other studies such as Beck et al. (2007), Dhrifi (2015) among others.

**Inequality:** measured by the Gini index as most of the empirical literature. Gini coefficient measures inequality. Datt and Ravallion (1992) showed that the change in poverty can be stated as a change in average consumption and a change in the parameters of the Lorenz curve over time. Lorenz curve shows the cumulative distribution of poverty across the whole population.

**Poverty:** measured by poverty headcount ratio at national poverty line (% of population).

But there are number of proxy measures used in other studies. However, there are a number of critics in all proxy measures, Lundberg and Squire (1998) has employed income and headcount data for the poor and Gini coefficient. Again, Beck et al., (2007) have used the rate of population living within dollar 1 or 2 per day.

However, most of the recent studies use household final consumption expenditure per capita growth (annual %) as a proxy Uddin et al. (2014), Sehrawat and Giri (2016), Ho et al. (2017) among others, The household final consumption expenditure per capita growth (annual %) has also been noted to be a suitable proxy for poverty reduction because data on it among the poor is usually more reliably reported and more stable than income (Datt and Ravallion, 1992; Quartey, 2005). In addition, it is consistent with the World Bank's definition of poverty. But time series data is not available for the case of Ethiopia except few years. Thus, this study use poverty head count ratio at national poverty line (% of population).

**Institutional Quality:** This indicator is constructed from the five governance indicators. The INS indicators are: Rule of Law, Control of Corruption, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality. These institutional variables are indicating information on the economic risk, political risk and social risk. The World Bank measured the estimate of governance performance ranges from approximately -2.5 (weak) to 2.5 (strong). Accordingly, Demirguc-Kunt and Levine (2008) state that the strong assumption is that financial institutions can divert resources and give priority to projects which are ranked higher whenever there is strong institution.

**Trade Openness:** Defined as the sum of exports and imports as a % of GDP and it captures international openness (Trade openness). Sehrawat and Giri (2016) stated that there is a positive link between financial development, trade openness, and the effect of consumer price index measuring inflation and in the process of poverty alleviation. In addition, the finding noted that there is a unidirectional causality running from the improvement of financial service to poverty reduction.

**Government Expenditure:** which proxies for general government final consumption. (Appiah et al., 2020) state that the government spending is a representative of the potential role of the state in the accumulation process of economic growth and reducing inequality.

**Human Capital:** Measured by average years of secondary schooling in the total population. Studies by Barro (1997) noted that the level of education is an important determinant of economic growth. As expected, the investment in human capital improves the productivity and ultimately affects welfare.

**Inflation:** which is proxied by consumer price index. (The study used inflation variable as the annual %age of consumer prices for Ethiopia which is not seasonally adjusted). Jeanneney & Kpodar (2011) noted that variable of inflation represents macroeconomic policy. Based on Appiah et al., (2020) inflation is a variable which is deteriorating the poverty level and it has a negative impact on the real value of assets and the purchasing power of household incomes.

**Number of subscriber telephone lines per 100 inhabitants:** This variable capture the role of infrastructure in reducing poverty. It could have a positive influence on the economic development. The technological advancement can encourage financial innovation and facilitate access to credit by the poor and to finalize financial transactions at low cost.

### 3.6 Model Assumption

The diagnostic tests were carried in order to ensure the data is in consistency with the linear regression models based on the following assumptions:

1.  $E(\epsilon_t) = 0$ , the errors have zero mean for all  $t= 1, 2, 3, \dots, n$ . But  $n=15$
2.  $\text{Var}(\epsilon_t) = \sigma^2$  the disturbance have a constant variance called Homoskedasticity assumption

3.  $Cov(X_t, \varepsilon_t) = 0$  No correlation between  $X_i$ 's and  $\varepsilon_i$ 's. The explanatory variables are non-stochastic in repeated sampling.
4. No serial autocorrelation between the error terms. The disturbance terms are not correlated. This assumption of OLS is the error terms are uncorrelated with one another and it lies on the notion that the covariance between error terms over time is zero. Also the assumptions of the test are that the errors are normally distributed with a mean value of zero and all errors are stationary.
5. The error terms or disturbances are normally distributed

### **3.7 Method of Data Analysis**

The statistical characteristic of time series data often violates the assumptions of conventional statistical methods. Because of this, analyzing time series data requires a unique set of tools and methods, collectively known as time series analysis. For instance, time series graphs can be used to get a valuable insight into the behavior of time series data. Most importantly, visualizing time series data provides a preliminary tool for detecting whether the data is mean-reverting or has explosive behavior, demonstrates structural break, has a time trend, exhibits seasonality and other important time series characteristics. This in turn could guide the testing, diagnostic and estimation methods using time series modeling and analysis.

Accordingly, this section summarizes the data analyses include specific statistical testing procedures and alternatives to be used if necessary. For data analysis STATA 14.2 has been used to analyze the time series data and the results presented with tables and figures in accordance with the proposed objectives and based on the types of variables.

### **3.8 Ethical consideration**

Most importantly, the study assured that all the materials and literatures referred, consulted and/or quoted are properly acknowledged to avoid any possibility of plagiarism.

## CHAPTER FOUR

### 4. RESULT AND DISCUSSION

This part the paper deals with data analysis and presentation which include descriptive statistics, graphical presentation, unit root test, Johansen cointegration test, regression analysis and interpretation of the regression. Furthermore, the post estimations results and discussion have been made. In addition to the usual validity tests of autocorrelation, multicollinearity, heterogeneity, the tests related with the simultaneous model has been made for endogeneity, weak instrument test and over identification.

#### 4.1 The Descriptive Statistics

Table 4.1 shows the summary statistics for each variable. In this, Pov, Gini and GDPg are dependent variables and others are independent. But as it is a simultaneous equation model, the variable once dependent become independent on another equation. Accordingly, the minimum and maximum results of the statistics are shown in below. For instance, for the poverty head count ratio is 20.2 and 45.9 for minimum and maximum respectively.

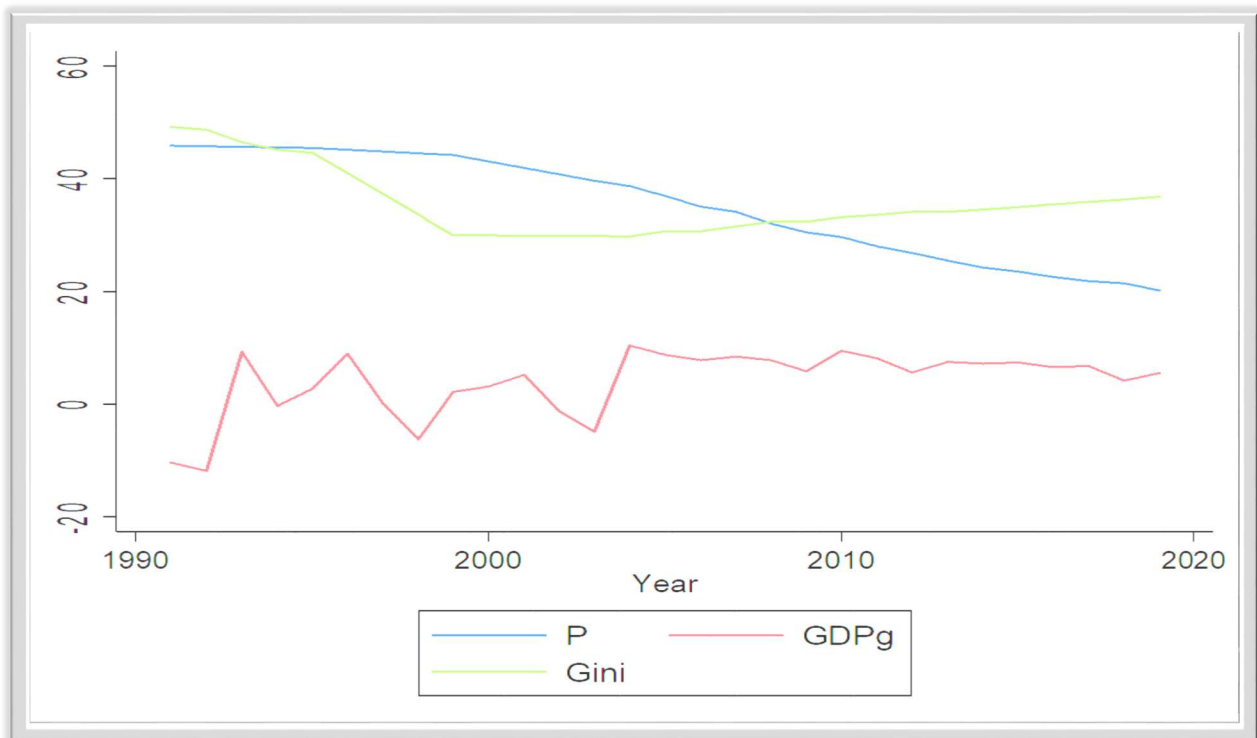
Table 4.1 Descriptive Statistics

Variables	Obs	Mean	Std. Dev	Min	Max
Pov	29	35.29138	9.209943	20.2	45.9
GDPg	29	3.903448	5.916954	-11.9	10.4
Gini	29	35.58793	5.948836	29.8	49.2
FD	29	12.86158	4.913615	2.474366	18.85968
Infl	29	10.86345	11.59611	-8.484249	44.39128
Tele	29	10.84024	14.91974	.2355834	38.31
Open	29	11.48225	3.481697	3.754188	18.69149
GoEx	29	24.24608	1.4125	22.15964	26.74697
HK	29	1.434483	.666954	.6	2.3
PPg	29	2.87377	.1921597	2.639563	3.302967
Inst	29	-.9594575	.1759005	-1.4	-.7366176
GGDP2	29	49.04	36.21619	.01	141.61

Source: Author's computation from Stata

In addition, the graphical result of the line plot below shows about the trend of the dependent variable through time. The trend of poverty is decreasing throughout the time. In the beginning of 1990s, it was around 45 and in the end of 2019 about decreased around 20. In addition, the graph of Gini coefficient shows that starting from the beginning of 1990s to the late 1990s. Later, for a few years it almost doesn't show a significant change. But after around late 2000s the trend of Gini index started growing relatively.

