UNIVERSITY OF CAPE COAST

FINANCIAL DEVELOPMENT, GOVERNMENT EXPENDITURE AND INCOME INEQUALITY IN SUB-SAHARAN AFRICA

THIERNO MAMOUDOU DIALLO

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BY

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Thesis submitted to the Department of Economic Studies of the School of Economics, College of Humanities and Legal Studies, University of Cape Coast, in partial fulfillment of the requirements for the award of Master of Philosophy degree in Economics.

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature……. Date……

Name: Thierno Mamoudou Diallo

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature……Date……..

Name: Dr. Emanuel Ekow Asmah

Co-Supervisor's Signature……..Date……..

Name: Dr. James Atta Peprah

ABSTRACT

The main purpose of this study is to assess the effects of financial development and government expenditure on income inequality in Sub-Saharan Africa. It specifically assesses the interactive effect of financial development and government expenditure on income inequality. The study compares the effects of financial development, government expenditure on income inequality across sub-regional groups in the region. It covers 25 African countries and analyses panel data spanning between the period 2000 to 2016 by employing two different estimation techniques namely Fixed and Random Effects Models. The findings reveal that an increase in financial development increases income inequality. On the contrary, an increase in government expenditure lowers income inequality. The interactive effect indicates that given government expenditure, an increase in financial development highly increases income inequality as compared to the individual effect of financial development. Finally, financial development shows a positive and significant relationship with income inequality across sub-regions, except for Central Africa that has an insignificant relationship. On the other hand, government expenditure also shows a negative relationship with income inequality across sub-regions except for Eastern Africa. The study recommends that governments of sub-Saharan Africa should complement financial development reforms that yield disproportionately greater gains for the rich than the poor with redistributive policies. Again, governments of these economies, financial institutions and development partners should steer the development of the financial system in a pro-poor direction.

KEYWORDS

Financial Development

Government Expenditure

Income Inequality

Sub-Saharan Africa

Random Effect

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DEDICATION

To my wife and children

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LIST OF ABBREVIATIONS

SSA	Sub-Saharan Africa
WDI	World Development Indicator
FE	Fixed Effect
RE	Random Effect
WA	West Africa
SA	Southern Africa
CA	Central Africa
EA	Eastern Africa
CPI	Corruption Perception Index
SDGs	Sustainable Development Goals
CPI	Consumer Price Index
GDP	Gross Domestic Product
AfDB	African Development Bank
UNDP	United Nations Development Programme
OECD	Organisation for Economic Corporation and Development
SADC	Southern African Development community
HCDI	Human Capital Development Index
Trade	Sum of Import and Export of Goods and Services
M1	Money Supply composed of Cash, Demand and Checkable Deposits
M2	M1 plus Savings and Time deposits

CHAPTER ONE

INTRODUCTION

This chapter explicitly begins with the background to the study, the problem statement, objectives and research hypotheses, significance of the study, the scope of the study as well as the organisation of the study.

Background to the Study

Over the last two decades, income disparity has been one of the most prominent issues across the globe (Brandolini & Carta, 2016). The causes of the concentration of income and wealth in the hands of the top few richest people in the world pose a very serious and complex problem to handle; and its trends, variations, dimensions, and consequences are worth readdressing in a much more scientific and comprehensive manner. The concentration of wealth and income in the developed versus developing world creates global imbalances between the two extremes. The variations in global inequality are from 0.55 to 0.70 Gini, and it reflects the high level of per capita income disparities across countries (Milanovic, 2013).

Widening the income gap deprives the poor of many opportunities and harms long-run growth (Berg & Ostry, 2017). High levels of inequality reduce the opportunities and ability of lower-income households to stay healthy and accumulate physical and human capital (Aghion, Caroli, & Garcia-Penalosa et al., 1999; Galor & Moav, 2004). Also, a high level of inequality leads to underinvestment in education as poor children end up in lower-quality schools and are less fortunate to get higher education. Under such a situation, the optimal level of labour productivity cannot be achieved (J. E. Stiglitz, 2012).

Moreover, extreme or high inequality tends to affect financial markets. Empirical studies have argued that a prolonged period of higher inequality in the advanced economies was associated with the global financial crisis by intensifying leverage, overextension of credit, and a relaxation in mortgage-underwriting standards (Rajan, 2010) and allowing lobbyists to push for financial deregulation (Acemoglu, 2011). Many contemporary researchers, including Stiglitz (2009), Milanovic (2009) and Wade (2009) among others, also identified the rising inequality as the fundamental cause of the global financial crisis of 2007-2008.

