ECONOMIC GROWTH, FINANCIAL DEEPENING, INCOME DISTRIBUTION, FINANCIAL EFFICIENCY AND POVERTY LEVELS IN EAST AFRICAN COMMUNITY COUNTRIES

BY

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DECLARATION

I declare this thesis is my original work and has not been submitted to any other University or institution of higher learning for academic award purposes.

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DEDICATION

This thesis is dedicated to my beloved spouse Cecilia Nyamisa and adorable children, Patrick Mayaka, Agatha Moraa, Ursula Kemuma and Dalmatius Mageto. They bore the brunt of low and at times altogether lack of attention in the course of carrying out and documenting the research. May this thesis spur my children to work harder and attain their academic dreams. This thesis is also dedicated to my brothers and sisters for always being there for me.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	**:**	Analysis of Variance
ADB	**:**	African Development Bank
ATM	**:**	Automated Teller Machine
CBK	**:**	Central Bank of Kenya
CMA	**:**	Capital Markets Authority
DBA	**:**	Development bank of Africa
DFI	**:**	Development Finance Institution
EAC	**:**	East Africa Community
EU	**:**	European Union
FD	**:**	Financial Deepening
FGLS	**:**	Feasible Generalised Least Squares
FDI	**:**	Foreign Direct Investments
GDP	**:**	Gross Domestic Product
GEMS	**:**	Growth Enterprise Market Segment
GNI	**:**	Gross National Income
GNP	**:**	Gross National Product
HCR	**:**	Head Count Ratio
IMF	**:**	International Monetary Fund
KIHBS	**:**	Kenya Integrated Household Budget Survey
KNBS	**:**	Kenya National Bureau of Statistics
MFI	**:**	Microfinance Institution
NSE	**:**	Nairobi Securities Exchange
NBFI	**:**	Non-Bank Financial Institution
OLS	**:**	Ordinary Least Squares
PARCH	**:**	Power Auto-Regressive Condition Heteroskedastic
ROSCA	**:**	Rotating Savings and Credit Association
SACCO	**:**	Savings and Credit Cooperative Society
SSA	**:**	Sub-Saharan Africa
UNDP	**:**	United Nations Development Programme
USA	**:**	United States of America
USD	**:**	United States of America Dollar

ABSTRACT

The main objective of this study was to investigate the relationship between economic growth, financial deepening, income distribution, financial efficiency and poverty levels in East African Community countries. The specific objectives of the study included establishing the effect of economic growth on poverty levels in EAC countries; determining the effect of financial deepening on the relationship between economic growth and poverty levels in EAC countries; examining the effect of income distribution on the relationship between economic growth and poverty levels in EAC countries; examining the effect of financial efficiency on the relationship between economic growth and poverty levels in EAC countries; determining the joint effect of economic growth, financial deepening, income distribution and financial efficiency on poverty levels in EAC countries; and comparing the relationship between economic growth, financial deepening, income distribution and financial efficiency on poverty levels among EAC countries. The research design used in this study was a combination of comparative and descriptive. The financial intermediation theory, liberal theory, information asymmetry theory, public choice theory of distribution and neoclassical utility theory were the major theories that underpinned this research project. Through the course of the study, the positivism philosophy was followed. Kenya, Rwanda, Uganda, Burundi, and Tanzania were the five countries studied as part of the East African Community (EAC) study. It was necessary to collect annual data for the study's duration, which spanned from 1989 to 2018. The study made use of secondary data, which consisted primarily of annual data. Feasible Generalized Least Squares (FGLS) panel data regression models and hypotheses testing to determine whether there is a causal effect link between the various variables, inferential statistics analysis was carried out. A significant mediating effect on the relationship between economic growth and poverty levels in East African Community countries, according to the findings of the study, was also discovered. The study also discovered that income distribution has a significant mediating effect on the relationship between economic growth and poverty levels in countries of the Eastern African Community. Additionally, according to the findings of the study, financial efficiency has no statistically significant moderating effect on the relationship between economic growth and poverty levels in East African Community countries. After all was said and done, researchers discovered that the combined effect of economic growth, financial deepening, income distribution, and financial efficiency on poverty levels in the East African Community countries was statistically significant. Thus, policy recommendations and implications for the EAC countries are provided as a result of the study's results.

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Globally, the economic problem of poverty has been a source of concern for decades, as countries around the world pool their resources to combat the problem. According to theoretical studies of the factors that cause poverty, a variety of policies have been developed (Bitler and Hoynes, 2015). As a result of the financial development nexus, one of the policy areas has been the financial deepening, income distribution and financial efficiency. It has long been a source of concern for economists in both developed and developing countries to examine the relationship between economic growth, financial development, income distribution, financial efficiency, and poverty levels in their respective national economies (Sinha et al. 2017). According to Otieno (2013), a well-developed financial system tends to increase people's access to funds, whereas a poorly developed financial system, on the other hand, tends to restrict people's access to capital.

About 9.2% of the world, or 689 million people, live in extreme poverty on less than $1.90 a day. In the United States, 10.5% of the population approximately 34 million people live in poverty as of 2019 (World Bank, 2019). For an individual in the U.S., the poverty line is $12,880 a year, or about $35.28 per day. These numbers are calculated based on income and a person’s ability to meet basic needs. However, when looking beyond income to people experiencing deprivation in health, education, and living standards, 1.3 billion people in 107 developing countries are multidimensionally poor (United Nations, 2020).

The liberal theory, financial intermediation theory, information asymmetry theory, public choice theory of distribution and neoclassical utility theory are the key theories that underpin this research project. The liberal theory, first proposed by Keynes in 1936, holds that market forces have the ability to promote economic development which is considered to be an important tool in the fight against poverty. Developed by Akerlof (1970), the Financial Intermediation Theory posits that the financial system serves as a link between depositors and borrowers of funds. Investments in projects that improve the living conditions of citizens are made with the funds borrowed. In the financial intermediation industry, the information asymmetry theory proposed by Akerlof (1970) and Stiglitz and Weiss (1981) is founded on the premise that information asymmetry can result in both adverse selection and moral hazard (Obuya & Olweny, 2017). As proposed by Buchanan and Tullock (1975), the Public Choice Theory of Distribution postulates that income distribution can be useful in redistributing resources, particularly in countries with high levels of income disparity (Fiszbein et al., 2009).

The Neo-Classical Utility Theory proposed by Bentham (1994) assumes that people make the best use of their utility in the face of income constraints, which are associated with high levels of poverty in the society (Akresh et al., 2013). According to the theory, households are confronted with a wide range of consumption bundles to the point where they are forced to choose between educating their children and meeting their other responsibilities, for example. Among these are the income-generating activities that children can engage in to help their families supplement their own income. This theory (Akresh et al., 2013) proposes that people maximize their utility on the basis of income

constraints, which are associated with high levels of poverty. It can be used to explain the reasoning behind cash transfer programs in promoting consumption and encouraging accumulation of human capital (Akresh et al., 2013).

According to the findings of a research conducted by Al-Jarrahet et al. (2012) on the effects of financial deepening in the United States and the United Kingdom, the financial sector played a vital role in the economic development of both nations. While financial deepening has been attributed to higher inflation in the short run, research has shown a regulated market environment in which demand and supply forces govern the market, and as a result, financial deepening has been attributed to increased economic growth in the long term. Because of financial deepening measures such as the stock market, the potential of the two nations to depend substantially on security investments has increased. Michael Shaw (2013) agreed with the findings of the research and pointed out that the banking business in the United States contributes more to the country's economy than any other sector. This was shown by the credit crunch that occurred in 2008-2009, during which the financial crisis had an impact on financial deepening across the whole globe.

According to the findings of a research done by Apergis et al. (2007), financial depth has a beneficial impact on economic development. Theoretically, financial depth in an economy leads to an increase in the amount of money available. When financial resources are accessible in an economy, it implies that cash and cash-related resources may be accessed quickly, which is beneficial to both small and big firms. More activity in the business sector results in increased investment and savings, which in turn leads to

increased economic growth. Financial deepening in countries such as Switzerland, according to the findings of the study, has been identified as one of the reasons for the country's continued dominance as the world's most prosperous economy, with improved banking services resulting in increased money circulation in the economy, thereby stimulating economic growth.

Aside from 2012, when the East African Community (EAC) was severely affected by the effects of the global financial crisis, economies in financial and general sectors, particularly in member states of the East African Community (EAC), have been growing on average, except in 2012 (Rousseau and Wachtel, 2017). Additionally, the study discovered that, despite the fact that East Africa is a long way from having an advanced financial system, the region has the potential to grow, with a variety of economic and financial activities such as increased investment in security, a modern banking system, including internet banking, and investment in global financial markets all expected to take place.

Averaging around seven percent per year, the financial sector has experienced steady growth. The poverty rate, on the other hand, has remained high, ranging between 46 and 50 percent. Global poverty levels have decreased slightly, according to the World Bank's 2013 World Poverty Report. Jalilian and Kirkpatrick (2002), as well as Odhiambo (2015), were among the few researchers who investigated this connection. In contrast, studies of growth, finance, and poverty have not attracted much attention in this field; as

a result, the relationship between financial development and poverty reduction has not been adequately explored by research (Ncube, Anyanwu & Hausken, 2014).

1.1.1 Economic Growth

Economic growth is defined as the increase or reduction in the ability of the domestic economy to produce a given quantity of fini shed products (Hanushek, 2013). Ec onomic growth results when resources are rearranged by economic units in more valuable ways for the benefit of the economy (Popova, et al., 2016). Economic growth also describes the quantity of finished goods and services that an economy can produce within a given period, for example, one year without regard how the goods are produced. Todaro and Smith (2015) argue that growth occurs when productive potential in an economy increases, and that it is best measured by evaluating increase in national real output value over a given period of time. This means increase in the real Gross Domestic Product (meaning that it has been adjusted to take care of inflation). Van den Berg (2016) on the other hand argues that the rate of economic growth can be real terms or nominal terms where real economic growth are at base prices while nominal economic growth are at current prices. The difference between real and nominal economic growth is the adjustment in inflation (Ayres and Warr, 2010).

Economic growth can be understood as the continuous improvement of the economy. Economic growth means growth in output hence the reason discussions around it should be in quantitative terms (Haapanen and Tapio, 2016). The growth of the economy is measured as percentage increase or reduction on the money value of final services and

goods produced within a country during a year. This measure is commonly referred to as Gross Domestic Product (Rose, 1965). Studies by Iram and Nishat (2009) consider economic growth to be the health indicators of an economy. They claim that capital is a major component in maintaining and enhancing growth momentum.

As a result of economic development and growth, social progress is determined, which is the progressive evolution of society that involves an improvement in the human condition, a step higher on the scale of the human being's standard of living as a result of economic development and growth (Charfeddine & Mrabet 2017). The emphasis placed on the social aspects of economic development should not be interpreted as a rejection of economic growth as a whole (McClelland, 2019). The economic achievements lay the groundwork for the improvement of the standard of living, the provision of adequate medical care, the improvement of the educational system, and a more equitable redistribution of incomes throughout society. As a result, economic growth continues to be a top priority, while the correlation of economic problems with social problems should lead to the development of any national economic system, particularly when structural crises demonstrate that the system's limits are about to be exceeded (Popkova 2019).

A set of eight goals with phases and deadlines were adopted by the General Assembly of the United Nations in September 2000, also known as the Millennium Summit, after an analysis of the current state of human development taking into account all of its diverse aspects. According to Popkova (2019) the diversified approach to the broad topic of this process allows for the examination of a number of aspects that are alarmingly intense and

dramatic in various countries and regions. Extreme poverty, illiteracy, a lack of utilities, particularly access to running water, as well as environmental pollution were among the issues discussed.

Economic and social vulnerability is a flaw in the world's political and economic structure that the world's power centres would not hesitate to exploit. Nonetheless, the distinction between the two phenomena under consideration is clear. Even if we continue to refer to them as a pair in theory, there is a significant disconnect between them in practice. The goal of developing countries is to catch up with the developed countries in terms of technology (Haapanen & Tapio, 2016). Obviously, in terms of material wealth. People lose sight of the importance of education and solidarity when they are preoccupied with their own material wealth. This is done more or less deliberately. The pursuit of wealth leaves no time for anything else but ignorance, which is the source of all bad decisions. The mechanism is functional (McClelland, 2019). A number of countries have accepted to be manipulated, to grow at the expense of developing, as a result of the illusion of globalization and a desire to "sit with the rich." According to this scenario, the current economic-social situation arose.

Economic growth is a way to determine the well-being of economic units in a country; as such, it is an economic development aspect. Growth Rate of a country’s economy can improve or shrink hence becoming either positive or negative (Haapanen & Tapio, 2016). Growth in an economy is negative if the economy is contracting and positive if the

economy is expanding in terms of productivity. Net National Product (NNP) is another measure of economic growth (Mathias, 2013) that enables multiple nations comparisons as it is usually cited in a single currency, usually USD (Burda and Wyplosz, 2013). Additionally, when comparing countries of various population sizes, the per capita figure is usually cited. To make up for changes in the value of money, the GDP or GNP is usually stated in real terms that have been adjusted for inflation or deflation (Ayres and Warr, 2010). The study adopted real GDP to measure the rate of economic growth within EAC countries.

1.1.2 Financial Deepening

Financial deepening refers to an increase in the ratio of a country's financial assets to its GDP. Thus, financial asset accumulation simultaneously provides credit to finance real asset accumulation for the development process of any given country (Rachmawati, et. al., 2021). Additionally, it may describe a situation of wider option of financial services and improved access to financial services among different socioeconomic groups in an economy (Cole, Sampson & Zia, 2011). Shaw (1973) claims that the term is used by economists to depict increase in provision of financial services, particularly in terms of the number of choices and access that people in different socioeconomic groups have in an economy (Rousseau & Wachtel, 2011). One salient element of financial deepening is its ability to accelerate economic growth through the extension of access to financial services to economic units without adequate access to finances. Typically, in a situation of financial system that is underdeveloped, the economic units can only improve access to financial services via the process of relationship banking (Nzotta and Okereke, 2009).

In addition, economic units finances growth of undertakings by generating resources internally and depending less on external funding (Goswami & Sharma, 2011; Obuya & Olweny, 2017).

Consequently, financial deepening mean that agents and sectors are in a position to utilize money and capital markets for the purpose of investment and savings, including access to capital and money market assets like loans, insurance policies, government bonds and treasury bills (Ho & Odhiambo, 2011). Financial markets and intermediaries are in a position of advantage to make available larger volumes of capital base and manage larger turnover without necessarily causing a reciprocal volatility in asset prices (Uddin et al., 2014). Further, in a deep financial sector, financial institutions are able to make available a broader array of assets for hedging or diversification of risks in the process of risk sharing or transfer. Deep financial markets enable savers and investors to allocate excess funds using a broader array of risk sharing instruments and quality investment. According to Goswami and Sharma (2011), this allows borrowers to tap a wide array of risk management and financing instruments.

Financial deepening provides crucial firmness benefits to the economy through improved volumes of transactions, enabling the process of intermediation of capital flows into or out of the financial system with minimal swings in exchange rates and asset prices (Imran and Khalil, 2012). Financial deepening also has the ability to remove over reliance on foreign savings and debts eventually easing the problem of balance sheet imbalance in inflows and outflows by improving the ability of a country to generate funds in domestic

currencies and at longer maturities (Rousseau & Wachtel, 2011). Scholars and researchers generally agree that one of the methods of measuring financial depth is credit to private sector (Odhiambo, 2015); hence, the study adopted credit to private sector as a proxy for financial deepening in the banking sector of the EAC countries.

Excessive financial deepening or an excessively quick expansion of credit may have resulted in inflation as well as the weakening of banking systems, which in turn resulted in the emergence of growth-inhibiting financial crises (Olawumi et al, 2017). Additionally, extensive financial liberalizations in the late 1980s and early 1990s in nations lacking the legal or regulatory infrastructure to capitalize on financial development may have contributed to excessive financial depth (Olawumi et al, 2017). We find scant evidence, on the other hand, that financial liberalizations played a significant direct role in lowering the impact of finance. Also, there is little indication that the expansion of equity markets in recent years has substituted for debt financing or resulted in a diminished role for financial depth in terms of economic development (Olawumi et al, 2017).

Deepening the financial system is a multi-faceted process that involves the interplay of a large number of markets, financial instruments, and stakeholder organizations (Adetunji et al, 2018). Recent theoretical studies indicate that the financial sector is becoming increasingly important in understanding economic growth. It also believes that a strong financial sector and a reduced risk of financial crises will lead to better levels of economic growth.

When it comes to the theoretical linkage between financial deepening and economic growth, it is asserted that a well-developed financial system performs several critical functions to increase the efficiency of intermediation by reducing the cost of information transmission, transaction processing, and monitoring (Adetunji et al, 2018). A contemporary financial system encourages investment by identifying profitable business possibilities; it mobilizes funds; it facilitates trading; and it allows for risk diversification (Adetunji et al, 2018).

The "supply leading hypothesis" and the "demand leading hypothesis" are two primary competing ideas that demonstrate the relationship between financial development and economic growth (Thomi & Mose, 2021). Many researchers have concentrated their efforts on these two primary competing ideas, which are referred to as "supply leading hypothesis" and "demand leading hypothesis." The supply side hypothesis posits that there is a one-way relationship between financial deepening and economic expansion, and it is also known as the supply side theory (Thomi & Mose, 2021). Alternatively, the demand-side hypothesis asserts that the path of causality runs from economic expansion to financial deepening, and vice versa (Kirikkaleli 2019; Thomi & Mose, 2021).

An increase in the availability of financial resources can assist households and businesses in meeting their financial obligations, such as saving for retirement and making educational investments (Kirikkaleli 2019). It can also assist them in capitalizing on new

economic opportunities while also dealing with unforeseen catastrophes such as natural disasters, among other things. As a result, financial deepening, followed by the development of more inclusive financial systems, can contribute to the reduction of income inequality while also improving the allocation of resources available (Kirikkaleli 2019). Though theoretically possible in the early stages of growth, financial advancement may initially benefit just a small number of wealthy individuals, with the advantages becoming more widely dispersed as economies mature. Many studies have revealed that financial expansion, as measured by the relative participation of the banking and stock market sectors in the economy, has the greatest impact on top earnings during the early stages of a country's development, particularly in developing countries (Kirikkaleli 2019). As a result, inequality can grow as those with greater incomes and assets have a disproportionately larger share of access to finance, which can serve to further enhance the skill premium for those with more resources and, potentially, the return on capital for those with less (Thomi & Mose, 2021).

An increase in the availability of financial resources can assist households and businesses in meeting their financial obligations, such as saving for retirement and making educational investments. It can also assist them in capitalizing on new commercial ventures while also dealing with unforeseen events such as natural disasters, among other things. As a result, financial deepening, followed by the development of more inclusive financial systems, can contribute to the reduction of income inequality while also improving the allocation of resources available (Adetunji et al, 2018). Though theoretically possible in the early stages of development, financial progress may initially

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According to Dabla-Norris et al (2015) an increase in the availability of financial resources can assist households and businesses in meeting their financial obligations, such as saving for retirement and making educational investments (Olawumi et al, 2017). It can also assist them in capitalizing on new commercial ventures while also dealing with unforeseen events such as natural disasters, among other things (Olawumi et al, 2017). As a result, financial deepening, followed by the development of more inclusive financial systems, can contribute to the reduction of income inequality while also improving the allocation of resources available. Though theoretically possible in the early stages of development, financial progress may initially benefit only a small number of wealthy individuals, with the benefits becoming more widely distributed as economies mature (Olawumi et al, 2017).

Sackey and Nkurumah (2012) described financial deepening as a process that entails growing the provision of financial services via the provision of financial resources to the economy, as opposed to just increasing the supply of financial services. Amounts of genuine money available in large amounts in the economy are referred to as money circulation, with the goal of increasing efficiency in numerous activities that contribute to economic growth and development. According to the findings of a research done by Rahman and Mustafa (2015), financial deepening adds to the accessibility of goods and other commodities in the economy by increasing their availability. The survey also discovered that a wide range of stakeholders, including financial institutions, capital markets, money markets, investors, central banks, and brokers, are among the most important participants in financial deepening activities, according to the findings of the study.

According to Nguena and Abimbola (2013), financial deepening entails a number of steps that must be completed. Increasing the level of money circulation in the economy through mechanisms such as retail sales, small-scale businesses, mobile money transfers among individuals, and the normal purchase of fast-moving consumer goods, as well as borrowing and lending money from family and friends, is the primary approach to financial deepening.

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In the early stages of development, financial progress may initially benefit only the wealthy, with the benefits becoming more widely distributed as economies mature and become more developed. Many studies have discovered that financial growth, as measured by the relative participation of the banking and stock market sectors in the economy, has the greatest impact on top incomes during the early stages of a country's development, particularly in developing countries (Kirikkaleli, 2019). As a result, inequality can grow as people with higher incomes and assets have a disproportionately

larger share of access to finance, which can serve to further boost the skill premium for those with more resources and, potentially, the return on capital for those with less.

Financial deepening has been found to act as a catalyst for rapid economic growth as it accelerates the levels of investment in an economy. Deep financial markets ensure that all financial resources in an economy are put in useful use as opposed to markets with low depth which means that some resources are stored outside the formal financial system thus making it difficult to account for them (FSDK, 2011). Financial deepening has before been measured using several indicators including market capitalisation, private sector credit and broad money (Sackey & Nkrumah, 2012). This model of measuring financial deepening has been adopted by various scholars including Onwomene, Ibe, Ozoh and Mounanu (2012) and Alrabadi and Kharabsheh (2015).

1.1.3 Income Distribution

Income distribution is the equality or smoothness by which income is shared among individuals and groups within a country (Asimakopulos, 2012). In their book, Todaro and Smith (2015) explain income distribution as the manner in which total GDP of a country is distributed among the members of the public. To date, income together with its distribution has been a major concern in the development of economic policies and theories (Choong, 2012). If everybody within a country earns an equal amount of income, at that point the income distribution is said to be perfectly achieved. Income inequality implies that one fragment of the populace has an excessively expensive share

of income contrasted with different portions of that populace (Atkinson and Bourguignon, 2017).

A further point of view expressed by Ghildital, Pokhriyal & Mohan (2015), financial deepening and economic development, is that financial institutions are critical components of economic growth. Financial institutions are tasked with the role of overseeing both the surplus and deficit spending units in their respective countries.

The income distribution emerges from individuals' choices about savings, work and investment as they cooperate through business sectors and are influenced by the system of tax in a country (Odhiambo, 2015). Disparities in income distribution result from training, background, family structure, regressive tax system, capability, aptitudes and capacities mutilation in factor costs (Bitler and Hoynes, 2015). Inequality is an imperative issue in financial improvement as it can ruin monetary development and result in social unrest instability in the country.

There are a number of measures that have been advanced by economists to quantify income inequality. However, due to challenges with most of the methods, the Gini coefficient named after Corrado Gini (1912) is the most used method (Sinha, et al., 2017). The Gini coefficient is determined by dividing the area under A by the sum area between A and B. When income is distributed uniformly, the line that defines total equality and the Lorenz curve merges. In such a case, the Gini coefficient is zero (Gini, 1912).

The Gini coefficient values are finite and ranges from 0 to 1, where a value of 0 signifies perfect equality in income distribution where all economic units receive the same level of income while value of 1 signifies perfect inequality in income distribution such that all income in a country is earned by one person (Hood and Waters, 2017). The value of 0 and 1 are extreme that exist in theory but not in economics. In reality, the value of GINI coefficient, in the majority of the nations range from about 0.3 to 0.7. For most developed countries, the GINI coefficient is about 0.3 while for developing countries the GINI coefficient is about 0.7 for most countries (Thurow and Lucas, 2017). The study adopted GINI coefficient as the proxy for income distribution in the EAC countries.

1.1.4 Financial Efficiency

Efficiency is a term used to describe minimization of wastages and improving output/input ratio (Choong, 2012). Financial Efficiency describes the capability of financial markets to provide high quality financial products at minimal cost. The terms financial efficiency and competition in the money, and capital markets are two concepts that are related in that more competitive systems are usually efficient too (Permana and Andjani, 2014). Kanghwa (2010) stated that a quantitative proxy of efficiency that help in evaluation of efficiency of financial system is the total cost of financial intermediation to total assets ratio (Iwasaki and Tokunaga, 2014). Elements of cost of financial intermediation include cost of operations, loan loss provision, taxes, net profits and other intermediation costs (Próchniak, 2011).

Gohou and Soumaré (2012) argued that financial efficiency in capital markets refers to a situation where spot prices of financial assets reflect fully available market intelligence. Therefore, in a financial system which is efficient, daily variations of market prices of financial assets is random and information possessed by investors on past prices may not aid in forecasting future price movements in the market (Bazot, 2017). The bid and ask spread which is the bargain price for financial assets is where the lowest price represents the price at which a dealer may be willing to buy financial assets and the highest price the one he/she might be willing to sell a financial asset. Markets that are more efficient tends to exhibit narrower bid-ask spreads (Bazot, 2017).

Financial markets are expected to contribute to the efficient allocation of available resources, which can have a positive impact on economic growth (Bazot, 2017). Financial depth mobilizes and pools savings, and financial depth is expected to contribute to the efficient allocation of available resources. As a result, it not only promotes capital accumulation, but it also contributes to more efficient resource allocation throughout the economy. This is accomplished through the application of economies of scale and the elimination of investment indivisibilities. Financial markets encourage specialization while simultaneously lowering transaction costs, resulting in productivity gains that translate into higher economic growth (Choong, 2012). As a result of their ability to convert liquid financial assets (which are desired by savers) into long-term capital investments, financial institutions also help to reduce the risk of liquidity (Bazot, 2017). Furthermore, financial markets modernize the costs of information about investment opportunities and, as a result, enhance the efficiency with which capital is allocated.

Financial intermediaries that operate efficiently improve the monitoring of investment activities and the overall quality of corporate governance in their respective industries (Permana & Andjani, 2014). Market frictions, such as high transaction costs and information asymmetries, may prevent diffused shareholders from exercising adequate control over the management of their companies. The problem of corporate governance can be alleviated by ensuring that financial arrangements operate as smoothly as they possibly can. In general, the mechanisms outlined above suggest that financial development should have a significant positive impact on economic growth because it encourages capital formation.

The development of the financial sector has no negative relationship with economic growth. The improvement of institutions is a critical factor in growth, but it is not sufficient to ensure that the development of the banking sector contributes positively to growth (Permana & Andjani, 2014). However, by introducing a relationship between market capitalization and the quality of institutions, the impact of stock market capitalization and turnover becomes more positive and significant than it was previously. However, improving the efficiency of the banking sector alone will not be sufficient to spur growth in east African countries; additional conditions, such as higher-quality institutions, regulations, and supervision, must be in place as part of the package. Financial development is thus considered to be the accumulation of financial assets at a faster rate than the accumulation of non-financial assets over a period of time (Bazot, 2017).

Proxies of volatility of financial assets price may also be adapted to measure market efficiency. However, variability of prices in the short-run may just reflect shifts in the liquidity amounts in the specific capital market (Zhang and Daly, 2011). There are two important elements of financial market liquidity that ought to be taken into consideration; that is market tightness and market depth (Pradhan, et al., 2013). Market depth describes the capability of the financial market to take up large trade volumes in assets with minimal impact on market prices of the same financial assets (Bazot, 2017). The second dimension of market liquidity is market tightness that is the capability of the capital market to match demand of financial assets against supply of the same at minimal possible cost (Cojocaru, et al., 2016). The proxy for market tightness may be the average of the difference between bids and ask prices (Bazot, 2017). The study adopted cost to income ratio as the proxy for financial efficiency of the banking sector in the EAC countries.

1.1.5 Poverty Levels

Poverty is a human condition that is characterized by long term lack of service and inability to get adequate capabilities, choices, resources, security and power required by any human beings to enable them enjoy a specified and adequate standard of living as well as other economic, political, cultural, civil and social rights (Hulme, 2015). Poverty can also be described as the lack of a given quantity of material possessions such as money. The concept and condition of Poverty is multifaceted including economic, social and political element (Fosu, 2017). The term absolute poverty describes the inadequate

access to means of satisfying basic needs, which include shelter, clothing and food (Baulch, 2011). This is uniform worldwide regardless of where one lives geographically or the era one lives in. Atkinson (2019) defines poverty as deprivation of well-being whereas (Chetty et al., 2017) claim that it has many dimensions because it includes incapability to get basic goods and services that are necessary for human survival and low income among other things.

Relative poverty is said to occur to a person residing in a given country who has no enjoyment of a set minimum level of standard of living in comparison to other members of the rest of the population of the same country (Sané, 2016). The government strategies for increasing per capita income and making basic goods of life affordable typically includes economic freedom, welfare and provision of financial services to the economic units within an economy (Kamruzzaman, 2014). The comprehension of poverty as a form of deprivation of economic units of their capabilities and rights may include conditions and situations such as undernourishment, low income, premature mortality, illiteracy, social stigmatization and low self-esteem. The capability approach of viewing the concept and condition of poverty allows some situations that are relative to be viewed as absolute (Sané, 2011). Most of the populace in third world countries especially in Africa are languishing in poverty with the majority of the inhabitants living in abject poverty. Over the last three decades, worldwide poverty levels have fallen significantly from above 40% to under 20%, but the poverty levels in African countries have almost remained the same in the same period. Over 40% of people who live in the sub-Saharan Africa live in abject poverty (Anyanwu, 2013).

Poverty's impact on education in East Africa remains one of the most pressing issues, compounded by major structural issues such as a shortage (if not complete lack) of job possibilities for school and university graduates. One of the reasons we concentrate on developing cheap, high-quality homes is because of this (Banks, 2016). This not only benefits the health of entire families and communities (by increasing school attendance and decreasing dropout rates), but it also provides a safe environment for youngsters to complete their homework (adequate lighting, no leaks or even floods). Despite advances over the last decade, 67 million children around the world, over 53 percent of whom are females, lack access to basic education. If current trends continue, only 4 out of 10 children of school age (1.4 billion children) in low- and middle-income countries will be on track to obtain basic secondary-level skills by 2030, according to the Education Commission. The goal of investing in job-creating SME's is to provide appealing post-education prospects for young people, which will help to establish a virtuous cycle of advancement in the future (Guo & Wang, 2021).

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Economic growth is the most effective tool for decreasing poverty and raising living standards in emerging countries. Both cross-country research and country case studies show that rapid and sustained growth is essential for achieving the Sustainable Development Goals – and not just the first objective of lowering the worldwide share of people living on less than $1 per day. Growth has the potential to create virtuous spirals of wealth and opportunity. Strong economic growth and job prospects encourage parents to invest in their children's education by enrolling them in school (Cooke, Hague & McKay, 2016). This might lead to the creation of a powerful and rising group of entrepreneurs, putting pressure on the government to reform governance. As a result, strong economic growth fosters human development, which in turn fosters economic growth. However, identical rates of growth can have quite different consequences on poverty, impoverished people's employment chances, and broader metrics of human development depending on the circumstances.

The degree to which the poor participate in the economic process and share in its benefits determines the amount to which growth eliminates poverty. As a result, both the rate and pattern of growth are important in eliminating poverty. A comprehensive poverty reduction strategy must include efforts to encourage rapid and sustained economic growth as a major component. The policy issue is to integrate growth-promoting policies with policies that allow the poor to fully participate in the possibilities that have been created and thereby contribute to growth. This includes measures aimed at improving labor markets, reducing gender disparities, and increasing financial inclusion. Asian countries are progressively addressing the 'inclusive growth' agenda. The two main goals of India's most recent development plan are to increase economic growth and make it more inclusive, a policy that is being replicated across South Asia and Africa. Future growth will have to be built on a more globalised environment, which brings with it new opportunities as well as new challenges (Prima, 2020). New technologies provide not only 'catch-up' but also 'leapfrogging' opportunities.

Both the production and service industries have stronger possibilities thanks to new research. Future expansion will also have to be environmentally friendly. Water and other natural resources must be better managed, and both industrialized and developing countries must progress toward low-carbon technologies. Growth and environmental sustainability can be considered as complements, not substitutes, with the right institutions in place. DFID will aim to promote inclusive growth through a variety of initiatives and will continue to invest extensively in health and education, which have a significant impact on poor people's capacity to participate in economic opportunities. To

enhance policy, more and better research on the determinants of growth will be required. But, in the end, a country's leadership, policies, and institutions will be the most important factors of progress (Barford, Coombe & Proefke, 2021).

There are a number of proxies that have been adopted in the literature to measure poverty. One of a leading measure of poverty is head count ratio measure. The head count ratio has been defined as the percentage of the total population whose earning is below the poverty line. Given that time series data on poverty is incomplete for most countries, scholars have tended to estimate annual poverty headcount ratio-based poverty changes decomposition that is based on the general concept that the leading cause of changes in poverty in the long run is economic growth and income distribution (Mwabu et al., 2003, Ali and Thorbecke, 2000). Another measure that has been adopted by some studies is per capita consumption of the country. However, the per capita consumption measure has been blamed for various weaknesses including the fact that it is a general measure of welfare and not poverty specifically. The study therefore adopted head count ratio as the proxy for poverty levels in EAC countries.