**Fig 4.1:** Graphical representation of the trend of Poverty, Growth of GDP and Gini



Source: Author's computation from Stata

## 4.2 Econometrics Model Results

### 4.2.1 Test for Unit Root

To tackle stationarity and autocorrelation problem, Dickey Fuller have developed a test called Augmented Dickey Fuller (ADF) test of unit root in three different ways. Which are: 1) an equation with intercept only, 2) equation with trend and intercept and 3) an equation with no trend and no intercept in Stata.

In this section the test results of the individual data set evaluated based on test statistic and critical value whether the data has unit root or not. If the time series data set is non-stationary, then, the regression result will be spurious. As a result, the first differenced results were taken to make it stationary. For the sake of deciding that the following conditions of test and hypothesis:

- Null hypothesis  $H_0$ : the variable data is not stationary or has got unit root
- Alternative hypothesis  $H_1$ : the variable data is stationary or variable does not have unit root

$H_0$  mean there is no change. On rejecting  $H_0$  at  $p=5\%$  level of significance, there is a possibility of committing type 1 error. The alternative is that there is a change. But there is enough evidence to infer from the data under this study to differentiate between two options (at 5% of significance level).

For all the following tabulated ADF results, the decision rule is similar. This decision rule is:

- According to the value of test statistics and critical value comparison if the test statistics is greater than the critical value, reject the null hypothesis,  $H_0$  and possible to accept the alternative hypothesis,  $H_1$ .
- In the case of a non-stationary series, one first difference operation creates a stationary series. It is a series that is called integrated of Order 1 and a single difference will generate a stationary series.

ADF Test for National Poverty Headcount Ratio: the national poverty headcount ratio shows that the data is stationary with the p value less than 0.05. The t stat of the trend term and the constant in the trend regression is greater than 2. Besides, the coefficient shows that the trend parameter is declining as the time goes by using trend regress and constant.

Table 4.2: Dickey-Fuller test for unit root

Variables	p-value for Z(t)	Test Statistic	1% Critical Value	5% Critical value	10% Critical value	
Pov	0.0485	-3.422	-4.352	-3.588	-3.233	Trend regress lags(0)
GDPg	0.0008	-4.652	-4.352	-3.588	-3.233	Trend regress lags(0)
Gini	0.0024	-3.082	-2.479	-1.706	-1.315	Drift reg log(0)
FD	0.0154	-2.283	-2479	-1.706	-1.315	Drift reg log(0)

Infl	0.0004	-4.827	-4.352	-3.588	-3.233	Trend regress lags(0)
Tele		3.347	-2.655	-1.950	-1.601	Noconstant reg lags(0)
Open	0.0090	-2.523	-2.479	-1.706	-1.315	Drift reg log(0)
GoEx*	0.0000	-5.360	-3.736	-2.994	-2.628	*At first difference
HK*	0.0289	-3.070	-3.736	-2.994	-2.628	*At first difference
PPg	0.0094	-2.520	-2.492	-1.711	-1.318	Drift reg log(0)
Inst	0.0115	-2.418	-2.479	-1.706	-1.315	Drift reg log(0)
<i>GGDP</i> <sup>2</sup>	0.0310	-3.587	-4.352	-3.588	-3.233	Trend regress lags(0)

Source: Author, Results from Stata, Time Series Data

ADF Test for Economic Growth Rate: According to the decision rule set above, GDP growth rate data is stationary at 1% critical value and Mackinnon approximate p value is significant by using trend regress and constant. Therefore, reject Ho.

ADF Test for Gini Index: The unit root test result in the table below shows that it is stationary at order (I<sub>0</sub>) and ADF Test for financial development result shows that it is stationary at order one.

ADF Test for Inflation Rate: the critical value is found at the level form of inflation rate is stationary at 1% significant level with trend regress and constant. Similarly, for the test for telephone Subscribed /100 People which is a proxy of infrastructure shows that it is stationary at critical value which is significant at 1% by no-constant regress of ADF test.

The ADF test result of the data of trade openness shows that it is stationary at critical value which is significant at 1% by drift regress. Similarly, ADF test for government spending is stationary at the first differenced of the government spending variable. The series must be order one (I<sub>1</sub>). At the order one, p value is significant at 1% critical value level.

ADF Test for Human Capital: The p value is insignificant. As a result, the trend is insignificant. Thus, Ho can't be rejected. But the first differenced result is stationary. Similarly, the ADF test for the population growth is that the p value is less than 0.05 and significant at 1% of the critical value. As a result, we reject the Ho and accept H<sub>1</sub> the series is stationary. In this case, the covariance is stationary and null hypothesis is rejected. Accordingly, the Augmented Dickey-Fuller test for institution and for the square of GGDP: The test is stationary and null hypothesis is rejected.

Generally, some of the above unit root test result of ADF shows that the data is non-stationarity. But after taking the first difference, the unit root test becomes a stationary. For instance, according to the t test statistics and critical value of the residual has found to be nonstationary but taking the first difference, then, at the critical value, it becomes stationary.

If the variables are first order integrated or variables are stationary in first difference, there is a need to establish a long run relationship. Hence, it can be performed by using Johansen cointegration.

#### 4.2.2 Johansen Cointegration Test

Although the cointegration test should be performed on the level form of the variables and not on their difference if series are integrated of order one, it is stationary in first difference. In this scenario, it is assumed that variables are stationary in first differencing i.e I(1) series (integrated of order one). Accordingly, this study assumed that there is long run relationship among the independent variables and that infers cointegration. In this case, the series are related and can be combined in a linear fashion. Irrespective of shocks in the short run which may affect movement in the individual series, it would converge with time in the long run.

**Hypothesis:** Ho: no cointegration among variables, H1: there is cointegration among variables

**The decision Criteria:** Reject the null hypothesis if the value of trace and Max statistic is greater than the 5% critical value. It implies that there is a cointegration among the variables. Otherwise, fail to reject the null hypothesis. Thus, to perform the cointegration test, the Johansen Cointegration test has been made for each equation of the model. For the first equation, the cointegration test reported in the table (*See Table 4.3: Johansen tests for cointegration in the Appendix*).

Johansen Cointegration test for Poverty, at equation #1: In the value of the trace statistic at rank 0 and 1 (i.e. the null hypothesis of there is no cointegration and there is one cointegration among variables) the trace statistic is greater than the critical value (i.e.  $110.42 > 68.52$  and  $62.21 > 47.21$ ). Thus, the null hypothesis rejected and there is a cointegration in the variables although rank 3 and 4, the max statistic is less than the critical value.

In addition, in the max statistics, at rank 0 and 1, the max statistic is greater than the critical value. Therefore, the null hypothesis is rejected. Because it shows there is cointegration equation in the model. However, in rank 2, 3 and 4, the null hypothesis is failed to be rejected, the five variables such as GDPg, Gini, FD, Pop and Tele are cointegrated and there is a long run association among the variables, or in long run, these five variables move together.

In addition, for the equation #2 of the model, the test results shown in the table in the appendix. Johansen Contegration test for growth of GDP, at equation #2: The value of trace statistic at rank zero and one is  $164.39 > 94.15$  and  $101.51 > 68.52$ , respectively. Therefore, reject the null hypothesis and accept H1. Similarly, at rank 1, 2, 3, 4 and 5:  $101.51 > 68.52$ ;  $59.49 > 47.21$ ;  $34.09 > 29.68$ ;  $17.62 > 15.41$  and  $6.97 > 3.76$  respectively. Therefore, there is the maximum of more than five cointegrating variables in equation 2 of the model.

Furthermore, in max statistic, for the rank 0, 1 and 5, the max statistic is greater than the critical value. Thus, the null hypothesis is rejected despite the fact that rank 2 and 3, the null is failed to be rejected. The above table of the second equation shows there is a long run relationship between the dependent variables.

Similarly, Johansen Contegration test for Gini Index, at equation #3: The cointegration test result of the null hypothesis that states there is no cointegration, there is one cointegration and two cointegration among variables (rank 0, 1 and 2) shows that the value of trace statistic is greater than the critical value. Therefore, the null is rejected. But for the null hypothesis of that says there is three cointegration equations, the null is failed to be rejected. Meaning that there is a long run association among the variables or there is a long run relation and a maximum of two cointegrations among the variables in the model.