Bardhan (2005) stated that extreme inequality may damage trust and social cohesion and also lead to conflicts, which discourage investment. Conflicts are particularly prevalent in the management of common resources where, for example, inequality makes resolving disputes more difficult. More widely, inequality overwhelms the economics of conflict, as it may intensify the complaint felt by certain groups or can reduce the opportunity costs of opening and joining a violent conflict (Lichbach, 1989).

However, some scholars assert that inequality is directly related to growth and provides incentives for innovation and entrepreneurship (Lazear & Rosen, 1981). Inequality may be relevant mostly in developing countries because it allows at least some few individuals to accumulate the minimum needed capital to acquire a quality of education and start new businesses (Barro, 2000). Growth is less efficient in lowering poverty in countries with high initial levels of inequality or in which the distributional pattern of growth favors the non-poor (Dabla-Norris, Kochhar, Suphaphiphat, Ricka, & Tsounta, 2015).

Fuentes-Nieva and Galasso (2014) suggest that almost half of the world's wealth is now owned by just 1 percent of the population, amounting to $110 trillion; 65 times the total wealth of the bottom half of the world's population. This unequal distribution of income and wealth causes serious harm to the poorest communities around the world. More recently, another relevant statistic by Fukuda-Parr (2016); shows that nearly 22 percent of global income is received by the top richest individuals. Another striking statistic by Hongbo (2013) proved that high-income countries with a population of 16% of the world's population generate 55 percent of the global income while low-income countries with a population of 72 percent of the world's population earn below 2% of global income.

Comparatively, regional income inequalities vary significantly across regions. According to the African Development Bank Report (2012), Asia has an average of 37.6 Gini coefficients, North America, 36.7 and Europe, having the least income disparity among the world's regions with an average of 28.9 Gini. Additionally, Sub-Saharan Africa (SSA) is the world's poorest region and second most unequal region in the world after Latin America with average Gini coefficients of 43.6 and 51.8 respectively (Odusola, Cornia, Bhorat, & Conceição, 2017). It was stated that 6 out of 10 most unequal countries worldwide are in Southern Africa (Namibia, South Africa, Angola, Botswana, Lesotho, and Swaziland).

According to the African Development Bank [AfDB] (2012), nearly 50 percent of the population in SSA live on less than US$ 1 a day; making it the poorest region in the world. Unequal distribution of income and wealth is directly and consequently related to poverty. South Africa is identified as one

of the countries with the highest income inequalities in the world, with only 10 percent of its population earning between 55 percent and 60 percent of total income. On average, 72 percent of the youth population in Nigeria, Ethiopia, Uganda, Zambia, and Burundi live with less than US$2 per day. The incidence of poverty among young people stands at over 80% (African Development Indicators, 2008/2009). Indeed, high-income inequality does not slow economic growth in Africa, but it results in extreme poverty and generates political instability in developing countries like SSA. This, therefore, is an issue of global concern for the region and the world at large. Also, the Sustainable Development Goals (SDGs) seek to "end extreme poverty and reduce inequality" across the globe. Despite numerous and a considerable amount of efforts to trickle down the disparity in inequality across the region, more is needed to be done to minimize the phenomenon because it has its own political and socio-economic implications. Figure 1 highlights the levels of inequality of selected countries in SSA.