1.1.6 East African Community Countries

The EAC countries are composed of countries in the eastern region of the African continent. They include Tanzania, Kenya, Uganda, Rwanda, Burundi and South Sudan. Growth in EAC Countries has for a long time been driven by developments in agriculture, which forms the basis of the larger percentage of their GDP. Accordingly,

agriculture has for a long time played a leading role in the majority of these countries. In 2017, it contributed about 41 percent of the region's average growth in actual GDP. Back in 2014, the GNI per capita for Burundi was $270, for Uganda it was $670, for Kenya it was $1290, for Tanzania it was $ 920 whereas for Rwanda it was $700.

Accordingly, between 2005 and 2014, it rose by 10.2 percent in Burundi, 23.7 percent in Kenya, 54.3 percent in Rwanda, 33.2 percent in Tanzania and 35.6 percent in Uganda (World Bank, 2017)." The report by Financial Sector Development Program, established that enhanced financial deepening in East Africa, has reduced poverty levels through funding financial markets that are inclusive, efficient and robust (Aduda, Chogii and Murayi, 2014). A report by the World Bank (2019), while analysing of financial deepening in EAC Countries established that the Countries are far from achieving advanced financial systems. However, the potential for growth in EAC has been witnessed with various economic and financial activities expected to be realised such as increased investment in security, modern banking system including internet banking and investment in global financial markets.

The adoption of 2030 agenda for sustainable development has to date drawn substantial attention to income inequality in sub-Saharan Africa (SSA) in general and EAC regional blocks in particular (World Bank, 2019). The Africa's regional UNDP feels that African nations need to understand that the more they address inequality as a challenge, the more they move towards achieving sustainable development. Even though the SSA's un-weighted, Gini reduced by 3.4 per cent between 1991 and 2011, SSA remains with a high

level of income inequality (World Bank, 2019). In addition, twelve countries, largely in East and South Africa economies recorded the increase in inequality. In East Africa, for instance, about 20% of the population controls almost half of national income whereas 20% of those at the bottom control about 5% of national income (ADB, 2017).

Even though Africa has experienced economic growth since 2003, the continent still has high levels of poverty because almost half of the population earns below $1.25 per day. This challenge is even more prevalent in EAC Countries community because effort geared towards reducing income disparity is minimal (World Bank, 2019). Over the last three decades, worldwide poverty levels have fallen greatly from 40% to under 20 %, but the poverty levels in African countries have almost remained the same in the same period under review. Over 40% of the people who live in the Sub-Saharan Africa live in abject poverty (Anyanwu, 2013). Various policies to combat poverty have been introduced in most EAC countries for instance Kenya introduced the National Poverty Eradication Plan (1999-2005). Under this program, the government hoped to eradicate poverty by 2015 (Aduda, Chogii & Murayi, 2014).

1.2 Research Problem

Concern has been expressed by academics in both developed and developing countries over the relationship between economic growth, financial deepening, income distribution, financial efficiency and poverty levels (Sinha et. al., 2017). No one can deny that economic growth, financial deepening, income distribution and financial efficiency are all important factors in addressing poverty in both developed and developing countries. A

significant relationship between financial deepening, income distribution and poverty levels was demonstrated by Singh and Huang (2015) in their study. Due to the fact that an expanding economy generates sufficient income for all citizens, regardless of their income status, economic growth is the single most important determinant of poverty reduction. According to Otieno (2013), a developed financial system has the tendency to increase people's access to funds and their ability to improve their living standards, resulting in low poverty rates in developed countries. Through economic growth, financial deepening can assist in improving the living conditions of the poor by improving the conditions of the communities where the less fortunate reside (Ravallion &Datt, 2012). For economic growth and poverty reduction, bank efficiency has a significant impact on the cost efficiency of the financial sector. Financial efficiency is defined as the provision of affordable financial services to the poor masses in order to improve their living standards (Hasan, Koetter, Lensink, & Meesters, 2004). As a key component of poverty alleviation, income distribution is also critical. It is important to have equitable income distribution so that the income generated through economic growth is distributed to all economic units that participated in the country's income earning, including the poor masses (Gakuru & Mathenge, 2012).

Over the course of several decades, the EAC countries have implemented significant political, structural and economic reforms that have been motivated by political gain and social advancement. Most of these reforms however, are still confronted with difficulties stemming from persistent poverty and high levels of inequality. When it comes to regional integration, the EAC is ambitious and some progress has been made in the

implementation of both the Customs Union and the Common Market. However, there are significant non-tariff barriers to integration as well as perforation of the common external tariff and constraints to poverty alleviation which continue to be obstacles to growth. Apart from that, the regional economy has historically been susceptible to both external and internal shocks. Accordingly, despite the economic growth that has been observed over the years, the region is confronted with the challenge of maintaining this growth over the long term (World Bank, 2017). Once again in 2017, East Africa's robust economic growth has not been met by an equally significant and significant reduction in poverty and inequality. Consequently, the region continues to be characterized by high levels of poverty, inequality, and unemployment as of the year 2020. Burundi and Rwanda are among the poorest countries in the region, with rates of poverty exceeding 90% in both countries (Rwigema,2021). According to World Bank data, the majority of the population in these countries lives in poverty, with the poverty headcount for the East African Community ($1.90 per day) standing at approximately 33.6 percent of Kenya's population, 52.7 percent of Tanzania's population, 34.6 percent of Uganda's population, 60.4 percent of Rwanda's population, and 77.7 percent of Burundi's population(World Bank, 2017). Clearly, the majority of the EAC population is subsisting on less than USD 2 per day, as evidenced by the data presented above.

Globally, in developed countries, empirical studies have been carried out. Using data from Singh and Huang (2015), they demonstrated that there was a significant relationship between financial deepening, poverty rates, and income inequality. But Singh and Huang (2015) discovered that the financial deepening process can exacerbate income inequality,

resulting in higher levels of poverty. This is in direct opposition to the finance-poverty nexus hypothesis. Despite this, the authors concentrated their attention on the direct effects of financial deepening on poverty rather than the indirect effects of financial deepening on economic development. In 2008, Hasana and colleagues discovered that financial efficiency and financial deepening had a statistically significant impact on economic growth; however, the study found no link between financial efficiency and financial deepening and poverty. Furthermore, because the research was conducted in developed countries, it is possible that the findings will not be applicable to the EAC. Abosedra, Shahbaz, and Nawaz (2016) investigated the relationship between poverty eradication and the development of the Egyptian financial sector. According to the findings, financial development has a positive effect on poverty rates. Because the research conducted by Abosedra, Shahbaz, and Nawaz (2016) took place in Egypt, which has a distinct economic environment from the EAC countries, the findings may not be applicable for policy recommendations in the EAC countries. The study also concentrated on the direct effects of financial deepening on poverty, while neglecting the indirect effects of financial deepening on poverty.

Additionally, in the EAC countries there are local studies that can be found. According to a study conducted by Waiyaki (2013), financial deepening was responsible for the reduction of poverty in the country of Nairobi. Waiyaki's (2013) study, on the other hand, is focused solely on Kenya and, as a result of country-specific considerations, it may not be readily applicable to all other countries in the EAC. The study also did not include income inequality, which is postulated in the growth-poverty theory which states that

poverty plays a moderating role in the growth-poverty nexus, as a mediating variable. Kenyan poverty levels are decreasing according to Odhiambo (2015) who discovers a specific causal stream linking financial development to poverty reduction. On the other hand, Odhiambo (2015) found mixed results in terms of the direction of causation between poverty and financial deepening when different proxies of financial deepening were used, which could be misleading. It should also be noted that the study was limited to Kenya, and as a result, the findings may not be readily applicable in all five EAC member countries because the economies of the countries are not comparable. Gakuru and Mathenge (2012) investigated the extent to which income inequality exists, as well as the role that policies aimed at reducing income inequality play in alleviating poverty. Since urban family units own the majority of the factors of production in Kenya, the findings demonstrated that, due to the country's high-income disparity, stimulating development in rural and manufacturing areas of the country was more advantageous to them. Although the findings of the study by Gakuru & Mathenge (2012) are limited to Kenya, the study also overlooked an indirect effect of income inequality on poverty, namely that income inequality mediates an association between economic growth and measures aimed at alleviating poverty (Gakuru & Mathenge 2012).

There is a lack of evidence on the linkages between economic growth, income distribution, financial deepening and poverty in the EAC from World Bank reports. There is some evidence on the impact of trade flows – and even there, the picture is mixed, but there is an almost complete absence of work on the link between economic growth, income distribution, financial deepening and of what is actually implemented as far as

poverty reduction is concerned. Discussion Paper No. 202 www.ecdpm.org/dp202 viii Standard measures of poverty such as the poverty line or the poverty gap focus on monetary (typically income based) measures. The literature on multidimensional poverty stresses the importance of nonmonetary measures of deprivation – such as access to health, education, housing, sanitation, electricity, as well as the absence of uncertainty and conflict.

Therefore, this study attempted to fill in a number of knowledge gaps that had previously been identified. In the first place, most studies that examine the effects of economic growth on poverty reduction in the East African Community (EAC) region are focused on specific nations. Pérez-Moreno and Weinhold (2012) found that they had limited applicability in the context of the EAC countries as a whole (Kakwani and Son, 2016), Keho (2017), and Williams, Adegoke and Dare (2017) found that they had limited applicability in the context of EAC countries as a whole. In addition, the vast majority of studies have overlooked the mediating effects of financial deepening and income distribution on the association between economic growth and poverty, which runs counter to the growth-finance-poverty nexus literature on the subject (Singh and Huang, 2015; Gries, Kraft and Meierrieks, 2009; Nzotta and Okereke, 2009). Three-fold, the majority of studies on the relationship between economic growth and poverty have neglected to take into account the moderating effect of financial efficiency on poverty (Hasana,et al., 2008; Ferreira, 2012). In this regard, the study sought to answer the question, what is the relationship between economic growth, financial deepening, income distribution, financial efficiency and poverty levels in the EAC countries?

1.3 Research Objectives

The general objective was to identify the relationship between Economic growth, financial deepening, income distribution, financial efficiency and poverty levels in EAC countries. Specific research objectives were:

i. To establish the effect of economic growth on poverty levels in EAC countries.
ii. To determine the effect of financial deepening on the relationship between economic growth and poverty levels in EAC countries.
iii. To examine the effect of income distribution on the relationship between economic growth and poverty levels in the EAC countries.
iv. To examine the effect of financial efficiency on the relationship between economic growth and poverty levels in the EAC countries.
v. To determine the joint effect of economic growth, financial deepening, income distribution and financial efficiency on poverty levels in EAC countries.

1.4 Value of the Study

The findings of the study will be significant to theory development, policy and practice. The current study will make significant contributions to the theory of Finance in general. It will specifically contribute knowledge to the link between economic growth, financial deepening, financial efficiency, Income distribution and poverty levels. The review provides a theoretical understanding of the nexus of finance and poverty by critically analyzing both theoretical and empirical relationships between three components of financial development and poverty. Researchers and academicians who wish to conduct

further studies in economic growth, financial deepening, financial efficiency, income distribution and poverty can use this study to gain further insights into their areas of interest. The study will therefore extend the boundary of literature on the long-held discussions on the nexus of finance and poverty.

The study is also very critical for policy makers at the national and international level. Government officials and financial sector regulators will find the current study very insightful in formulating policies related to financial deepening and efficiency. This knowledge will promote the growth of the financial sector in the region and beyond. The study will focus on making these people appreciate the critical role they play in promoting financial deepening through decision-making processes and their overall impact on poverty eradication. The financial market regulators globally may formulate financial regulatory policies based on the findings of the current study on the relationship existing between economic growth, financial deepening, income distribution, financial efficiency and poverty levels in EAC countries.

The study will also be important to practitioners in finance and economic development. Investment firms and individual investors will find the study informative especially in making decisions relating to investment portfolios within capital markets. Furthermore, the study will enable governments, especially those from developing countries develop a vision of transforming their underdeveloped economies into industrial economies. This will help them appreciate the critical role that financial sector plays in promoting economic development.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter discusses the literature review by examining theoretical and empirical literature showing the relationship between economic growth, financial deepening, income distribution, financial efficiency, and poverty levels with the view of identifying the gaps in the literature.

2.2 Theoretical Foundations

The section discusses the major theoretical underpinnings in the relationship between economic growth, financial deepening, income distribution, financial efficiency, and poverty levels. International attention has been drawn to the link between financial depth and economic development, which has attracted the attention of both economic experts and policymakers from across the world. Schumpeter (1911) is considered to be one of the first researchers to explore the relationship between financial depth and economic expansion.

The thesis was that the services provided by monetary institutions, such as the mobilization of savings, project appraisal, risk management, and transaction facilitation, are essential components in the advancement of financial technology and, subsequently, the expansion of economic development. The economist Joseph Schumpeter (1911) believes that financial institutions are critical components of economic development because they provide credit facilities to the private sector. The current study relied on financial intermediation theory which is the anchoring the theory, liberal theory,

information asymmetry theory, the public choice theory of distribution and The Neo Classical Utility Theory. It is for this reason we discuss those theoretical orientations in the following sections.

2.2.1 Financial Intermediation Theory

The financial intermediation theory as advanced by Akerlof (1970) postulates that the financial intermediation process includes economic units with surplus funds deposited with financial institutions who in turn lend the same funds to economic units with deficit funds. Leland and Pyle (1977) together with Bisignano (1998) noted that institutions and individuals providing financial intermediation services could be differentiated while employing four criteria that includes: their major categories of liabilities and deposits by surplus economic units are specified for a fixed sum of money not in any way associated with performance of their portfolio, the kind of financial intermediaries whose deposits (liabilities) are typically short-term in nature compared to their assets and those having most of their liabilities dominated by checking deposits hence depositors can access their funds on demand. Finally, those intermediaries whose liabilities and assets are normally not transferable easily.

Generally, financial intermediaries exist in the financial markets because of the very nature of market imperfections concerning surplus units and deficit units. In a 'perfect' financial market condition where there are no information and transaction costs, financial intermediaries would not exist since they would be serving no purpose. In reality, most financial markets are characterized by information asymmetry hence there exist

differences in access to market information between buyers and sellers of financial products. Financial markets have pronounced and elevated levels of information asymmetries that make it crucial that intermediaries should exist to bridge the gap in information and make flow of finances within an economic system practicable (Leland and Pyle, 1977; Obuya and Olweny,2017).

The theory underpins the current study by examining the contributions of financial intermediation to financial deepening and efficiency. Financial intermediation ensures that those with excess funds are connected with those who need finances to start business ventures. The purpose of financial intermediation is to reduce the intermediation cost hence efficiency in the financial system. However, the theory has some limitations in regards to underpinning the current study. The traditional criticism against the financial intermediation theory is that a massive number of financial assets are required for it to hold with the exception of special cases only. However, with the current development of advanced methods of option pricing and pricing models and the extension of these ideas on option valuation and other derivatives have served to negate this criticism and weakness of standard market theory of financial intermediation. This theory links all the study variables. It aids in explaining the relationship between economic growth, financial deepening, income distribution, financial efficiency, and poverty levels.

2.2.2 Liberal Theory

This theory revolves around the idea that poverty in an economy is caused by both market distortions and underdevelopment in various areas. This theory was formulated by Keynes (1936) who believed that market forces were capable of promoting economic

growth and in turn was able to eradicate poverty. Based on this belief, Keynes justified government's interventions at macroeconomic level especially in handling involuntary unemployment. From a liberal perspective, poverty is defined as the misfortune of a small group of people who cannot work even if they wished to work. As a consequence, governments should regulate as opposed to impose its rule on poverty reduction (Bradshaw et. al., 2000). The liberal theory argues that poverty can be used to reflect the extent to which market forces fail to justify redistributive taxation in kind and cash.

While economic growth may be critical in reducing absolute poverty by simply raising income levels, the relative benefits of relative poverty especially those relating to expansion in economic activities are only applicable so long as increases in income levels is accompanied by reduction in inequalities in income distribution (Granville and Mallick, 2006). In this respect, wage growths that are accompanied by GDP growth may force relative poverty to surge (Dickens and Ellwood, 2001). The effects on absolute poverty though may not necessarily be clear so long as the average wages increase as well. This hypothesis is in line with the argument that poverty levels may persist and even grow even when economic growth is recorded so long as deprived people are not included in the growth wagon (Dickens and Ellwood, 2001).

Even with the contribution of liberal theory to growth, employment and poverty analysis, opponents of the theory argue that it is an inadequate, indeterminate, unrealistic, incomplete and unrealistic theory of interest rate (Schumpeter, 2017; Haberlert, 2017: Hamilton, 2017). According to Schlesinger (1959), there are certain inherent defects that

are suffered from aggregate demand that make job creation unrealistic. Keynes'(1936) thereby treated demand as simple and in so doing forgot to acknowledge the fact that relative prices that prevailed in different sectors in a way determined part of the total amounts of outlays. In addition, his hypothesis was largely imaginary and based on perfect competition. This makes his thesis unsuitable for communistic and socialistic societies where economies are synchronized by national governments. In such economies, there are no cyclical redundancies; hence, Keynesian theory cannot apply to them. Keynes (1936) has also been criticized for focusing so much on cyclic redundancy and leaving out other types of redundancies that are normally found within capitalist economies. In addition, Keynes did not offer a solution to technological and frictional redundancies that lead to unemployment because he disregarded the difficulty of technological redundancy.

In line with the argument above, liberal theory was of great importance to the proposed study because it presumes that economic growth leads to development that in turn leads to poverty eradication. Economic growth has the tendency to improve per capita income of the population that results in reduced poverty levels. An expanding economy through economic growth also leads to reduced unemployment that enables households to afford basic goods needed to support life. Economic growth thus is very critical in poverty reduction at the microscopic and macroeconomic level. The theory aids in explaining the relationship between economic growth and poverty levels.

2.2.3 Information Asymmetry Theory

The information asymmetry theory proposed by Akerlof (1970), Stiglitz & Weiss (1981) made significant contribution to its formulation. The theory is based on the assumption that borrowers of funds possess more information compared to lenders on the inherent risks of their investment for which funds are sought. The information asymmetry between borrower and lender of funds to the advantage of borrower may result in the twin problems of adverse selection and moral hazard (Matthews and Thompson, 2008). Both problems reduce the efficiency of the flow of funds in the money market from lenders to borrowers. Financial intermediaries can overcome these problems by creating a relationship of long-term commitment with current and prospective customers of information sharing via credit reference bureaus (McDonald & Schumacher, 2007; Obuya & Olweny, 2017).

Moral hazard problem is a risk that a party to a transaction that has better information about a transaction provides information that is misleading. The party may also have high appetite for risk due to promised incentives premiums hence they may take on unusual risks in a desperate move to get large sum of profit before the contract settles. It is postulated in the Information Asymmetry theory, that moral hazard problem is usually occasioned by information asymmetry that makes it extremely difficult for lenders to differentiate between good borrowers who can be trusted and bad borrowers who cannot be trusted (Stoughton, 1993). The theory further maintains that moral hazard problem leads to heightened credit risk with the quality of financial assets, especially bank loans falling erratically (Hausmann, 2004).

Information asymmetry theory is considered relevant in this study on the effect of economic growth, financial deepening, Income distribution and financial efficiency on poverty levels in that the theory explains how credit information opaqueness reduces the efficiency of financial intermediation and access to finances. The differential in information concerning the risks involved in business ventures may put the financial institutions on the disadvantaged side, as they do not possess enough information about the risks of different investments of their clients. The information asymmetry makes banks to incorporate a risk on the cost of finances making the financial products costly and this therefore discourages borrowing for investment. Although a very useful theory, information asymmetry theory only considers information asymmetries in one direction, while in the real world however, there exist also information differences, which is bi-directional in nature (Fuhrmann, et al., 2017). The theory aided the study by explaining the relationship between financial deepening and financial efficiency on poverty levels.

2.2.4 The Public Choice Theory of Distribution

Buchanan and Tullock (1975) were the first people to propose the Public Choice Theory of Distribution. The theory claims that income distribution can be critical in redistributing resources in countries that have high levels of income disparity (Fiszbein et al., 2009). In proportion to this argument, the first fundamental economic theory presupposes that competitive market economies are able to provide effective means that can be utilized to allocate resources to Pareto's optimal point (Blaug, 2007). Such an allocation would not make certain people better than others meaning that all people would be equal.

This theory supports Smith's invisible hand hypothesis that claims that if markets were left on their own to allocate resources without being interfered with, they would arrive at Pareto efficient allocation. Arrow and Debreu (1954) claim that perfect markets are effective in allocating resources meaning that once they allocate resources, there would be no way of re-allocating them. In this respect, they claim that there would be no way of improving society well-being in perfect market. Nonetheless, this type of efficiency does not mean that desirable outcomes are achieved in a society. For this reason, even if it would be desirable to believe that market forces allocate resources effectively, it would be imperative to acknowledge the fact that they do not allocate resources in the right way (Blaug, 2007).

The Public Choice Theory of Distribution is relevant to the current study because of the relationship between economic growth, financial deepening, income distribution, financial efficiency and poverty levels. The theory identifies the role of income distribution in redistributing resources in countries that have high levels of income disparity especially the East African Countries. Additionally, the fundamental purpose of competitive market economies are able to provide effective means that can be utilized to allocate resources when there is skewed resource allocation. The theory further explains how income distribution can be utilized to reallocate resources in the society hence leading to poverty reduction. This theory has bee used in this study to examine the relationship between economic growth, financial deepening, income distribution, financial efficiency and poverty levels.

2.2.5 The Neo Classical Utility Theory

The major proponent of the Neo Classical Utility theory was Bentham (1994). The idea behind cash transfer programs in promoting consumption and encouraging accumulation of human capital may be explained by this theory (Akresh et al., 2013). The Neo Classical Utility theory presumes that people maximize their utility on the basis of income constraints, which are linked to high poverty levels (Akresh et al., 2013). The theory, therefore, argues that households are faced with a variety of consumption bundles to the extent that they have to choose between educating their children and meeting other obligations. This may include the income generating activities that children may offer to supplement income in their respective families.

Despite the factuality and objectivity claims set out by microeconomic studies, consumer behavior model is justified on rationality grounds. If the Neo Classical Utility theory is correct, then it should be supported by observations made from consumer behaviors. However, there is no such evidence to support it because it. Sen (1977) argues that rational behaviors may be foolish according to economic axioms.

Over the years, empirical evidence that discredits the accuracy of economic theories especially those relating to human behaviors has increased in big numbers. Researchers in psychology particularly those inclined towards human behavior have identified the failures in predictive role of economic theories. This has led to re-evaluation of such theories to establish their accuracy. Accordingly, the majority of the people consider

rational behavior theories used in economics as normative. This argument is in contrast with the assertion that economic theories cannot be disputed. The 2008 financial crisis is used to support this argument because most of leading economists argue that theories of rational behaviors cannot be used to explain crashes that occur within stock markets. Nevertheless, Shiller (2005) with the help of behavioral theories was able to envisage the crash.

The theory presumes that people maximize their utility based on income constraints, which are linked to high poverty levels. The theory is the reason behind cash transfer programs in promoting consumption and encouraging accumulation of human capital. The theory argues that households are faced with a variety of consumption bundles to the extent that they have to choose between educating their children and meeting other obligations. This may include the income generating activities that children may offer to supplement income in their respective families. The Neo Classical Utility Theory underpinned the current study on the association among economic growth, financial deepening, income distribution, financial efficiency and poverty levels. The theory in particular explains the relationship existing between income distribution and poverty levels.

2.3 Empirical Review

This section discusses empirical works that have evaluated the link between economic growth, financial deepening, income distribution, financial efficiency and poverty levels globally and locally.

2.3.1 Economic Growth and Poverty Level

According to Kaidi and Mensi, (2020), the relationship between financial development (FD), political institutions (PI), income inequalities (II), and poverty was investigated in their study. They investigated the association between the two variables using two distinct estimating methods and two different samples. There are two samples in this study: the first is composed of a panel of 93 democratic countries, while the second is composed of a panel of 31 autocratic countries. The findings demonstrate that, in contrast to autocratic countries, foreign direct investment (FDI) and democratic institutions, when considered separately, contribute to closing the gap between the rich and the poor by reducing poverty in democratic countries. Surprisingly, unlike in autocratic countries, the interplay between FD and PI has little effect on the reduction of II and poverty in democratic countries. An examination of this group produces diametrically opposed outcomes, notably in low-, mid-, and upper mid-income countries, when compared to high-income ones, as seen in the table below.

Sehrawat and Giri (2018) used the autoregressive distributed lag (ARDL) bounds testing approach to investigate the impact of financial development, economic growth, and income inequality on poverty: evidence from India from 1970 to 2015 using the autoregressive distributed lag (ARDL). Findings from the study found that there is a

strong long-run association between financial development, economic growth, inequality, and poverty. The findings revealed that financial development and economic expansion aid in the eradication of poverty in India, however income inequality and inflation exacerbate the situation of poverty. The Granger-causality test provides empirical evidence that there is unidirectional causality from financial development and economic progress to poverty in the United States. Furthermore, there is a bidirectional causal relationship between inequality and poverty. According to the findings of this study, policymakers can move forward with a more extensive assessment of how certain financial sector policies and interventions can be employed as effective tools for attaining positive economic growth and income distribution in the future. A policy of promoting financial development and economic growth, as advised by the report, should be implemented in order to lessen the high levels of poverty and inequality that now exist in India.

Using data from China's regional financial efficiency and economic development, Zhang and Chao (2019) conducted an investigation. They discovered that there were considerable disparities in financial efficiency between the eastern, central, and western areas of China, as well as a non-linear link between financial efficiency and economic growth in each region. According to their findings, financial efficiency promotes economic growth only after it has reached a particular degree of efficiency (financial threshold). Where it crosses the threshold, it enhances the ability for the accumulation and allocation of financial resources. In order to foster ongoing progress of the Chinese

economy, rapid financial development can provide a superior financial environment and enhanced circumstances for economic growth.

A nonlinear relationship between financial development and economic growth in Pakistan was investigated by Tariq, Khan, and Rahman (2020), who used the threshold regression model to assess the relationship for the period 1980-2017. We also used quantile regression to analyze conditional distributions with 0.25, 0.50, and 0.75 quantiles, respectively. The quantile regression method is based on the principle of minimization of the sum of squared residuals. When the degree of financial development exceeds the threshold value of 0.151, the result demonstrates that economic growth is favorably related to financial development. When financial development falls below the threshold value (i.e., 0.151), on the other hand, the influence on economic growth is negative. When Pakistan's financial development reaches a certain threshold level, it becomes more beneficial to the economy since a higher level of financial development supports economic growth more than a lower level of financial development does. This discovery demonstrates that economic growth reacts differentially to financial development, and that the relationship between financial development and economic growth in Pakistan is U-shaped. Physical capital, labor force, and government expenditure are among the characteristics that have a beneficial impact on economic growth, among other things. Furthermore, the rate of inflation and the degree to which trade is open have a negligible impact on economic growth. Furthermore, the results of quantile regression support the existence of a non-linear link between financial

development and economic growth in Pakistan. The findings of this study point to the need for a rethinking of Pakistan's financial sector policies.

Research carried out by Pérez-Moreno and Weinhold (2012) analyzed the causal connection between poverty and economic growth in less developed nations between the period 1970 and 1998. The investigation applied Granger causality tests and panel data specification. The examination implied that economic development causes unidirectional decrease in poverty level. Pérez-Moreno and Weinhold (2012) however, used short panels limited to ten years that is associated with the challenge of fewer observations that may make it more difficult to detect any causal linkages between growth and poverty. In addition, the study did not include income inequality as a moderating variable between growth and poverty as a norm in growth poverty studies. Waiyaki (2013) evaluated the connection between economic growth, poverty and development of financial sector in Kenya for the period between 1997 and 2012. The examination utilized OLS technique under the PARCH model. Waiyaki (2013) utilized time series model since the study was carried out in Kenya and may not be readily applicable to other EAC Countries due to each country's inequalities. In addition, the study has not introduced income inequality as a mediating variable as postulated in growth poverty theory which states that economic growth can impact on poverty directly or indirectly through income distribution.

A study by Kakwani and Son (2016) analyzed how connection between poverty and growth can vary depending on income inequality and economic development. Utilizing the possibility of poverty elasticity of income, estimating the degree to which economic development diminishes poverty, the examination offers a few suggestions to exhibit that

the underlying dimensions of income inequality and economic growth can affect reduction in poverty. Further, the study exhibits that tradeoff between economic growth and income inequality can be clarified as far as initial states of income inequality and development. The study by Kakwani and Son (2016), however, was not based on the East African community countries. In addition, the study utilized income inequality to measure poverty, which may not be a better measure since income is relative and can only measure relative poverty but cannot capture absolute poverty.

An investigation by Keho (2017) analyzed the link between growth of economy, development of financial sector and poverty reduction in nine African nations using the data from 1970 to 2013. The study adopted the Autoregressive Distributed-lagged model. The study established a strong relationship between GDP and financial deepening with GDP positively affecting poverty decrease in five nations including South Africa, Cote d'Ivoire, Benin, Cameroon and Gabon's GDP also affected decrease in poverty positively affecting growth of economy in three nations including Senegal, Nigeria and Ghana. The examination likewise uncovers two-way causation between poverty reduction and financial development in South Africa, Gabon and Cote d'Ivoire and two-way causality between reduction of poverty and development of financial sector in South Africa, Cameroon and Benin. Keho (2017) established mixed findings concerning direction of causation between financial deepening, economic growth and poverty. The study model ignored the role of income distribution on poverty reduction as stated in economic theory that income inequality moderates the relationship between poverty and income growth.

Another study by Williams, et al., (2017) examined the association between growth of economy, reduction of poverty and financial inclusion in less developed countries using panel data running from 2006 to 2015. The analysis showed that, bank branches, number of ATM and expenditure of the government of three Africa nations were the most significant proxies of financial inclusion on reduction of poverty. The study further observed that One percent expansion of number of ATM prompted about 0.0082 percent increment in the GDP and a decrease in poverty in less developed countries. Williams et al., (2017), however, did not cover any East African country and also did not use economic growth as the dependent variable.

Ductor and Grechyna (2015) examined the interdependence between financial development and real sector output, as well as the impact on economic growth in the United Kingdom and the United States. Using panel data for 101 developed and developing countries over the period 1970 to 2010, we demonstrate that the effect of financial development on economic growth is dependent on the growth of private credit relative to real output growth. The findings also suggest that if there is rapid growth in private credit that is not accompanied by growth in real output, the effect of financial development on growth becomes negative. There is empirical support for theories that postulate the existence of an optimal level of financial development that is determined by the characteristics of an economy based on their findings.

2.3.2 Economic Growth, Financial Deepening and Poverty Levels

According to Chen et al., (2020), the asymmetric effects of financial development on economic growth were investigated using a model that was reinforced with inflation and government expenditure asymmetries to inform model specification. The research question that was used was, "Do their asymmetry changes have a substantial impact on growth?" The nonlinear auto-regressive distributive lag (NARDL) was used to obtain the most significant results, which suggest that positive shocks in financial development in the short run and negative shocks in financial development in the long run increase and decrease economic growth, respectively. Regarding inflation, its positive (negative) shocks reduce (raise) economic growth in both runs, depending on the direction of the shock. Positive shocks to financial development that boost growth in the short run, and negative shocks to financial development (government expenditure) that raise (decrease) growth are the most dominant effects, with the remainder of the shocks having a negligible effect on growth in the long run. The findings clearly suggest that, in an environment characterized by stable and sustained inflation, regulated government expenditure and a complete financial system deepening would both contribute to positive economic growth and increase the likelihood of inflation. Therefore, in order for genuine growth to occur, proper policies that promote low inflation and reduced government spending, expansion of feasible reformated financial institutions, capital accumulation, and increased resource mobilization should be implemented.

Nguyen (2019). The implications of financial deepening on growth dynamics and productivity in the Japanese economy, where diverse businesses are constrained by

endogenous borrowing limits, have been investigated. According to quantitative data from a calibrated model, financial deepening impacts may be attributed to 38 percent of Japan's total factor productivity between 1961 and 1991, and the rate of convergence is 29 percent slower than that predicted by neoclassical models. A further theoretical finding of the current research is that an economy with a larger degree of productivity heterogeneity is more likely to avoid the poverty trap and to reach its steady state at a later rate than a more uniformly productive one.

Igwebuike, UDEH, and Okonkwo, (2019) investigated the effects of financial deepening on the economic growth of Nigeria from 1981 to 2016 through two of the basic arms of the financial industry: the banking and insurance industries and the insurance industry (Insurance companies and Banking Industry). Secondary data from the Central Bank of Nigeria's statistical bulletin and the World Bank's Global Financial Development Bulletin, 2017 were used in this study. The study used an ex-post facto research design to gather information. Ordinary Least Squares (OLS) was the analytical tool that was used (OLS). A positive but not statistically significant relationship was observed between insurance premiums and gross domestic product (GDP), while the relationship between credit to the private sector by commercial banks and GDP was found to be both positive and statistically significant. According to the findings of the study, loan to the private sector by commercial banks as a percentage of GDP has a considerable impact on economic growth in Nigeria, whereas insurance industry premium as a percentage of GDP has no meaningful impact on economic growth. In addition to other recommendations, it was suggested that the insurance industry should undergo another

cycle of recapitalization in order to increase their ability to provide coverage in the economy. In this position, they have the ability to create a more secure environment, which will encourage more investment and innovation, and as a result, more economic growth.