To sum up the above three equations cointegration results, the finding indicates that there is a long run association between financial development and poverty reduction. Thus, it is consistent with the result of Quartey (2005).

### **4.2.3 The Regression Result on Effects of Financial Development**

To clarify the impact of financial development on poverty reduction, first, analyze the direct effects on the endogenous variables which are poverty, growth and inequality. Then, specifically focusing on variables to each equation, regression results interpreted. The significance of p value

is used to as decision criteria just to accept or reject  $H_0$ . The probability density function for test statistic, under null hypothesis,  $H_0: \theta = 0$  and under alternative hypothesis,  $H_1: \theta \neq 0$ . The p value is a proportion of repeated samples, under null hypothesis, that would be as extreme as the test statistics, T that is generated.

**Decision rule:** If  $p < 0.05$ , at 5% level of significance there is enough evidence to reject  $H_0$ ; if  $p > 0.05$  there isn't enough evidence to reject  $H_0$ .

Generally, the statistical test result in the table below shows that the model fits the data very well. The adjusted  $R^2$  of the model shows that the overall regression result explains 97.01%, 27.17% and 87.54% of the variation in poverty, growth and inequality, while the model test overall P-statistics shows the model fit the data. In addition, as it can be seen on the table below as a rule of thumb, according to the z statistics and p value, almost all of the variables are significant.

#### 4.2.3.1 The Direct Effects of Financial Development

**The GDP Growth on Poverty Reduction:** The regression result shows that there is a negative and highly significant relationship between the growth rate of real GDP per capita and poverty headcount ratio at national poverty line as percentage of population. Indeed, an increased growth rate of 1% point results in a 0.2% point decrease in head count ratio of the population living below poverty line.

In relation to this, World Bank (2020) states that Ethiopia's economy experienced strong, broad-based growth averaging 9.8% a year from 2008/2009 to 2018/2019, with the share of the population living below the national poverty line declining from 38% to 24% over the same period. In 2015 the poverty headcount ratio at national poverty lines (% of population) in Ethiopia was reported at 23.5 %.

**Inequality on Poverty:** Concerning the effect of inequality on the incidence of poverty, results shows that the P value and Z statistic of inequality measured by the Gini index is insignificant, confirming it's not robust. Thus, P value is greater than 0.05 and Z statistics is less than 2.

**Financial Development on Poverty:** the domestic credit to private sector by banks (% of GDP) as a proxy indicator of financial development that is most interested estimate of this study. The

result shows that the P value of financial development is significant and the coefficient of beta is positive. The level of financial development of a point increase would result in 0.7 points increase in the population living below the national poverty line. This means that the headcount ratio of the people living below the poverty line increases as financial development increases and the argument is supported by Beck, et al., (2007). They argued that financial development not necessary helps the poor. Although the effect of the financial development on poverty alleviation depends on the structure of the economy, most of these studies conclude that the improvement in financial service leads to poverty reduction.

Actually, there are some of previous studies that argue that the progress of the formal financial system does not have a direct effect on income of the poor and ultimately poverty reduction. The percentage of population who live below the poverty line has no direct access to financial services, other than that through growth. Greenwood and Jovanovic (1990) state that bank credits may be caught up by high unit costs of small loans for poor and small business. As a result, of imperfections in the financial system would only favor the wealthiest households who can borrow with the lesser risk of default and ultimately, they grow.

Similarly, the robust result of this paper in relation to financial development and poverty indicates that getting credit service is too expensive and unaffordable for the poor to access it with high transaction costs. Therefore, it can be interpreted as inefficiency of allocating private credit, credit rationing, a requirement of collateral that excludes the poor, the lenders skewness and preference in favor of rich to reduce transaction cost, the other related cost of monitoring and risk of poor's inability to pay the debt might be a reason to increase the head count ratio which measures percentage of the people living below the poverty line.

In some sense, this result supports the theoretical prediction that states that while the share of credit has grown over time in most LDCs, they still don't represent the prominent providers of credit to the poor. In Ghana, the effect of financial development on poverty reduction is positive but insignificant. Thus, it indicates that finance is not adequately channeled to the pro-poor sectors of the economy because of high default rate, lack of collateral for poor and lack of proper business proposals which is related with literacy level (Quartey, 2005).

Allen et al. (2010) show that in SSA, the average ratio of private credit is 17 per cent while in other developing regins, it ranged between 32 and 43 per cent. This implies that households do

not have access to credit. This is because banks prefer the relative safety of government securities to the risks and high transaction costs of lending to the private sector. Hence, banks avoid lending to small and medium enterprises (SMEs) because of difficulty in obtaining information for risk assessment; SMEs have small loan requirements as against the high costs of loan processing; and the perception that new SMEs are more likely to fail (Aryeetey, 1998). A possible way to correct this will be the development of credit rating agencies and better risk assessment departments in banks as this would ensure effective risk assessment of borrowers and limit the problem of moral hazard that banks are trying to avoid.

In relation to this, small businesses, especially young firms, generally face tight resource constraints. But, their success and survival, employment growth strategies, productivity and innovation largely depend on access to financial resources. SMEs have lower productivity, and this is at least partly due to financial constraints. The productivity is an important issue both because of their importance in the economy but also because of the role they play in the creative destruction process and the spillovers they generate for large firms and economy-wide productivity (Bakhtiari et al., 2020). Although SMEs serve as an engine of job creation Ayyagari et al., (2010) and are seedbeds of developing entrepreneurial talent and innovation, they are constrained by the inaccessibility of finance.

***Population Growth on Poverty:*** The effect of population growth on the poverty is very significant. When population growth increases by one percentage unit, the number of population living below poverty line will increase by 37.54 units. Demographic traits influence changes in poverty (Beck et al., 2007).

***Impact of Infrastructure on Poverty:*** The infrastructure development can help to reduce poverty reduction. The P value of the number of the telephone subscribed per 100 people is significant and it means the investment in infrastructure can reduce poverty. In relation to infrastructure, for instance, rural road quality appears to be driving the low secondary school enrolment rates seen in rural areas. Similarly, electrification rates also remain low in rural areas that is below 10% and that have a negative impact on poverty (PDC, 2018).

### 4.2.3.2 The Indirect Effect of Financial Development

In addition to the direct effects on poverty, financial development may also impact poverty reduction through other possible strategic variables which are economic growth and income distribution. Thus, this study focuses more definitely on the channel of growth and inequality.

**Effect of Financial Development through Economic Growth:** On examining the results of growth equation, on the channel of growth, the model has significant effect on growth and validating the hypothesis of financial development is pro-growth.

As expected, a percentage point increase in financial development would lead to a 2.58 percentage point growth of real GDP per capita. In other words, for every additional amount of private credit, the expected level economy grows by 2.58. As a result of this, P value is significant and the coefficient of the estimate is positive.

Table 4.4: Long Run Regression Result of the 3SLS Model

Equation	Obs	Parms	RMSE	“R-Sq”	Chi2	P
<b>Poverty</b>	29	5	1.564441	0.9701	1083.47	0.0000
<b>Growth</b>	29	6	4.961694	0.2717	28.75	0.0001
<b>Inequality</b>	29	4	2.052593	0.8754	211.81	0.0000

		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
<b>Poverty</b>							
	GDPg	-.201404	.0835835	-2.42	0.016	-.3646367	-.3646367
	Gini	-.0516032	.2153427	-0.24	0.811	-.4736672	.3704608
	FD	.7016167	.1854564	3.78	0.000	.3381295	1.065104
	Tele	-.2266696	.0418699	-5.41	0.000	-.34087332	-.144606
	PPg	37.54731	5.330841	7.04	0.000	27.09905	47.99556
	Cons	-77.06599	14.31515	-5.38	0.000	-105.1232	-49.0088
<b>Growth</b>							
	Gini	2.975221	1.381882	2.15	0.031	0.2667835	5.683659
	FD	2.582125	1.218153	2.12	0.034	.1945884	4.969661

	Infl	-.4062826	.1520218	-2.67	0.008	-.7042398	-.1083254
	Open	2.100317	.7817064	2.69	0.007	.5682003	3.632433
	GoEx	-3.408718	1.887145	-1.81	0.071	-7.107456	.2900188
	HK	15.18847	5.695449	2.67	0.008	4.02559	26.35134
	Cons	-94.03097	58.3524	-1.61	0.107	-208.3996	20.33763
Inequality	GDPg	-.2109833	.0987176	-2.14	0.033	-.4044662	-.0175005
	FD	-.851981	.1028943	-8.28	0.000	-1.05365	-.6503118
	Inst	-7.444826	3.26526	-2.28	0.023	-13.84462	-1.045034
	GGDP2	-.0010087	.0120534	-0.08	0.933	-.0246331	.0226158
	Cons	40.27578	4.011109	10.04	0.000	32.41415	48.13741
Endogenous variables: Pov GDPg Gini							
Exogenous Variables: FD Tele PPg Infl Open GoEx HK Inst GGDP2							

Source: Author's computation from Stata

The result is consistent with the theoretical predictions advanced by Goldsmith (1969) and McKinnon (1973). According to these authors, financial development plays a crucial role in the endogenous growth theory and it impacts positively on levels of capital accumulation, savings or technological innovations. Furthermore, other empirical studies which shows a positive link between financial development and economic development, (Beck et al., 2007). In relation to this, Jalilian and Kirkpatrick (2001) have suggested that in developing countries, as financial development increases by 1%, income grow by 0.4 % points.