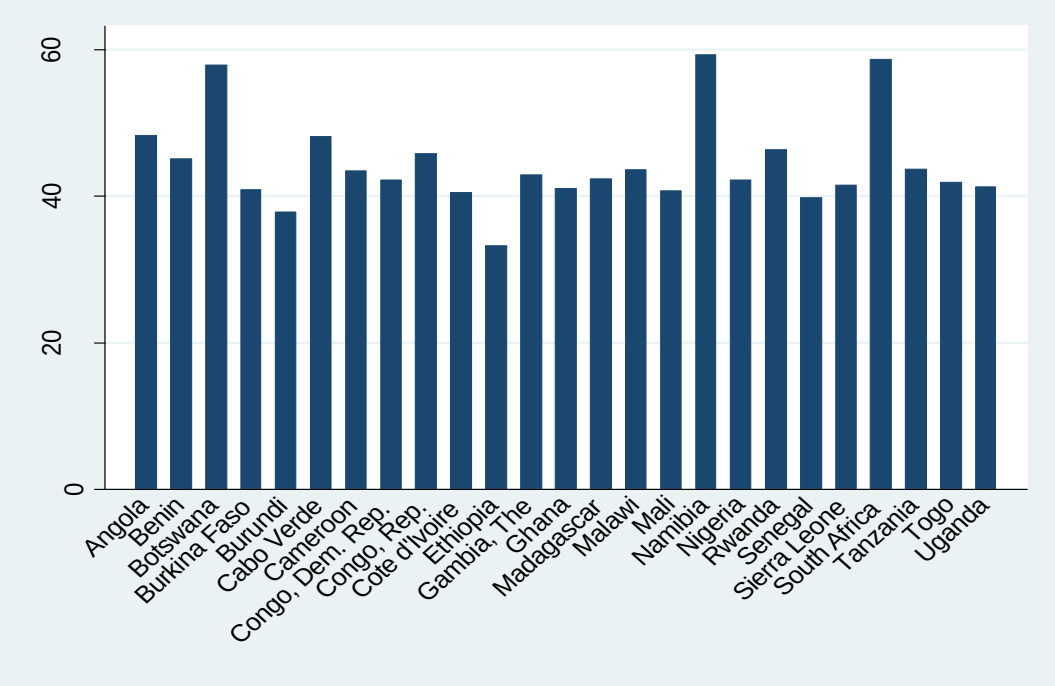

Figure 1: Graph of Income Inequality in SSA countries
Source: Author's construct, 2019

The above figure shows that countries like South Africa, Namibia and Botswana experience the highest form of income inequality making southern Africa the most vulnerable in terms of income inequality. On the regional level, income inequality is around 43 percent as compared to other regions of the world. This calls for serious attention and re-examination of the determinants of income inequality in the sub-region.

Sub-Saharan African countries have made substantial progress in financial development over the past decade (Andersen, Jones, & Tarp, 2012). Notwithstanding, the improvement of the financial system is among the potential benefits of the financial market liberalisation through the structural adjustment programme in Sub-Saharan Africa. These reforms aim at improving efficient mobilisation and pooling of funds and transforming them into loans for high return investment thereby promoting inclusive economic

growth which in turn will lead to the reduction of extreme poverty and lower-income disparity (Mlachila et al., 2016).

The major proposition of the financial development and income inequality models is that financial imperfections such as transaction costs, financial asymmetries, and costly contract enforcement may be a stumbling block for low-income people who may want to borrow to invest in their human capital (such as education) and poor budding entrepreneurs who may lack credit histories, networks and collateral. These constraints will, in turn, inhibit the flow of capital to poor individuals with lucrative projects or proposals, hence leading to inefficient allocation of capital and worsening income inequality. In line with the foregoing, improvements in financial contracts, intermediaries and markets would reduce income inequality (Banerjee & Newman, 1993; Galor & Zeira, 1993).

In defiance of the improvement of the financial system of these reforms, there are still more than 350 million adults in SSA who do not have access to financial services (Stijns, Borysko, & Marchitto, 2017). According to Tita and Aziakpono (2016), only Mauritius, South Africa and Botswana in SSA had financial inclusion above 50 percent, while the remaining 46 countries are far below average in 2014. This exclusion of the largest segment of the population reduces the potential market size and obscures the connection between financial development and income inequality. The persistence of extreme poverty and high-income disparity can be attributed to the fact that financial exclusion in the region has been high since only 22 percent of small enterprises gain credit from formal financial institutions (Demirgüç-Kunt & Klapper, 2012). Considering these challenges and

sacrifices made to improve the financial sector, it is imperative to assess deeply the link between financial development and income inequality in Africa.

In countries with the most effective governments, government expenditure promotes equity with no adverse effect on growth. This likely reflects that larger governments tend to redistribute more, and that better functioning governments tend to better target transfer programmes to disadvantaged groups. In countries with less effective governments, improving government effectiveness can both increase growth and reduce inequality. In these countries, reducing the size of government increases the income of all (Fournier & Johansson, 2016).

Nonetheless, it benefits less those with lower income as smaller governments tend to redistribute less. For a given level of public education spending, improving student performance yields large gains for all by raising skills and thereby productivity. An education reform that aims at encouraging completion of secondary education may also decrease income inequality as it can reduce education inequality (Doumbia & Kinda, 2019). Increasing the share of public investment in spending yields large growth gains. These gains are particularly strong for public investment in health (e.g. hospitals and their equipment). A spending shift towards public investment, away from another spending, would also speed up the convergence of income towards the most economies. Overall, such a spending shift lift “all boats” as it raises average income without any adverse equity effect. Government spending, such as unemployment and welfare support, directly affects income (Joumard, Pisu, & Bloch, 2012). Government expenditure can also influence household income

indirectly via its impact on GDP per capita. Recent OECD research investigated how gains in long-term GDP per capita "trickle-down" to households along with the income distribution (Causa, De Serres, & Ruiz, 2014).