Zhang and Naceur (2019) looked at the relationship between financial development, economic disparity, and poverty in the United States. A multidimensional investigation is carried out in this paper, in contrast to the existing literature, which has mostly concentrated on the consequences of financial deepening. They looked at factors such as financial access, depth, efficiency, stability, and liberalization, among others. Three important findings are presented in this research. The first point to mention is that four of the five characteristics of financial development (access, depth, efficiency, and stability) have the potential to greatly reduce inequality and poverty. Two points to note about financial liberalizations: they have a tendency to aggravate inequality and poverty. Third, the development of the banking industry has a greater impact on income distribution than the development of the stock market, as seen in the chart below.

A study by Ndebbio (2004) analyzed the association between growth of an economy and deepening in the financial sector. The study used simple OLS which was multiple regression in nature. An intercountry regression was used for 34 Sub Saharan countries. The study holds that countries put effort to grow real money balances thereby they should strive to improve money balances to influence their economic growth. Study by Ndebbio

(2004) ,however, was not carried out in East African Community Countries hence the results may not be applicable for policy recommendation in the EAC context.

Yet another study by Gries, et al., (2009) evaluated the link between economic development, trade openness and financial deepening in a number of Sub-Saharan Africa countries. Its focus was on causality between financial deepening and economic development among 16 African countries. Gries et al., (2009) did not study any of the East African Community Countries. In addition he used broader economic development instead of economic growth. The study even though showed weak causal link between economic development and financial deepening.

A research by Nzotta and Okereke (2009) examined the association between economic development and financial deepening in Nigeria for the period between 1986 and 2007. The study adopted two stages least squares regression and established that financial deepening proxies had a statistical association with economic growth. The study by Nzotta and Okereke (2009), however, was limited to Nigeria in addition to using financial deepening as an independent variable.

Odhiambo (2010) analyzed the link between poverty and financial development in Kenya. The study established that financial development Granger contributed significantly to domestic savings thereby reducing poverty levels within the country. However, the direction of causation between poverty reduction and financial deepening had mixed findings when different proxies of financial deepening are used which may be

misleading. The study was limited to Kenya hence findings may not be readily adopted in the five countries of the EAC owing to different economic situations.

Khan and Ahmad (2011) evaluated the connection between poverty reduction and financial sector development for various nations. The study established that economic growth largely depended on developments made in financial sector and that poverty reduction relied on economic development together with developments made in the financial sector. The study, however, focused only on the direct effects of financial deepening on poverty thereby ignoring the indirect effects.

Fowowe and Abidoye (2013) examined the causal link between inequality, financial development and poverty in African nations. The study established that income inequality and poverty were affected significantly by financial development in the African Nations studied. Fowowe and Abidoye (2013) established insignificant influence of finance on poverty that is conflicting with expectations based on finance- poverty nexus literature. In addition, the study employed income inequality as co-dependent variable with poverty which is conflicting with general theoretical expectation that states that income inequality would mediate the link between poverty and finance.

A research by Uddin, et al., (2014) analyzed the association between growth of economy, poverty reduction and development of financial sector in Bangladesh. The study used quarterly data from 1975 to 2011. The study established that economic growth was largely influenced by developments made in the financial sector whereas poverty was

influenced by growth. Uddin et al., (2014) was based in Bangladesh with unique economic environment compared to East African Community Countries. The study utilized consumption among private households as poverty proxy, which might be misleading since the measure does not capture correctly absolute nature of poverty. Income inequality was ignored in the analysis model conflicting finance-growth-poverty literature that uses inequality to capture the indirect effects of growth on poverty via inequality.

Research by Okereke (2015) examined how the financial deepening has influenced the welfare of Nigerians, using data running between 1975 and 2010. Regression analysis was employed specific to each country by introducing a dummy variable. The findings demonstrated that aggregate welfare is not directly affected by financial deepening. A study by Okereke (2015) was limited to Nigeria and financial deepening was used as an independent variable rather than a mediating variable.

Abosedra, Shahbaz and Nawaz (2016) analyzed the association between poverty eradication and development of financial sector in Egypt using quarterly data for the period between the first quarter of 1975 and the last quarter of 2011. The results revealed that poverty rates are reduced by financial development. Abosedra, Shahbaz and Nawaz (2016) was conducted in Egypt, which has different economic situations hence results may not be used in EAC Countries for policy recommendations. In addition, the study focused on the direct effect of financial deepening on poverty only while ignoring the indirect effects otherwise known as trickle-down effect. Finally, causality between

finance and poverty is not significant which may be misleading since finance and poverty nexus theories show significant relationships.

Naceur and Zhang (2016) examined the link between financial development, inequality and poverty. They utilized a sample of 143 countries and focused on the period between 1961 and 2011. They established that the components of financial deepening especially those related to banking sector were able to reduce poverty and income inequality. The study uses poverty gap index to measure poverty that may be misleading, as it does not capture the differences in the severity of poverty amongst the poor. Poverty gap index is also a recent proxy for poverty and is lacking for years before 2000.

Nwanna and Chinwudu (2016) evaluated the causal link between economic growth and financial deepening in Nigeria between 1985 and 2014 using ordinary least squares (OLS). The findings showed that financial deepening based on banking and stock exchange market had positive influence on economic growth that was significant statistically. The study was conducted in Nigeria; hence, its findings may not necessarily be applicable to the current study even though they would depict what would be expected to happen. In addition, it interchanged the roles of financial deepening by considering it to be the independent variable as opposed to evaluating its mediating role.

Chinweze (2017) investigated the direction of causation between poverty reduction and Financial Deepening in Nigeria. Data used from 1981 to 2015 with the study establishing mono causation from financial deepening to Poverty Reduction. Chinweze (2017)

however, was specific to Nigeria; hence, findings may not be relevant to East African Community Countries. Moreover, the study utilized Human Development Index to measure poverty that may be misleading since Human Development Index is a measure of general welfare and not poverty.

Dauda (2017) investigated the issues surrounding the paradox of rising poverty in the midst of high economic growth in Nigeria. He discovered that the Nigerian economy has experienced significant growth in recent years. Despite this, poverty continues to plague the world. Among the reasons for this absurdity, according to him, are jobless growth, a growth that is not pro-poor, and the failure of poverty alleviation initiatives to address structural transformation, which is required for long-term economic growth, job creation, and the closing of income gaps within the economy. Because of this, it is recommended that greater emphasis be placed on structural transformation, genuine commitment to good governance, combating corruption, as well as provision of social protection for the poor and disadvantaged populations.

Ncube and colleagues (2014). Inequality, economic growth, and poverty in the Middle East and North Africa are all issues that require attention (MENA). African Development Review, volume 26, number 3, pages 435-453. In this paper, we discuss the patterns of inequality, growth, and income inequality in the Middle East and North Africa (MENA) region. The impact of income inequality on key societal development indicators in the Middle East and North Africa (MENA) region, such as economic growth and poverty, has also been investigated using cross-sectional time series data from MENA countries

for the period 1985–2009. Our empirical findings indicate that income inequality has a negative impact on economic growth and has a negative impact on poverty in the region.

In an economy, financial deepening was deemed to be the most important factor to consider, and this included activities such as mortgages, financial markets, internal borrowing from the public sector, external borrowing, banking, and saving institutions, as well as allocating large financial resources to infrastructural projects such as road construction and other national projects that contribute to financial deepening. According to Adan (2017), positive financial deepening, such as the rapid supply of financial resources within an economy with limited borrowing, contributes effectively to resource and risk management in relation to the loss of financial resources due to debt repayment and other leakages. According to the findings of the research, developing nations stimulate innovation, investment, and entrepreneurship via the use of government subsidies in order to boost the interchange of financial resources in the economy. In addition, increasing investment in a planned economy was taken into consideration. Several variables, including the amount of money in circulation in the economy, credit facilities to the private sector, which represents the rate of credit financing, and the volume of traded stock, which represents the rate of financial market investment, have been used to measure financial deepening in the United States (Sackey & Nkrumah, 2012; Alrabadi & Kharabsheh, 2015)

Valickova, Havranek and Horvath (2015) using 1334 estimates from 67 studies that examine the effect of financial development on economic growth, conducted an analysis of the findings. When taken as a whole, the studies suggest a positive and statistically significant effect, but the estimates from the individual studies are highly variable. We discover that both the research design and the heterogeneity of the underlying effect play a role in explaining the differences in results between studies. Studies that do not take into account endogeneity have a tendency to exaggerate the impact of finance on growth. While the effect appears to be weaker in less developed countries, the effect appears to be diminishing worldwide after the 1980s, regardless of where you live. Our findings also suggest that the stock market contributes to economic growth at a faster rate than other financial intermediaries.

A study conducted by Kanayo, Ndlovu and Agholor (2021) evaluated the impact of an LED initiative (EPWP) on reducing the triple challenges that South Africa is currently facing. In order to determine the effect of LED, a mixed method approach and a paired-sample t-test were used. The findings of the qualitative research revealed that LED clearly has a role to play in the relief of poverty and unemployment, but that the initiative alone is insufficient. Several projects are recommended in this article, including those that will provide sufficient livelihood for local beneficiaries and those that will facilitate local participation in project development.

2.3.3 Economic Growth, Income Distribution and Poverty Levels

Aluko and Ibrahim (2020), investigated the effect of financial development on economic growth in Sub-Saharan Africa. They used a sample splitting approach that did not impose an exogenous quadratic factor and instead allowed the link to be mediated by the degree of institutions. Their studies demonstrated that finance had a disproportionately positive growth-enhancing effect when compared to other factors, such as institutional quality. Even when the International Country Risk Guide-derived measure of institutions is employed as the threshold variable, financial development does not significantly improve economic growth when the optimal level of institutional quality is less than the minimum level of the measure of institutions. A higher level of finance is connected with growth in countries where institutional quality is above a certain threshold. Using the World Governance Indicators proxy, we find that financial development has a considerable impact on institutions, regardless of whether a country is below or above the threshold for financial development. The growth-enhancing effect of finance, it turns out, is stronger in low-institution countries than it is in high-institution countries. As a result, the well-developed financial sector may also be able to execute the function of sound institutions in terms of influencing economic growth, thanks to its ability to provide some critical functions.

Breunig and Majeed (2020) looked into the concept that inequality has a detrimental impact on economic growth and found no evidence to support it. They revisited the idea, paying particular attention to inequality as well as poverty, and the interactions between them. They confirmed prior findings, which indicated that inequality has a detrimental

impact on the rate of economic growth. It was noted by the researchers, however, that when both inequality and poverty are taken into consideration, the negative effect of inequality on growth tends to be concentrated in nations with high levels of poverty. If policies aimed at reducing poverty do not have an impact on inequality, this would argue in favor of measures aimed at alleviating poverty.

According to Nansadiqa, Masbar, and Majid (2019), the effects of economic growth and unemployment on poverty reduction in Indonesia over the period 1990-2017 were investigated in this study. Additionally, it aimed to investigate the multivariate dynamic causal relationship between poverty, unemployment, and economic growth by employing the vector error correcting method. According to the findings of the study, economic growth and unemployment had a negative impact on the degree of poverty over the long term. There was also evidence of a bidirectional Granger causal relationship between poverty and economic growth, as well as a unidirectional causal effect that ran from unemployment to poverty. It is clear from our findings that poverty reduction programs, carried out through the promotion of inclusive economic development, are extremely important. Because poverty is a multi-faceted issue, any poverty reduction strategy in the country should be developed in a comprehensive manner, with a particular emphasis on the promotion of inclusive development, so that all sectors of the population can reap the advantages of economic prosperity. Developmental activities that provide additional job opportunities, such as the establishment and expansion of micro-small and medium-sized businesses, should be the primary emphasis of the economic development agenda in every state and territory across the country.

Michálek and Vbook (2019) revealed that the poverty rate in a country is influenced by a wide range of factors, including economic growth and the distribution of its impacts on the population. In their study, they attempted to categorize member states of the European Union (EU) in terms of their ability to deal with the economic issues of the previous decade. Based on a review of trends in economic development, inequality, and poverty across all 28 EU member nations, they arrived at their classification of the world. The classification was developed as a result of closely tracking patterns in economic growth and inequality, as well as their relationships with poverty across different countries. For the purpose of analyzing these interactions, the Bourguignon model (Poverty-Growth-Inequality Triangle–PGI) as well as the Growth Incidence Curve were employed. In the study, the researchers discovered that economic growth is associated with a reduction in poverty. Poverty, on the other hand, rises in tandem with increasing income inequities. Nonetheless, the rates of development vary from one country to the next.

Asteriou and Spanos (2019) looked at a panel dataset of 26 European Union nations over the period 1990–2016 to see how the relationship between financial development and economic growth changed. Using multiplicative dummies, the empirical approach was utilized to examine two distinct sub-periods prior to and after the financial crisis. The findings revealed that, prior to the crisis, financial development aided economic growth, however, following the crisis, it served to impede economic activity. Furthermore, the

findings imply that the capital sufficiency of banks provided protection to depositors and contributed to the stability of the financial system throughout the years 2008 and 2009.

Erdoan, Yldrm, and Gedikli, A. (2020) investigated the relationship between the impact of natural resource exports on economic growth and the level of financial deepening by using data from the selected Next-11 countries for the period 1996–2016, and the results were published in the journal Economic Development and Cultural Change. In this work, the nonlinear panel data methodology is employed. According to the empirical findings, under the first regime, where the rate of financial depth is less than 45 percent, an increase in oil exports has no statistically significant impact on economic growth. In order to have a beneficial impact on economic growth, the financial system must continue to grow and develop. Unless the level of development of the financial system exceeds a particular threshold, the effect of natural resource exports on economic growth will be insufficient. In this line, it is necessary to clarify the criteria for determining the amount and depth of financial development that has a favorable impact on the expansion of natural resource exports. growth. In the second regime, where financial deepening is greater than 45 percent, a one-unit rise in oil exports results in a seven-percent boost in overall economic growth.

Various investigations exist on connection between poverty and income inequality. Fosu (2010) for example analyzed data spanning from 1980 to 2004 showed that income elasticity of poverty kept on declining. In addition, he found out that poverty income

elasticity was less than income inequality's responsiveness. The study ignored economic growth as a variable in the model in addition to using income inequality as an independent variable instead of a mediating variable.

Levin and Bigsten (2010) carried out a review of empirical literature connection to income distribution, poverty and economic growth. The Study never, however, established any precise connection between economic development and expanding income disparity. Nations that have been fruitful as far as economic development is concerned are in all respects effective in decreasing poverty influence.

A research by Gakuru and Mathenge (2012) examined the level of income inequality and the role that policies developed toward income inequality played in reducing poverty. The outcomes demonstrated that because of high-income imbalance in Kenya, stimulation of development in rural and manufacturing parts of the country essentially was more advantageous to the urban family unit since they own most of the factors of production. Gakuru and Mathenge (2012) study has limited application to Kenya in addition to using income distribution as independent variable instead of mediating variable.

Santos-Paulino (2012) examined the link between poverty, income inequality and trade liberalization. He established that trade liberalization had a significant impact on poverty and income distribution, but the impact was negligible and conveyed unequally. In spite

of this, Santos-Paulino (2012) ignored economic growth as a variable in the model and used trade liberalization in place of economic growth.

Singh and Huang (2015) analyzed the association between Poverty, property rights and Financial Deepening Sub-Saharan Africa countries. The Data was from 37 countries in Africa from 1992 to 2006. The study used panel data regression model. Study showed that poverty, financial deepening and income inequality were significantly related. It specifically showed that financial deepening was able to increase income inequality thereby increasing poverty that is contrary to finance- poverty nexus. In addition, the study only considered direct effect of financial deepening on poverty thereby ignoring the indirect ones.

An empirical examination by Ben and Zhang (2016) analyzed the connection between income distribution and financial development proxies. Utilizing selected 143 nations and analyzing data covering the period 1961 to 2011. The research established that financial development proxies fundamentally lessened poverty and income inequality. Ben and Zhang (2016) used income distribution as dependent variable instead of using it as a mediating variable. In addition, Ben and Zhang (2016) ignored economic growth in the analysis model.

Fosu (2017) examined the link between economic development poverty in less developed nations, with attention to the role of income inequality. The empirical examination found that out growth of income has largely been significant in the changes in poverty.

Rossignolo (2017) examined the effects that tax and government expenditure had on poverty and income distribution within Argentina using data spanning from 2012 to 2013. The outcomes of the study demonstrate that monetary and fiscal strategy has been an incredible asset in decreasing income imbalance and poverty. However, Rossignolo (2017) used government expenditure in the place of economic growth as an independent variable in addition to the study having limited application to Argentina.

Niyimbanira (2017) used data from the South African province of Mpumalanga to estimate the impact of economic growth on income inequality and poverty. Theoretically, it is possible to argue that there is a negative relationship between the Gini coefficient and economic growth, but empirical evidence has shown that this is not always the case. Economic growth and poverty can both be justified using the same logic. The purpose of this paper was to determine whether or not there is empirical evidence of such relationships. Furthermore, the paper investigated the extent to which such nexuses are visible in South Africa, with a particular focus on the province of Mpumalanga. The Gini coefficient was used to represent income inequality as a proxy. The fixed effect and pool regression models were used in conjunction with secondary data from all 18 local municipalities in Mpumalanga to conduct the research. The findings have demonstrated that economic growth reduces poverty, but that it does not reduce inequality of income distribution. In South Africa, the findings of this study have implications for policymakers who are trying to devise strategies for reducing income inequality. The study concludes with a set of socio-economic policies that could help to boost economic growth while also improving human development in a knowledge-based society.

Basile and Usai, (2015) used a multi-region endogenous growth model to examine the competing claims of income growth and income distribution in South Africa, and the results were published in the journal Development and Change. Using redistributive taxes to compensate for limited capital mobility between high and low income regions, the study argues that greater income growth and greater income equality can be achieved. Due to the fact that low-income regions are typically characterized by low levels of both physical and human capital, which provide little incentive to outside investors, market-based capital mobility is limited in low-income regions. In the absence of specific redistributive policies, the model predicts that annual cross-regional convergence rates will be less than 1 percent.

Abid (2016) investigated the effects of corruption on economic growth and income distribution using panel data from African countries and a dynamic panel estimator. I have discovered that corruption has a negative impact on economic growth, both directly and indirectly, through a reduction in investment in physical capital. The growth rates of GDP and per capita income are reduced by 0.75 to 0.9 percentage points and 0.39 to 0.41 percentage points per year, respectively, for every unit increase in corruption. Increased corruption, it was discovered, appears to be positively correlated with income inequality. The combined effects of lower income growth and greater inequality suggest that corruption has a disproportionately negative impact on the poor in African countries..

2.3.4 Economic Growth, Financial Efficiency and Poverty Levels

Economic development is characterized by the reduction or elimination of the costs of obtaining information, the costs of contract execution, and the costs of transaction as a result of improving the efficiency with which financial instruments, financial markets, and financial intermediaries perform their financial functions. Understanding of the nature and relationship between financial systems and economic growth has evolved over time as economists have gained more knowledge and experience (Ewah, et al., 2009). According to Ferreira (2012) the role of the financial system in economic development has gotten more attention from both academics and policymakers, and as a result, there have been some divergent viewpoints expressed. Over the past few decades, there has been an increase in interest in this area, with mixed findings that continue to be the subject of theoretical and empirical debate.

A research by Ferreira (2012) analysed the influence of efficiency of banking institutions on growth of an economy. The investigation examined data from 27 EU nations for the period between 1996 and 2008. The investigation examined the impact of bank efficiency on Gross Domestic Product (GDP). The findings demonstrated a positive impact of bank cost effectiveness on development of an economy based on the GDP estimates. Ferreira (2012) utilized bank efficiency as independent variable instead of moderating variable in addition to using economic growth as dependent variable instead of independent variable.

A study by Belke, et al., (2016) sought to establish whether areas of the country with banks that have high quality financial intermediation were growing faster during

economic booms and were more stable compared to regions with banks that have poor quality financial intermediation. The findings established that banks that are relatively more efficient in terms of intermediation quality stimulated growth in economy of the regions of their existence. Belke et al., (2016) used economic growth as dependent variable instead of independent variable. The study also ignored poverty as a variable and even used financial efficiency as an independent variable instead of a moderating variable.

Ewah, et al., (2009) examined the association between capital market efficiency and economic growth in Nigeria for the period beginning 1961 and ending in 2004. The study adopted OLS, which were multiple regressions in nature. The study ascertained that Nigerian economic growth had not been affected much by capital market efficiency. Ewah, et al., (2009), however, used economic growth as the dependent variable instead of independent variable in addition to ignoring poverty in the model.

A study by Hasan et al., (2009) evaluated the link between bank efficiency, financial depth and economic growth. It tested the link between quality finance measured by economic growth and financial efficiency for a highly wide-ranging sample comprising over 100 countries covering the study period between 1996 and 2005. The research ascertained that the quality of financial deepening and development had statistically significant effect on economic growth, suggesting that the association between deeper capital market and better banking was indeed most beneficial for economic growth. Hasan et al., (2009), however, used economic growth as dependent variable instead of

independent variable in addition to the study being carried out outside East African Community. Hasan et al., (2009) also ignored poverty as a variable in the study.

Ayadi, et al., (2015) analyzed the link between growth in economy and financial sector development in selected nations found in the northern and southern part of the Mediterranean Sea for the period between 1985 and 2009. The study established that financial deepening is inversely related to growth of the economy and credit to the private segment is adversely related with development. Ayadi et al., (2015) however, ignored poverty as the dependent variable in addition to study being carried out outside East African Community.

2.3.5 Economic Growth, Financial Deepening, Income Distribution, Financial Efficiency and Poverty Levels

Malarvizhi et al ,(2019) investigated the relationship between financial sector development and economic growth in a sample of ASEAN-5 countries (Malaysia, Indonesia, Singapore, Thailand, and the Philippines) from 1980 to 2011. They used data from Malaysia, Indonesia, Singapore, Thailand, and the Philippines from 1980 to 2011. The researchers explored whether greater levels of financial development (FD) are significantly and robustly associated with quicker present and future rates of economic growth, physical capital accumulation and improvements in economic efficiency. According to the findings of the study, foreign direct investment has a statistically significant positive effect on economic growth. The estimated models, on the other hand,

demonstrate that foreign direct investment (FDI) has a less impact on economic growth in the ASEAN-5 countries than domestic investment and exports do in the region.

Ibrahim and Alagidede (2018) investigated the relationship between financial development and economic growth in Sub-Saharan Africa. They looked at the overall economic growth effect when the growth in finance and real sector is disproportionately large, using panel data for 29 sub-Saharan African countries over the period 1980–2014, and found that the relationship was positive. Generalized methods of moments (GMM) analysis found that, while financial development contributes to economic growth, the extent to which finance contributes to growth is highly dependent on the simultaneous expansion of both the real and financial sectors. Under balanced sectoral growth, the elasticity of growth to changes in either the size of the real or financial sectors is stronger. We also demonstrate that rapid and unfettered credit growth has a significant negative impact on economic growth, with implications arising from the funding of risky and unsustainable investments, as well as from excessive consumption, which is fuelling inflation. The pass-through surplus finance–economic growth effect, on the other hand, is stronger when it occurs through the investment channel.

Rewilak (2017) conducted research to determine whether financial development is beneficial to poverty reduction. According to his findings, which were based on newly accessible data and a division of financial development into four categories, both financial deepening and better physical access are advantageous in lowering the number

of individuals living below the poverty line. The findings, which were based on different measures of financial instability, also call into question previously published conclusions suggesting financial instability may increase the incidence of poverty. Furthermore, even after adjusting for mobile money, the findings are consistent, resulting in an important addition to the body of literature.

Dewi et al. (2018) investigated the interconnections between financial sector development and poverty reduction in Indonesia, using a case study approach. The study uses annual data spanning the period 1980 to 2015 to explore the long-run connection between the variables. The Autoregressive Distributed Lag (ARDL) cointegration approach is used to examine the long-run relationship between the variables. A long-term association between financial development, economic growth, and poverty reduction was discovered in the study's findings for the Indonesian context. A unidirectional connection between the financial sector and poverty reduction was also discovered, as was a bidirectional causality between economic growth and poverty reduction. Because of this, policies to promote economic growth and employment opportunities in the financial sector would go a long way toward accelerating poverty eradication and promoting the growth of the overall economy.

Abosedra, Shahbaz, and Nawaz (2016) investigated the relationships between financial development and poverty reduction in Egypt, using data from the first quarter of 1975 through the fourth quarter of 2011. Zivot–Andrews structural break unit root test was

used to determine whether the variables' stationarity qualities were satisfactory. For the purpose of examining the long run relationship between the variables, the structural break autoregressive distributed lag-bounds testing approach to cointegration is employed. In the study's findings, there was evidence of cointegration, which demonstrated the existence of a long-term relationship between financial depth, economic growth, and poverty alleviation. When domestic lending to the private sector is employed as a proxy for financial development, the findings revealed that financial development helps to reduce poverty in developing countries. This confirms the direct channel by which financial sector development can lead to the poor being able to access or expanding their access to financial services, such as credit and insurance-risk services, as seen in Egypt.

Kare and Druet (2016) present comparative global evidence on the transformation of economic growth into poverty reduction in developing countries, with an emphasis on the role of income inequality. The emphasis is on the time between the early and mid-1990s, when growth in these countries as a group has been rather strong, even outpacing that of the advanced economies in some cases. Using World Bank Povcalnet data, both regional and country-specific statistics are studied for the $1.25 and $2.50 poverty headcount ratios at the $1.25 and $2.50 level. According to the findings of the study, on average, income growth has been the most important factor driving both the decreases and increases in poverty. The study, on the other hand, finds that there are significant regional and country variances that are obscured by this 'average' dominant-growth narrative. While growth was the most important factor in determining whether poverty was dropping or increasing in the majority of nations, inequality was the most important

factor in determining poverty behavior in a substantial number of countries. Furthermore, even in countries where growth has been the primary driver of poverty reduction, additional progress could have been made if income distribution had been more evenly distributed among the population. As a result, countries' unique characteristics should be highlighted in order to improve the efficiency of policymaking. As a rule, high levels of inequality at the outset limit the effectiveness of growth in alleviating poverty, while rising inequality directly worsens poverty for a given level of growth. It seems reasonable to devote special attention to the reduction of inequality in specific nations where the distribution of income is particularly unfavorable. Unfortunately, the present analysis also indicates that growth and inequality-reducing strategies in low-income nations have only a limited impact on their economies.

Dutta, et al., (2012) together with Mellor (2009) have supported trickle-down theory where income distribution affect poverty through economic growth, but the study used broader financial development instead of financial deepening in addition to using economic growth as mediating variable instead of independent variable. Ben and Zhang (2016) analyzed the connection between income distribution and financial development proxies. Utilizing selected 143 nations and analyzing data covering the period 1961 to 2011, the research established that financial development proxies fundamentally lessened poverty and income inequality. Ben and Zhang (2016) however, used income distribution as a dependent variable instead of using it as a mediating variable.

Research by Pérez-Moreno and Weinhold (2016) held that development causes poverty reduction which is unidirectional. Pérez-Moreno and Weinhold (2016) additionally established causality between poverty and improvement in financial development. Pérez-Moreno and Weinhold (2016), however, did not include financial deepening, income distribution and financial efficiency in the analysis model. Keho (2017) evaluated the link between financial development, poverty and economic growth showed that GDP and financial development are positively affecting poverty in five nations. However, Keho (2017) study was not carried out in EAC Countries hence has limited application.

Dabwor and Abimiku (2016) conducted an empirical study to determine whether or not financial deepening has played a significant role in the poverty alleviation efforts in Nigeria. The paper estimated three models in which poverty rates for rural areas, urban areas, and national poverty rates were regressed on indicators of financial development, using both quantitative and descriptive analyses. According to the estimated parameters, the paper discovered that the coefficient of the ratio of broad money supply to GDP has a positive effect on poverty rate reduction in Nigeria. The market capitalization to GDP ratio and the foreign direct investment in equities to GDP ratio both have a positive impact on poverty reduction in rural and urban areas, respectively. The ratio of credit to the private sector and the ratio of total stock traded to GDP, on the other hand, had the opposite effect on poverty alleviation across the board. The descriptive analysis revealed that, despite the country's abundant natural and human resources, the poverty rate in Nigeria has remained unacceptably high. This led to the paper recommending that urgent

reforms in the financial sector be implemented in order to facilitate development in both the money and capital markets, improve liquidity, lower the yield on deposits, and increase financial access for the poor.

Karimo and Ogbonna (2017) conducted a study to examine the direction of causality between financial deepening and economic growth in Nigeria over the period 1970–2013,. The Toda–Yamamoto augmented Granger causality test was used in the study, and the results revealed that the growth-financial deepening nexus in Nigeria is consistent with the supply-leading hypothesis. The implications of this are that growth leads to financial deepening, not the other way around. A number of recommendations were made by the study, including that policy efforts should be directed toward the removal of obstacles that impede the expansion of credit to the private sector and the restoration of investors' confidence in the operation of the stock market.

Chamalwa and Bakari (2016). With the help of data from the Central Bank of Nigeria (CBN) statistical bulletin covering the period 1981-2012, we looked into the relationship between economic growth (GDP) and some financial deepening indicators (money supply and credit to the private sector). When testing for stationarity among the three variables (GDP, money supply, and credit to the private sector), the conventional augmented dickey fuller test was used, as was the Johensen cointegration technique for determining the order or the cointegrating equation. The Granger causality test was used to determine whether there was a causal relationship between the variables (i.e., whether it was uni-directional, bi-directional, or feedback), and then the Vector Error Correction

was used to determine whether there was a short-run or long-run relationship between the three variables. The findings indicate that all three variables are non-stationary at their initial levels, but that they become stationary after being differentiated once. At most one cointegrating equation can be used to cointegrate the three variables, and there is b-bidirectional causality between the three variables. The VECM suggested that there is a long-term relationship between the three. Testing the adequacy of the VECM on the residuals shows that they are homoskedastic, have no serial correlation, and are normally distributed, indicating that the model is satisfactory.

Bakang (2015) set out to investigate the effects of financial deepening on economic growth in the Kenyan banking sector, with the goal of identifying policy implications. A quarterly time series of data from 2000 to 2013 is used to achieve this goal in this study. A number of alternative indicators were used to measure financial deepening, including the ratio of liquid liabilities to nominal gross domestic product (GDP), the ratio of credit to the private sector (CPS) to nominal GDP, the ratio of commercial bank assets to commercial bank assets plus Central Bank Assets (CCBA), and the ratio of commercial bank deposits to nominal GDP. The dependent variable, economic growth, was measured in terms of real gross domestic product (GDP). In the Johansen Jeluisus cointegration test, evidence of cointegrating equations between GDP and financial deepening indicators was found for all variables integrated at level I (1). In order to determine the long- and short-term effects, four models were estimated. According to the findings of the study, the banking sector in Kenya plays an important role in the process of economic growth.

In particular, the empirical findings reveal that liquid liabilities, credit to the private sector, commercial central bank assets, and commercial bank deposits all have positive and statistically significant effects on GDP. As a result, the study recommends that existing policies be strengthened in order to encourage the general public to save more money in commercial banks. People will save more money if the interest rate paid to depositors on their deposits is raised, for example. In addition, the study recommends that financial inclusion policies be intensified by increasing access to and usage of formal banking services while simultaneously reducing the transaction costs of banks. Increased participation in economic activities, as well as increased borrowing and investment, will result as a result of these measures.

Trabelsi and Cherif (2017) used quarterly data from 1993 to 2011 to investigate the relationship between remittances, financial deepening, and the growth of the Lebanese economy. Their findings provided strong support for the theoretical proposition that remittances and financial development have a robust long-run relationship with economic growth in Lebanon. However, the findings indicate that short-run effects on growth volatility from financial development are statistically insignificant, whereas they are highly significant from remittances. It appears that benefits expected from remittances for mitigating growth volatility in Lebanon materialize more frequently than benefits associated with financial development, according to recent findings on the nexus between financial development, remittances, and economic growth.

Abedifar, Hasan, and Tarazi (2016) investigated the relative importance of Islamic banks in comparison to their conventional counterparts in terms of banking and financial development as well as economic welfare. Using a sample of 22 Muslim countries with dual banking systems over the period 1999–2011, this paper found a statistically significant positive relationship between the market share of Islamic banks and the development of financial intermediation, financial deepening, and economic welfare, particularly in low-income or predominantly Muslim countries, as well as countries with a comparatively higher uncertainty avoidance index. Furthermore, the findings reveal that a higher market share of Islamic banks is associated with higher efficiency of conventional banks.