Similarly, substantial bodies of literatures have generated the relationship between financial development and poverty reduction. Those have shown that financial development may result in poverty reduction by enhancing economic growth. This view is consistent with the so-called “trickle-down” mechanism. Although some previous studies argue in favor of a trickle-down effect between financial development and poverty reduction, a number of studies maintain that financial sector development can only contribute to poverty reduction up to a certain threshold level of economic development (Jeanneney and Kpodar, 2005). On other hand, Stiglitz (2014) argues that the trickle-down economics doesn't work but the trickle-up economics can be effective.

In addition, there is a strong and positive relationship between of financial development, human capital investment and trade openness in the process of reducing poverty by using indirect channel. The result is consistent with Barro (1997) which stated that the level of education is an important determinant of economic growth whereas the results of human capital are consistent with the findings of Beck et al. (2007) who found that trade openness reduces poverty while inflation is harmful to the poor.

On other hand, as the coefficient of beta estimate of Gini is positive and increasing inequality by one unit, it can enhance growth by 2.97 %age. In relation to poverty reduction, two side arguments go on in relation to poverty reduction. First, it means that the presence of increased inequality could end up on higher poverty just by eliminating the gain of economic growth. (Seven and Coskun 2016; Ho and Iyke 2018) argue that due to inadequate distribution of the gain of economic growth, the positive effects of financial development are weakened by the presence of growing inequalities. Basically, lack of access to finance can be the main cause of the pervasive generation of income inequality and extreme poverty. Hence, the positive effects of finance and the rising inequality happen at a time and that result in the benefit of growth that is expected to be gained by the poor get offset.

Second, it might motivate and also it can work as incentive to enhance economic growth by increasing the labor efficiency and productivity Kumbhakar and Mavrotas (2005). Ultimately, that will attract more investment as saving increases. Aye (2013) concluded that the financial functions can influence saving and investment decisions and the efficiency with which funds are allocated. As a result, finance affects the accumulation of physical and human capital and total factor productivity. In addition, Galor and Zeira (1993), financial market imperfections are mainly binding on the poor. Better access to credit markets, allowing more poor people to become entrepreneurs or to invest in human capital, will help the economy to reach a better equilibrium.

In Ethiopia, examining non-income aspects of wellbeing such as health, nutrition, education and literacy, sanitation, access to services and assets using data from the 2015/16, consumption poverty incidence, depth, and severity sharply decline as the level of education of the household head increases. Where there are many improvements on poverty reduction since 1995, some aspects of improvement on non-monetary poverty (PDC, 2018).

Furthermore, Beck et al. (2007) stated that financial development helps the poorest quintile beyond financial effect on aggregate growth and 60% of the impact of financial development on the poorest quintile works through aggregate growth and about 40% operates through reductions in income inequality.

***Effect of Financial Development through Distribution Channel:*** Based on the results of the indirect effects, the channel of inequality reveals that a development in financial service has a negative effect on the rate of poverty. An increase in one unit of the financial development indicator would lead to 0.85% point decrease in Gini coefficient. It indicates that such reduction in the income gap between poor and rich would improve the income distribution and ultimately, it might contribute to poverty reduction. Actually, this result could be interpreted based on the analysis of the previous literature.

Economic growth affects inequality and the test result confirms that a percentage increase in growth rate of GDP results in a 0.21 percentage point decrease in inequality. Economic growth has a negative impact on income inequality since growth is often positively associated with higher investment and creating greater access for the poor for employment and income from the job. Similarly, financial development reduces inequality through the distribution channel. The regression result indicates that a percentage unit increase in private credit will reduce inequality by 0.85%.

In relation to this, on examining the result of institutional variable introduced to the model as it was in the previous literature, institutional quality displays a negative coefficient as expected at 5% threshold level which validating the hypothesis. Indeed, it is evident from the result that improving the quality of institution by one standard deviation point leads to decrease in inequality rate by 7.44 percentage points. The result reaffirms the hypothetical prediction by the theory which says that institutions play a significant role in determining relationship between inequality and poverty. The institutional variables that reflect the quality of governance directly affects the interaction between economic agents like control of corruption or property rights or rule of law or government procedures. This indicates that to have an effective income distribution policy instrument can reduce poverty. Thus, it is better to support it by institutional quality.

Furthermore, through the introduction of the effect of growth of real GDP per capita and the quadratic effect  $(GDPG)^2$ , Kuznets curve estimation result has been made and the test result shows that the coefficient of the growth rate of GDP per capita is significant and negative, whereas the coefficient of  $(GGDP)^2$  is insignificantly negative. Though the coefficient is close to zero, it is impossible to interpret the result as p value is insignificant.

Thus, in this paper, the inverted “U” shape of Kuznets curve that is explaining the average income inequality in the long run of the model is unverified. This refers that it is inconsistent with the dualistic theories that dictates that inequality and growth positively associated, then, stabilize at the peak to the turning point and at final phase of redistribution effect, the inequality decreases.

Similarly, as Naceur and Zhang (2016) concluded that the higher the level of poverty implies that financial services are less affordable and less accessible to the poor. When income inequality is less, it is easy to promote economic growth according to the inverted-U pattern and the impact of income distribution can support economic growth. However, Kuznets (1955) argues that as the financial system develops, the credit constraint can be removed; the poor can borrow and reduce inequality. Then, the indirect effect of financial development can impact inequality through the channel of economic growth and technology transitions. Moreover, all of these mechanisms are dependent on economic structure.

Generally, Todaro (1997) stated the relationship between finance, growth and poverty reduction in comprehensive way and argues that in least developed countries, the effect of finance on poverty is inconsistent and ambiguous. However, Ho and Odhiambo (2011) concluded that financial development Granger cause poverty alleviation in long run where as a feedback effect exists in short run

### ***Short Run Regression Results***

First of all, holding other things constant, in average, the short run regression result in the table shows that there has no significant change in p values nor in the coefficient of beta estimates and change in the sign. The result is more or less similar to long run results. The finding is consistent with Sehrawat and Giri (2016) that finance system growth and economic progress through growth of GDP can reduce poverty in both long run and short run.

In short, the difference in the short run result is the P value of Gini in direct channel of first equation and the P value of government expenditure in second equation. The p value of Gini has turned up to be significant in short run and the coefficient is positive. It refers that the increase in inequality increases poverty. This means that the trickle-down theory of redistribution of wealth is ineffective to reduce poverty. Stiglitz (2014) argues that the trickle-down economics doesn't work but the trickle-up economics can be effective. Similarly, the p value of government spending becomes significant and negative. The result shows that an increase in government spending leads to a decrease in economic growth.

In relation to finance and government expenditure, Mustafa and Ozkanb (2012) stated an alternative explanation for 'contractionary fiscal expansions' by exploring a different channel through which fiscal policy influences the financial sector and economic outcomes. When the government has a dominant presence as a major borrower in the domestic securities market, a rise in public debt crowds out the funds available to the private sector which is a key measure of financial development. Finally, it in turn reduces economic activity. Actually, the potential role of fiscal policy as a determinant of financial development has been largely ignored in the existing literature. The unfavorable impact of large fiscal deficits on financial development working through public sector borrowing from the banking sector. In addition, one interesting finding in this literature is that fiscal expansions may be contractionary, contrary to the conventional wisdom that is based on Keynesian policy prescriptions. A rise in public sector borrowing from the banking sector reduces the scope of bank lending to the private sector and is therefore harmful for financial development. Moreover, the lower the financial depth, the greater the degree of public borrowing's crowding out of credit to the private sector. *(See table 4.5: Short Run Regression Results in the Appendix)*

Generally, the overall p value is significant; the R square is high and the variation is explained well which is 1 for both Poverty and GDPg, and also 0.88% for Gini. Meaning that in short run, holding other things constant, 100% of the variance of dependent variable that is explained by the explanatory variable. In other words 100% indicates that the model explains all the variability of the data around the mean.

But still in short run, the Kuznets hypothesis prediction going in reverse way. Though the p value is insignificant, the sign of the coefficients for growth of GDP and the square of GGDP is changed from negative to positive. Furthermore, the error term, e1 and e2 are significant but e3.

**Direct Effect:** The direct impact of financial development in poverty reduction is similar to that in the case of long run. A regression result shows that a unit increase in the financial service results in 0.84 unit increase on poverty reduction. In other words, for every additional amount of private credit, the expected level of poverty headcount ratio increases by 0.84 on average, holding all other variables constant. Similarly, concerning the effect of inequality in poverty through the direct channel is positive. It indicates that an increase in Gini index by one percentage point, it will increase poverty head count ratio of the population living below the national poverty line by 0.07 points. In addition, the unit percentage increase in economic growth and infrastructure, will lead to 0.076 and 0.21 unit decreases in poverty, respectively. In relation to this, the impact of population growth in poverty is very significant as it is in long run which is 39. Meaning that a unit increase in population growth rate, it will lead to 39 unit increase in population living below the poverty line. On other hand, the coefficient of the constant is negative and very significant and it reduces the poor population who are below poverty line by 89 units. But the change in error term coefficient is one. This indicates that the effect of error term is constant.