Despite the well-established fact that public transfers can be the effective instruments to redistribute income to the poor; the redistributive effects in some countries are still regressive (Lindert, Skoufias, & Shapiro, 2006). The recent global recession substantially influenced government spending and income redistribution at varying lengths and depth across countries (Guzi & Kahanec, 2018). It is against this background that the current study seeks to objectively investigate the relationship between financial developments, government expenditure and income inequality across the Sub-Saharan Africa region.

Statement of the Problem

Over the past three decades, SSA has significantly undergone a vast financial reform from state-owned institutions to a market-oriented system to enable the financial sector to efficiently achieve its core mandate. Financial exclusion has become rampant in the region because financial services including loans are mostly given to the rich. According to Demirgüç-Kunt and Klapper (2012), only 22 percent of small enterprises in the region have access to credit relative to 43 percent in other developing economies outside of Africa.

Although the financial sector of Africa has witnessed massive reforms to enhance its ability by expanding the economic opportunities to reduce

poverty and lower-income inequality, Africa remains the poorest region and the second most unequal region in the world after Latin America. Despite these facts, little empirical research exists on the relationship between financial development and income inequality in Africa. Adeleye, Osabuohien and Bowale (2017) investigate the role of institutions in the finance-inequality nexus in sub-Saharan Africa, but they find no significant impact of financial development measured by domestic credit to GDP ratio on inequality. A similar study by Rewilak (2013), finds a negative and significant relationship between financial development and inequality. Tita and Aziakpono (2016) also report a non-linear relationship between financial development and income inequality after employing the augmented Mean Group estimator.

Financial development has improved in the SSA and governments of various countries in the region have implemented income equalization expenditures, but the question remains whether financial development and the income equalization expenditure by the governments have lowered income inequality over the years. Again, government spending stimulates the economy and promotes more economic activities. A growing economy also enhances the development of the financial sector as credits and other financial products become readily available. Therefore, it is likely for government expenditure to influence financial development to affect income inequality. This study seeks to fill this gap by examining how financial development interacts with important factors such as government expenditure to affect income inequality, and more importantly, move a bit further by paying particular attention to how these effects differ among the various regional blocks within SSA.

In addressing this gap observed and to contribute to the current empirical literature, this study employs an up-to-date dataset on the Gini index (the measure of income inequality); and a broader measure of financial development which adequately captures access, efficiency and depth of both financial markets and financial institutions (Svirydzenka, 2016). This measure is an improvement over the domestic credit to the private sector and the ratio of broad money to GDP (Bhatti, Batool, & Naqvi, 2015).

Purpose of the Study

The purpose of this study is to empirically examine the effects of financial development and government expenditure on income inequality in Sub-Saharan Africa.

Objectives of the Study

Specifically, this study seeks to achieve the following objectives.

1. Examine the effects of financial development and government spending on income inequality in Sub-Saharan Africa.
2. Examine the interactive effect of financial development and government spending on income inequality in Sub-Saharan Africa.

Hypotheses

1. Ho: Financial development and government spending have no significant effect on income inequality in SSA.

   H1: Financial development and government spending have a significant effect on income inequality in SSA.

2. Ho: Financial development and government expenditure have no interactive effect on income inequality in SSA

   H1: Financial development and government expenditure have an interactive effect on income inequality in SSA.

Delimitation of the Study

The study is delimited to 25 Sub-Saharan Africa over the period 2000 to 2016. The use of 25 countries in the region was due to some data issues including missing observations. Again, the study used government spending and financial development index to determine the income inequality levels.

Significance of the Study

The importance of financial development and government expenditure in reducing income inequality deserves attention when it comes to sub-Saharan Africa. This study is timely and useful in seeking to contribute significantly to literature by empirically examining the interactive effects of financial development and government expenditure on income inequality. This study provides more relevant and efficient policy recommendations and measures in guiding policymakers to reinforce policies related to government spending and financial development towards reducing income inequality. The findings of this study will also broaden the knowledge of authorities, researchers and students on financial development, government expenditure and income inequality nexus of SSA countries.