Babajide, Adegboye, and Omankhanlen (2015) discovered that financial development is not only a result of economic growth, but it is also a driver of economic growth. As a feature of financial development, financial development (FD) is a process that results in increased availability of financial intermediary services of higher quality and efficiency. It generates savings in the local economy, which is then used to increase productive investments in local businesses. His paper looked into the effect of foreign direct investment on economic growth in Nigeria. Its purpose was to draw attention to the factors that influence foreign direct investment and its impact on economic growth. Secondary data were obtained from the World Development Indicators, and the data were analyzed using the ordinary least square regression model (OLSR). The conclusion is that FI is a significant determinant of the total factor of production, as well as capital per worker, which invariably determines the final level of output in the economy. The

findings of this study suggest that natural and economic resources should be fully exploited as an alternative means of revitalizing and diversifying Nigeria's oil-dependent monocultural economy.

Sahay and colleagues (2015) used a new measure of financial development to demonstrate that many benefits in terms of growth and stability can still be reaped from further financial development in the majority of emerging markets. First and foremost, it defined financial development as a combination of depth, access, and efficiency. Second, he stated that economic growth becomes more sluggish at higher levels of financial development. Third, he stated that the rate at which financial development takes place is important. In addition, it offers a fresh perspective on the tradeoffs associated with financial regulation. After all that research, he came to the conclusion that there is no single "best-fit" sequence for the development of financial institutions versus the development of markets, though as economies develop, the relative benefits from institutions decline and the relative benefits of markets increase.

Batuo, Mlambo, and Asongu (2018), investigated the implications of financial liberalisation for stability and economic growth. One school of thought holds that financial liberalization is associated with economic growth and development. Others, on the other hand, emphasize the connection between financial liberalisation and financial instability, which they argue is detrimental to economic growth and development. During the period 1985–2010, this study examines the relationships between financial instability,

financial liberalization, financial development, and economic growth in 41 African countries. According to the findings, financial development and financial liberalization have beneficial effects on financial instability. The findings also show that economic growth has a positive effect on financial instability, with the magnitude of the effect being greater in the pre-liberalisation period than in the post-liberalisation period.

Sharma (2016) examined the relationship between foreign direct investment (FDI) and economic growth in the SEMC and the EU-Med in the period 1985–2009, using a variety of variables and accounting for the effects of both quantity and quality. Credit to the private sector and bank deposits are negatively associated with growth, indicating that credit allocation problems, as well as a lack of effective financial regulation and supervision, exist. The size and liquidity of the stock market have an impact on growth, particularly when considering the quality of the institutions. Investments, whether domestic or foreign, are important contributors to economic development. Growth factors include stronger institutions and low inflation. Initial GDP has a consistently and significantly negative impact on growth, which confirms the catching-up hypothesis.

2.4 Summary of Empirical Review and Research Gaps

The empirical review has examined a number of studies that relate Economic Growth, financial deepening, Income distribution, financial efficiency, and poverty levels. Table 2.1 shows the gaps established in the empirical review.

Table 2.1: A Summary of the Review and Research Gaps

Researcher	Study methodology	Research Findings	Focus of the study	Research Gaps	Handling of gaps in the current study
Gries, Kraft and Meierrieks (2009)	Study used Granger causality test to evaluate the direction of causality and presence of unit roots.	Established causal link between financial deepening, trade openness and economic development.	Relationship between development of economy, trade openness and financial deepening.	The effect of financial deepening and economic growth on poverty was ignored.	Present study was carried out in east African community member countries. In a addition, the current study used economic growth as dependent variable to capture indirect effect of financial deepening on poverty.
Fosu (2010)	Study employed panel data models and test causality using granger	The study ascertained that income distribution explained poverty	Causation relationship between income, inequality and	The study looked at direct effect of economic growth on poverty, but forgot to look at the moderate effects of growth on poverty.	The present study examined the direct influence of financial deepening on poverty via economic growth by introducing

	causality test. Long-term link between variables tested.	reduction.	poverty		economic growth as the independent variable.
Odhiambo (2010)	Study used ARDL-Bounds testing procedure and Granger causality test.	Established that financial development encouraged people to save domestically thereby reduced poverty in the country.	It focuses much of its attention on the link between poverty and financial development in Kenya.	The study established mixed findings concerning direction of causation between financial deepening and poverty especially when different proxies of financial deepening are used, which may be misleading.	Present study adopted the head count Ratio to measure poverty to capture differences in severity of poverty.
Ferreira (2012)	The paper was a panel study covering all 27 European Union countries from 1996 to 2008.	The results showed that growth of economy was positively influenced by bank cost efficiency and banking sector	Influence of efficiency of banking firms on growth of economy countries in the European Union.	Study did not follow up on effect of bank efficiency on poverty and role economic growth on poverty."	The present study introduced the moderated link between poverty and economic growth by introducing moderating role of income distribution.

		concentration.			
Khan et al.(2012)	Error Correction Method(ECM) to evaluate the impact of financial development on poverty	The findings suggested that financial development was able to reduce poverty.	Association between financial development and poverty.	The study examined the direct effect of financial deepening on poverty but ignored the indirect effects.	The present study introduced income distribution as a mediating variable in the analysis model.
Pérez-Moreno and Weinhold (2012)	Adopted Granger causality tests and Panel data techniques of data analysis between 1970 and 1998.	Growth of economy and poverty reduction is unidirectional from growth to poverty.	Association between poverty and growth of economy in developing countries.	The used short panels limited to ten years which is associated with the challenge of fewer observations that may make it more difficult to detect any causal linkages between growth and poverty.	The present study employed income inequality as moderating variable on relationship between economic growth and poverty.
Fowowe and Abidoye (2013)	Generalized Method of Moment was used to analyze	Financial development was not found to have significant effect	Influence financial deepening on poverty and	The study establishes insignificant influence of finance on poverty that is conflicting with expectation	Poverty was introduced as a dependent variable in the analysis model of the

	the panel data	on reducing poverty and inequality within African countries.	inequality.	based on finance and poverty theoretical literature, In addition, the employs income inequality as co-dependent variable with poverty which is conflicting with general theoretical expectation that shows that income inequality mediates the link between finance and poverty.	current study
Waiyaki (2013)	"The research adopted OLS and PARCH model together with Vector Error Correction Model and granger causality test.	"Financial development leads to poverty reduction.	Link between growth of economy, poverty and development of the Kenyan financial sector.	The study was localized in Kenya and may not be readily applicable to other countries in the EAC due to country specific factors. In addition, the study has not introduced income inequality as a mediating variable as postulated in growth poverty theory .	The study had a longer time series data covering 30 years. In addition, income inequality has been introduced as explanatory variable moderating link between poverty and economic growth.
Ajisafe and Ajide (2014)	Study used vector error correction in the	Improvement of efficiency of the financial markets	The association between	The study omitted the effect of financial deepening on economic growth. Additionally,	Current study introduced poverty as the dependent variable with financial

	analysis of the association between variables. Data collected from 1986 to 2012	enhanced growth of economy greatly.	growth of economy and bank efficiency in Nigeria.	it did not follow up on the role of economic growth on poverty.	deepening being mediating variable.
Uddin Shahbaz, Arouri and Teulon (2014)	Quarterly data was used between 1975 and 2011. Study employed structural break autoregressive distributed lag model.	Growth of economy was weakly related with financial development and that Growth reduces poverty.	Relationship between Poverty, growth of economy and financial development in Bangladesh."	Study was based in Bangladesh with unique economic environment compared to EAC. Income inequality was ignored in the analysis model conflicting Finance-growth-poverty literature that uses inequality to capture the indirect effect of growth on poverty through inequality.	Present was expanded to include the five countries in EAC apart from Kenya. The study has adopted income inequality as mediating variable in the analysis model
Abosedra , Shahbaz and Nawaz (2015)	Quarterly data used .Granger causality test for direction of causation.	Established a direct link between financial development and poverty.	Association between reduction of poverty and financial development in	The study was localized in Egypt, which has different economic situations hence results may not readily be used in EAC Countries for policy recommendations. In addition,	The present study covered the five EAC countries apart from Kenya. The study also settled on one proxy of financial deepening that has largest

			Egypt.	the study only considered direct effect of financial deepening on poverty and ignored the indirect effects.	contribution to poverty in most empirical studies(head count ratio).
Singh and Huang (2015)	Data for 37 countries in Africa from 1992 to 2006. The study used panel data regression model	Study showed that Poverty, income inequality and Financial deepening were statistically significantly related	Association between Poverty, property rights and Financial Deepening within Africa countries	The paper finds that financial deepening is likely to widen income inequality thereby increasing poverty that is contrary to finance- poverty nexus. In addition, the study only considered direct effect of financial deepening on poverty, but ignored the indirect effects.	The current study adopted financial efficiency as a moderating variable.
Naceur and Zhang (2016)	A sample of 143 nations was utilized. The study focused much of its attention on the period between 1961 and 2011. The study	It established financial deepening were able to reduce poverty and income inequality.	Focused much of its attention on the link between financial development, inequality and poverty.	The study uses poverty gap index to measure poverty which may be misleading as it does not capture differences in the severity of poverty amongst the poor. Poverty gap index is also a recent proxy for poverty and is lacking for years before 2000	The current study adopted the generally accepted head count ratio to measure poverty. In addition, the study covered the five countries under east African community.

	adopted Fixed effect Panel data regression model.				
Nwanna and Chinwudu (2016)	The study used ordinary least square (OLS) to analyze the data covering the year between 1985 and 2014.	The findings showed Finance depth had positive and significant association with economic growth	Link between economic growth and financial deepening.	Study did not follow up on effect financial deepening on poverty with economic growth and development."	Poverty had been included as a dependent variable in the study model
Chinueze (2017)	Data used was from 1981 to 2015. Study adopted quasi-experimental research design.	Study established unidirectional Causality in financial deepening in the reduction of Poverty in Nigeria.	The study focused much of its attention on the link between poverty reduction and financial deepening	The study was localized in Nigeria hence findings may not be relevant for east African countries with different economic set up. Moreover, the study utilized Human Development Index to measure poverty that may be miss leading since HDI is a measure of general welfare and not	Current study established the influence that financial efficiency and financial deepening have on the link between economic growth and poverty

				poverty.	
Keho (2017)	It uses Granger causality test for testing direction of causation between growth of economy and poverty.	"Two causation between poverty and Growth of economy in South Africa, Cote d'Ivoire and Gabon.	"Association between poverty, Growth of economy and financial development in African countries.	The study model ignored the role that income distribution played in reducing poverty since theoretical basis of that model stated that income inequality moderated the link between poverty and income growth.	The current study was carried out in East African Community Countries in addition to introducing income inequality as a mediating variable.

2.5 Conceptual Framework

Figure 2.1 conceptualizes the link between Economic Growth, Financial Deepening, Income Distribution, Financial Efficiency and Poverty levels.

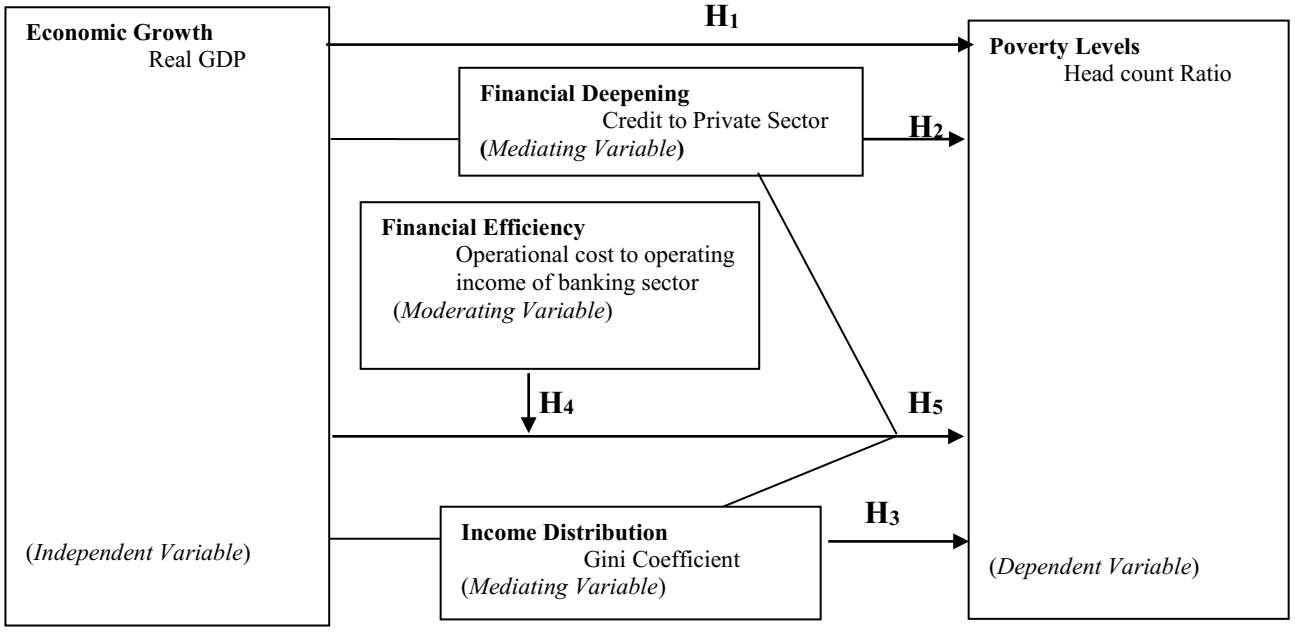

Figure 2.1: Conceptual Model

In the conceptual framework, the independent variable is Economic growth, the intervening variable is income distribution and financial deepening, the moderating variable is financial efficiency and the dependent variable is poverty levels. Literature has identified the link between economic growth, financial deepening, financial efficiency, Income distribution and poverty levels.

2.6 Study Hypotheses

The study tested the following null hypotheses:

H_{01}: Economic growth has no significant effect on poverty levels in East African Community countries.

H_{02}: Financial deepening has no significant effect on the link between economic growth and poverty levels in East African Community countries.

H_{03}: Income distribution has no significant effect on the link between economic growth and poverty levels in East African Community countries.

H_{04}: Financial efficiency has no significant effect on the link between economic growth and poverty levels in East African Community countries.

H_{05}: Economic growth, financial deepening, income distribution and financial efficiency have no joint effect on poverty levels in East African Community countries.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This section deals with methodology that was used to conduct this study. It focuses on methods that were used to collect and analyse the data.

3.2 Research Philosophy

The research philosophy can be described as the overarching framework within which the researcher makes choices about theories and methodologies. Research philosophy is the way that a person thinks about the development of knowledge (Saunders *et al.,* 2009). The positivism philosophy was adopted throughout the study. This philosophy traces its origins to natural science, and it is generally deductive in nature because it focuses on testing hypotheses delivered from existing theories. It presumes that theoretical models of a study can be developed and generalized to elucidate the cause and effect relationship between observable issues in reality (Johnson & Christensen, 2010).

The study choose this framework or the positivism philosophy on the basis that values of validity, truth and reason and it makes use of statistical and quantitative methods to predict outcomes (Saunders, *et al.,* 2009), as employed in this study. The philosophy was adopted because like natural sciences; the current study intends to test hypotheses on the link between economic growth, financial deepening, income distribution, financial efficiency and poverty levels.

3.3 Research Design

The study adopted a descriptive and comparative research designs. The design was preferred as the study attempts to investigate the link between economic growth, financial deepening, income distribution financial efficiency and poverty levels in EAC countries. A comparative design aims to compare issues from different backgrounds (Kothari, 2009). Since the study intends to compare the relationship between study variables across the five countries in East African Community, comparative research design is the most appropriate.

3.4 Population

This was the specific population from which research participants were to come from (Mugenda et al, 2012). The study population was five countries in the EAC, which included Kenya, Rwanda, Uganda, Burundi, and Tanzania. South Sudan was omitted because it is not a full member of the EAC. Annual data for 30 years beginning 1989 to 2018 was gathered for the study purpose.

3.5 Data Collection

Secondary data, which consisted of annual data, was utilized in the study. The data relating to credit to the private sector was obtained from respective websites of central banks of the EAC countries. The real GDP data was gathered from World Bank's website whereas data on cost efficiency of the respective banking sector was gathered from the website of Central Banks of EAC countries and IMF. Data on headcount ratio and Gini

coefficient was acquired from the World Bank and African Development Bank websites. The study collected annual data for 30 years from 1989 to 2018 from five EAC countries.

3.6 Diagnostic Tests

These tests were carried out to examine the conformity of the empirical model to classical ordinary least squares assumptions. This ensured that the model is fit for the purpose of forecasting. The study employed normality, heteroscedasticity, multicollinearity, serial correlation, Optimal lag test, unit root diagnostic tests, cointegration test, Cross sectional correlation test.

3.6.1 Normality Test

This test is utilized in statistics to evaluate whether a data set comes from normal distribution or not. It thereby determines the way a random variable from the data set is normally distributed. The Shapiro-Wilk test was adopted to test for normality of estimates' residuals. The residuals were said to be normal if their p-values are greater than 0.05 level of significance. Accordingly, those below 0.05 was said to depict cases of abnormal distribution (Garson, 2012). For the overall panel data regression model, If the regression residuals are normal, the study would adopt classical least squares panel data regression model. However, if the residuals are not normally distributed, the study transformed the data using natural logarithm to obtain log linear relationship. If the regression residuals are still not normal even after transformation, the study would adopt Feasible Generalised Least Squares (FGLS) model estimate the parameters of the explanatory variables.

For the country multivariate time series analysis, data regression model, ff the regression residuals are normal, the study would adopt classical least squares panel data regression model. However, if the residuals are not normally distributed, the study would transform the data using natural logarithm to obtain log linear relationship.

3.6.2 Heteroscedasticity Test

In statistical analysis, a sequence of random variables is said to be homoscedastic if all its variables have similar finite variance. In contrast, if the variance is not finite, the sequence is said to be heteroscedasticity. Serious violations of homoscedasticity may result to overestimation of goodness of fit (R^2) of a data (McCulloch, 1985). A study by Gujarati (2003) explained that heteroscedasticity describes a lack of constant error term variance. The research employed Breusch-Pagan / Cook-Weisberg test to evaluate for heteroscedasticity. If the calculated p-value was expected to be less than 0.05, then would be concluded that there is no heteroscedasticity. If the data is heteroskedastic implying that the standard errors are overestimated or underestimated, the data can still adopt OLS with robust standard errors also referred to as heteroscedasticity consistent standard errors. Regression with robust standard errors addresses the issue of computing misleading and incorrect values for student t-test statistics. However, it does not address the issue of the least squares estimators no longer being best. Due to the above weaknesses of using robust errors, the study would perform Feasible Generalized least squares (FGLS) regression panel data model for overall panel data model.

3.6.3 Multicollinearity

This phenomenon occurs when predictor variables in multiple regression model correlate with each other. In such a case, the coefficient estimates for the model may change significantly to small changes in the data (Goldberger, 1991). Kothari (2009) held that multicollinearity among the independent variable is said to exist if bivariate correlation among the independent variables are very high. Cooper and Schindler (2006) assert that multicollinearity results to inflated coefficients of the repressors making the significance values invalid tests. The Variance Inflation Factor (VIF) and Pearson correlation was be adopted to evaluate the existence of multicollinearity problem. Multicollinearity does not exist (Gujarati, 2003) when the VIF value is less than 10. In the presence, the problem of multicollinearity, means two or more regressors are highly correlated. In statistics, when two or more explanatory variables are highly correlated, for instance if the Pearson correlation coefficients are 0.90 and above, either of each variable should be removed from the model. The model with lesser R^2 and high standard errors should be removed from the model. In cases where complete elimination of multicollinearity problem is not possible, multicollinearity can also reduce by transforming one or more of the correlated variables in STATA into orthogonal variables the study would adopts regression with orthogonal variable in cases of high multicollinearity.

3.6.4 Serial (Auto) Correlation

This is a cross-correlation of an indicator with itself at diverse points in time (Kmenta, 1986). Gujarati (2003) asserted that auto correlation is said to exist if the residuals in the current period are correlated with other period. The dependent variables are normally affected by lagged values of independent variables leading to serial correlation especially

for long-term time series data. The study adopted Wooldridge Drukker test to evaluate the presence of autocorrelation in the model where a Probability value greater than 0.05 would be taken to imply absence of autocorrelation. In the presence of high autocorrelation, the OLS panel data model would be rejected since the estimates would not be BLUE. For overall panel data regression model, to minimise autocorrelation the study would use lagged values of the exogenous variables. In addition, the study would also adopt FGLS panel data model in the cases autocorrelation. The FGLS would ensure that the parameter estimates are BLUE. For country specific multivariate time series model, to minimise autocorrelation the study would use lagged values of the exogenous variables.

3.6.5 Unit Root Test

Econometric estimation requires that variables contained in a regression model to be stationary. As such, their covariance, variance and mean need to be time invariant. When non-stationary variables are utilized in a model, this could result to spurious regression. Gujarati (2003) argues that data lacks unit roots when Mean, variance and autocorrelation do not differ statistically in successive periods. Accordingly, stationarity ensures that regression coefficient estimates are robust (Wooldridge, 2012). To test for the existence of unit roots within the data, the study utilized Levin Lin chiu unit root test. A p-value greater than 0.05 was taken to imply for non-stationarity of the data; hence, the data was considered to have unit roots. In the presence of unit roots, the parameter estimates would not be correct. In addition, the standard errors would be over or underestimated. To correct unit roots problem in overall panel data regression, the study would reject the

general panel data model and adopt Feasible Generalized least squares (FGLS) regression panel data model. In the situation where estimators not being BLUE, the problem can be resolved by transforming the model into a model with homoscedastic errors without affecting the structure of model.

Table 3.1: Summary of Diagnostic Tests

CLS assumptions	Level of Analysis	Test of CLS Assumption	Conclusion on Assumption test
Normality	Country level time series analysis	Shapiro-Wilk test	if p> 0.05, the regression error terms normally distributed
	Overall panel data analysis	Shapiro-Wilk test	if p> 0.05, the regression error terms normally distributed
Homoscedasticity	Country level time series analysis	Breusch-Pagan / Cook-Weisberg	if p> 0.05, the regression error terms are homoscedastic
	Overall panel data analysis	Modified Wald test	if p> 0.05, the regression error terms are homoscedastic
Multicollinearity	Country level time series analysis	VIF	if VIF is less than 10 ,the regression error terms are not collinear
	overall panel data analysis	VIF	if VIF is less than 10 ,the regression error terms are not collinear
Autocorrelation	Country level time series analysis	Durbin Watson test	if p> 0.05, the regression error terms are not auto correlated
	Overall panel data analysis	Wooldridge Drukker Test	if p> 0.05, the regression error terms are not auto correlated
Unit roots test	Country level time series analysis	Augmented Dickey Fuller (ADF) unit	if p> 0.05, the regression error terms are said to have unit roots
	overall panel data analysis	Augmented Dickey Fuller (ADF) unit	if p> 0.05, the regression error terms are said to have unit roots

3.7 Data Analysis

The data were analysed using both descriptive and inferential statistics. The process of analysing the data started start by sorting, classifying, collating and checking for the data completeness. The data were then tabulated in to Microsoft excel and various variables generated. The excel file was then be exported to STATA version 14 for further analysis. The descriptive statistics, which included skewness, minimum and maximum values, standard deviation and mean among others, were calculated and tabulated. Diagnostic tests were then carried out and finally inferential statistics analysis were performed based on Feasible Generalised Least squares (FGLS) panel data regression models for overall results and hypotheses testing to ascertain the causal effect link between various variables relating to economic growth, financial deepening, income distribution, financial efficiency and poverty levels in EAC Member Countries. The tests of hypotheses were examined at 95% confidence level.

3.8 Operationalization of Study Variables

Table 3.2: Definition and Measurement of Variables

Variable	Proxy	Unit of Measurement	Literature Source
Dependent Variable			
Poverty (Y)	Head Count Ratio	Ratio of the population earning less than USD.2 per day to the total population within a country.	Jeanneney and Kpodar (2011)
Independent Variable			
Economic growth (X)	Real GDP	Natural logarithm of real GDP	Kargbo (2012)
Mediating Variables			
Financial Deepening (U)	Credit to Private Sector (CPS)	Natural logarithm of Credit to private sector	Adamopoulos (2010)
Income Distribution (W)	Gini coefficient	Gini coefficient	World Bank (1990)
Moderating Variable			
Financial efficiency (Z)	Operational cost efficiency	Ratio of operational cost to operational income of banking sector	Odhiambo (2015)

3.9 Analytical Model

There are several types of panel data models including fixed effect model, random effect model, between estimators, within estimator, dummy variable estimator, first differencing estimator, Feasible Generalized Least Square (FGLS), Ordinary Least Square (OLS), Monte Carlo approaches and many others (Wooldridge, 2012).

However, most of them just focused on the estimation itself and lack of attention to efficiency and consistency of the estimations. Reed and Ye (2009) in their research mentioned that the most common estimators in panel data are Generalized Least Square

(GLS) and Feasible Generalized Least Square (FGLS). Since variance covariance is often unknown, FGLS is more frequently used rather than GLS.

Furthermore, Reed and Ye (2009) also mentioned that Ordinary Least Square (OLS) is also one of the preferable estimators in panel data analysis. Unfortunately, the OLS estimator is generally inconsistent when the independent variable and random error disturbance are correlated. It is important to choose appropriate model which leads a better consistency and efficiency by considering several important aspect such as RMSE and other test if needed in order to choose the best one.

The study adopted FGLS panel data regression models to determine the link between Economic growth, financial deepening, Income distribution, financial efficiency and poverty level. The summary of data analysis models are given in Table 3.2 for each hypothesis clearly showing analytical model, statistics output and decision rule.

Table 3. 3: Data Analysis Models

Objectives	Hypotheses	Analysis Model	Statistics Output	Decision Rule
To establish the effect of economic growth on poverty levels in EAC countries.	H_{01}: Economic Growth has no significant effect on poverty levels in EAC member countries.	**Simple Regression** $Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon$ .....(1) Where: Y_t = Poverty Level (Dependent Variable) for the current period X_{t-1} = Real GDP (Economic Growth) for lagged one period β_0= Constant β_1= coefficient of real GDP j= 1,2,3,4,5 (Country) ε = error term	F test T test R^2 p value	If $p < 0.05$ the Null hypothesis will be rejected
To determine the effect of financial deepening on the relationship between economic growth and poverty levels in EAC countries.	**H_{02}:** Financial Deepening has no significant mediating effect on the relationship between Economic growth and poverty levels in EAC Member countries.	**Hierarchical Regression** $Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon$.....(1) $U_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon$.....(2) $Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \beta_2 U_{jt-1} + \varepsilon$ .....(3) Where: Y_t = Poverty Level (Dependent Variable) for the current period X_{t-1} = Real GDP (Independent Variable) for lagged one period U_t = Financial Deepening (Mediating variable) for current period U_{t-1} = Financial Deepening for lagged one period j= 1,2,3,4,5 (Country) β_0= Constant β_1= coefficient of real GDP β_2 = coefficient of Financial Deepening ε = error term (Baron & Kenny, 1986)	F test T test R^2 p value	For equation (1) p should be < 0.05 For equation (2) p should be < 0.05 For equation (3) **p** associated with U should < 0.05 and **p** associated with X should > 0.05 for complete mediation. If three conditions hold, reject null hypothesis
To examine the effect of	**H_{03}**: Income Distribution has no significant	**Hierarchical Regression**	ANOVA F test	For equation (1) p should be < 0.05

income distribution on the relationship between economic growth and poverty levels in EAC countries.	mediating effect on the relationship between economic Growth and poverty levels in EAC member countries.	$Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon$ .....(1) $W_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon$.....(4) $Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \beta_2 W_{jt-1} + \varepsilon$ .....(5) Where: Y_t = Poverty Level (Dependent Variable) for the current period X_{t-1} = Real GDP (Independent Variable) for lagged one period W_t = Income Distribution (Mediating Variable) for current period W_{t-1} = Income Distribution for lagged one period β_0= Constant β_1= coefficient of real GDP β_2 = coefficient of Income Distribution ε = error term j= 1,2,3,4,5 (Country) $t-1$= lagged one period t= Current Period	T test R^2 p value	For equation (4) p should be < 0.05 For equation (5) **p** associated with W should < 0.05 and **p** associated with X should > 0.05 for complete mediation. If three conditions hold, reject null hypothesis
To examine the effect of financial efficiency on the relationship between economic growth and poverty levels in EAC countries.	H_{04}: Financial Efficiency has no significant moderating effect on the relationship between economic growth and poverty levels in EAC Member countries.	**Stepwise Regression** $Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon$ .....(1) $Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \beta_2 Z_{jt-1} + \varepsilon$ .....(6) $Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \beta_2 Z_{jt-1} + \beta_3 X_{jt-1} . Z_{jt-1} + \varepsilon$ .....(7) Where: Y_t = Poverty Level (Dependent Variable) for the current period X_{t-1} = Real GDP (Independent Variable) for lagged one period Z_{t-1}= Financial Efficiency (moderating variable) for lagged one period $X_{t-1} \bullet Z_{t-1}$= Product of Real GDP and Financial Efficiency for lagged one period β_0= Constant β_1= coefficient of real GDP β_2 = coefficient of Financial Efficiency	ANOVA ΔF test ΔT test ΔR^2 p value	For equation (1) should be less than 0.05. For equation (6) p associated with Z should be less than 0.05. For equation (7), p value associated with Z and product of Z and X should be less than 0.05. If three conditions hold, reject null hypothesis

		β_3 = coefficient of product of Real GDP and Financial Efficiency ε = error term ***t-1***= lagged one period ***t***= Current Period j= 1,2,3,4,5 (Country)		
To determine the joint effect of economic growth, financial deepeing, income distribution and financial efficiency on poverty levels in EAC countries.	**H_{05}**: Economic growth, Financial deepening, Financial efficiency, Income distribution have no joint effect on poverty levels in EAC countries.	**Multiple Regression** $Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \beta_2 U_{jt-1} + \beta_3 W_{jt-1} + \beta_4 Z_{jt-1} + \varepsilon$.....*(8)* Where Y_t = Poverty Level for the current period X_{t-1} = Economic Growth for lagged one period U_{t-1} = Financial Deepening for lagged one period W_{t-1} = Income Distribution for lagged one period Z_{t-1} = Financial Efficiency for lagged one period β_0= Constant $\beta_1, \beta_2, \beta_3$ *and* β_4 = coefficients of explanatory variables (**X,U,W** and **Z** respectively) ε = error term ***t***= current period ***t-1***= lagged one period j= 1,2,3,4,5 (Country)	ANOVA F-test T-test R^2 p value	If $p < 0.05$ Reject Null hypothesis"

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND INTERPRETATIONS

4.1 Introduction

The purpose of this study was to establish the relationship between economic growth, financial deepening, income distribution, financial efficiency and poverty levels in East African countries. The analysis presented in this chapter involved the use of descriptive analysis where mean, standard deviation, minimum, maximum and time series line graphs were used. Diagnostic tests and test of assumptions were also conducted to measure the suitability of the variables for subsequent inferential analysis to establish the relationship between economic growth, financial deepening, income distribution, financial efficiency and poverty levels at the country level.

4.2 Descriptive Analysis

Descriptive statistics for all the variables were conducted to determine the statistical properties of the data before making an estimation. This involved the use of descriptive statistical tools including mean, standard deviation, minimum, maximum and time series line graphs. The purpose of descriptive analysis was to describe the basic features of the data in the study because they provide simple summaries about the sample and the measures. The analysis forms the basic virtual of any quantitative analysis. Descriptive Statistics also enables the researcher to present quantitative data about variables in a manageable form. In a research, descriptive statistic reduces lots of data into a simpler summary that is easy to understand at a glance. Therefore, descriptive statistics comes in to break numerous amounts of data into a simple form. Descriptive statistics analysis is critical since if the research is presented in raw data it would be hard to visualize what the

data is showing, especially if there was a lot of data for use. Descriptive statistics therefore enables this research to present its data in a more meaningful way, which allows simpler interpretation of the data. Descriptive analysis also enables the researcher to identify outliers that might bring problems during inferential analysis.

4.2.1 Summary of Statistics

The summary of statistics presents the measures of central tendency and dispersal (mean, standard deviation, minimum and maximum) for all the five countries in East African Community countries including Burundi, Kenya, Rwanda, Tanzania and Uganda. The results are presented in table 4.1.

Table 4. 1: Summary of Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Poverty (Y)	150	60.005	16.433	31.108	86
Economic growth (X)	150	1.62e+10	1.51e+10	1.23e+09	6.18e+10
Financial Deepening (U)	150	2.63e+09	4.72e+09	7.45e+07	2.46e+10
Income Distribution (W)	145	.412	.091	.199	.59
Financial efficiency (Z)	150	.496	.119	.117	.758

Source: Research Data (2019)

Table 4.1 presented the mean, standard deviation, minimum and maximum point. All the observations (Obs) were 150 with the exception of income distribution. The income distribution variable used as independent variable yielded 145 observations. The 150 observations were generated by getting the product of the time period and the number of the countries. Since the time was 30 years, from 1989 to 2018, and there were five

countries, the observations were thus (30*5) = 150. However, data for income distribution (W) was only available for 29 years from 1989 to 2017 giving 145 observations (29*5) = 145. The mean for poverty measured by head count ratio for all the five countries considered in the study was 60%. The poverty average mean means that on average for the 30-year period of the study, poverty level has remained high in East African countries with more than 60% of the population earning less than 2 USD per day. The standard deviation was 16.43 meaning specific country poverty levels deviated away from the mean by about 16.4%. The minimum poverty level was 31.1% and the maximum poverty level was 86%.