**Indirect Effect:** the indirect effect of financial development in poverty reduction is significant for almost all variables in the study. Through growth effect, financial development has a significant impact on poverty. For instance, finance, a unit increase in trade openness, human capital, Gini will have a positive effect on economic growth. Holding other things constant, on average, a unit increase in private credit, as a percentage of GDP, Gini, human capital and sum of import and, it will result in 0.74, 0.95, 6.7 and 1.2 percentage points in economic growth. In other words, the result of estimations also shows that the coefficient of elasticity variable of the years of secondary school life expectancy (average year secondary education) is positive and statistically significant at threshold of 5%.

On other hand, the case related with Gini and growth of GDP is related with incentive side argument that increases productivity and ultimately increase saving and investment. But inflation government expenditure and constant are significant and negatively affecting growth. Similarly,

financial development, institution and growth of GDP are significantly affecting poverty through distribution effect. It shows that holding other things constant, a unit increase in institutional quality, growth of GDP, and financial development results in 7.3, 0.17 and 0.86 unit decrease in inequality, in average. Ultimately, through growth and distributional effect, the indirect effect of financial development would result in poverty reduction. To sum up the regression results interpretation both table 4.4 and 4.5, the estimation is valid for irrespective of whether the estimation made for short run or long run.

#### **4.2.4 Diagnostic Test for Validity**

Following the econometric regression result analysis, the diagnostic test for validity has been made. Hence, a series of diagnostics have been done to fulfill the best, linear and unbiased estimation (BLUE) condition. In addition, in this section, the data is tested for the existence of autocorrelation, multicollinearity, and homoscedasticity problem.

##### **4.2.4.1 Autocorrelation Test**

The most important assumption of OLS is the error terms are uncorrelated with one another and its assumption lies on the notion that the covariance between error terms over time is zero. The assumptions of the test are that the errors are normally distributed with a mean value of zero and all errors are stationary. The serial correlation or autocorrelation refers to the degree of correlation between the values of variables across different data sets. It is usually used when working with time series data in which observations occur at different points in time. To check this test, the Durbin-Watson (DW) test of the regression result has been employed for the data.

The hypotheses of DW:  $H_0$ : residuals from OLS regression are not serially correlated and  $H_1$ : the residuals are serially correlated. Hence, interpreting the Durban Watson Statistic assumed a value between 0 and 4. Accordingly, the DW test statistic values in the regression result shown below for respective simultaneous equations.

- DW d-statistic (6, 29) = 0.9262703 for equation #1 of the simultaneous model
- DW d-statistic (7, 29),  $\alpha = 2.390341$  for the equation #2 of the model.
- DW d-statistic (5, 29),  $\alpha = 0.6795734$  for the third equation of the model

#### ***Decision Rule***

- A value of  $DW = 2$  indicates that there is no autocorrelation.
- When the value is below 2 and closer to 0, it indicates a positive autocorrelation.
- When the value is above 2 and much closer to 4 indicates a significantly negative serial correlation.
- When the value is far away from 2 and closer to zero, it means significantly positively correlated

Finally, to test for positive or negative autocorrelation at significance level, the test statistic DW is compared to lower (dL) and upper (dU) critical values. The cut offs depend on the number of observations and number of independent variables on each equation plus constant. The DW table shows at 5% significance level the critical value to test autocorrelation of dL and dU is **(1.050 and 1.841); (0.975 and 1.944); (0.900 and 2.052)** for equation #1, #2, and #3 respectively.

To interpret the 1<sup>st</sup> equation, to know where the result fall:  $(4 - 1.050 = 2.950)$  and  $(4 - 1.841 = 2.159)$  the **DW = 0.926** which falls below dL= 1.050. Therefore, it is concluded that comparing DW and dL there is a significant positive autocorrelation and reject Ho. For 2<sup>nd</sup> equation, **DW = 2.39** and  $(4 - 0.975 = 3.025)$  and  $(4 - 1.944 = 2.56)$ . As a result, 2.39 is between 2 and the calculated value of 2.56. Therefore, by comparing the results, it is possible to conclude that there is no autocorrelation. Thus, fail to reject Ho. Besides, the table below supports the argument that the model is desirable and the author failed to reject the null hypothesis.

Table 4.6: Autocorrelation Test

Durbin's Alternative test for autocorrelation			
Lags (p)	Chi2	df	Prob>chi2
1	0.898	1	0.3434
Ho: no serial correlation			

Breusch-Godfrey LM test for autocorrelation			
Lags (p)	Chi2	df	Prob>chi2
1	1.189	1	0.2755
Ho: no serial correlation			

Source: Author's computation from Stata

Furthermore, for the 3<sup>rd</sup> equation,  $DW=0.679$  and  $(4 - 0.9 = 3.1)$  and  $(4 - 2.052=1.948)$ . But the value of  $DW = 0.679$  is below 0.9. Hence, it could be concluded that there is positive autocorrelation and failed to reject  $H_0$ .

#### 4.2.4.2 Multicollinearity Test

It is related with substantial correlation among independent variables. Correlation Matrix is reported in research studies to identify the multicollinearity among the explanatory variables. Asteriou and Hall (2007) state that researchers appear to believe that correlation coefficient of more than 0.9 between variables may be problematic in estimation. Taking 0.9 as the benchmark, the test result shows less than the minimum value.

Table 4.7: Correlation Matrix from Stata Command for Each Equation of the Model

Test for collinearity of equation #1

	GDPg	Gini	FD	Tele	PPg
GDPg	1.0000				
Gini	-0.4262	1.0000			
FD	0.3026	-0.9073	1.0000		
Tele	0.3211	-0.0654	-0.0987	1.0000	
PPg	-0.5519	0.7801	-0.6521	-0.5927	1.0000

Test for collinearity of equation #2

	GDPg	Gini	FD	Infl	Open	GoEx	HK
GDPg	1.0000						
Gini	-0.4262	1.000					
FD	0.3026	-0.9073	1.0000				
Infl	-0.0925	0.0924	-0.1209	1.0000			
Open	0.5626	-0.7711	0.5871	0.2653	1.0000		
GoEx	0.4884	-0.3762	0.2083	0.1913	0.4937	1.0000	
HK	0.5131	-0.3656	0.1205	0.3798	0.5883	0.8956	1.0000

Test for collinearity of equation #3

	Gini	GDPg	FD	Inst	$GGDP^2$
--	------	------	----	------	----------

Gini	1.0000				
GDPg	-0.4262	1.0000			
FD	-0.9073	0.3026	1.0000		
Inst	-0.7539	0.4478	0.6254	1.0000	
<b>GGDP<sup>2</sup></b>	0.3146	0.0081	-0.3616	-0.3672	1.0000

Source: Author's computation from Stata

The correlation table shows that the correlation between independent variables indicates there is no series multicollinearity. However, financial development and Gini index, financial development and population growth result shows greater than 0.75 correlations, the mean value of overall multicollinearity result is lower. For equation #1, the variance inflation factor (VIF) =7.11 and this is less than 10. On other hand, the regression result shows the beta coefficients are statistically significant and as expected,  $R^2$  is high and the variation is well explained. Accordingly, the null hypothesis is rejected. Thus, these all show that there is no serial multicollinearity problem.

To sum up, similar argument goes in each cases of the simultaneous equation as raised above. Whenever there is a high correlation between multiple independent variables, there would be a bias on regression estimate. But in the three simultaneous equations, the beta coefficient is very significant and the null hypothesis is rejected. Mainly, the VIF for the first, second and third equation of the model are, Mean VIF = 7.11, 8.85 and 1.57 respectively. Most of the literatures assume that the VIF value greater than 10 could be said there is high multicollinearity. Accordingly, the VIF result is less than 10 and it indicates that there is no serial correlation in that model and the null hypothesis is rejected.

#### 4.2.4.3 Heteroscedasticity

The problem is dispersion of the error distribution varies across the observation. But it is possible to solve it by re-specifying the model. A scatter plot test can help to detect it and hanging the scale to solve the problem of heteroscedasticity.

Hypothesis:  $H_0 = \alpha_1 = \alpha_2 = \alpha_3 \dots = \alpha_k = 0$ ,  $H_1 =$  At least one of the  $\alpha_j$  different from zero and that at least one of the  $X_j$  affects the variance of the residual.

**The decision criteria:** If the p-value  $< 0.05$ , reject the null and conclude that there is significant evidence of heteroscedasticity.

Table 4.8: Heteroscedasticity Test

Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity		
Ho: Constant Variance		
Variables: Fitted values of Poverty, Pov	Variables: Fitted values of Growth of GDP, GDPg	Variables: Fitted values of Gini
Chi2 (1) = 0.11 Prob > chi2 = 0.7434	Chi2 (1) = 7.58 Prob > chi2 = 0.0059	Chi2 (1) = 0.16 Prob > chi2 = 0.6855

Source: Author's computation from Stata

The above heteroscedasticity results shows in the variables fitted values of 1<sup>st</sup> equation poverty and 3<sup>rd</sup> equation Gini, the p value is  $> 0.05$ . In both cases, there is constant variance. Therefore, fail to reject Ho. But in the 2<sup>nd</sup> equation, p value is  $< 0.05$  and it indicates that the model is heteroscedastic. Thus, the null hypothesis rejected.

#### 4.2.5 Diagnostic Tests for Endogeneity, Over Identification and Weak Instrument

In this part the result in the table will be tested to each of the simultaneous model equations for the corresponding diagnostics: Endogeneity, Over Identification, and Weak Instruments Test respectively.

**Endogeneity test for eqn. #1:** First using the hypothesis for endogeneity

- Ho = Variables are exogenous and H1 = Variables are endogenous

**Decision Rule:** If the value of Durbin and Wu-Hausman's test result P value is less than 0.05, then Ho is rejected and H1 is accepted. Accordingly, in the tables below, the ivregress result shows that P value and the beta coefficients are significant. Furthermore, based on the Durbin and Wu-Hausman's test result of the P value of endogeneity test of each equation is below 0.05. Therefore, null hypothesis is rejected. This because of the variables which are endogenous and the instrumental variables are strongly correlated with the Gini but not with error term.

**Over Identification Test for eqn. #1:** The test result of over identification of Sargan (score) of  $P = 0.55$  which is insignificant. It indicates the instruments are good and valid instrument and

error terms are not correlated with instrumental variables. Thus, the instrument is not over identified.

**Weak Instrument test for eqn. #1:** Decision rule: reject the weak instruments if minimum eigenvalue statistic is larger than the critical value of Wald test result and compare to Stock and Yogo (2005) rule of thumb. Based on the [ivregress 2sls Pov GDPg PPg (Gini = GDPg FD Tele PPg)] result, the following table shows the test results for each.

Table 4.9: Diagnostic Test for Simultaneous Equation #1

Test for Endogeneity:

Durbin (score) chi2 (1)	= 22.2412 (p = 0.0000)
Wu-Hausman F(1, 24)	= 78.9765 (p = 0.0000)
Ho: Variables are exogenous	

Test for Overidentifying Restrictions:

Sargan (score) chi2 (1)	= .357503 (p = 0.5499)
Basmann chi2 (1)	= .299558 (p = 0.5842)

Test for weak instrument is first-stage regression summary statistics						
Variable	R-sq	Adjusted R-sq	Partial R-sq	F (2, 24)	Prob > F	
Gini	0.9009	0.8844	0.7469	35.4137	0.0000	
Minimum eigenvalue statistics =35.4137						
2SLS relative bias			5%	10%	20%	30%
			(Not available)			
			10%	15%	20%	25%
2SLS size of normal 5% Wald Test			19.93	11.59	8.75	7.25
LIML size of normal 5% Wald Test			8.68	5.33	4.42	3.92
Critical values				# of endogenous repressors: 1		
Ho: Instruments are weak				# of excluded instruments: 2		

Source: Author's computation from Stata

The minimum eigenvalue =35 which is high and greater than the critical value it means that it is possible to reject the null hypothesis that the instruments are weak. Besides to that, R square = 0.9 which is high and it indicates stronger instruments. In relation to this, F statistics is significant. Therefore, this value for 1<sup>st</sup> equation is 35 which is high and the null is rejected.

In relation to this, the diagnostic test for equation #2 is the resulted from [ivregress 2sls GDPg FD Infl (Gini = FD Infl Open GoEx HK)]. **Endogeneity Test:** Based on the 2<sup>nd</sup> equation table result of the Durbin and Wu-Hausman's test result of the P value of endogeneity test of is below 0.05. Therefore, null hypothesis is rejected. This is because the variables are endogenous and the instrumental variables are strongly correlated with the Gini but not with error term.

Table 4.10: Diagnostic Test Result for Equation #2

Test for Endogeneity:

Durbin (score) chi2 (1)	= 10.4477 (p = 0.0012)
Wu-Hausman F(1, 24)	= 13.5156 (p = 0.0012)
Ho: Variables are exogenous	

Test for Overidentifying Restrictions:

Sargan (score) chi2 (1)	= .790823 (p = 0.6734)
Basmann chi2 (1)	= .644787 (p = 0.7244)

Test for weak instrument is first-stage regression summary statistics					
Variable	R-sq	Adjusted R-sq	Partial R-sq	F (2, 24)	Prob > F
Gini	0.9429	0.9305	0.6765	16.0356	0.0000
Minimum eigenvalue statistics = 16.0356					
2SLS relative bias		5%	10%	20%	30%
		13.91	9.08	6.46	5.39
2SLS size of normal 5% Wald Test		10%	15%	20%	25%
		22.30	12.83	9.54	7.80
LIML size of normal 5% Wald Test		10%	15%	20%	25%
		6.46	4.36	3.69	3.32
Critical values			# of endogenous repressors: 1		
Ho: Instruments are weak			# of excluded instruments: 3		

Source: Author's computation from Stata

**Over Identification Test:** The test result of over identification of Sargan (score) of P= 0.67 which is insignificant. It indicates the instruments are good and valid instrument and error terms are not correlated with instrumental variables.

**Weak Instrument test:** The minimum eigenvalue = 16 and higher than the critical value of Wald test. It means that it is possible to reject the null hypothesis that the instruments are weak.

Besides to that, Adjusted R square = 0.93 which is high and it indicates stronger instruments. In relation to this, F statistics is significant. Thus, instrument is not weak and the null is rejected.

Furthermore, it is noted that the diagnostic test for equation #3 is made based on the [ivregress 2sls Gini FD (GDPg = FD Inst GGDP2)]. Accordingly, the following test results in the table below have been made.

**Endogeneity Test:** Similarly, based on the Durbin and Wu-Hausman’s test result of the P value of endogeneity test of 3<sup>rd</sup> equation is below 0.05. Therefore, null hypothesis is rejected. This is because the variables are endogenous and the instrumental variables are strongly correlated with the GDPg but not with error term.

**Over Identification Test:** The test result of over identification of Sargan (score) of P= 0.53 which is insignificant. It indicates the instruments are good and valid instrument and error terms are not correlated with instrumental variables.

**Weak Instrument test:** The minimum eigenvalue is low (2.4) and less than the critical value it means that it failed to reject the null hypothesis that the instruments are weak. Besides to that, R square = 0.23 which is relatively low but still it indicates stronger instruments in general. In relation to this, F statistics is insignificant. Therefore, the null hypothesis is not rejected.

Table 4:11 Diagnostic Tests for Simultaneous Equation #3

Test for Endogeneity:

Durbin (score) chi2 (1)	6.86701 (p = 0.0088)
Wu-Hausman F(1, 24)	7.75653 (p = 0.0101)
Ho: Variables are exogenous	

Test for Overidentifying Restrictions:

Sargan (score) chi2 (1)	.389528 (p = 0.5325)
Basmann chi2 (1)	.340372 (p = 0.5596)

Test for weak instrument is first-stage regression summary statistics					
Variable	R-sq	Adjusted R-sq	Partial R-sq	F (2, 24)	Prob > F
Gini	0.2390	0.1477	0.1623	2.4212	0.1094
Minimum eigenvalue statistics = 2.4212					

2SLS relative bias	5%	10%	20%	30%
	(Not available)			
	10%	15%	20%	25%
2SLS size of normal 5% Wald Test	19.93	11.59	8.75	7.25
LIML size of normal 5% Wald Test	8.68	5.33	4.42	3.92
Critical values Ho: Instruments are weak	# of endogenous repressors: 1 # of excluded instruments: 2			

Source: Author's computation from Stata

However, the problem is still possible to test hypothesis about the coefficient if instruments are weak. But there are cases where the literature on weak IV detection is still limited and open for the debate in econometrics. Fully robust testing results are much more developed for the case of one endogenous repressor. If there is more than one endogenous repressor, it is still an open econometric problem (Stock and Yogo, 2005) and it depends on how much bias there could be tolerated either at 5%, 15%, 20% or 25% at 2SLS.

As this study considers testing for weak instruments in a model with multiple endogenous variables, unlike Stock and Yogo who considered a weak instruments problem where the rank of the matrix of reduced form parameters is near zero, but Sanderson and Windmeijera (2016) consider a weak instruments problem of a near rank reduction of one in the matrix of reduced form parameters. The F statistic is equivalent to the Cragg and Donald (1993) minimum eigenvalue rank test statistic, and is informative about the maximum total relative bias of the 2SLS estimator and the Wald tests size distortions. When  $\delta = 0$  in the three endogenous variable model, further information over and above the Cragg–Donald statistic can be obtained about the nature of the weak instrument problem by computing the conditional first-stage F –statistics.

## Chapter Five

### 5. Summary, Conclusion and Recommendations

#### 5.1 Summary

The aim of the paper was to assess the direct and indirect effect of financial development in reducing poverty just by taking into account the simultaneous effects of economic growth and inequality in Ethiopia. In order to investigate this, the time series data has been used for the econometric analysis for the period of 1991 to 2019.