The economic growth was measured by real GDP in USD. The average economic growth was USD 162 billion, the standard deviation was USD 151 billion implying the economic growth of the East African Community countries is spread around the mean by USD 151 billion. The highest economic growth was USD 618 billion and the minimum economic growth was USD 12.3 Billion. Financial deepening was measured by credit to the private sector. The mean financial deepening was USD 26.3 Billion while the standard deviation for financial deepening was USD 47.2 billion. Finally, maximum financial deepening was USD 246 and minimum financial deepening was USD 0.745 Billion.

Income distribution was measured using the GINI coefficient. The mean income distribution was 0.41. A GINI coefficient of between 0.1 and 0.3 signified fair distribution of income and a GINI coefficient between above 0.4 signified unequal income distribution. The study suggests that the higher the ratio the higher the unequal

the income was distributed. The distribution of income for the five countries for the last 30 years has been about 0.41 implying that the income distribution is unequal. The standard deviation was 0.091, the maximum income distribution was 0.59 meaning most of the income earned within the country is in the hands of a few people.

Financial efficiency was measured by the ratio of cost of the banking sector compared to income earned by the banking sector. This means the higher the ratio the higher the financially inefficient the banking sector. The mean financial efficiency was 49.62 implying the cost of financial intermediation was about 49.62 % as a proportion of the income earned by the banking sector. The standard deviation was about 11. 9% around the mean, the maximum financial efficiency ratio was 75.8 % and the minimum financial efficiency ratio was 11.6%. The higher the cost efficiency ratio, the worse of a country is doing in terms of financial efficiency.

4.2.2 Trend Movement of Poverty among five East African Countries

The research sought to establish the trend movement of poverty among EAC countries. The time series trend movement for poverty for the five countries in presented in Figure 4.1

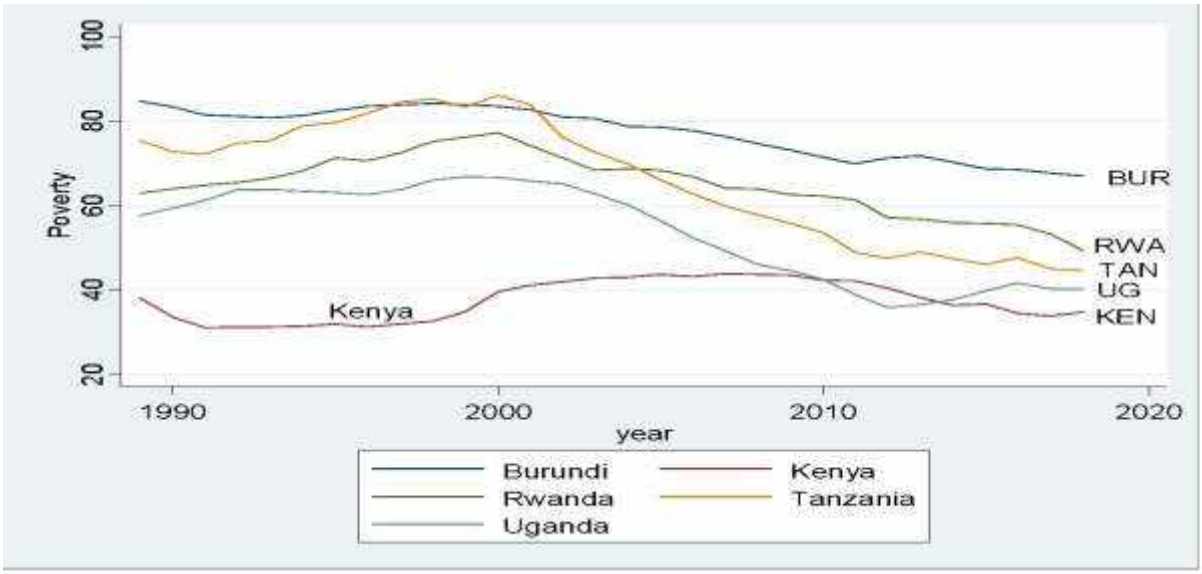

Figure 4. 1: Trend movement of poverty among five East African Community Countries

Source: Research Data (2019)

Figure 4.1 shows the time trend for poverty levels for the five countries. Between the year 1990 to year 2000, Kenya has had the lowest poverty level among other east African member countries. Kenya was followed closely by Uganda, then Rwanda, then Tanzania and lastly Burundi. Between year 2000 to 2010. The poverty level in Kenya rose from to about 40%. During same period, the poverty level for the other countries fell greatly. After the year 2010 Poverty level in Kenya begun falling steadily as well as other East African member countries.

4.2.3 Trend Movement of Economic Growth among Five East African Countries

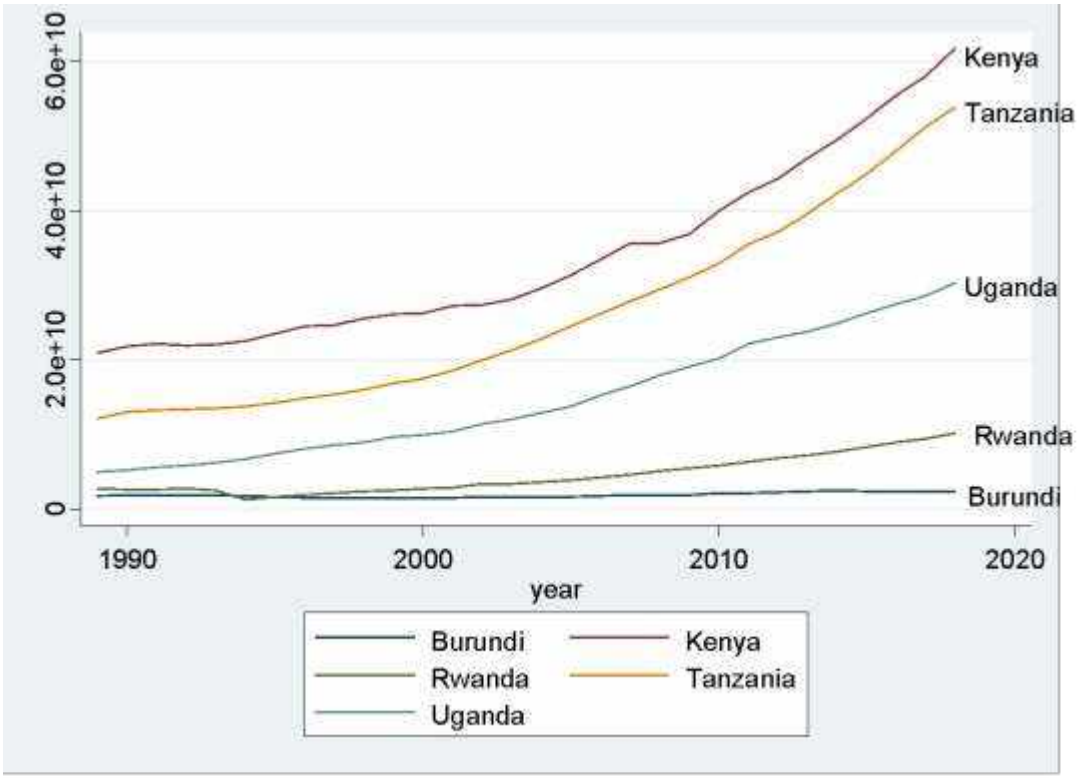

Figure 4.2: Trend movement of Economic growth among five East African Countries

Source: Research Data (2019)

Figure 4.2 shows the time trend for poverty levels for the five countries. Between the year 1990 to the year 2000, Kenya had the highest real economic growth level among other east African member countries. Kenya was followed closely by Tanzania, Uganda, Rwanda and Burundi. Between the year 2000 to 2010, the real economic growth rate for the east African countries have been growing since 1990 with the exception of Burundi that has a flattened real economic growth.

4.2.4 Trend Movement of financial deepening among Five East African Countries

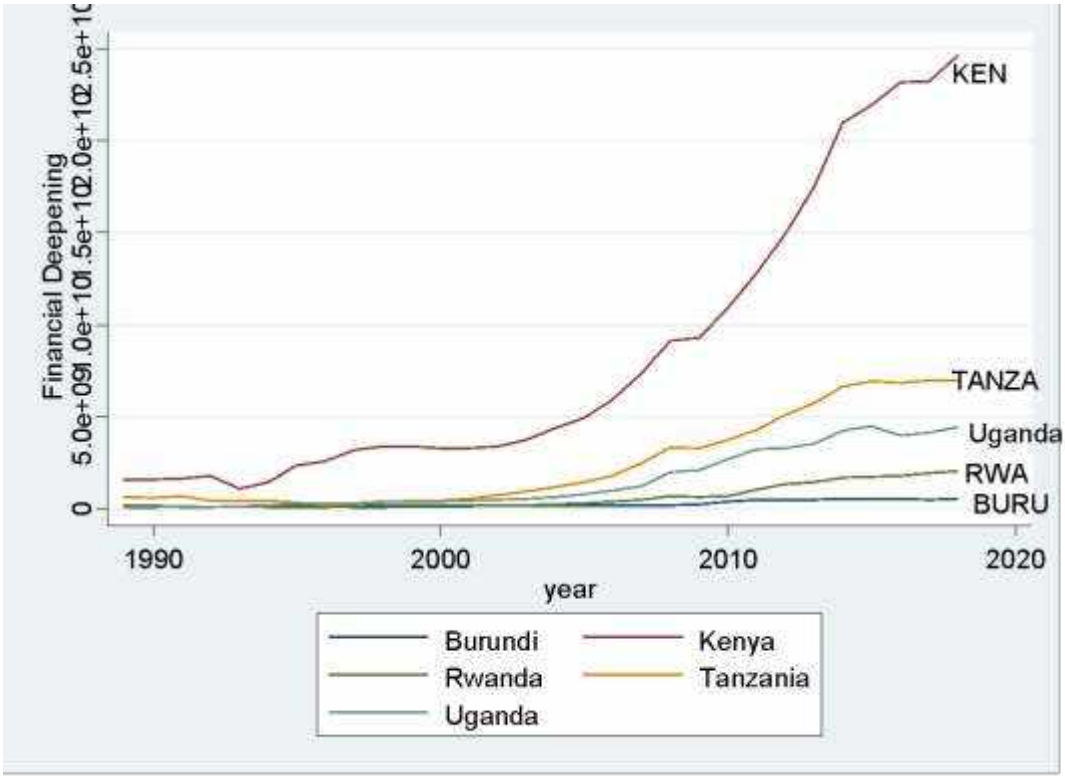

Figure 4.3: Trend movement of Financial Deepening among five East African Countries

Source: Research Data (2019)

Figure 4.3 shows the time trend for financial deepening for the five countries. Between the year 1990 to the year 2000, Kenya was slightly above other EAC countries in financial deepening. Between 2000 and 2019, Kenya experienced rapid financial deepening in terms of credit to private sector and has had the highest real economic growth level among other East African Community countries. Kenya was followed by Tanzania, Uganda, Rwanda and Burundi. Between the year 2000 to 2010, generally, financial deepening for the East African countries had grown since 1990 with the exception of Burundi that had a flattened financial deepening.

4.2.5 Trend Movement of Income distribution among Five East African Countries

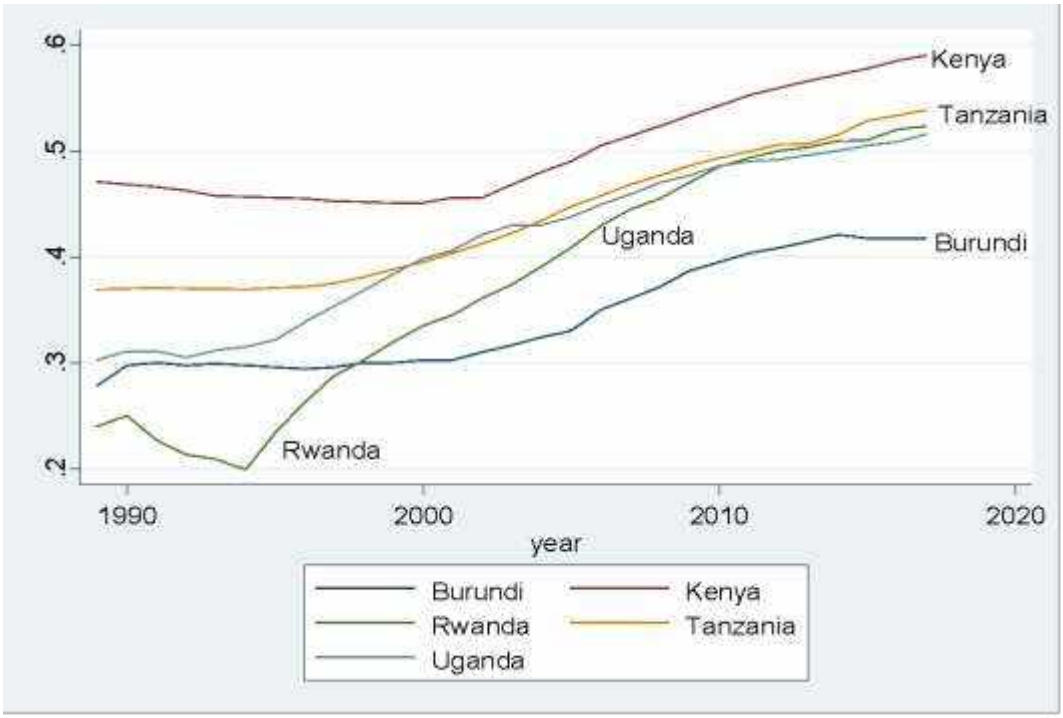

Figure 4.4: Trend movement of income distribution among five East African Countries

Source: Research Data (2019)

Figure 4.4 shows the time trend for income distribution for the five countries. Between the years 1990 to 2000, the income distribution for Kenya improved with the GINI coefficient falling through out that period. The income distribution for Burundi and Tanzania was flat during the same period. The income distribution for Rwanda improved up to mid-1990s and then dropped with a sharp increase in GINI coefficient. Between 2000 and 2019, all EAC countries income distribution had worsened with all countries recording increasing GINI coefficients.

4.2.6 Trend Movement of Financial efficiency among Five East African Countries

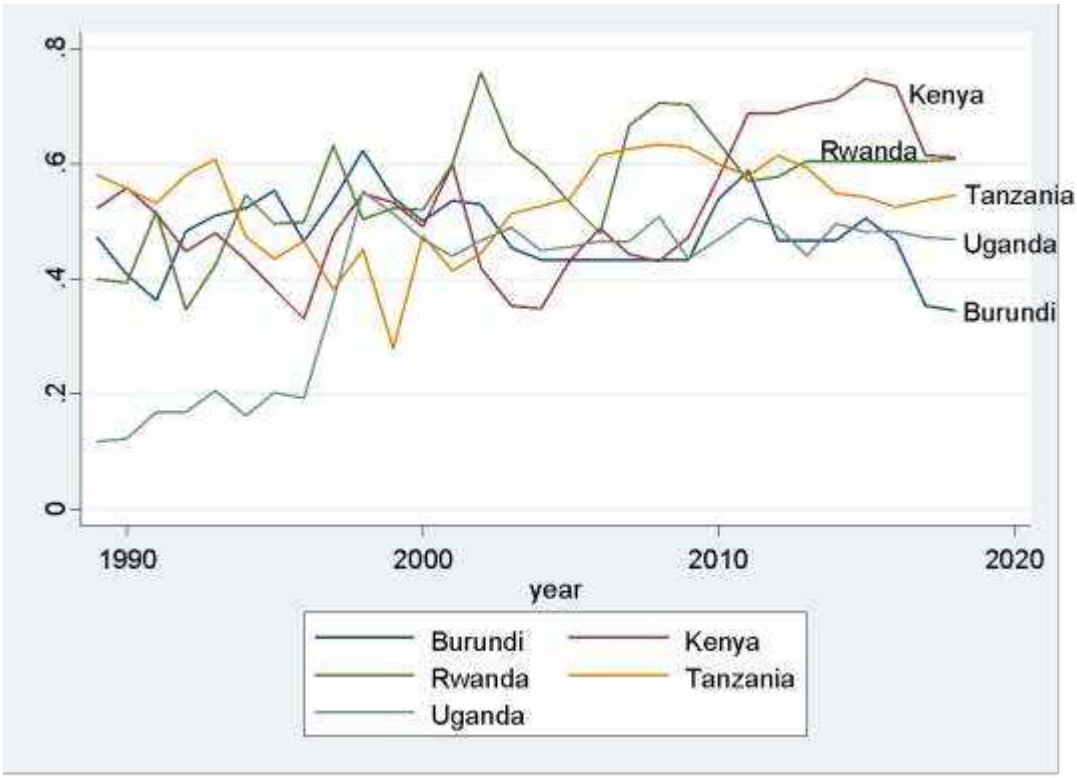

Figure 4.5: Trend movement of financial efficiency among five East African Countries

Source: Research Data (2019)

Figure 4.5 shows the time trend for financial efficiency for the five countries. Between the years 1990 to year 2019, the financial efficiency for all the countries in the EAC had been fluctuating greatly sometimes more efficient while sometimes less efficient. The operating environment for most banks has been hash with banking sector recording fluctuating financial efficiency in terms of cost efficiency.

4.3 Diagnostic tests

The study carried out diagnostic test of the panel data for the five countries in the EAC. The goal was to ensure the model was robust and to establish the general association between the explanatory variables and poverty levels. These tests were carried out to examine the conformity of the empirical model. This ensured that the model is fit and robust for the purpose of forecasting. The study tested panel data assumptions including normality, heteroscedasticity, multicollinearity, serial correlation, unit root tests, and cross-sectional correlation.

4.3.1 Normality Test

This test is utilized in statistics to evaluate whether a data set comes from normal distribution or not. It thereby determines the way a random variable from the data set is normally distributed. The Shapiro-Wilk test was adopted to test for normality of estimates' residuals. The residuals would be said to be normally distributed if their p-values are found to be greater than 0.05 level of significance. Accordingly, those below 0.05 depict cases of non-distribution (Garson, 2012).The findings are presented in Table 4.2.

Table 4.2: Shapiro-wilk Test

Variable	Obs	W	V	z	Prob>z
y	150	0.918	9.573	5.121	0.000
x_01	145	0.939	6.874	4.362	0.000
u_01	145	0.947	6.004	4.056	0.000
w_01	145	0.946	6.058	4.077	0.000
z_01	145	0.782	24.584	7.246	0.000

Source: Research Data (2019)

All the p-values were less than 0.05 meaning there of a problem of normality hence assumptions of normality of observed variables and residuals is violated hence the study adopted FGLS model for parameter estimation.

4.3.2 Test for Multicollinearity

This phenomenon occurs when predictor variables in multiple regression model correlate with each other. In such a case, the coefficient estimates for the model may change significantly to small changes in the data (Goldberger, 1991). Kothari (2009) held that multicollinearity among the independent variables is said to exist if bivariate correlation among the independent variables are very high. Cooper and Schindler (2006) assert that multicollinearity results to inflated coefficients of the repressors making the significance values invalid tests. The Variance Inflation Factor (VIF) was adopted to evaluate the existence of multicollinearity problem. Multicollinearity does not exist (Gujarati, 2003) when the VIF value is less than 10. The results are presented in Table 4.3.

Table 4.3: Value Inflation Factor (VIF) for panel Data

Variable	VIF	1/VIF
lnw	9.580	0.104
lnu	5.250	0.191
lnx	5.180	0.193
lnz	1.370	0.729
Mean VIF	5.340	

Source: Research Data (2019)

Table 4.3 shows that all the explanatory variables had a VIF value less than 10.The explanatory variables therefore showed a lower VIF value. With no explanatory variables

showing signs of multicollinearity, the classical least squares panel data model may be appropriate for the analysis. However, for the study to adopt classical least squares panel data model, there should be no violation of heteroscedasticity, unit roots and autocorrelation assumptions.

4.3.3 Test for heteroscedasticity

In statistical analysis, a sequence of random variables is said to be homoscedastic if all its variables have similar finite variance. In contrast, if the variance is not finite, the sequence is said to be heteroscedasticity. Serious violations of homoscedasticity may result in overestimation of goodness of fit (R^2) of a data (McCulloch, 1985). A study by Gujarati (2003) explained that heteroscedasticity describes a lack of constant error term variance. The research employed modified Wald test to evaluate for heteroscedasticity. If the calculated p-value is less than 0.05, then it is concluded that there is no heteroscedasticity. The results are presented in table 4.4.

Table 4.4: Modified Wald Test for Heteroskedasticity

Modified Wald test for group wise heteroskedasticity in FGLS effect regression model
H0: sigma(i)^2 = sigma^2 for all i
chi2 (5) = 4971.56
Prob>chi2 = 0.0000

Source: Research Data (2019)

The p-value (0.0000) is less than the significance level (0.05) hence the test concluded that there is no constant variance meaning the error terms are heteroskedastic and the panel data assumptions of homoscedasticity is violated. An attempt to remove heteroscedasticity by getting robust standard errors and did not solve the problem. The

study therefore ignored the Ordinary Least Squares panel model regression model and adopted FGLS model.

4.3.4 Test for autocorrelation/ Serial correlation

This is a cross-correlation of an indicator with itself at diverse points in time (Kmenta, 1986). Gujarati (2003) asserted that autocorrelation is said to exist if the residuals in the current period are correlated with other period. The dependent variables are normally affected by lagged values of independent variables leading to serial correlation especially for long-term time series data. The study adopted Wooldridge Drukker test to evaluate the presence of autocorrelation in the model where a Probability value greater than 0.05 was to be taken to imply absence of autocorrelation. The results are presented in table 4.5.

Table 4.5: Wooldridge Test for autocorrelation

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
F(1, 4) = 149.845
Prob > F = 0.0003

Source: Research Data (2019)

The results in Table 4.5 showed that the p-value (0.0003) was less than the significance level (0.05) hence the test rejects the null hypothesis of no autocorrelation implying that the data has strong serial correlation. In addition utilising first order difference data transformation of the variables did not eliminate autocorrelation. Hence, the Ordinary least squares (OLS) assumption of no autocorrelation is violated. The study had to make a choice between Panel Correlated Standard errors (PCSE) model and Feasible

Generalised Least Squares (FGLS) model. The study settled on FGLS given that it is used when T > n (T = 30 years and n= 5 countries).

4.3.5 Test for Unit roots

Econometric estimation requires that variables contained in a regression model to be stationary. As such, their covariance, variance and mean need to be time invariant. When non-stationary variables are utilized in a model, this could result in spurious regression. Gujarati (2003) argues that data lacks unit roots when Mean, variance and autocorrelation do not differ statistically in successive periods. Accordingly, stationarity ensures that regression coefficient estimates are robust (Wooldridge, 2012). Testing for the existence of unit roots within the data, the study utilized the Augmented Dickey Fuller (ADF) unit root test. A p-value greater less than 0.05 level of significance would be taken to imply for stationarity of the data; hence, the data have unit roots. The results are presented in Tables 4.6.

Table 4.6: Unit- root Test (Poverty and Financial Efficiency)

Levin-Lin-Chu unit-root test for lny

Ho: Panels contain unit roots		Number of panels = 5
Ha: Panels are stationary		Number of periods = 30
AR parameter: Common		Asymptotics: N/T -> 0
Panel means: Included		
Time trend: Not included		
ADF regressions: 1 lag		
LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC)		
	Statistic	p-value
Unadjusted t	-0.9180	
Adjusted t*	1.5421	0.9385

Levin-Lin-Chu unit-root test for lnz

Ho: Panels contain unit roots		Number of panels = 5
Ha: Panels are stationary		Number of periods = 30
AR parameter: Common		Asymptotics: N/T -> 0
Panel means: Included		
Time trend: Not included		
ADF regressions: 1 lag		
LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC)		
	Statistic	p-value
Unadjusted t	-5.0138	
Adjusted t*	-2.3774	0.0087

Source: Research Data (2019)

In table 4.6, since the P-value for poverty (0.9385) was greater than the significance level (0.05), the test fails to reject the null hypothesis hence poverty has unit units meaning the variable is significantly affected by time. Given the P-value (0.0087) being less than 0.05 level of significance, the test rejects the null hypothesis that panels contain unit roots

hence financial efficiency did not have unit units meaning the variable is not significantly affected by time.

Table 4.7: Unit- Root Test (Financial Deepening and Income Distribution)

Levin-Lin-Chu unit-root test for lnu

Ho: Panels contain unit roots	Number of panels = 5
Ha: Panels are stationary	Number of periods = 30
AR parameter: Common	Asymptotics: N/T -> 0
Panel means: Included	
Time trend: Not included	
ADF regressions: 1 lag	
LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC)	

	Statistic	p-value
Unadjusted t	-0.4211	
Adjusted t*	0.7785	0.7819

Levin-Lin-Chu unit-root test for w

Ho: Panels contain unit roots	Number of panels = 5
Ha: Panels are stationary	Number of periods = 29
AR parameter: Common	Asymptotics: N/T -> 0
Panel means: Included	
Time trend: Not included	
ADF regressions: 1 lag	
LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC)	

	Statistic	p-value
Unadjusted t	-0.3811	
Adjusted t*	0.9348	0.8251

Source: Research Data (2019)

In Table 4.7, since the P-value for financial deepening (0.7819) was greater than the significance level (0.05), the test fails to reject the null hypothesis hence financial deepening has unit units meaning the variable is significantly affected by time. Additionally, given the P-value for income distribution (0.6568) being greater than 0.05 level of significance, the test fails to reject the null hypothesis that panels contain unit roots hence income distribution has unit units meaning the variable is significantly affected by time.

Table 4.8: Unit- Root Test (Economic Growth)

Levin-Lin-Chu unit-root test for lnx

Ho: Panels contain unit roots	Number of panels = 5
Ha: Panels are stationary	Number of periods = 30
AR parameter: Common	Asymptotics: N/T -> 0
Panel means: Included	
Time trend: Not included	
ADF regressions: 1 lag	
LR variance: Bartlett kernel, 9.00 lags average (chosen by LLC)	

	Statistic	p-value
Unadjusted t	0.6628	
Adjusted t*	1.3855	0.9171

Source: Research Data (2019)

In table 4.8, since the P-value for economic growth (0.9171) was greater than the significance level (0.05), the test fails to reject the null hypothesis that panels contain unit roots hence economic growth has unit roots meaning the variable is significantly affected

by time and may result in spurious regression. In conclusion, given that all the variables except financial efficiency showed presence of unit roots with P-values being greater than 0.05 except financial efficiency. The study therefore concluded that the effect of change in time on parameter estimates is significant. Hence, classical least squares panel model cannot be adopted. The study therefore adopted FGLS model in parameter estimation.

4.3.6 Test for Cross-sectional Correlation

The study also sought to establish the cross sectional correlation. Cross sectional correlation develops when a variable residual in one data panel is correlated with the same variable residual in another data panel. The cross-sectional correlation is presented in table 4.9.

Table 4.9: Correlation Matrix for Residuals

	__e1	__e2	__e3	__e4	__e5
__e1	1.0000				
__e2	-0.8327	1.0000			
__e3	-0.5433	0.6156	1.0000		
__e4	0.6623	-0.4720	-0.1908	1.0000	
__e5	0.4488	-0.3043	-0.1268	0.8953	1.0000

Breusch-Pagan LM test of independence: chi2 (10)= 92.133, Pr = 0.0000Based on 29 complete observations over panel units

Source: Research Data (2019)

In Table 4.9, the p-value (0.000) is less than the level of significance implying that data shows presence of cross sectional correlation. The study therefore concluded that the

panels were not independent since there exist significant cross-panel correlation. Synergies of the economies in terms of trade and other avenues of cooperation can explain the panel dependence across east African countries.

4.4 Correlation Analysis

The study adopted correlation analysis to assist explain the association between economic growth, financial deepening, income distribution and financial efficiency and poverty levels among east African community countries. The study also used pairwise Pearson Correlation to establish the relationship as shown in Table 4.10.

Table 4.10: Pairwise Correlation Coefficients

Variables	(1)	(2)	(3)	(4)	(5)
(1) lny	1.000				
(2) lnx_01	-0.748* 0.000	1.000			
(3) lnu_01	-0.824* 0.000	0.880* 0.000	1.000		
(4) lnz_01	-0.119 0.154	0.142 0.089	0.358* 0.000	1.000	
(5) lnw_01	-0.701* 0.000	0.787* 0.000	0.897* 0.000	0.366* 0.000	1.000

* shows significance at the .05 level

Source: Research Data (2019)

In Table 4.10, Pairwise Pearson correlation coefficient was generated at 0.05 level of significance. Pearson's correlation (r) indicated that there was a statistically significant negative correlation between income distribution and poverty ($r = -0.701$, $p = 0.000 < \alpha = 0.05$). The association between Financial efficiency and poverty level was negative and

statistically insignificant ($r = -0.119$, $p = .0.154 < \alpha = 0.05$). The correlation between financial deepening and poverty level was negative and statistically significant ($r = -0.824$, $p = 0.0000 < \alpha = 0.05$). The relationship between economic growth and poverty level was negative and statistically significant ($r = 0.748$, $p = .000 < \alpha = 0.05$). All the explanatory variables were negatively correlated with poverty implying that the explanatory variables (economic growth, financial deepening, income distribution and financial efficiency were inversely related to poverty levels in east African countries (Kenya, Uganda, Tanzania, Burundi and Rwanda).

CHAPTER FIVE: HYPOTHESES TESTING AND DISCUSSIONS

5.1 Introduction

The chapter sought to test five hypotheses of the study. The chapter examines the various hypotheses that were put forward with the aim of either rejecting failing to reject the null hypotheses of the study.

5.2 Hypotheses Tests

The study adopted Feasible Generalised Least squares (FGLS) panel data model in carrying out regression after classical least squares panel data models was rejected since the data had units roots, was serially correlated and did not have constant variance. Any analysis based on classical least squares panel model that is not BLUE would result into inflated parameter estimates and miss leading standard errors. The study therefore settled on FGLS panel model to determine the link between economic growth, financial deepening, Income distribution, financial efficiency and poverty level.

The panel data adopted in the FGLS regression model had 150 observations for all variables with the exception of income distribution. All the regression output based on explanatory variables; economic growth, financial deepening and financial efficiency had 145 observations given that the FGLS panel data model adopted was based on lagged one values of the explanatory variables. The adoption of lagged one values of explanatory variables led to 15 observations of 2018 being omitted from the regression analysis hence 145 observations. Further, the regression model where income distribution was used as dependent variables yielded 140 observations given that the variable had 145

observations initially running from 1989 to 2017 and adoption of lagged one values for the independent variable economic growth led to loss of another 5 observations hence 140 observations.

5.2.1 The Effect of Economic Growth on Poverty Levels

The study sought to test the null hypothesis (H_{01}) that economic growth has no significant effect on poverty levels in East African Community countries. The hypotheses test was based on p- values of FGLS regression analysis. The null hypothesis one would be rejected if the p-value generated is less than 0.05 level of significance. Additionally, the null hypothesis was rejected if calculated t-statistic is greater than the critical t-value of +- 1.96. The findings were presented on Table 5.1

Table 5.1: Effect of Economic Growth on Poverty Levels, Hypothesis one test

lny	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
lnx_01	-0.135	0.019	-7.23	0.000	-0.171	-0.098	***
Constant	7.122	0.401	17.74	0.000	6.335	7.908	***
Mean dependent var		4.050	SD dependent var				0.299
Number of obs		145.000	Chi-square				52.309
			Prob < chi2				0.000

*** *p<0.01,* ** *p<0.05,* * *p<0.1*

Source: Research Data (2019)

Table 5.1 shows that the overall p-value (0.0000) generated was less than 0.05 implying that economic growth has a significant effect on poverty levels among EAC countries. In addition, the p-value (p= 0.000) associated with economic growth was less than the level of significance (α=0.05) meaning that lagged economic growth has a significant effect on poverty levels in east African countries. Given that, the p-value of economic growth (0.000) was less than 0.05; the null hypothesis (H_{01}) that economic growth has no significant effect on poverty levels in East African Community countries was rejected meaning economic growth had a statistically significant effect on poverty levels in East African countries. The simple Regression model (1) equation was thus fitted as follows:

$$Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon \quad \text{.....(1)}$$

Where:

Y_t = Poverty Level (Dependent Variable) for the current period

X_{t-1} = Real GDP (Economic Growth) for lagged one period

β_0= Constant

β_1= coefficient of real GDP

j= 1,2,3,4,5 (Country)

ε = error term

$$\mathbf{Y_{jt} = 7.122 - 0.135X_{jt-1} + \varepsilon \quad .....(1)}$$

In the fitted model, Intercept term β_0 (7.122) gives the level of poverty when the explanatory variables are held constant at zero. The coefficient of economic growth (β_1= - 0.135) was negative meaning a growing economy is also associated with falling poverty levels as citizens income improves.