This research is a longitudinal study which is extended beyond a single moment in a time and able to detect changes in the characteristics of the target population. Basically, the data was collected from World Bank data base which is the World Development Indicators (WDI) database (2019), International Financial Statistics and National Bank of Ethiopia. To test the effect of financial development on the growth-inequality-poverty triangle, this study operates in a simultaneous regression equations for econometric model specification. These equations are: poverty equation, the growth equation, and inequality equation.

There is a spurious regression problem in time series data. Therefore, to avoid the spurious problem of regression, the study used cointegration and unit root test for a stationarity test. ADF test was made and validity of the model checked like autocorrelation, multicollinierity, heterogeneity test. On other hand, in the simultaneous model of the structural equation, there is a problem of endogeneity as the variables interact simultaneously. To solve endogeneity problems in turn, 3SLS model used which is complete information method and the instrument variables introduced in the model and the endogenous variable is among the explanatory variable. The endogenous variable lists identify variables in the system that are not only dependent variables but also are endogenous to the system. However, the 3SLS model is vulnerable to model specification error and to minimize this error, post estimation tests like overidentification and weak instrument test have been made. Ultimately, the total effect of financial development is tested and interactions through the growth, poverty and inequality triangle were identified.

Furthermore, this method helped to correctly distinguish the effects of financial development passing directly through saving, credit and insurance; and also indirectly through growth and rising inequality. The treatment with the STATA 14.2 simplified a resolution using the method

3SLS. Thus, series of econometric tests has been conducted on the usual set of equations and variables in the model estimated.

Beginning the analysis and result interpretation part, the descriptive statistics, the unit root tests and Johansen cointegration tests were made. The stationary test result shows that there are three outcomes. First, the series are integrated of order zero. That means it is stationary at level which requires no differencing. Second, the series are integrated of order one which is stationary after first difference. Third, the series are integrated of different orders that is having a combination of  $I(0)$  and  $I(1)$  series. As a result, all the test results are stationary based on the decision criterion set at the beginning and the null hypothesis is rejected and the alternative hypothesis is accepted. In addition, the cointegration test result shows that there is a long run association among the variables in the model. This finding shows that there is a long-run cointegration association between financial service development and poverty reduction.

Following that the estimation result of the direct effect of financial development in poverty reduction, primarily, the level of financial development of a point increase would result in 0.7 points increase in the percentage of population living the national poverty line. This means that the headcount ratio of the people living below the poverty line increases as financial development increases and the argument is supported by previous studies. It indicates that financial development not necessary helps the poor. The effect of the financial development on poverty alleviation depends on the structure of the economy but most of these studies conclude that the improvement in financial service leads to poverty reduction. Besides, there are some of other studies that argue that the evolution of the formal financial system does not have a direct effect on income of the poor. The percentage of population who are living below the poverty line has no direct access to financial services, other than that of waiting for any benefit through growth. The credits expected from financial institutions may be hampered by information asymmetry for risk assessment and high unit costs of small loans for poor (SMEs), however, a possible way remedy to this will be the establishing of credit rating agencies and strong risk assessment departments in financial institutions. Thus, it can ensure effective risk assessment of borrowers and limit the problem of moral hazard that banks are trying to avoid.

In addition, the economic growth on poverty was interpreted. The result indicated that there is a negative and highly significant relationship between the growth rate of real GDP per capita and poverty headcount ratio at national poverty line as percentage of population. Indeed, an increased growth rate of 1% point results in a 0.2 percentage point decrease in head count ratio of the population living below poverty line.

Similarly, the infrastructure development helps to reduce poverty reduction and as expected the effect of population growth on the poverty is very significant. On other hand, the effect of inequality on the incidence of poverty shows that the P value and Z statistic of inequality measured by the Gini index is insignificant, confirming it's not robust.

Furthermore, the indirect effect of financial development on poverty through the channel of growth effect and income distribution is mostly robust. Using the channel of growth, the model result has significant effects on growth and catalyzes it. The financial development plays a crucial role in the on economic growth. Besides to that, the indirect effects through the channel of inequality reveal that a development in financial service has a negative effect on the rate of poverty through income inequality. An increase in one unit of the financial development indicator would lead to 0.85% point decrease in Gini coefficient. It indicates that such reduction in the income gap between poor and rich would improve the income distribution and ultimately, it might contribute to poverty reduction. Actually, this result could be interpreted based on the analysis of the previous literature.

The economic growth leads to the reduction of inequality. Similarly, improving institutional quality decreases inequality and ultimately reduces poverty. The result indicates the hypothetical prediction supported by the theory which says that institutions play a significant role in determining relationship between inequality and poverty. The institutional variables that reflect the institutional quality directly affects the interaction between economic agents like property rights, rule of law and effective control of corruption. This indicates that to have an effective income distribution policy instrument and reduce poverty, it is better to support it by institutional quality.

On other hand, through the introduction of the effect of growth of real GDP per capita and the quadratic effect  $(GDPG)^2$ , Kuznets curve estimation result has been made and the test result shows that the coefficient of the growth rate of GDP per capita is significant and negative,

whereas the coefficient of  $(GGDP)^2$  is insignificantly negative. Thus, in this paper, the inverted “U” shape of Kuznets curve that is explaining the average income and inequality in the long run of the model is unverified. This refers that it is inconsistent with the dualistic theories that dictates that inequality and growth positively associated, then, stabilize at the peak to the turning point and at final phase of redistribution effect, the inequality decreases, however, Kuznets (1955) argues that as the financial system develops, the credit constraint can be removed, the poor can borrow and reduce inequality.

Finally, the diagnostic test for validity and endogeneity checked. First, based on the autocorrelation test result, it is concluded that there is no autocorrelation. Therefore, it is failed to reject  $H_0$ . Second, the correlation test result indicated that between independent variables, there is no series multicollinearity. The regression result shows the coefficients are statistically significant and as expected,  $R^2$  is high and the variation is well explained. Accordingly, the null hypothesis is rejected. Thus, this shows that there isn’t any serial multicollinearity problem. Third, heteroscedasticity results indicated that in the fitted values of 1<sup>st</sup> equation, poverty and 3<sup>rd</sup> equation, Gini, the p value is  $>0.05$ . In both cases, there is constant variance. Therefore,  $H_0$  is accepted. But in the 2<sup>nd</sup> equation, p value is  $< 0.05$  and it indicates that the model is heteroscedastic. As a result, it is concluded that it is failed to reject  $H_0$ .

Furthermore, the diagnostic test for endogeneity, over identification and weak instrument test results evaluated based on the decision rule. In relation to this, first, the variables are endogenous and the instrumental variables are strongly correlated with the dependent variables but not with error term. Second, the test result of over identification is insignificant. It indicates the instruments are good and valid instrument and error terms are not correlated with instrumental variables. Third, instrument is not weak and the null is rejected.

## **5.2 Conclusion**

The world we are living is dynamically changing and the time is puzzling with increasing poverty, inequality, political conflict, climate change and pandemic. Despite the huge strides in the fight against poverty made possible by globalization and technological advancement, poverty and inequality has increased markedly around the world. Therefore, financing for development lay out an ambitious set of commitments to create a more inclusive global economy that will provide equal opportunities for people and ensure a healthier planet for next generations.

In relation to this, the study examined the impact of financial development by taking into account the simultaneous effects of poverty, growth and inequality by using simultaneous equations model. Finally, it is concluded based on the research findings by focusing on the main objective of this study that is the assessment of the impact of financial development in reducing poverty directly through access to credit and indirect channel of economic growth.

According to the regression results, the findings support the existence of a positive and significant effect of financial development on poverty reduction through the indirect channel of growth and inequality. But the direct channel doesn't reduce poverty. It is failed to benefit the poor through credit, savings and insurances. Because of the lack of collateral, reluctances of the financial institutions to finance the poor by fearing default and high transaction cost are the bottlenecks of the poor or SME to access the credit from formal financial market.

Based on the headcount ratio of the people living below the poverty line increases as financial development increases and it indicates that financial development not necessary helps the poor. In relation to this, the effect of the financial development on poverty alleviation depends on the structure of the economy. But this finding does not support the hypothetical prediction that stated the improvement in financial service leads to poverty reduction. Therefore, the result failed to support H<sub>1</sub>, which says, "Financial development reduces poverty in direct channel through saving, credit and insurance." Therefore, based on this study, financial development does not necessary reduce the percentage of population living below the poverty line through the direct channel. This effect, in turn, could limit human capital development, entrepreneur innovation, productivity, and ultimately industrial development.

In relation to this, the counter argument is that the credits expected from financial institutions may be hampered by information asymmetry for risk assessment and high unit costs of small loans for poor (SMEs), however, a possible way remedy to this will be the establishing of credit rating agencies and strong risk assessment departments in financial institutions. Thus, it can ensure effective risk assessment of borrowers and limit the problem of moral hazard that banks are trying to avoid.

The indirect effect of financial development through growth and inequality is very significant and robust. The results indicate that financial development lead to economic growth and reduce inequality. Accordingly, it reduces poverty and improves the wellbeing of the poor and the

finding indicates the theoretical prediction of H2 is supported. (H2: Financial development improves the wellbeing of the poor indirectly through growth and inequality).

Furthermore, the financial development reduces inequality as it was predicted. (H3: Financial development reduces inequality). Therefore, H3 is supported. Similarly, an increase in real GDP growth rate of a point increase could result in 0.2 percentage point decrease in head count ratio of the population living below poverty line. This implies that the hypothetical prediction of financial development is pro-growth and reduce poverty through indirect channel is supported. (H4: Financial system development is pro-growth and it would enhance poverty reduction by promoting economic growth).

In relation to institutional quality, as expected, it has a significant effect on poverty reduction. That means the finding supports the hypothesis of H5 which has predicted that the institutional quality plays a significant role on financial development in reducing inequality and poverty.

On other hand, the findings of this study shows that the inverted “U” shape of Kuznets curve that is explaining the average income and inequality in the long run of the model is unverified. Therefore, the theoretical and empirical prediction of H6 is not supported, however, Kuznets (1955) argues that as the financial system develops, the credit constraint can be removed; the poor can borrow and reduce inequality. (H6: There is Kuznets’ inverted-U shape relationship between finance and income inequality). This refers that it is inconsistent with the dualistic theories that dictates that inequality and growth positively associated, then, stabilize at the peak to the turning point and at final phase of redistribution effect, the inequality decreases. But, the finding result shows that there is a long-run cointegration association between financial service development and poverty reduction.

### **5.3 Recommendations**

Financial development is one of the critical elements on addressing development quests of poor countries like Ethiopia. Certainly, it can play a primary role in giving directions to development interventions policies. The development strategies related with poverty and inequality reduction especially rural development strategy require financial system to support its implementation.

The finding results of the models developed in this paper provide several lessons about the role of financial development and its multidimensional impact on poverty reduction and development

policies in Ethiopia. Therefore, based on the findings of the study, the following policy recommendations were made:

- To achieve poverty alleviation target and to enhance sustainable development, the government of Ethiopia shall strongly promote inclusive financial system
- The government shall design a policy which is pro-poor and help the poor to access financial services like credit, saving and insurance which can directly reduce poverty and enhance income distribution.
- Develop a sophisticated, well-functioning and efficient financial institutions to create an equal opportunity for every class of society and entrepreneur development
- Build the a credit rating agency and capacity of financial institutions to better equip it at evaluating investment proposals (rank projects) for making financial system accessible for all and accelerate innovation and industrial development
- To enhance a fair distribution of national wealth, financial development must not be neglected as it affects human capital development, technological advancement and SMEs.
- Financial sector development in Ethiopia is under developed. Thus, the government shall strategically support this sector to expand in capacity and scale up the coverage to poor people especially rural community.
- Build quality institutional to reduce inequality by allowing the poor to access finance to invest in human and physical capital. Otherwise, weak institutions (like lack of legal protection) opens door for corruption which neither improve economic welfare nor decrease inequality due to discriminatory lending and skewed distribution of credits only to the rich
- Encourage more sophisticated financial mechanisms (like capital market, leasing, equity funds leasing) and also microfinance institutions shall be supported with mandatory policy to provide microcredit to SMEs and poor households of rural communities.
- Finally, I suggest more research in the area in the future on the impact of finance on poverty alleviation, economic welfare, human capital, innovation and entrepreneur development.

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## Appendix

**Table 4.3: Johansen tests for cointegration**

On Equation #1: vecrank GDPg Gini FD Tele PPg, trend(constant) max  
Trend: constant      Number of obs = 27      Sample: 1993 - 2019      Lags = 2

Maximum Rank	Parms	LL	eigenvalue	Trace statistic	5% Critical value
0	30	-132.22294	0	110.4201	68.52
1	39	-108.11899	0.83228	62.2122	47.21
2	46	-90.302242	0.73280	26.5787*	29.68
3	51	-81.850679	0.46530	9.6755	15.41
4	54	-77.072999	0.29806	0.1202	3.76
5	55	-77.012904	0.00444		
Maximum Rank	Parms	LL	eigenvalue	Max statistic	5% Critical value
0	30	-132.22294	0	48.2079	33.46
1	39	-108.11899	0.83228	35.6335	27.07
2	46	-90.302242	0.73280	16.9031	20.97
3	51	-81.850679	0.46530	9.5554	14.07
4	54	-77.072999	0.29806	0.1202	3.76
5	55	-77.012904	0.00444		

On Equation #2: vecrank Gini FD Infl Open GoEx HK, trend(constant) max

Maximum Rank	Parms	LL	eigenvalue	Trace statistic	5% Critical value
0	42	-168.82257	.	164.3998	94.15
1	53	-137.38192	0.90260	101.5185	68.52
2	62	-116.36932	0.78912	59.4933	47.21
3	69	-103.67065	0.60962	34.0960	29.68
4	74	-95.434111	0.45671	17.6229	15.41
5	77	-90.110958	0.32585	6.9766	3.76
6	78	-86.622655	0.22771		
Maximum Rank	Parms	LL	eigenvalue	Max statistic	5% Critical value
0	42	-168.82257	.	62.8813	39.37
1	53	-137.38192	0.90260	42.0252	33.46
2	62	-116.36932	0.78912	25.3973	27.07
3	69	-103.67065	0.60962	16.4731	20.97
4	74	-95.434111	0.45671	10.6463	14.07
5	77	-90.110958	0.32585	6.9766	3.76
6	78	-86.622655	0.22771		

On Equation #3: vecrank GDPg FD Inst GGD2, trend (constant) max

Maximum Rank	Parms	LL	eigenvalue	Max statistic	5% Critical value
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Rank					value
<b>0</b>	20	-229.56547	.	80.7880	47.21
<b>1</b>	27	-205.58448	0.83075	32.8260	29.68
<b>2</b>	32	-197.23164	0.46137	16.1203	15.41
<b>3</b>	35	-190.38416	0.39783	2.4254*	3.76
<b>4</b>	36	-189.17147	0.08591		
Maximum Rank	Parms	LL	eigenvalue	Max statistic	5% Critical value
<b>0</b>	20	-229.56547	.	47.9620	27.07
<b>1</b>	27	-205.58448	0.83075	16.7057	20.97
<b>2</b>	32	-197.23164	0.46137	13.6950	14.07
<b>3</b>	35	-190.38416	0.39783	2.4254	3.76
<b>4</b>	36	-189.17147	0.08591		

Source: Author's computation from Stata

**Table 4.5: Short Run Regression Result of the 3SLS Model**

Equation	Obs	Parms	RMSE	“R-Sq”	Chi2	P
<b>Poverty</b>	29	6	3.53e-09	1.0000	2.28e+18	0.0000
<b>Growth</b>	29	7	9.73e-08	1.0000	1.18e+17	0.0000
<b>Inequality</b>	29	5	2.009075	0.8807	227.70	0.0000

		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
<b>Poverty</b>							
	GDPg	-.0760524	1.39e-09	-5.5e+07	0.000	-.0760525	-.0760524
	Gini	.070306	4.61e-09	1.5e+07	0.000	.070306	.070306
	FD	.8426085	3.92e-09	2.2e+08	0.000	.8426085	.8426085
	Tele	-.2187417	9.24e-10	-2.4e+08	0.000	-.2187417	-.2187417
	PPg	39.54952	1.16e+07	3.4e+08	0.000	39.54952	39.54952
	e1	1	4.08e-09	2.4+08	0.000	1	1
	-Cons	-89.57426	2.98e-07	-3.0e+08	0.000	-38.19475	-38.19474
<b>Growth</b>	Gini	.9521347	2.57e-08	3.7e+07	0.000	.9521347	.9521348
	FD	.7453725	2.27e-08	3.3e+07	0.000	.7453725	.7453726
	Infl	-.2793468	2.86e-09	-9.8e+07	0.000	-.2793468	-.2793468
	Open	1.263962	1.48e-08	8.5e+07	0.000	1.263962	1.263962
	GoEx	-.9266328	3.69e-08	-2.5e+07	0.000	-.9266328	-.9266327
	HK	6.703311	1.10e-07	6.1e+07	0.000	6.70331	6.703311
	e2	1	4.09e-09	2.4e+08	0.000	1	1
	-Cons	-38.19475	1.08e-06	-3.5e+07	0.000	-38.19475	-38.19474
<b>Inequality</b>							
	GDPg	-.1718218	.0774047	-2.22	0.026	-.3235323	-.0201114
	FD	-.8657284	.098453	-8.79	0.000	-1.058693	-.672764
	Inst	-7.302711	3.021052	-2.42	0.016	-13.22386	-1.381559
	GGDP2	.0003811	.0116614	0.03	0.974	-.0224749	.0232371
	e3	-.0115952	.0141946	-0.82	0.414	-.0394162	.0162257
	Cons	40.36789	3.725613	10.84	0.000	33.06582	47.66996
Endogenous variables: Pov GDPg Gini							
Exogenous Variables: FD Tele PPg e1 Infl Open GoEx HK e2 Inst GGDP2 e3							

Source: Author’s computation from Stata