5.2.2 The Mediating Effect of Financial Deepening on the Relationship between Economic Growth and Poverty Levels

The study sought to test the null hypothesis (H_{02}) that Financial Deepening has no significant mediating effect on the relationship between economic growth and poverty levels in EAC member countries. The hypotheses test was based on p- values of FGLS regression analysis. Null hypothesis 2 would be rejected if three conditions were satisfied. For the first condition, the first step of regression, p-value associated with lagged one economic growth values (LnX_01) should be less than 0.05 level of significance (p-value < 0.05). The second condition is that the p value associated with

economic growth generated in the second step of regression should be less than 0.05 level of significance < 0.05. The third condition is that p-values generated in the third step regression associated with U should be less than 0.05 level of significance and p associated with X should be greater than 0.05 for there to be complete mediation if p values for both economic growth and financial deepening are both less than 0.05 then there is partial mediation. The findings are presented in Tables 5.2, 5.3 and 5.4.

Table 5.2: Effect of Economic Growth on Poverty, Hypothesis Two test, Step One

lny	Coef.	St.Err.	t-value	p-value	Sig
lnx_01	-0.135	0.019	-7.23	0.000	***
Constant	7.122	0.401	17.74	0.000	***
Mean dependent var		4.050	SD dependent var		0.299
Number of obs		145.000	Chi-square		52.309
			Prob < chi2		0.000

**** p<0.01, ** p<0.05, * p<0.1*

Source: Research Data (2019)

Table 5.2 showed that the overall p-value (0.0000) generated in the first step of mediation process for hypothesis two test was less than 0.05 implying that economic growth has a significant effect on poverty levels among EAC countries. In addition. p-value (0.000) associated with estimated coefficient of economic growth (LnX_01) was less than 0.05 level of significance (p-value = 0.000< α= 0.05). Further, the model was estimated as shown in model equation (1).

$$Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon \quad \text{.....(1)}$$

Where:

Y_t = Poverty Level (Dependent Variable) for the current period

X_{t-1} = Real GDP (Economic Growth) for lagged one period

j= 1, 2,3,4,5 (Country)

β_0= Constant

β_1= coefficient of real GDP

ε = error term

$$Y_{jt} = 7.122 - 0.135\, X_{jt-1} \quad \text{..... (1)}$$

In the fitted model (1), Intercept term β_0 (7.122) gives the level of poverty when the explanatory variables are held constant at zero. The coefficient of economic growth (β_1= -0.135) was negative meaning a growing economy is also associated with falling poverty levels as citizen's income improves. The first condition for rejection of the hypothesis two was satisfied given that the p-value associated with economic growth (LnX_01) was less than 0.05 level of significance (p-value < 0.05).

Table 5.3: Effect of Economic Growth on Financial Deepening, Hypothesis Two test, Step two

lnu	Coef.	St.Err.	t-	p-	Sig

			value	value	
lnx_01	0.952	0.100	9.50	0.000	***
Constant	-1.031	2.246	-0.46	0.646	
Mean dependent var		20.577	SD dependent var		1.537
Number of obs		145.000	Chi-square		90.257
			Prob> chi2		0.000

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Research Data (2019)

Table 5.3 showed that in the second step of mediation process for hypothesis 2 test, the overall p-value (0.0000) generated was less than 0.05 implying that economic growth has a significant effect on financial deepening among EAC countries. In addition, the p – value (0.000) associated with economic growth on financial deepening generated in the second step of mediation process for hypothesis two was less than 0.05 level of significance ($p= 0.000< \alpha = 0.05$). The p-value being less than the level of significance means that economic growth has a significant effect on financial deepening. The model was thus estimated as shown in equation (2).

$$U_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon \quad \text{.....(2)}$$

Where:

Y_t = Poverty Level (Dependent Variable) for the current period

X_{t-1} = Real GDP (Economic Growth) for lagged one period

U_t = Financial Deepening (Mediating variable) for current period

U_{t-1} = Financial Deepening for lagged one period

j= 1, 2,3,4,5 (Country)

β_0= Constant

β_1= coefficient of real GDP

β_2 = coefficient of Financial Deepening x

ε = error term

$U_{jt} = -1.031 + 0.952 X_{jt-1}$ ……..……..……..(2)

In the fitted mode (2), Intercept term for the model (**-1.031**) gives the level of financial deepening when economic growth is held constant at zero. The coefficient of economic growth (β_1= **0.952**) was positive meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with rising financial deepening by **0.952** units. Given that the p –value (0.000) associated with economic growth on financial deepening generated in the second step of regression was less than 0.05 level of significance (p= 0.000< α = 0.05), the second condition for rejection of the null hypothesis 2 was thus satisfied.

Table 5.4: Effect of Economic Growth and Financial Deepening on Poverty Levels, Hypothesis Two test, Step Three

lny	Coef.	St.Err.	t-value	p-value	Sig
lnx_01	-0.103	0.021	-5.01	0.000	***
lnu_01	-0.029	0.011	-2.73	0.006	***
Constant	7.007	0.367	19.07	0.000	***
Mean dependent var		4.050	SD dependent var		0.299
Number of obs		145.000	Chi-square		71.463
			Prob> chi2		0.000

*** *p<0.01, ** p<0.05, * p<0.1*

Source: Research Data (2019)

Table 5.4 shows the third step of mediation process for hypothesis 2 test, overall p-value (0.000) was less than 0.05 hence it can be concluded that both economic growth and

financial deepening have a significant effect on poverty levels in EAC countries. In addition, the p-values for economic growth and financial deepening, (lnx_01, p-value= 0.000 and Lnu_01, p-value = 0.006) were less than the level of significance (0.05), implying both variables had a significant effect on poverty levels in EAC countries. The model is thus estimated as shown in equation (3).

$$\mathbf{Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \beta_2 U_{jt-1} + \varepsilon} \quad \textbf{(3)}$$

Where:

Y_t = Poverty Levels (Dependent Variable) for the current period

X_{t-1} = Real GDP (Economic Growth) for lagged one period

U_{t-1} = Financial Deepening for lagged one period

j= 1, 2,3,4,5 (Country)

β_0= Constant

β_1= coefficient of real GDP

β_2 = coefficient of Financial Deepening x

ε = error term

$$\mathbf{Y_{jt} = 7.007 - 0.103\, X_{jt-1} - 0.029 U_{jt-1}} \quad \textbf{(3)}$$

In the fitted model, Intercept term for model equation (**7.007)** gives the level of poverty when economic growth and financial deepening held constant at zero. The coefficient of economic growth (β_1= **-0.103**) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling poverty level by **0.103** units. The coefficient of economic growth gives direct effect economic growth on poverty levels in EAC countries. The coefficient of financial deepening (β_2= -0.029) gives the indirect effect of economic growth on poverty through financial deepening and that a unitary increase in financial deepening through credit to the private sector is associated

with poverty reduction by 0.029 units, ceteris paribus. Given that the p values associated with economic growth and financial deepening were all significant at 0.05 level of significance, the third condition for rejection of the null hypothesis 2 was thus satisfied.

The three steps for mediation showed that the three conditions for rejection of the null hypothesis two were all satisfied. The study therefore rejected the null hypothesis that financial deepening has no significant effect on the link between economic growth and poverty levels in East African Community countries. The study therefore concludes that financial deepening has a significant meditation effect on the link between economic growth and poverty levels in East African Community countries. Additionally, the effect was negative meaning increase in financial deepening leads to reduced poverty levels.

5.2.3 The Mediating effect of Income Distribution on the Relationship between Economic Growth and Poverty Levels

The study sought to test the null hypothesis (H_{03}) that income distribution has no significant mediating effect on the relationship between economic growth and poverty levels in EAC member countries. The hypothesis test was based on p- values of FGLS regression analysis. The null hypothesis three would be rejected if three conditions for mediation were satisfied. For the first condition, the first step of regression, p-value associated with economic growth (LnX_01) should be less than 0.05 level of significance (p-value < 0.05). The second condition is that the p-value associated with growth values (LnX_01) on income distribution generated in the second step of regression should be less than 0.05 level of significance < 0.05.

The third condition is that the p-value generated in the third step regression associated with income distribution should be less than 0.05 level of significance and p associated with lagged one economic growth values (LnX_01) should > 0.05 for there to be complete mediation. However if p-values for economic growth and income distribution generated in step three are all significant, then it is concluded that there is partial mediation. The findings are presented in Tables 5.5, 5.6 and 5.7.

Table 5.5: Effect of Economic Growth on Poverty Levels, Hypothesis three test, step one

lny	Coef.	St.Err.	t-value	p-value	Sig
lnx_01	-0.135	0.019	-7.23	0.000	***
Constant	7.122	0.401	17.74	0.000	***
Mean dependent var		4.050	SD dependent var		0.299
Number of obs		145.000	Chi-square		52.309
			Prob < chi2		0.000

**** p<0.01, ** p<0.05, * p<0.1*

Source: Research Data (2019)

Table 5.5 shows that in the first step of mediation process for hypothesis three test , the overall p-value (0.000) is less than 0.05 hence it can be concluded that economic growth has a significant effect on poverty levels in EAC member countries. In addition, the p-value (p= 0.000) associated with economic growth on poverty levels was less than the level of significance (α=0.05) meaning economic growth has a significant effect on poverty levels in EAC countries. The model was thus estimated as shown in equation (1)

$$\mathbf{Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon} \quad \textbf{.....(1)}$$

Where:

Y_t = Poverty Level (Dependent Variable) for the current period

X_{t-1} = Real GDP (Independent Variable) for lagged one period

β_0= Constant

β_1= coefficient of real GDP

t-1= lagged one period

t= Current Period

j= 1,2,3,4,5 (Country)

ε = error term

$$Y_{jt} = 7.122 - 0.135X_{jt-1} \quad \text{.....(1)}$$

In the fitted model (1), Intercept term for model equation 7.122 gives the level of poverty when economic growth is held constant at zero. The coefficient of economic growth (β_1= - 0.135) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling poverty levels by 0.135 units. The coefficient of economic growth gives direct effect of economic growth on poverty. Given that the p-values associated with economic growth was less than 0.05, the second condition for rejection of the null hypothesis 3 was satisfied.

Table 5.6: Effect of economic growth on Income distribution, Hypothesis three test, step two

lnw	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
lnx_01	0.115	0.016	7.19	0.000	0.083	0.146	***
Constant	-3.477	0.399	-8.71	0.000	-4.259	-2.695	***
Mean dependent var		-0.904	SD dependent var			0.234	
Number of obs		140.000	Chi-square			51.639	
			Prob> chi2			0.000	

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source: Research Data (2019)

Table 5.6 presented the second step of mediation process for hypothesis 3. The overall p-value (0.000) was less than 0.05 implying that economic growth has a significant effect on income distribution among EAC member countries. In addition, the p value associated with economic growth (LnX_01= 0.000) generated in the second step of regression was less than 0.05 level of significance (000< 0.05) meaning economic growth has a significant effect on Income distribution. The model was thus estimated as shown in equation (4).

$$W_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon \quad \text{.....(4)}$$

Where:

Y_t = Poverty Levels (Dependent Variable) for the current period

X_{t-1} = Real GDP (Independent Variable) for lagged one period

W_t = Income Distribution (Mediating Variable) for current period

β_0= Constant

β_1= coefficient of real GDP

$t-1$= lagged one period

t= Current Period

j= 1,2,3,4,5 (Country)

ε = error term

$$\mathbf{W_{jt} = -3.477 + 0.115\ X_{jt-1}} \quad \mathbf{.....(4)}$$

In the fitted model, Intercept term for model equation **(-3.477)** gives the level of income distribution when economic growth is held constant at zero. The coefficient of economic growth (β_1= **0.115**) was positive meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling income inequality by **0.115** units. The study thus concludes that economic growth is associated with falling income inequality among EAC member countries. Given that the p-value associated with economic growth in the second step of regression was less than 0.05, the second condition for rejection of the null hypothesis three was thus satisfied.

Table 5.7: Effect of economic growth and income distribution on poverty levels, hypothesis three test, step three

Cross-sectional time-series FGLS regression

lny	Coef.	St.Err.	t-value	p-value	Sig
lnx_01	-0.116	0.020	-5.70	0.000	***
lnw_01	-0.144	0.059	-2.43	0.015	**
Constant	6.565	0.474	13.84	0.000	***
Mean dependent var		4.050	SD dependent var		0.299
Number of obs		145.000	Chi-square		76.837
			Prob> chi2		0.000

*** *p<0.01, ** p<0.05, * p<0.1*

Source: Research Data (2019)

Table 5.7 shows the third step of mediation process for hypothesis 3 test. The overall p-value (0.000) was less than 0.05 implying that both economic growth and income distribution have a significant effect on poverty levels in EAC countries. In addition, the p-values for economic growth and income distribution (lnx_01, p-value= 0.000 and Lwu_01, p-value = 0.015) were less than 0.05 level of significance implying that both economic growth and income distribution have a significant effect on poverty levels in EAC member countries. The model was thus estimated as shown in equation (5).

$$Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \beta_2 W_{jt-1} + \varepsilon \quad \text{.....(5)}$$

Where:

Y_t = Poverty Level (Dependent Variable) for the current period

X_{t-1} = Real GDP (Independent Variable) for lagged one period

W_{t-1} = Income Distribution for lagged one period

β_0= Constant

β_1= coefficient of real GDP

β_2 = coefficient of Income Distribution

$t-1$= lagged one period

t= Current Period

j= 1,2,3,4,5 (Country)

ε = error term

$$Y_{jt} = 6.565 - 0.116\, X_{jt-1} - 0.144\, W_{jt-1} + \quad \text{.....(5)}$$

In the fitted model, Intercept term for model equation (**6.565)** gives the level of poverty when economic growth and income distribution is held constant at zero. The coefficient of economic growth (β_1= **-0.116**) was negative meaning a unitary growth in economy in

terms of real GDP, ceteris paribus, is associated with falling poverty levels by **0.116** units. The coefficient of economic growth gives direct effect of economic growth on poverty. The coefficient of income distribution (β_2= **-0.144**) was negative, capturing the indirect effect of economic growth on poverty through income distribution and that a unitary increase in income distribution is associated with poverty reduction by 0.144 units, ceteris paribus. Given that the p values associated with economic growth and income distribution were less than 0.05 level of significance, the study concludes that the third condition for rejection of the null hypothesis 3 was thus satisfied.

Given that all the conditions for rejection of hypothesis 3 were satisfied, the study rejected the null hypothesis that Income distribution has no significant effect on the link between economic growth and poverty levels in the East African Community countries. The study therefore concludes that Income distribution has a significant effect on the link between economic growth and poverty levels in East African Community countries. The study further concludes that income distribution mediates the relationship between economic growth and poverty levels in EAC member countries.

5.2.4 The Moderating Effect of Financial Efficiency on the relationship between economic growth and poverty levels

The study sought to test the null hypothesis (H_{04}) that financial efficiency has no significant moderating effect on the relationship between economic growth and poverty levels in EAC Member countries. The hypotheses test was based on p-values of FGLS regression analysis. The null hypothesis 4 would be rejected if three conditions were satisfied. For the first condition, p-value associated with economic growth (LnX_01) in

the first step of regression, should be less than 0.05 level of significance (p-value < 0.05). The second condition is that the p-value associated with financial efficiency generated in the second step of regression should be less than 0.05. The third condition is that the p value associated with product of economic growth and financial efficiency (LnX_01**.** Lnz_01) generated in the third step of regression should be less than 0.05 level of significance.. The findings are presented in Tables 5.8, 5.9 and 5.10.

Table 5.8: Effect Economic growth on poverty level, Hypothesis Four Test, Step One

lny	Coef.	St.Err.	t-value	p-value	Sig
lnx_01	-0.135	0.019	-7.23	0.000	***
Constant	7.122	0.401	17.74	0.000	***
Mean dependent var		4.050	SD dependent var		0.299
Number of obs		145.000	Chi-square		52.309
			Prob < chi2		0.000

*** *p<0.01, ** p<0.05, * p<0.1*
Source: Research Data (2019)

In table 5.8 presenting the first step of moderation, process for hypothesis 4 test, the overall p-value (0.000) is less than 0.05 meaning that economic growth had a significant effect on poverty levels in EAC member countries. Furthermore, the p-value associated with economic growth (0.000) is less than the level of significance (0.05) meaning economic growth has a significant effect on poverty levels among EAC countries. The model is thus estimated as shown in equation (1).

$$Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \varepsilon \quad \text{.....(1)}$$

Where:

Y_t = Poverty Levels (Dependent Variable) for the current period

X_{t-1} = Real GDP (Independent Variable) for lagged one period

t-1= lagged one period

t= Current Period

j= 1,2, 3,4,5 (Country)

$$Y_{jt} = 7.122 - 0.135X_{jt-1} \quad \text{.....(1)}$$

In the fitted model, Intercept term for model equation 7.122 gives the levels of poverty when economic growth is held constant at zero. The coefficient of economic growth (β_1= - 0.135) is negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling poverty level by 0.135 units. The coefficient of economic growth gives direct effect of economic growth on poverty. The first condition for rejection of the null hypothesis 4 is satisfied since p-value associated with economic growth (LnX_01) was less than 0.05 level of significance.

Table 5.9: Effect of Economic Growth and Financial Efficiency on Poverty Level, Hypothesis four Test, Step Two Cross-sectional time-series FGLS regression

lny	Coef.	St.Err.	t-value	p-value	Sig
lnx_01	-0.135	0.019	-7.26	0.000	***
lnz_01	0.011	0.011	0.96	0.336	
Constant	7.132	0.400	17.84	0.000	***
Mean dependent var		4.050	SD dependent var		0.299
Number of obs		145.000	Chi-square		54.032
			Prob> chi2		0.000

*** *p<0.01, ** p<0.05, * p<0.1*

Source: Research Data (2019)

Table 5.9 presents the second step of moderation process for hypothesis 4 test. The overall p-value (0.000) is less than 0.05 implying that both economic growth and financial efficiency have a significant effect on poverty levels in EAC member countries. In addition, the p value associated with economic growth (0.000) is less than 0.05 implying that economic growth has a direct significant effect on poverty even in the presence of financial efficiency. However, the p-value associated with financial efficiency (0.336) is not statistically significant meaning that financial efficiency has a weaker effect on poverty levels in EAC countries. The model is thus estimated as shown in equation (6).

$$Y_{jt} = \beta_0 + \beta_2 X_{jt-1} + \beta_2 Z_{Jt-1} + \varepsilon \quad \text{.....(6)}$$

Where:

Y_t = Poverty Level (Dependent Variable) for the current period

X_{t-1} = Real GDP (Independent Variable) for lagged one period

Z_{t-1}= Financial Efficiency (moderating variable) for lagged one period

t-1= lagged one period

t= Current Period

j= 1,2, 3,4,5 (Country)

$$Y_{jt} = 7.132 - 0.135 X_{jt-1} + 0.011\ Z_{Jt-1} \quad \text{.....(6)}$$

The intercept term for model equation (6) is **7.132** showing the levels of poverty when both economic growth and financial efficiency was held constant at zero. The coefficient of economic growth (β_1= **-0.135**) is negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling poverty level by -0.135 units. The coefficient of financial efficiency (β_2= **0.011**) is positive meaning a unitary

increase in financial inefficiency, ceteris paribus, is associated with increasing poverty level by **0.011** units. Given that the p-value associated with moderator variable, (financial efficiency) is greater than 0.05 hence not significant, the second condition for rejection of the null hypothesis four is not satisfied.

Table 5.10: Effect of Economic Growth, Financial Efficiency and Interaction term on Poverty Levels, Hypothesis four test, Step Three

lny	Coef.	St.Err.	t-value	p-value	Sig
lnx_01	-0.148	0.019	-7.66	0.000	***
lnz_01	0.409	0.270	1.52	0.129	
lnxz_01	-0.018	0.012	-1.47	0.141	
Constant	7.432	0.418	17.79	0.000	***
Mean dependent var		4.050	SD dependent var		0.299
Number of obs		145.000	Chi-square		64.226
			Prob>		0.000

*** *p<0.01, ** p<0.05, * p<0.1*

Source: Research Data (2019)

The Table 5.10 presented the third step of moderation relationship for hypothesis 4 test. The overall p-value (0.000) is less than 0.05 hence economic growth, financial efficiency and interaction term have a significant effect on poverty levels in EAC countries. In addition, the p-values for economic growth (p=0.000) measuring direct effect of economic growth on poverty is less than 0.05 meaning than in the presence of financial efficiency, economic growth still has a significant effect on poverty levels among EAC member countries. However, the p values associated with financial efficiency (p=0.129)

and the interaction term (product of economic growth and financial efficiency) (0.141) were greater than the level of significance (0.05). This implies that financial efficiency and the interaction term does not have a significant effect on poverty levels in EAC countries. The model was thus estimated as shown in equation (7).

$$\boldsymbol{Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \beta_2 Z_{Jt-1} + \beta_3 (X_{jt-1})(Z_{jt-1})} + \varepsilon \quad \text{.....(7)}$$

Where:

$\boldsymbol{Y_t}$ = Poverty Level (Dependent Variable) for the current period

$\boldsymbol{X_{t-1}}$ = Real GDP (Independent Variable) for lagged one period

$\boldsymbol{Z_{t-1}}$= Financial Efficiency (moderating variable) for lagged one period

$\mathbf{X_{t-1}.\ Z_{t-1}}$= Product of Real GDP and Financial Efficiency for lagged one period (Interaction term)

t-1= lagged one period

t= Current Period

j= 1,2, 3,4,5 (Country)

$$\mathbf{Y_{jt} = 7.432 - 0.148\ X_{jt-1} + 0.409\ Z_{t-1} - 0.018\ (X_{jt-1})(Z_{jt-1})} \text{ .....(7)}$$

In equation (7), the intercept term was **7.432** showing the level of poverty when economic growth, financial efficiency and interaction term were held constant at zero. The coefficient of economic growth (β_1= **-0.148**) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling poverty levels by **0.148** units. The coefficient of financial efficiency (β_2= **0.409**) was positive meaning a unitary increase in financial inefficiency, ceteris paribus, is associated with increasing

poverty levels by **0.409** units. The coefficient of product of economic growth and financial efficiency (β3= **-0.018**) gives the moderating effect of financial efficiency on the link between economic growth and poverty levels in East African member countries. The value of β3 = -0.018 means that financial inefficiency weakens the association between economic growth and poverty levels. Given that p- values of financial efficiency and the interaction term were less than 0.05 level of significance, the study concludes that the third condition for rejection of the null hypothesis 4 was not satisfied.

In conclusion, not all conditions for rejection of the null hypothesis were not satisfied hence the study therefore fails to reject the null hypothesis that financial efficiency has no significant effect on the link between economic growth and poverty levels in East African Community member countries. The study therefore concludes that financial efficiency has no significant effect on the link between economic growth and poverty levels in East African Community countries. Financial efficiency is therefore not a moderator for the relationship between economic growth and poverty reduction among EAC member countries.

5.2.5 The Joint Effect of Economic Growth, Financial deepening, income distribution, Financial Efficiency on Poverty Levels

Finally, the study sought to test the null hypothesis (**H_{05}**) that economic growth, financial deepening, Financial efficiency, income distribution have no joint effect on poverty levels in the East African member countries. The hypothesis test was based on p-values of FGLS regression analysis. The null hypothesis 5 would be rejected if the overall p-

value associated with the model was less than 0.05 level of significance. The results were presented in table 5.11.

Table 5.11: Joint Effect of economic growth, financial deepening, financial efficiency, Income distribution on poverty levels, Hypothesis Five Test. Cross-sectional time-series FGLS regression

lny	Coef.	St.Err.	t-value	p-value	Sig
lnx_01	-0.113	0.017	-6.69	0.000	***
lnu_01	-0.027	0.014	-1.96	0.051	*
lnw_01	-0.102	0.065	-1.58	0.114	
lnz_01	0.011	0.012	0.89	0.373	
Constant	7.094	0.369	19.24	0.000	***
Mean dependent var		4.050	SD dependent var		0.299
Number of obs		145.000	Chi-square		206.960
			Prob> chi2		0.000

*** *p<0.01, ** p<0.05, * p<0.1*

Source: Research Data (2019)

The Table 5.11 revealed that the overall p-value (0.000) was less than the level of significance (0.05), hence the null hypothesis that Economic growth, financial deepening, income distribution and financial efficiency have no joint effect on poverty levels in East African Community member countries was rejected meaning lagged values Economic growth, financial deepening, income distribution and financial efficiency have joint effect on poverty levels in East African Community member countries. The Multiple Regression was thus fitted as follows.

$$\mathbf{Y_{jt} = \beta_0 + \beta_1 X_{jt-1} + \beta_2 U_{jt-1} + \beta_3 W_{jt-1} + \beta_4 Z_{jt-1} + \varepsilon} \quad \textbf{.....(7)}$$

Where

Y_t = Poverty Levels for the current period

X_{t-1} = Economic Growth for lagged one period

U_{t-1} = Financial Deepening for lagged one period

W_{t-1} = Income Distribution for lagged one period

Z_{t-1} = Financial Efficiency for lagged one period

β_0= Constant

$\beta_1, \beta_2, \beta_3$ *and* β_4 = coefficients of explanatory variables (**X,U,W** and **Z** respectively)

ε = error term

t= current period

t-1= lagged one period

j= 1, 2, 3, 4, 5 (Country)

$$\mathbf{Y_{jt} = 7.0936 - 0.1126X_{jt-1} - 0.02705U_{jt-1} - 0.102094\ W_{jt-1} + 0.011087\ Z_{jt-1}} \quad \textbf{.....(8)}$$

In the fitted model, Intercept term 7.0936 gives the levels of poverty when all the explanatory variables (economic growth, financial deepening, income distribution and financial efficiency) are held constant at zero. The coefficient of economic growth (β_1= -0.1126) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with reducing poverty levels by 0.1126 units. The coefficient of economic growth gives direct effect of economic growth on poverty. The coefficient of financial deepening (β_2= – 0.02705) gives the indirect effect of economic growth on

poverty through financial deepening. Additionally, the coefficient of income distribution (β_3= – 0.1020) gives the indirect effect of economic growth on poverty through income distribution. Finally, the coefficient of financial efficiency (β_4= 0.011087) gives the indirect effect of economic growth on poverty through financial efficiency.

5.3 Discussion of Findings

The discussion of findings presents the interpretation and implications of the study findings in the light of the empirical literature. The discussion is organised in terms of study objectives.

5.3.1 Effect of Economic Growth on Poverty Levels

The expected relationship between economic growth and poverty levels is an inverse relationship. Keynes (1936), a pioneer of liberal theory believed that market forces were capable of promoting economic growth that in turn was able to eradicate poverty. Based on this belief, he justified government's interventions at macroeconomic level, especially in handling involuntary unemployment. The theory argues that poverty can be used to reflect the extent to which market forces fail to justify redistributive taxation in kind and cash.

The overall p-value (0.0000) generated was less than 0.05 implying that economic growth has a significant effect on poverty levels among EAC member countries. In addition, the p-value (p= 0.000) associated with economic growth was less than the level of significance (α=0.05) meaning lagged economic growth has a significant effect on

poverty levels in east African countries. Given that, the p-value of economic growth (0.000) was less than 0.05; the null hypothesis (H_{01}) that economic growth has no significant effect on poverty levels in East African Community member countries was rejected meaning economic growth had a statistically significant effect on poverty levels in East African countries.

In the fitted model equation (1), Intercept term β_0 (7.122) gives the level of poverty when the explanatory variables are held constant at zero. The coefficient of economic growth (β_1= - 0.135) was negative meaning a growing economy is also associated with falling poverty level as citizens' income improves. The finding implies that improvement of economic growth was crucial in enhancing poverty reduction among countries in east Africa.

The findings are in agreement with a number of empirical studies. Research carried out by Pérez-Moreno and Weinhold (2012) inferred that economic development causes unidirectional decrease in poverty level. Waiyaki (2013) evaluated the connection between economic growth, poverty and development of financial sector in Kenya for the period between 1997 and 2012 establishing that economic growth impacted on poverty levels in Kenya. Keho (2017) established a strong relationship between GDP and financial deepening with GDP positively affecting poverty decrease. An empirical examination by Ben and Zhang (2016) analyzed the connection between income distribution and financial development proxies. The research established that financial development proxies fundamentally lessened poverty and income inequality.

5.3.2 Effect of Financial Deepening on the Link between Economic Growth and Poverty

The expected effect of financial deepening on the relationship between economic growth and poverty inverse. The Financial intermediation theory advanced by Akerlof (1970) postulates that the financial deepening propagated by financial intermediation theory is helpful in lowering poverty levels. The theory further explains that when economic units have access to financial resources, they can adopt utilize the resources to start business ventures and improve their living standards. The theory thus supports the inverse relationship between financial deepening and poverty reduction.

For the first step of mediation process for hypothesis two test, the p-value (p= 0.000) was less than the level of significance (α=0.05) meaning economic growth has a significant effect on poverty levels in East African member countries. In the fitted model equation (1), Intercept term β_0 (7.122) gives the level of poverty when the explanatory variables are held constant at zero. The coefficient of economic growth (β_1= - 0.135) was negative, meaning a growing economy is also associated with falling poverty level as citizens income improves. The finding implies that improvement of economic growth was crucial in enhancing poverty reduction among countries in East Africa. Given that, the p-value of economic growth was less than 0.05; the first condition for rejection of the null hypothesis was satisfied.

In the second step of mediation process for hypothesis 2 test, the overall p –value (0.000) was less than 0.05 hence implying that economic growth has a significant effect on financial deepening. In addition, the p –value (0.000) associated with economic growth on financial deepening generated in second step of regression was less than 0.05 level of significance ($p= 0.000< \alpha = 0.05$). The p-value is less than the level of significance means that economic growth has a significant effect on financial deepening. In the fitted mode (2), Intercept term for the model (**-1.030939**) gives the level of financial deepening when economic growth is held constant at zero. The coefficient of economic growth (β_1= **.9524876**) was positive meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with rising financial deepening by **.9524876** units. Given that the p–value (0.000) associated with economic growth on financial deepening generated in the second step of mediation process was less than 0.05 level of significance ($p= 0.000< \alpha = 0.05$), the second condition for rejection of the null hypothesis 2 was thus satisfied.

In third step of the mediation process for hypothesis 2 test, the overall p-value (0.000) generated in the third step of regression was less than 0.05 implying that both economic growth and financial deepening have a significant effect on poverty levels among EAC countries. In addition, the p-values for economic growth and financial deepening, (lnx_01, p-value= 0.000 and Lnu_01, p-value = 0.006) were less than the level of significance (0.05) implying both variables had a significant effect on poverty levels in EAC member countries. In the fitted model, Intercept term for model equation (**7.007)** gives the level of poverty when economic growth and financial deepening is held

constant at zero. The coefficient of economic growth (β_1= **-.1032**) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling poverty level by **.1032** units. The coefficient of economic growth (β1= -.1032) gives direct effect economic growth on poverty levels in East African member countries. The coefficient of financial deepening (β_2= -.029) gives the indirect effect of economic growth on poverty through financial deepening and that a unitary increase in financial deepening through credit to the private sector is associated with poverty reduction by -.029, units ceteris paribus. Given that the p values associated economic growth and financial deepening were all significant at 0.05 level of significance, the third condition for rejection of the null hypothesis 2 was thus satisfied.

The three steps for mediation showed that the three conditions for rejection of the null hypothesis 2 were all satisfied. The study therefore rejected the null hypothesis that financial deepening has no significant effect on the link between economic growth and poverty levels in the East African Community countries. The study therefore concludes that financial deepening has a significant meditation effect on the link between economic growth and poverty levels in East African Community countries. Additionally, the effect was negative, meaning increase in financial deepening leads to reduced poverty levels.

The empirical finding that financial deepening has a significant mediating effect on the link between economic growth and poverty levels in East African member countries was in congruence with empirical studies by a number of authors. Abosedra, Shahbaz and Nawaz (2016) revealed that poverty rates are reduced by financial development. Naceur and Zhang (2016) established that financial deepening was able to reduce poverty and

income inequality. Fowowe and Abidoye (2013) examined the causal link between inequality, financial development and poverty in African nations. The study established that income inequalities and poverty were affected significantly by financial development in the African Nations studied. Chinweze (2017) investigated the direction of causation between poverty reduction and Financial Deepening in Nigeria establishing mono causation from financial deepening to Poverty Reduction.

5.3.3 Effect of Income Distribution on the Link between Economic Growth and Poverty Levels.

The expected effect of income distribution on the relationship between economic growth and poverty levels. Public Choice Theory of Distribution proposed by Buchanan and Tullock (1975) claims that income distribution can be critical in redistributing resources in countries that have high levels of income disparity leading to reduction of poverty level (Fiszbein et al., 2009). The theory presupposes that competitive market economies are able to provide effective means that can be utilized to allocate resources to Pareto's optimal point (Blaug, 2007). Such an allocation would not make certain people better than others meaning that all people would be equal. The Public Choice Theory of Distribution therefore presupposes positive relationship between income distribution and poverty.

In the first step of mediation process for hypothesis 3 test, the overall p-value (0.000) associated with the model was less than 0.05 hence economic growth has a significant effect on poverty levels in EAC member countries. In addition, the p-value (p= 0.000)

associated with economic growth on poverty levels was less than the level of significance (α=0.05) meaning economic growth has a significant effect on poverty levels in EAC member countries. In the fitted model (1), Intercept term for model equation 7.122 gives the level of poverty when economic growth is held constant at zero. The coefficient of economic growth (β_1= -0.135) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling poverty levels by 0.135 units. The coefficient of economic growth gives direct effect of economic growth on poverty. Given that the p-values associated with economic growth was less than 0.05, the first condition for rejection of the null hypothesis 3 was satisfied.

In the second step of mediation process for hypothesis 3 test, the overall p-value (0.0000) was less than 0.05 implying that economic growth had a significant effect on income distribution in EAC countries. In addition, the p value associated with economic growth (LnX_01= 0.000) generated in the second step of mediation process was less than 0.05 level of significance (< 0.05), meaning economic growth has a significant effect on income distribution. Intercept term for model equation (-3.477**)** gives the level of income distribution when economic growth is held constant at zero. The coefficient of economic growth (β_1= **0.115**) was positive meaning a unitary growth in the economy in terms of real GDP, ceteris paribus, is associated with falling income inequality by **0.115** units. The study thus concludes that economic growth is associated with falling income inequality among EAC countries. Given that the p-value associated with economic growth in the second step of regression was less than 0.05, the second condition for rejection of the null hypothesis 3 was thus satisfied.

In the third step of mediation process for hypothesis 3 test, the overall p-value (0.0000) was less than 0.05 implying that both economic growth and income distribution have a significant effect on poverty levels in EAC countries. In addition, p-values for economic growth and income distribution (lnx_01, p-value= 0.000 and lwu_01, p-value = 0.015) were less than 0.05 level of significance, implying that both economic growth and income distribution have a significant effect on poverty levels in the EAC member countries. The Intercept term for model equation (**6.565)** gives the level of poverty when economic growth and income distribution is held constant at zero. The coefficient of economic growth (β_1= **-0.116**) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling poverty level by **0.116** units. The coefficient of economic growth gives direct effect of economic growth on poverty. The coefficient of income distribution (β_2= **-0.144**) was negative capturing the indirect effect of economic growth on poverty through income distribution and that a unitary increase in income distribution is associated with poverty reduction by 0.144 units, ceteris paribus. Given that the p values associated with economic growth and income distribution were less than 0.05 level of significance, the study concludes that the third condition for rejection of the null hypothesis 3 was thus satisfied.

Given that all the conditions for rejection of hypothesis 3 were satisfied, the study therefore rejected the null hypothesis that Income distribution has no significant effect on the link between economic growth and poverty levels in East African Community countries. The study therefore concludes that Income distribution has a significant effect

on the link between economic growth and poverty levels in East African Community countries. The study further concludes that income distribution mediates the relationship between economic growth and poverty levels in EAC countries. However**,** the expected sign of indirect relationship between income distribution and poverty was positive; something which is in conflict with the current findings.

Fosu (2017) examined the link between economic development to poverty in less developed nations, with attention to the role of income inequality. The empirical examination finds that largely growth of income has been significant in the changes in poverty levels. A research by Gakuru and Mathenge (2012) examined the level of income inequality and the role that policies developed towards income inequality played in reducing poverty. Rossignolo (2017) examined the effects that tax and government expenditure had on poverty and income distribution within Argentina using data spanning from 2012 to 2013. The outcomes of the study demonstrate that fiscal strategy has been an incredible asset in decreasing income imbalance and poverty. Empirical Singh and Huang (2015) analyzed the association between Poverty, property rights and Financial Deepening Sub-Saharan Africa countries. Study showed that financial deepening was able to increase income inequality and poverty that is contrary to finance- poverty nexus. In addition, the study only considered direct effect of financial deepening on poverty thereby ignored the indirect ones.

5.3.4 Effect of financial efficiency on the link between economic growth and poverty levels

The expected effect of financial efficiency on the relationship between economic growth and poverty levels is inverse, such that improved financial efficiency should lead to reduced poverty. The Information asymmetry theory proposed by Akerlof (1970) and Stiglitz & Weiss (1981) explains how credit information opaqueness reduces the efficiency of financial intermediation and access to finances. The differential in information concerning the risks involved in business ventures may put the financial institutions on the disadvantaged side, as they do not possess enough information about the risks of different investments of their clients. The information asymmetry makes banks to input a risk on the cost of finances making the financial products to be costly and this discourages borrowing for investment. Increasing information asymmetry leads to high cost of capital hence reduced income inefficiency that further leads to increased poverty rates.

In the first step of moderation process for hypothesis 4 test, the overall p-value (0.000) was less than 0.05, meaning that economic growth had a significant effect on poverty levels in EAC countries. In addition, the p-value associated with economic growth (0.000) was less than the level of significance (0.05) meaning economic growth has a significant effect on poverty levels among EAC countries. In the fitted model, Intercept term for model equation 7.122 gives the level of poverty when economic growth is held constant at zero. The coefficient of economic growth (β_1= -0.135) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with

falling poverty level by 0.135 units. The coefficient of economic growth gives direct effect of economic growth on poverty. The first condition for rejection of the null hypothesis 4 was satisfied since p-value associated with economic growth (LnX_01) was less than 0.05 level of significance.

In the second step of moderation process for hypothesis 4 test, the overall p= (0.000) was less than 0.05 level of significance meaning that both economic growth and financial efficiency had a statistically significant effect on poverty levels in EAC countries. In addition, the p-value associated with economic growth (0.000) was less than 0.05 implying that economic growth has a direct significant effect on poverty even in the presence of financial efficiency. However, the p-value (0.336) associated with financial efficiency was not statistically significant meaning that financial efficiency has a weaker effect on poverty levels in EAC countries. The intercept term for model equation (6) was **7.132** showing the level of poverty when both economic growth and financial efficiency were held constant at zero. The coefficient of economic growth (β_1= **-0.135**) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling poverty level by 0.135 units. The coefficient of financial efficiency (β_2= **0.011**) was positive meaning a unitary increase in financial inefficiency, ceteris paribus, is associated with increasing poverty levels by **0.011** units. Given that the p-value associated with moderator variable, (financial efficiency) was greater than 0.05 hence not significant, the second condition for rejection of the null hypothesis four was not satisfied.

In the third step of moderation process for hypothesis 4 test, the overall p-value (0.0000) was less than 0.05 implying that economic growth, financial efficiency and the interaction term have a significant effect on poverty levels among EAC member countries. In addition, p-values (0.000) for economic growth measuring direct effect of economic growth on poverty was less than 0.05, meaning that in the presence of financial efficiency, economic growth still has a significant effect on poverty levels among EAC countries. However, the p value (0.129) associated with financial efficiency and p-value (0.141) associated the interaction term (product of economic growth and financial efficiency) were all greater than the level of significance (0.05). This implies that financial efficiency and the interaction term does not have a significant effect on poverty levels in EAC member countries.

The intercept term was **7.432** showing the level of poverty when economic growth, financial efficiency and interaction term were held constant at zero. The coefficient of economic growth (β_1= **-0.148**) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with falling poverty level by 0.148 units. The coefficient of financial efficiency (β_2= **0.409**) was positive, meaning a unitary increase in financial inefficiency, ceteris paribus, is associated with increasing poverty level by 0.409 units. The coefficient of product of economic growth and financial efficiency (β3= -0.018) gives the moderating effect of financial efficiency on the link between economic growth and poverty levels in east African countries. The value of β3 = -0.018 means that financial inefficiency weakens the association between economic growth and poverty levels. Given that p- values of financial efficiency and the interaction

term were less than 0.05 level of significance, the study concludes that the third condition for rejection of the null hypothesis 4 was not satisfied.

In conclusion, not all conditions for rejection of the null hypothesis were not satisfied hence the study therefore fails to reject the null hypothesis that financial efficiency has no significant effect on the link between economic growth and poverty levels in East African Community countries. The study therefore concludes that financial efficiency has no significant effect on the link between economic growth and poverty levels in East African Community countries. Financial efficiency is therefore not a moderator for the relationship between economic growth and poverty reduction among EAC countries.

The study is in congruence with empirical literature. A study by Hasan et al., (2009) evaluated the association between bank efficiency, financial depth and economic growth. The research ascertained that financial efficiency had statistically significant effect on economic growth. Ferreira (2012) analyzed the influence of efficiency of banking institutions on growth of the economy. The findings demonstrated a positive impact of bank cost effectiveness on development of economy as estimated by GDP. Ewah, et al., (2009) examined the association between capital market efficiency and economic growth in Nigeria for the period beginning 1961 and ending in 2004. The study ascertained that Nigerian economic growth had not been affected much by capital market efficiency. Ayadi, et al., (2015) analysed the link between growth in economy and financial sector development in selected nations found in the northern and southern part of the Mediterranean Sea for the period between 1985 and 2009. The study established that

financial deepening is inversely related to growth of economy and credit to the private segment is adversely related with development. Belke, et al., (2016) sought to establish whether areas of the country with banks that have high quality financial intermediation were growing faster during economic booms and were more stable compared to regions with banks that have poor quality financial intermediation. The findings established that banks that are relatively more efficient in terms of intermediation quality stimulated growth in the economy of the regions of their existence.

In East African countries, financial development has played a significant role in economic development. Policymakers are generally of the opinion that financial development increases productivity, which in turn promotes economic growth and development (Belke, et al., 2016). The various findings made on financial development and economic growth differ due to the various research methods that have been used in the studies. Some researchers have discovered that financial development has a positive impact on economic growth, whereas others have discovered the inverse relationship between the two.

The relationship between financial liberalization and other macroeconomic variables has been extensively researched by contemporary finance researchers; however, the importance of financial development is not universally recognized. The relationship between financial development and economic growth is characterized by the fact that the services provided by financial intermediaries are critical for innovation and development. There is no relationship between the development of the financial system and the

expansion of the economy. Finance is a determinant of economic growth that has been "overstressed." Because of this, any policies that aim to promote the development of the financial system would be a waste of resources, as they would divert attention away from more important policies such as labor and productivity improvement programs, the implementation of pro-investment tax reforms, and the encouragement of exports, amongst other things.

5.3.5 Effect of Economic Growth, Financial Deepening, Income Distribution and Financial Efficiency on Poverty Levels.

The results additionally established that the overall p-value (0.000) was less than level of significance (0.05). Hence the null hypothesis that Economic growth, financial deepening, income distribution and financial efficiency have no joint effect on poverty levels in East African Community countries was rejected, meaning lagged values Economic growth, financial deepening, income distribution and financial efficiency have joint effect on poverty levels in East African Community member countries. In the fitted model, Intercept term 7.0936 gives the level of poverty when all the explanatory variables (economic growth, financial deepening, income distribution and financial efficiency) are held constant at zero. The coefficient of economic growth (β_1= - 0.113) was negative meaning a unitary growth in economy in terms of real GDP, ceteris paribus, is associated with reducing poverty level by 0.113 units. The coefficient of economic growth gives direct effect of economic growth on poverty. The coefficient of financial deepening (β_2= – 0.027) gives the indirect effect of economic growth on poverty through financial deepening. Additionally, The coefficient of income distribution (β_3= – 0.102)

gives the indirect effect of economic growth on poverty through income distribution. Finally, the coefficient of financial efficiency (β_4= 0.011) gives the indirect effect of economic growth on poverty through financial efficiency.

The findings of the study have a basis in empirical literature. Research by Pérez-Moreno and Weinhold (2016), for example, held that development causes poverty reduction which is unidirectional. Keho (2017) evaluated the link between financial development, poverty and economic growth which showed that GDP and financial development were positively affecting poverty in five nations. Dutta, et al., (2012) together with Mellor (2009) have supported trickledown theory where income distribution affect poverty through economic growth. A study by Fosu (2010) found that income elasticity of poverty keeps on falling and that the poverty income elasticity is less than responsiveness of income inequality. Ben and Zhang (2016) analyzed the connection between income distribution and financial development proxies. The research established that financial development proxies fundamentally lessened poverty and income inequality.

5.4 Summary of Hypotheses Tests

The summary of hypotheses test presents the model estimation, inferences and decision on hypothesis rejection or failure to reject.

Table 5.12: Summary of Hypotheses Tests

Hypotheses	Analysis Model	Significance	Decision
H_{01}: Economic Growth has no significant effect on poverty levels in EAC member countries.	**Simple Regression** $Y_{jt} = 7.122 - 0.135X_{jt-1}.....(1)$ Where: Y_t = Poverty Level (Dependent Variable) for the current period X_{t-1} = Real GDP (Economic Growth) for lagged one period j= 1,2,3,4,5 (Country)	P-value (0.000) was less than 0.05	Reject null hypothesis
H_{02}: Financial Deepening has no significant mediating effect on the relationship between Economic growth and poverty levels in EAC Member countries.	**Hierarchical Regression** ***$Yjt = 7.122 - 0.135X_{jt-1}$.....(1)*** ***$U_{jt} = -1.031 + 0.952X_{jt-1}$……..(2)*** ***$Y_{jt} = 7.007 - 0.103 X_{jt-1} - 0.029 U_{jt-1}$ …..(3)*** Where: Y_t = Poverty Level (Dependent Variable) for the current period X_{t-1} = Real GDP (Independent Variable) for lagged one period U_t = Financial Deepening (Mediating variable) for current period U_{t-1} = Financial Deepening for lagged one period j= 1,2,3,4,5 (Country)	P- value for equation (1) p was less than 0.05 For equation (2) p should was less than 0.05 For equation (3) p associated with U should was less than 0.05 and p associated with X was also less than 0.05	Reject null hypothesis
H_{03}: Income Distribution has no significant mediating effect on the relationship between economic Growth and poverty levels in EAC member countries.	**Hierarchical Regression** ***$Yjt = 7.122 - 0.135X_{jt-1}$.....(1)*** ***$W_{jt} = -3.477 + 0.115 X_{jt-1}$ .....(4)*** ***$Y_{jt} = 6.565 - 0.116 X_{jt-1} - 0.144 W_{jt-1}$ + ...(5)*** Where: Y_t = Poverty Level (Dependent Variable) for the current period X_{t-1} = Real GDP (Independent Variable) for lagged one period W_t = Income Distribution (Mediating Variable) for current period W_{t-1} = Income Distribution for lagged one period *j*= 1,2,3,4,5 (Country) *t-1*= lagged one period *t*= Current Period	For equation (1) p was less than 0.05 For equation (4) p was less than 0.05 For equation (5) p associated with W should was less than 0.05 and p associated with X was also less than 0.05	Reject null hypothesis
H_{04}: Financial Efficiency has no significant moderating effect	**Stepwise Regression** **$Yjt = 7.122 - 0.135X_{jt-1}$.....(1)** **$Y_{jt} = 7.132 - 0.135 X_{jt-1} + 0.011 Z_{Jt-1}$.....(6)**	For equation (1) p was less than 0.05. For equation (6) p associated with Z was	Failed to reject Null hypothesis

on the relationship between economic growth and poverty levels in EAC Member countries.	$\mathbf{Y}_{jt} = 7.432 - 0.148\ X_{jt-1} + 0.409\ Z_{Jt-1} + -0.018\ (X_{jt-1})(Z_{jt-1}) + \varepsilon$.....(7) Where: Y_t = Poverty Level (Dependent Variable) for the current period X_{t-1} = Real GDP (Independent Variable) for lagged one period Z_{t-1}= Financial Efficiency (moderating variable) for lagged one period $X_{t-1} \bullet Z_{t-1}$= Product of Real GDP and Financial Efficiency for lagged one period *t-1*= lagged one period *t*= Current Period j= 1,2,3,4,5 (Country)	greater than 0.05 For equation seven, p value associated with Z and product of Z and X were greater than 0.05	
H_{05}: Economic growth, Financial deepening, Financial efficiency, Income distribution have no joint effect on poverty levels in EAC countries.	**Multiple Regression** $Y_{jt} = 7.09 - 0.113X_{jt-1} - 0.027\ U_{jt-1} - 0.102\ W_{jt-1} + 0.011\ Z_{jt-1} + ...(8)$ Where Y_t = Poverty Level for the current period X_{t-1} = Economic Growth for lagged one period U_{t-1} = Financial Deepening for lagged one period W_{t-1} = Income Distribution for lagged one period Z_{t-1} = Financial Efficiency for lagged one period *t*= current period *t-1*= lagged one period j= 1,2,3,4,5 (Country)	overall p-value was less than 0.05	Reject null hypothesis

Source: Research Data (2019)

CHAPTER SIX: SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter presents a summary of the study findings, conclusions drawn from the findings, contribution of the study, and policy recommendations. The chapter also makes suggestions for further research.

6.2 Summary of findings

6.2.1 Economic Growth and Poverty Levels

The first objective sought to establish the effect of economic growth on poverty levels in the EAC countries. The p-value generated was less than 0.05 level of significance meaning that economic growth has a significant effect on poverty levels in EAC countries. Given that, the p-value of economic growth was less than 0.05; the null hypothesis (H_{01}) that economic growth has no significant effect on poverty levels in East African Community countries was rejected. In addition, the coefficient of economic growth was negative.

6.2.2 Economic Growth, Financial Deepening and Poverty

The second objective sought to establish the effect of financial deepening on the relationship between economic growth and poverty levels in the EAC member countries. The study showed that the p-values for economic growth and financial deepening economic were less than 0,05 level of significance in all the three steps of mediation. The study therefore rejected the null hypothesis that financial deepening has no significant effect on the link between economic growth and poverty levels in the East African Community member countries. The coefficient of economic growth revealed that a

unitary growth in the economy in terms of real GDP, ceteris paribus, is associated with falling poverty level by 0.135 units. The coefficient of financial deepening showed that a unitary increase in financial deepening through credit to the private sector is associated with poverty reduction by 0.029 units, ceteris paribus.

6.2.3 Economic Growth, Income Distribution and Poverty Levels.

The third objective was interested in establishing the effect of income distribution on the relationship between economic growth and poverty levels in the EAC countries. The findings established that p-values for economic growth and income distribution were less than 0.05 level of significance in all the steps of mediation relationship. The study therefore rejected the null hypothesis that income distribution has no significant effect on the link between economic growth and poverty levels in East African Community countries. The coefficient of income distribution gives the indirect effect of economic growth on poverty through income distribution and that a unitary increase in income distribution is associated with poverty reduction by 0.144 units ceteris paribus.

6.2.4 Economic Growth, Financial Efficiency and Poverty Levels

The fourth objective sought to establish the effect of financial efficiency on the relationship between economic growth and poverty levels in the EAC countries. The findings showed that the p-values for financial efficiency and the product economic growth and financial efficiency (interaction term) were greater than 0.05 level of significance in the three steps of the moderation process. Additionally, the value of coefficient increased when the effect of financial efficiency was introduced in the

relationship between economic growth and poverty levels. The study therefore failed to reject the null hypothesis that financial efficiency has no significant effect on the link between economic growth and poverty levels in East African Community countries.

6.2.5 Economic Growth, Financial Deepening, Income Distribution, Financial Efficiency and Poverty Levels.

The study finally sought to establish the joint effect of economic growth, financial deepening, income distribution, financial efficiency and poverty levels. The findings established that the overall p-value was less than 0.05 level of significance. The null hypothesis that economic growth, financial deepening, income distribution and financial efficiency have no joint effect on poverty levels in East African Community member countries was rejected. The coefficient of economic growth, financial deepening and income distribution were negative while the coefficient of financial efficiency was positive, giving the indirect effect of economic growth on poverty through financial efficiency.

6.3 Conclusion

Based on the findings on the relationship between economic growth, financial deepening, income distribution, financial efficiency and poverty levels, the study makes a number of conclusions. First, the study concludes that economic growth has a significant effect on poverty levels in East African Community countries. The coefficient of economic growth was negative meaning a growing economy is also associated with falling poverty level as citizens income improves. The finding implies that improvement of economic growth

was crucial in enhancing poverty reduction among countries in east Africa. The findings provide an insight into the significant role that economic growth play in reduction of poverty, especially among EAC member countries.

The study also concluded that financial deepening has a significant effect on the link between economic growth and poverty levels in East African Community countries. The coefficient of financial deepening gives the indirect effect of economic growth on poverty through financial deepening. The negative relationship between financial deepening and poverty shows that increased financial deepening through credit to private sectors is associated with falling poverty levels among EAC countries. Further, the study reveals that financial deepening is a mediator in the relationship between economic growth and poverty levels among EAC countries. The relationship between economic growth and poverty levels through financial deepening is the indirect effect of growth on poverty reduction. Globalization is one of the variables that has been acknowledged for its ability to contribute directly to financial depth and fiscal advancement. Because of this, capital markets and foreign direct investment have grown, allowing investors to move their financial resources to countries of their choosing, resulting in an increased flow of financial resources into an economy, which has an impact on the gross national product.

The study also concluded that income distribution has a significant effect on the link between economic growth and poverty levels in East African Community countries. The coefficient of income distribution gives the indirect effect of economic growth on poverty through income distribution. The expected sign of indirect relationship between growth

and poverty levels via income distribution was negative which is in conflict with the current findings. It was concluded that income distribution has a significant effect on negative poverty.

In conclusion, the study held that financial efficiency has no significant effect on the link between economic growth and poverty levels in East African Community countries. The positive coefficient of financial efficiency is associated with rising poverty levels. Financial efficiency was measured by cost to income ratio meaning increase in the ratio means falling financial efficiency hence the positive relationship means falling efficiency levels in the banking sector is associated with rising poverty levels. A banking sector that is inefficient cannot play the role of financial intermediation as expected hence rising poverty associated with reduced investment activities. Finally, the study concluded that economic growth, financial deepening, income distribution and financial efficiency have a joint effect on poverty levels in East African Community countries.

6.4 Recommendations for Policy and Practice

The study makes a number of recommendations for policy purposes. Given that economic growth has a significant effect on poverty levels in EAC countries, the finding implies that improvement of economic growth was crucial in enhancing poverty reduction among countries in east Africa. The study therefore recommends that the government in general and ministries of planning and economic affairs of EAC countries should put down concrete plans and concerted actions aimed at improving economic growth rates. Additionally, the EAC countries' central banks and the government ministries of finance

and treasury should keep the rate of inflation at one digit level to ensure that economic growth is not eroded by increased general price level in the economy. Increased economic growth means improved income for the general population, especially the poor masses. It is argued that governments' restrictive policies, such as interest rate capping, currency devaluation, high taxes levied on the banking industry, and large minimum reserve requirements, act as a barrier to the growth of the financial market and should be avoided. It is thus recommended that governments may achieve economic development only by ending the use of repressive financial policies since this would open the door to the right allocation and distribution of financial resources.

In addition, given that financial deepening had a significant effect on the link between economic growth and poverty levels in East African Community countries. Moreover, the effect was negative meaning increase in financial deepening leads to reduced poverty levels. The study therefore recommends to government of EAC countries in general and regulatory authorities like Central banks to work towards encourage financial deepening within their respective countries. The countries' regulatory authorities should come with policies that ensure the deepening of the financial sector for instance; interest rate should be regulated to ensure that the interest spread is narrow hence making it cheaper for the general population to have access to financial products, especially credit for business start-ups.

Finally, concerning financial efficiency, it was established that financial efficiency has no significant effect on the link between economic growth and poverty levels in East African

Community countries. However, the effect of financial efficiency on poverty was positive hence the study recommends to EAC governments and regulatory authorities to put down plans and policies aimed at making the financial sector efficient. Efficient financial sector is associated with reduced cost of financial intermediation and a banking sector that is not efficient is linked with high cost of financial intermediation. The respective governments and regulatory authorities can increase financial sector efficiency within their respective countries through encouraging the banking sector to adopt and enhance technology further to lower transaction costs for the benefit of the poor masses.

Theoretical Contributions: This study has advanced frontiers of knowledge from the study findings. It lends support to liberal theory that the idea that poverty in an economy is caused by both market distortions and underdevelopment in various areas (Granville & Mallick, 2006; Haberlert, 2017). This study has confirmed the contributions by the various theories and lends support for the hypothesized relationships. The result contributes to the strengthening of the literature by confirming the postulations of liberal theory, financial intermediation theory and public choice theory.

The results pointed out that for economic growth to have meaningful relationship with poverty levels, financial deepening, income distribution and financial efficiency should be considered, controlled and streamlined with the key country level characteristics. The study gives more support to the established theories in augmenting that fundamental economic theory that presupposes that competitive market economies are able to provide effective means that can be utilized to allocate resources to Pareto's optimal point.

Policy Contributions: The findings of this study offer suggestions that will provide a guide to policy makers to develop strategies to enhance effective growth of economies in EAC countries. The study therefore recommends that the government in general and ministries of planning and economic affairs of EAC countries should put down concrete plans and concerted actions aimed at improving economic growth rates. The study also encourage develop policies to enhance financial deepening within their respective countries. This has been embraced better in a Kenyan case, but it can be done better.

Contributions to Management Practice: Effective poverty reduction policies at the country level are timely to boost relevant institutional strategies. The government needs to encourage institutions to be innovative enough to offer wider option of financial services and improved access to financial services among different socioeconomic groups in an economy. This could be done via application capacity of appropriate process technologies to produce new products and the capacity to develop and adopt new products and processing technologies to meet future needs respond to competitive technology activities and unforeseen opportunities composed by competitors. Constantly embrace technological innovations to boost financial deepening through corporate governance directorship to improve performance of firms.

Methodological Contributions: Any studies involving large samples, a dynamic model is mostly appropriate. The choice of analytical tools suggested for panel data regression analysis was based on econometric reasoning. The estimating technique was a very

powerful analytical technique more especially when looking for estimates that are unbiased and consistent.

The approach which diverted from the norm was able to give various statistical reports that guided this study on statistical significance to support or not support the various hypotheses. It allowed drawing of conclusions based on verifiable empirical evidence. If another choice of analytical tool was to be used, the statistically significant results may be altered.

6.5 Limitations of the study

The study although successfully carried out, a number of gaps exist. The study was carried out with annual data for thirty-year period yielding 30 observations per variable per country. Even though the overall panel data analysis had adequate observations per variable for regression analysis, the country specific multivariate time series analysis did not have sufficient observations for stronger relationship between the variables. In regression analysis, scholars argue that at least 50 observations per variable is necessary for regression even though others state 30 observations is the bare minimum observation needed for analysis. The expected relationship between income distribution and poverty when gini coefficient is used to measure income distribution ought to be positive, given than increasing gini coefficient is associated with worsening income distribution that should further lead to worsening poverty levels. However, the findings established negative relationship that is contrary to theoretical expectations.

Finally, the current study was carried out using static panel data and multivariate time series model that does not capture dynamism in data. The use of static a model has a weakness in that it fails to capture the dynamic nature of most macroeconomic and financial aggregates. The current study was also limited to four explanatory variables explaining poverty levels including economic growth, financial deepening, financial efficiency and income distribution. In reality, poverty is affected by a dozen of factors. The study therefore did not examine all major factor affecting poverty level. Finally, financial deepening and financial efficiency were restricted to banking sector indicators. The scope of the study did not include indicators of financial deepening and financial efficiency in capital market and insurance sector.

6.6 Areas for Further Research

The study was successfully carried out, however, a number of study gaps exist for future studies. The study recommends that future studies should be carried out with quarterly data at the country level to increase the number of observations and enhance the strength of the relationship between study variables in the short run and long run period.

Given that the relationship between income distribution and poverty levels were positive which is contrary to theoretical expectations. The study recommends that future studies should be carried out in other jurisdictions beyond the current geographic scope to establish if the findings hold. Given that the current study was based on static panel data and multivariate time series model that does not capture dynamism in data. The study wishes to suggest to future researchers to carry out the same study while employing

dynamic models. The dynamic models would be in a position to capture the dynamic nature of macroeconomic and financial data aggregates in the study.

Given that the current study was limited to four explanatory variables explaining poverty levels including economic growth, financial deepening, financial efficiency and income distribution. In reality, poverty is affected by a dozen of factors. The study therefore suggest to future researchers to introduce control variables in the examination of the association between economic growth, financial deepening, financial efficiency, income distribution and poverty levels.

Finally, financial deepening and financial efficiency were restricted to banking sector indicators. The scope of the study did not include indicators of financial deepening and financial efficiency in capital market and insurance sector. The study recommends that future studies should be carried out with financial deepening and financial proxies in the banking, capital market and insurance sector. This would enable complete capturing of financial deepening and financial efficiency.

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APPENDICES

Appendix I: Data Collection Sheet

Name of Country……..

Time	Real GDP	Head count ratio	Credit to private sector	GINI coefficient	Operational cost of banking sector	Operational income of banking sector
2018						
2017						
2016						
2015						
2014						
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Appendix II: Raw Data One

Country	year	id	W	z	u	x	y	w_01	z_01	u_01	x_01
Burundi	2018	1		0.345444	551566398.2	2355586068	67.0847379	0.417	0.351882	490554840.6	2318490758
	2017	1	0.417	0.351882	490554840.6	2318490758	67.6780892	0.418	0.465422	508167612.7	2306955749
	2016	1	0.418	0.465422	508167612.7	2306955749	68.5519679	0.418	0.505378	508686980.6	2320881502
	2015	1	0.418	0.505378	508686980.6	2320881502	68.7761324	0.421	0.466041	522037915	2415069278
	2014	1	0.421	0.466041	522037915	2415069278	70.2224485	0.414	0.466041	475362146.1	2316820972
	2013	1	0.414	0.466041	475362146.1	2316820972	71.8	0.408	0.466041	471449885.5	2208090294
	2012	1	0.408	0.466041	471449885.5	2208090294	71.25365	0.403	0.588826	482040972.6	2114083183
	2011	1	0.403	0.588826	482040972.6	2114083183	69.8925875	0.395	0.537725	373139008.2	2032135247
	2010	1	0.395	0.537725	373139008.2	2032135247	71.3795366	0.387	0.433192	260631703.1	1933081018
	2009	1	0.387	0.433192	260631703.1	1933081018	73.2658893	0.372	0.433192	220223771.7	1862084450
	2008	1	0.372	0.433192	220223771.7	1862084450	74.6656149	0.361	0.433192	200372004.1	1775752462
	2007	1	0.361	0.433192	200372004.1	1775752462	76.4408211	0.35	0.433192	201586474.2	1716499708
	2006	1	0.35	0.433192	201586474.2	1716499708	77.7	0.33	0.433192	162469216.3	1628344288
	2005	1	0.33	0.433192	162469216.3	1628344288	78.5242159	0.324	0.433192	158803989.4	1613819909
	2004	1	0.324	0.433192	158803989.4	1613819909	78.8162567	0.316	0.453714	157972326.4	1539410094
	2003	1	0.316	0.453714	157972326.4	1539410094	80.5960696	0.31	0.528928	167639789.5	1558481670
	2002	1	0.31	0.528928	167639789.5	1558481670	81.03246	0.302	0.534994	142942373.7	1492133657
	2001	1	0.302	0.534994	142942373.7	1492133657	82.6681269	0.303	0.500377	148679145.8	1462076191
	2000	1	0.303	0.500377	148679145.8	1462076191	83.4122859	0.3	0.539724	124364752.6	1474712472
	1999	1	0.3	0.539724	124364752.6	1474712472	83.732326	0.3	0.622081	120973732.3	1489759038
	1998	1	0.3	0.622081	120973732.3	1489759038	84.1	0.296	0.536181	115499361.4	1422204332
	1997	1	0.296	0.536181	115499361.4	1422204332	83.874369	0.294	0.464139	123693146.2	1445182738
	1996	1	0.294	0.464139	123693146.2	1445182738	83.4547172	0.296	0.552414	122709182.5	1570850802
	1995	1	0.296	0.552414	122709182.5	1570850802	82.4168338	0.298	0.522859	136313587.7	1705963078
	1994	1	0.298	0.522859	136313587.7	1705963078	81.3586175	0.299	0.51028	131701400.3	1773903585
	1993	1	0.299	0.51028	131701400.3	1773903585	80.7835935	0.297	0.482837	116112586	1891962015
	1992	1	0.297	0.482837	116112586	1891962015	81.1	0.3	0.363393	125477514	1873044298

	1991	1	0.3	0.363393	125477514	1873044298	81.4699219	0.297	0.407968	97525327.73	1783905460
	1990	1	0.297	0.407968	97525327.73	1783905460	83.3298832	0.278	0.470777	78035130.18	1723583116
	1989	1	0.278	0.470777	78035130.18	1723583116	84.6208382				
Kenya	2018	2		0.611244	24577979480	61781234461	34.7986003	0.59	0.614726	23204638275	9354383538
	2017	2	0.59	0.614726	23204638275	58108880274	33.8307412	0.585	0.733283	23170718669	8820078085
	2016	2	0.585	0.733283	23170718669	55414336959	34.6281293	0.578	0.747521	21920400404	8322295390
	2015	2	0.578	0.747521	21920400404	52337445097	36.8	0.572	0.71258	20974499521	7644392401
	2014	2	0.572	0.71258	20974499521	49506417104	36.3125328	0.566	0.701655	17472854437	7102831624
	2013	2	0.566	0.701655	17472854437	46989149335	38.2919248	0.559	0.688041	14889990352	6783106461
	2012	2	0.559	0.688041	14889990352	44380180300	40.4634125	0.552	0.688041	12826273589	6233308624
	2011	2	0.552	0.688041	12826273589	42443399231	42.1469483	0.543	0.573918	10891273259	5783152633
	2010	2	0.543	0.573918	10891273259	40000088347	42.4007871	0.533	0.473045	9263378361	5387786373
	2009	2	0.533	0.473045	9263378361	36898510533	43.5051241	0.523	0.429498	9110409503	5070588267
	2008	2	0.523	0.429498	9110409503	35717358968	43.7183393	0.514	0.442018	7364754665	4561224742
	2007	2	0.514	0.442018	7364754665	35634585974	43.7924268	0.505	0.487309	5911026437	4235845516
	2006	2	0.505	0.487309	5911026437	33349876084	43.3207505	0.49	0.431782	4923734056	3878017311
	2005	2	0.49	0.431782	4923734056	31322527291	43.7	0.48	0.348565	4392017690	3545522608
	2004	2	0.48	0.348565	4392017690	29575595617	43.0578138	0.468	0.352345	3749332054	3299765958
	2003	2	0.468	0.352345	3749332054	28139282294	42.9330908	0.456	0.418822	3399296838	3228658740
	2002	2	0.456	0.418822	3399296838	27337613464	42.0024823	0.456	0.597715	3275419967	2852371970
	2001	2	0.456	0.597715	3275419967	27188928219	41.2052851	0.451	0.491514	3272694515	2629288910
	2000	2	0.451	0.491514	3272694515	26198643973	39.599431	0.451	0.531792	3426398839	2426194353
	1999	2	0.451	0.531792	3426398839	26042468490	34.821828	0.452	0.547744	3377403684	2326999911
	1998	2	0.452	0.547744	3377403684	25455617585	32.6783045	0.453	0.475848	3194370018	2137633982
	1997	2	0.453	0.475848	3194370018	24644752554	31.9	0.455	0.331192	2611737988	1877592120
	1996	2	0.455	0.331192	2611737988	24528267342	31.325083	0.456	0.380971	2335229264	1665333748
	1995	2	0.456	0.380971	2335229264	23551619535	31.8644481	0.457	0.432635	1417774297	1231536401
	1994	2	0.457	0.432635	1417774297	22557679340	31.5	0.458	0.480037	1063862362	2475353880
	1993	2	0.458	0.480037	1063862362	21979019127	31.2615821	0.463	0.446223	1818523255	2693784570
	1992	2	0.463	0.446223	1818523255	21901663054	31.4	0.466	0.513236	1626878097	2544361227
	1991	2	0.466	0.513236	1626878097	22078176744	31.1079397	0.468	0.557595	1599304961	2609986188

	1990	2	0.468	0.557595	1599304961	21765118855	33.6442927	0.471	0.522387	1592385616	2674146753
	1989	2	0.471	0.522387	1592385616	20889423571	38.2032999				
Rwanda	2018	3		0.606565	2062283873	10165566061	49.3544052	0.524	0.604401	1905398650	9354383538
	2017	3	0.524	0.604401	1905398650	9354383538	53.258749	0.52	0.604401	1779827710	8820078085
	2016	3	0.52	0.604401	1779827710	8820078085	55.5	0.51	0.604401	1749179682	8322295390
	2015	3	0.51	0.604401	1749179682	8322295390	55.6933014	0.509	0.604401	1665599807	7644392401
	2014	3	0.509	0.604401	1665599807	7644392401	55.9806382	0.503	0.604401	1461363601	7102831624
	2013	3	0.503	0.604401	1461363601	7102831624	56.8	0.5	0.577682	1353543015	6783106461
	2012	3	0.5	0.577682	1353543015	6783106461	57.1634481	0.493	0.568804	1038877770	6233308624
	2011	3	0.493	0.568804	1038877770	6233308624	61.424689	0.485	0.637714	703814400.8	5783152633
	2010	3	0.485	0.637714	703814400.8	5783152633	62.3	0.47	0.701722	633287741.8	5387786373
	2009	3	0.47	0.701722	633287741.8	5387786373	62.6674204	0.455	0.705722	692250376.2	5070588267
	2008	3	0.455	0.705722	692250376.2	5070588267	63.964631	0.445	0.667051	489822219.4	4561224742
	2007	3	0.445	0.667051	489822219.4	4561224742	64.0905361	0.429	0.478518	390701427.9	4235845516
	2006	3	0.429	0.478518	390701427.9	4235845516	66.913568	0.408	0.531268	302503177.5	3878017311
	2005	3	0.408	0.531268	302503177.5	3878017311	68.3	0.391	0.588175	233639330.2	3545522608
	2004	3	0.391	0.588175	233639330.2	3545522608	68.6910643	0.374	0.628522	190935469.8	3299765958
	2003	3	0.374	0.628522	190935469.8	3299765958	68.4217505	0.361	0.75794	185283083.4	3228658740
	2002	3	0.361	0.75794	185283083.4	3228658740	71.21371	0.345	0.599448	178544122.4	2852371970
	2001	3	0.345	0.599448	178544122.4	2852371970	74.0740592	0.335	0.518618	180656111.1	2629288910
	2000	3	0.335	0.518618	180656111.1	2629288910	77.2	0.32	0.521682	180413389.3	2426194353
	1999	3	0.32	0.521682	180413389.3	2426194353	76.272081	0.302	0.502796	174250858.4	2326999911
	1998	3	0.302	0.502796	174250858.4	2326999911	75.257198	0.288	0.631552	149796139.6	2137633982
	1997	3	0.288	0.631552	149796139.6	2137633982	72.5089693	0.262	0.498426	94087738.74	1877592120
	1996	3	0.262	0.498426	94087738.74	1877592120	70.5768305	0.234	0.495361	108849453.2	1665333748
	1995	3	0.234	0.495361	108849453.2	1665333748	71.2211932	0.199	0.544964	74476454.55	1231536401
	1994	3	0.199	0.544964	74476454.55	1231536401	68.1629584	0.209	0.422887	124780742.8	2475353880
	1993	3	0.209	0.422887	124780742.8	2475353880	66.5614029	0.213	0.34621	115150524.2	2693784570
	1992	3	0.213	0.34621	115150524.2	2693784570	65.5672232	0.227	0.516008	97868240.28	2544361227
	1991	3	0.227	0.516008	97868240.28	2544361227	64.7875828	0.25	0.393399	176489562.6	2609986188
	1990	3	0.25	0.393399	176489562.6	2609986188	63.9184625	0.24	0.399426	221780683.5	2674146753

	1989	3	0.24	0.399426	221780683.5	2674146753	63				
Tanzania	2018	4		0.544342	6999846354	53903751497	44.5069922	0.538	0.535656	6966497173	51236560631
	2017	4	0.538	0.535656	6966497173	51236560631	45.1238622	0.533	0.524442	6804261377	47978173850
	2016	4	0.533	0.524442	6804261377	47978173850	47.6338734	0.528	0.541886	6923689612	44892771987
	2015	4	0.528	0.541886	6923689612	44892771987	46.174024	0.515	0.548174	6647183001	42285335943
	2014	4	0.515	0.548174	6647183001	42285335943	47.4413149	0.507	0.59262	5727120625	39615956899
	2013	4	0.507	0.59262	5727120625	39615956899	48.9271852	0.506	0.614416	5082582951	37098018199
	2012	4	0.506	0.614416	5082582951	37098018199	47.4407757	0.499	0.578421	4281876834	35498561451
	2011	4	0.499	0.578421	4281876834	35498561451	49.1	0.493	0.600409	3751513762	32967374524
	2010	4	0.493	0.600409	3751513762	32967374524	53.5233899	0.486	0.628347	3276717126	31001232407
	2009	4	0.486	0.628347	3276717126	31001232407	55.8633737	0.477	0.632868	3328080779	29447953449
	2008	4	0.477	0.632868	3328080779	29447953449	57.8044317	0.468	0.62618	2505223133	27862051544
	2007	4	0.468	0.62618	2505223133	27862051544	59.9	0.458	0.613019	1825798620	26094379898
	2006	4	0.458	0.613019	1825798620	26094379898	62.7688424	0.448	0.539929	1439796089	24493070014
	2005	4	0.448	0.539929	1439796089	24493070014	66.1759495	0.434	0.525093	1185198242	22788078384
	2004	4	0.434	0.525093	1185198242	22788078384	69.9263345	0.423	0.513594	942408195.1	21196352732
	2003	4	0.423	0.513594	942408195.1	21196352732	72.6912212	0.413	0.443689	738533601.5	19869403552
	2002	4	0.413	0.443689	738533601.5	19869403552	76.1491558	0.403	0.412701	558788056.4	18552124967
	2001	4	0.403	0.412701	558788056.4	18552124967	83.762584	0.395	0.474026	416367737.2	17489144309
	2000	4	0.395	0.474026	416367737.2	17489144309	86	0.388	0.279224	405721796.5	16731572129
	1999	4	0.388	0.279224	405721796.5	16731572129	83.3902571	0.381	0.451361	360871661.1	15954449262
	1998	4	0.381	0.451361	360871661.1	15954449262	85.1813723	0.375	0.380521	272419327.8	15382906877
	1997	4	0.375	0.380521	272419327.8	15382906877	84.5456587	0.372	0.46528	200966694	14858092473
	1996	4	0.372	0.46528	200966694	14858092473	81.8474561	0.371	0.433644	349736247.2	14211291554
	1995	4	0.371	0.433644	349736247.2	14211291554	79.5308788	0.369	0.471479	437528415.2	13720537896
	1994	4	0.369	0.471479	437528415.2	13720537896	78.8510492	0.37	0.607604	459705754.6	13507872191
	1993	4	0.37	0.607604	459705754.6	13507872191	75.4342772	0.37	0.580418	448392536.2	13346053850
	1992	4	0.37	0.580418	448392536.2	13346053850	74.8814485	0.371	0.531386	695415258.6	13267649037
	1991	4	0.371	0.531386	695415258.6	13267649037	72.1	0.37	0.555902	592050278.9	12997471035
	1990	4	0.37	0.555902	592050278.9	12997471035	72.8665362	0.369	0.580418	621463429.6	12141258974
	1989	4	0.369	0.580418	621463429.6	12141258974	75.4773353				

Uganda	2018	5		0.467465	4459290359	30319150878	40.3312593	0.516	0.47123	4146018739	28578668646
	2017	5	0.516	0.47123	4146018739	28578668646	40.2782394	0.508	0.482647	3983467820	27515729480
	2016	5	0.508	0.482647	3983467820	27515729480	41.7	0.505	0.481343	4475213729	26260227907
	2015	5	0.505	0.481343	4475213729	26260227907	39.7702377	0.5	0.495581	4214430046	24965074811
	2014	5	0.5	0.495581	4214430046	24965074811	37.6872711	0.496	0.439017	3540864189	23752213779
	2013	5	0.496	0.439017	3540864189	23752213779	36.5753931	0.492	0.490114	3319923452	22929745405
	2012	5	0.492	0.490114	3319923452	22929745405	35.9	0.49	0.504715	3248918363	22082345211
	2011	5	0.49	0.504715	3248918363	22082345211	39.045052	0.486	0.469085	2693140550	20186496527
	2010	5	0.486	0.469085	2693140550	20186496527	42.5222857	0.477	0.433614	2070158384	19109196503
	2009	5	0.477	0.433614	2070158384	19109196503	44.6	0.47	0.507909	1979375008	17892251887
	2008	5	0.47	0.507909	1979375008	17892251887	46.1018253	0.459	0.464808	1257742772	16458888152
	2007	5	0.459	0.464808	1257742772	16458888152	49.3149671	0.449	0.463825	1005073212	15181735862
	2006	5	0.449	0.463825	1005073212	15181735862	52.4193823	0.437	0.455103	776614478.5	13703814498
	2005	5	0.437	0.455103	776614478.5	13703814498	56.4	0.43	0.448808	639810605.6	12887692950
	2004	5	0.43	0.448808	639810605.6	12887692950	60.189647	0.43	0.488755	532288020.7	12066311003
	2003	5	0.43	0.488755	532288020.7	12066311003	62.7141095	0.421	0.466048	491019090.3	11332715044
	2002	5	0.421	0.466048	491019090.3	11332715044	65.1	0.406	0.438806	415015167.3	10422546785
	2001	5	0.406	0.438806	415015167.3	10422546785	65.8514009	0.398	0.467585	386097839.4	9908902840
	2000	5	0.398	0.467585	386097839.4	9908902840	66.7599234	0.384	0.512709	381210852.7	9607057981
	1999	5	0.384	0.512709	381210852.7	9607057981	66.9	0.368	0.551556	369917605.5	8890982815
	1998	5	0.368	0.551556	369917605.5	8890982815	65.9493534	0.353	0.363422	302912909.5	8475249334
	1997	5	0.353	0.363422	302912909.5	8475249334	63.7392168	0.338	0.192315	319625758.5	8063985903
	1996	5	0.338	0.192315	319625758.5	8063985903	62.6	0.321	0.20294	264186480.8	7393260811
	1995	5	0.321	0.20294	264186480.8	7393260811	63.0995447	0.315	0.161274	174261743.1	6629345200
	1994	5	0.315	0.161274	174261743.1	6629345200	63.3598263	0.312	0.204845	142535678	6230374699
	1993	5	0.312	0.204845	142535678	6230374699	63.7279949	0.305	0.167773	114328951.3	5751488908
	1992	5	0.305	0.167773	114328951.3	5751488908	63.8	0.311	0.168086	133942080.8	5561381056
	1991	5	0.311	0.168086	133942080.8	5561381056	61.2598455	0.311	0.121282	123524334.2	5268749668
	1990	5	0.311	0.121282	123524334.2	5268749668	59.3195818	0.302	0.116601	102543423.3	4948384331
	1989	5	0.302	0.116601	102543423.3	4948384331	57.7				

Appendix III: Raw Data Two

Country	year	id	lnw	lnz	lnu	lnx	lny	lnw_01	lnz_01	lnu_01	lnx_01
Burundi	2018	1		-1.06293	20.1283	21.5801	4.20596	-0.87467	-1.04446	20.011	21.5642
	2017	1	-0.87467	-1.04446	20.011	21.5642	4.21476	-0.87227	-0.76481	20.0463	21.5592
	2016	1	-0.87227	-0.76481	20.0463	21.5592	4.22759	-0.87227	-0.68245	20.0473	21.5652
	2015	1	-0.87227	-0.68245	20.0473	21.5652	4.23086	-0.86512	-0.76348	20.0733	21.605
	2014	1	-0.86512	-0.76348	20.0733	21.605	4.25167	-0.88189	-0.76348	19.9796	21.5635
	2013	1	-0.88189	-0.76348	19.9796	21.5635	4.27388	-0.89649	-0.76348	19.9713	21.5154
	2012	1	-0.89649	-0.76348	19.9713	21.5154	4.26625	-0.90882	-0.52963	19.9935	21.4719
	2011	1	-0.90882	-0.52963	19.9935	21.4719	4.24696	-0.92887	-0.62041	19.7375	21.4324
	2010	1	-0.92887	-0.62041	19.7375	21.4324	4.26801	-0.94933	-0.83657	19.3786	21.3824
	2009	1	-0.94933	-0.83657	19.3786	21.3824	4.2941	-0.98886	-0.83657	19.2102	21.345
	2008	1	-0.98886	-0.83657	19.2102	21.345	4.31302	-1.01888	-0.83657	19.1157	21.2975
	2007	1	-1.01888	-0.83657	19.1157	21.2975	4.33652	-1.04982	-0.83657	19.1217	21.2636
	2006	1	-1.04982	-0.83657	19.1217	21.2636	4.35286	-1.10866	-0.83657	18.906	21.2108
	2005	1	-1.10866	-0.83657	18.906	21.2108	4.36341	-1.12701	-0.83657	18.8832	21.2019
	2004	1	-1.12701	-0.83657	18.8832	21.2019	4.36712	-1.15201	-0.79029	18.8779	21.1547
	2003	1	-1.15201	-0.79029	18.8779	21.1547	4.38945	-1.17118	-0.6369	18.9373	21.167
	2002	1	-1.17118	-0.6369	18.9373	21.167	4.39485	-1.19733	-0.6255	18.778	21.1235
	2001	1	-1.19733	-0.6255	18.778	21.1235	4.41483	-1.19402	-0.69239	18.8173	21.1031
	2000	1	-1.19402	-0.69239	18.8173	21.1031	4.4238	-1.20397	-0.6167	18.6387	21.1117
	1999	1	-1.20397	-0.6167	18.6387	21.1117	4.42763	-1.20397	-0.47468	18.6111	21.1219
	1998	1	-1.20397	-0.47468	18.6111	21.1219	4.43201	-1.2174	-0.62328	18.5648	21.0755
	1997	1	-1.2174	-0.62328	18.5648	21.0755	4.42932	-1.22418	-0.76757	18.6333	21.0915
	1996	1	-1.22418	-0.76757	18.6333	21.0915	4.4243	-1.2174	-0.59346	18.6253	21.1749
	1995	1	-1.2174	-0.59346	18.6253	21.1749	4.41179	-1.21066	-0.64844	18.7305	21.2574
	1994	1	-1.21066	-0.64844	18.7305	21.2574	4.39887	-1.20731	-0.6728	18.696	21.2964
	1993	1	-1.20731	-0.6728	18.696	21.2964	4.39177	-1.21402	-0.72808	18.5701	21.3609

	1992	1	-1.21402	-0.72808	18.5701	21.3609	4.39568	-1.20397	-1.01227	18.6476	21.3508
	1991	1	-1.20397	-1.01227	18.6476	21.3508	4.40023	-1.21402	-0.89657	18.3956	21.3021
	1990	1	-1.21402	-0.89657	18.3956	21.3021	4.42281	-1.28013	-0.75337	18.1727	21.2677
	1989	1	-1.28013	-0.75337	18.1727	21.2677	4.43818				
Kenya	2018	2		-0.49226	23.9251	24.8469	3.54958	-0.52763	-0.48658	23.8676	24.7856
	2017	2	-0.52763	-0.48658	23.8676	24.7856	3.52137	-0.53614	-0.31022	23.8662	24.7381
	2016	2	-0.53614	-0.31022	23.8662	24.7381	3.54467	-0.54818	-0.29099	23.8107	24.681
	2015	2	-0.54818	-0.29099	23.8107	24.681	3.6055	-0.55862	-0.33886	23.7666	24.6254
	2014	2	-0.55862	-0.33886	23.7666	24.6254	3.59216	-0.56916	-0.35431	23.5839	24.5732
	2013	2	-0.56916	-0.35431	23.5839	24.5732	3.64524	-0.58161	-0.37391	23.424	24.5161
	2012	2	-0.58161	-0.37391	23.424	24.5161	3.7004	-0.59421	-0.37391	23.2748	24.4714
	2011	2	-0.59421	-0.37391	23.2748	24.4714	3.74116	-0.61065	-0.55527	23.1112	24.4121
	2010	2	-0.61065	-0.55527	23.1112	24.4121	3.74717	-0.62923	-0.74857	22.9493	24.3314
	2009	2	-0.62923	-0.74857	22.9493	24.3314	3.77288	-0.64817	-0.84514	22.9327	24.2989
	2008	2	-0.64817	-0.84514	22.9327	24.2989	3.77777	-0.66553	-0.81641	22.72	24.2966
	2007	2	-0.66553	-0.81641	22.72	24.2966	3.77946	-0.6832	-0.71886	22.5001	24.2303
	2006	2	-0.6832	-0.71886	22.5001	24.2303	3.76863	-0.71335	-0.83983	22.3173	24.1676
	2005	2	-0.71335	-0.83983	22.3173	24.1676	3.77735	-0.73397	-1.05393	22.2031	24.1102
	2004	2	-0.73397	-1.05393	22.2031	24.1102	3.76254	-0.75929	-1.04314	22.0448	24.0604
	2003	2	-0.75929	-1.04314	22.0448	24.0604	3.75964	-0.78526	-0.87031	21.9468	24.0315
	2002	2	-0.78526	-0.87031	21.9468	24.0315	3.73773	-0.78526	-0.51464	21.9097	24.0261
	2001	2	-0.78526	-0.51464	21.9097	24.0261	3.71857	-0.79629	-0.71027	21.9089	23.989
	2000	2	-0.79629	-0.71027	21.9089	23.989	3.67881	-0.79629	-0.6315	21.9548	23.983
	1999	2	-0.79629	-0.6315	21.9548	23.983	3.55024	-0.79407	-0.60195	21.9404	23.9602
	1998	2	-0.79407	-0.60195	21.9404	23.9602	3.48671	-0.79186	-0.74266	21.8847	23.9278
	1997	2	-0.79186	-0.74266	21.8847	23.9278	3.46261	-0.78746	-1.10506	21.6833	23.9231
	1996	2	-0.78746	-1.10506	21.6833	23.9231	3.44442	-0.78526	-0.96503	21.5714	23.8825
	1995	2	-0.78526	-0.96503	21.5714	23.8825	3.46149	-0.78307	-0.83786	21.0724	23.8393
	1994	2	-0.78307	-0.83786	21.0724	23.8393	3.44999	-0.78089	-0.73389	20.7852	23.8134
	1993	2	-0.78089	-0.73389	20.7852	23.8134	3.44239	-0.77003	-0.80694	21.3213	23.8098
	1992	2	-0.77003	-0.80694	21.3213	23.8098	3.44681	-0.76357	-0.66702	21.2099	23.8179

	1991	2	-0.76357	-0.66702	21.2099	23.8179	3.43746	-0.75929	-0.58412	21.1928	23.8036
	1990	2	-0.75929	-0.58412	21.1928	23.8036	3.51584	-0.7529	-0.64935	21.1885	23.7625
	1989	2	-0.7529	-0.64935	21.1885	23.7625	3.64292				
Rwanda	2018	3		-0.49994	21.4471	23.0423	3.89903	-0.64626	-0.50352	21.368	22.9591
	2017	3	-0.64626	-0.50352	21.368	22.9591	3.97516	-0.65393	-0.50352	21.2998	22.9003
	2016	3	-0.65393	-0.50352	21.2998	22.9003	4.01638	-0.67335	-0.50352	21.2824	22.8422
	2015	3	-0.67335	-0.50352	21.2824	22.8422	4.01986	-0.67531	-0.50352	21.2335	22.7572
	2014	3	-0.67531	-0.50352	21.2335	22.7572	4.02501	-0.68717	-0.50352	21.1026	22.6838
	2013	3	-0.68717	-0.50352	21.1026	22.6838	4.03954	-0.69315	-0.54873	21.026	22.6377
	2012	3	-0.69315	-0.54873	21.026	22.6377	4.04591	-0.70725	-0.56422	20.7614	22.5532
	2011	3	-0.70725	-0.56422	20.7614	22.5532	4.11781	-0.72361	-0.44987	20.372	22.4782
	2010	3	-0.72361	-0.44987	20.372	22.4782	4.13196	-0.75502	-0.35422	20.2664	22.4074
	2009	3	-0.75502	-0.35422	20.2664	22.4074	4.13784	-0.78746	-0.34853	20.3555	22.3467
	2008	3	-0.78746	-0.34853	20.3555	22.3467	4.15833	-0.80968	-0.40489	20.0096	22.2409
	2007	3	-0.80968	-0.40489	20.0096	22.2409	4.1603	-0.8463	-0.73706	19.7835	22.1668
	2006	3	-0.8463	-0.73706	19.7835	22.1668	4.2034	-0.89649	-0.63249	19.5276	22.0786
	2005	3	-0.89649	-0.63249	19.5276	22.0786	4.22391	-0.93905	-0.53073	19.2693	21.989
	2004	3	-0.93905	-0.53073	19.2693	21.989	4.22962	-0.9835	-0.46439	19.0674	21.9171
	2003	3	-0.9835	-0.46439	19.0674	21.9171	4.22569	-1.01888	-0.27715	19.0374	21.8953
	2002	3	-1.01888	-0.27715	19.0374	21.8953	4.26569	-1.06421	-0.51175	19.0003	21.7714
	2001	3	-1.06421	-0.51175	19.0003	21.7714	4.30507	-1.09362	-0.65659	19.0121	21.69
	2000	3	-1.09362	-0.65659	19.0121	21.69	4.3464	-1.13943	-0.6507	19.0108	21.6096
	1999	3	-1.13943	-0.6507	19.0108	21.6096	4.33431	-1.19733	-0.68757	18.976	21.5678
	1998	3	-1.19733	-0.68757	18.976	21.5678	4.32091	-1.24479	-0.45958	18.8248	21.483
	1997	3	-1.24479	-0.45958	18.8248	21.483	4.28371	-1.33941	-0.6963	18.3597	21.3533
	1996	3	-1.33941	-0.6963	18.3597	21.3533	4.2567	-1.45243	-0.70247	18.5055	21.2333
	1995	3	-1.45243	-0.70247	18.5055	21.2333	4.26579	-1.61445	-0.60704	18.126	20.9315
	1994	3	-1.61445	-0.60704	18.126	20.9315	4.2219	-1.56542	-0.86065	18.6421	21.6297
	1993	3	-1.56542	-0.86065	18.6421	21.6297	4.19812	-1.54646	-1.06071	18.5618	21.7142
	1992	3	-1.54646	-1.06071	18.5618	21.7142	4.18308	-1.48281	-0.66163	18.3991	21.6571
	1991	3	-1.48281	-0.66163	18.3991	21.6571	4.17111	-1.38629	-0.93293	18.9888	21.6826

	1990	3	-1.38629	-0.93293	18.9888	21.6826	4.15761	-1.42712	-0.91773	19.2172	21.7069
	1989	3	-1.42712	-0.91773	19.2172	21.7069	4.14313				
Tanzania	2018	4		-0.60818	22.6692	24.7105	3.79565	-0.6199	-0.62426	22.6644	24.6597
	2017	4	-0.6199	-0.62426	22.6644	24.6597	3.80941	-0.62923	-0.64542	22.6408	24.594
	2016	4	-0.62923	-0.64542	22.6408	24.594	3.86354	-0.63866	-0.6127	22.6582	24.5275
	2015	4	-0.63866	-0.6127	22.6582	24.5275	3.83242	-0.66359	-0.60116	22.6175	24.4677
	2014	4	-0.66359	-0.60116	22.6175	24.4677	3.85949	-0.67924	-0.5232	22.4685	24.4025
	2013	4	-0.67924	-0.5232	22.4685	24.4025	3.89033	-0.68122	-0.48708	22.3491	24.3368
	2012	4	-0.68122	-0.48708	22.3491	24.3368	3.85948	-0.69515	-0.54745	22.1777	24.2928
	2011	4	-0.69515	-0.54745	22.1777	24.2928	3.89386	-0.70725	-0.51014	22.0454	24.2188
	2010	4	-0.70725	-0.51014	22.0454	24.2188	3.98012	-0.72155	-0.46466	21.9101	24.1573
	2009	4	-0.72155	-0.46466	21.9101	24.1573	4.02291	-0.74024	-0.45749	21.9257	24.1059
	2008	4	-0.74024	-0.45749	21.9257	24.1059	4.05707	-0.75929	-0.46812	21.6416	24.0505
	2007	4	-0.75929	-0.46812	21.6416	24.0505	4.09268	-0.78089	-0.48936	21.3253	23.985
	2006	4	-0.78089	-0.48936	21.3253	23.985	4.13946	-0.80296	-0.61632	21.0878	23.9217
	2005	4	-0.80296	-0.61632	21.0878	23.9217	4.19232	-0.83471	-0.64418	20.8932	23.8495
	2004	4	-0.83471	-0.64418	20.8932	23.8495	4.24744	-0.86038	-0.66632	20.6639	23.7771
	2003	4	-0.86038	-0.66632	20.6639	23.7771	4.28622	-0.88431	-0.81263	20.4202	23.7124
	2002	4	-0.88431	-0.81263	20.4202	23.7124	4.33269	-0.90882	-0.88503	20.1413	23.6439
	2001	4	-0.90882	-0.88503	20.1413	23.6439	4.42799	-0.92887	-0.74649	19.8471	23.5848
	2000	4	-0.92887	-0.74649	19.8471	23.5848	4.45435	-0.94675	-1.27574	19.8212	23.5406
	1999	4	-0.94675	-1.27574	19.8212	23.5406	4.42353	-0.96496	-0.79549	19.704	23.493
	1998	4	-0.96496	-0.79549	19.704	23.493	4.44478	-0.98083	-0.96621	19.4229	23.4565
	1997	4	-0.98083	-0.96621	19.4229	23.4565	4.43729	-0.98886	-0.76512	19.1187	23.4218
	1996	4	-0.98886	-0.76512	19.1187	23.4218	4.40486	-0.99155	-0.83553	19.6727	23.3773
	1995	4	-0.99155	-0.83553	19.6727	23.3773	4.37615	-0.99696	-0.75188	19.8967	23.3422
	1994	4	-0.99696	-0.75188	19.8967	23.3422	4.36756	-0.99425	-0.49823	19.9461	23.3265
	1993	4	-0.99425	-0.49823	19.9461	23.3265	4.32326	-0.99425	-0.54401	19.9212	23.3145
	1992	4	-0.99425	-0.54401	19.9212	23.3145	4.31591	-0.99155	-0.63227	20.36	23.3086
	1991	4	-0.99155	-0.63227	20.36	23.3086	4.27805	-0.99425	-0.58716	20.1991	23.288
	1990	4	-0.99425	-0.58716	20.1991	23.288	4.28863	-0.99696	-0.54401	20.2476	23.2199

	1989	4	-0.99696	-0.54401	20.2476	23.2199	4.32383				
Uganda	2018	5		-0.76043	22.2183	24.135	3.69713	-0.66165	-0.75241	22.1454	24.0759
	2017	5	-0.66165	-0.75241	22.1454	24.0759	3.69581	-0.67727	-0.72847	22.1054	24.038
	2016	5	-0.67727	-0.72847	22.1054	24.038	3.7305	-0.6832	-0.73118	22.2218	23.9913
	2015	5	-0.6832	-0.73118	22.2218	23.9913	3.68312	-0.69315	-0.70202	22.1618	23.9407
	2014	5	-0.69315	-0.70202	22.1618	23.9407	3.62932	-0.70118	-0.82322	21.9876	23.8909
	2013	5	-0.70118	-0.82322	21.9876	23.8909	3.59938	-0.70928	-0.71312	21.9232	23.8557
	2012	5	-0.70928	-0.71312	21.9232	23.8557	3.58074	-0.71335	-0.68376	21.9016	23.818
	2011	5	-0.71335	-0.68376	21.9016	23.818	3.66472	-0.72155	-0.75697	21.714	23.7283
	2010	5	-0.72155	-0.75697	21.714	23.7283	3.75003	-0.74024	-0.8356	21.4509	23.6734
	2009	5	-0.74024	-0.8356	21.4509	23.6734	3.79773	-0.75502	-0.67745	21.406	23.6076
	2008	5	-0.75502	-0.67745	21.406	23.6076	3.83085	-0.77871	-0.76613	20.9526	23.5241
	2007	5	-0.77871	-0.76613	20.9526	23.5241	3.89823	-0.80073	-0.76825	20.7283	23.4434
	2006	5	-0.80073	-0.76825	20.7283	23.4434	3.95928	-0.82782	-0.78723	20.4705	23.3409
	2005	5	-0.82782	-0.78723	20.4705	23.3409	4.03247	-0.84397	-0.80116	20.2767	23.2795
	2004	5	-0.84397	-0.80116	20.2767	23.2795	4.0975	-0.84397	-0.71589	20.0927	23.2137
	2003	5	-0.84397	-0.71589	20.0927	23.2137	4.13859	-0.86512	-0.76347	20.012	23.151
	2002	5	-0.86512	-0.76347	20.012	23.151	4.17592	-0.9014	-0.8237	19.8438	23.0672
	2001	5	-0.9014	-0.8237	19.8438	23.0672	4.1874	-0.9213	-0.76018	19.7716	23.0167
	2000	5	-0.9213	-0.76018	19.7716	23.0167	4.2011	-0.95711	-0.66805	19.7589	22.9858
	1999	5	-0.95711	-0.66805	19.7589	22.9858	4.2032	-0.99967	-0.59501	19.7288	22.9083
	1998	5	-0.99967	-0.59501	19.7288	22.9083	4.18889	-1.04129	-1.01219	19.529	22.8604
	1997	5	-1.04129	-1.01219	19.529	22.8604	4.1548	-1.08471	-1.64862	19.5827	22.8107
	1996	5	-1.08471	-1.64862	19.5827	22.8107	4.13677	-1.13631	-1.59485	19.3922	22.7238
	1995	5	-1.13631	-1.59485	19.3922	22.7238	4.14471	-1.15518	-1.82465	18.9761	22.6148
	1994	5	-1.15518	-1.82465	18.9761	22.6148	4.14883	-1.16475	-1.5855	18.7751	22.5527
	1993	5	-1.16475	-1.5855	18.7751	22.5527	4.15462	-1.18744	-1.78514	18.5546	22.4727
	1992	5	-1.18744	-1.78514	18.5546	22.4727	4.15575	-1.16796	-1.78328	18.7129	22.4391
	1991	5	-1.16796	-1.78328	18.7129	22.4391	4.11512	-1.16796	-2.10964	18.6319	22.3851
	1990	5	-1.16796	-2.10964	18.6319	22.3851	4.08294	-1.19733	-2.149	18.4458	22.3223
	1989	5	-1.19733	-2.149	18.4458	22.3223	4.05526				