Organisation of the Study

This study is organised into five chapters. The first chapter contains the background of the study, the statement of the problem, the objective of the study, the limitation of the study, the delimitation of the study and the significance of the study. The rest of the chapters are organised as follows. Chapter Two captures a review of the literature related to the study. Both theoretical and empirical literature is reviewed. Chapter Three discusses the methodology of the study. It gives a detail description of the scope of the study, theories that provide theoretical antecedents to the study, the variables and the econometric model specification of the study. Results obtained from the study are presented and discussed in the Fourth Chapter. Finally, Chapter Five presents the summary, conclusion, and recommendation of the study.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This part presents a review of both theoretical and empirical literature relevant to this study. It focuses on conceptual and theoretical issues and empirical literature relevant to this study.

Conceptualization of the Issue of Income Inequality, Government Expenditure, and Financial Development

Income inequality

Income inequality, also known as the gap between the rich and the poor refers to the differences in the sharing of economic wealth; either assets or income between or within populations or individuals or groups within a society. Thus, it can even relate to the income disparity between countries or regions. The disparity of income pertains to the unequal distribution of household or individual income across the various participants in an economy. Most often, income disparity is considered as the percentage of income to a percentage of the population. For instance, one may show that only 12 percent of the population possesses more than 80 percent of a country's wealth and income. Consequently, such unequal distribution of income is generally considered "unfair" if the rich have a disproportionately larger portion of a country's income compared to their population (Rodríguez-Pose & Tselios, 2010).

Government expenditure

Government expenditure is defined as spending made by the government of a country based on collective needs and wants such as pension, provision and public infrastructures to address the social, economic and regulatory requirements of an economy (Akrani, 2011). Increasing government expenditure on social infrastructure improves the income of poorer households and facilitates their human capital development. As a result, their wellbeing conditions improve and the economic inequality gap is narrowed down.

Financial development

Financial development emerged as a result of the cost involved in acquiring and processing information about potential investment coupled with costs and uncertainties associated with writing, interpreting, and enforcing contracts in addition to costs associated with transacting goods, services, and financial instruments. The aforementioned market imperfections inhibit the flow of society‘s savings to those with the best ideas and projects, curtailing economic development and retarding improvements in living standards (Beck & Levine, 2005). Financial development occurs when financial instruments, markets, and intermediaries ameliorate the effects of imperfect information, limited enforcement, and transaction costs (Demirguc-Kunt, Cihak, Feyen, Beck, & Levine, 2013).

Defining financial development in terms of the degree to which the financial system eases market imperfections, however, is too narrow and does not provide much information on the actual functions provided by the

financial system. Demirgüç-Kunt, Levine, and Detragiache (2008) explained that financial development occurs when financial instruments, markets, and intermediaries ameliorate the effects of information, enforcement, and transaction costs and therefore do a correspondingly better job at providing the five financial functions. Financial development involves improvements in such functions provided by the financial systems as (i) pooling of savings; (ii) allocating capital to productive investments; (iii) monitoring those investments; (iv) risk diversification and (v) exchange of goods and services.

Measures of financial development

Most of the empirical literature since the 1970s approximate financial development by two measures of financial depth – the ratio of private credit to GDP and, to a lesser extent, by stock market capitalization, also as a ratio to GDP. Most researchers in this field use variations of these two measures to examine the role of the financial system in economic development. And yet, financial development is a multidimensional process. Therefore, Svirydzenka (2016) measured financial development by three dimensions which include depth, access, and efficiency. This is because financial sectors have evolved across the globe and modern financial systems have become multifaceted. To overcome the shortcomings of single indicators as proxies for financial development, Svirydzenka creates several indices that summarize how developed financial institutions and financial markets are in terms of their depth, access, and efficiency, culminating in the final index of financial development.

Depth is measured in terms of the size of financial institutions and the size of the stock market (capitalization, or the value of listed shares) how active they are. Furthermore, an important feature of financial systems is their access and efficiency. Large financial systems are of limited use if they are not accessible to a sufficiently large proportion of the population and firms (Aizenman, Jinjarak, & Park, 2015). Even if financial systems are sizeable and have a broad reach, their contribution to economic development would be limited if they were wasteful and inefficient.

Financial institutions' access is proxied by the number of bank branches and ATMs per 100,000 adults. Additional indicators were considered, such as the number of bank accounts per 1,000 adults, percent of firms with a line of credit, and usage of mobile phones to send and receive money. For the financial market access, the percentage of market capitalization outside of the top 10 largest companies was used to proxy access to stock markets. For bond market access, the number of financial and nonfinancial corporate issuers on the domestic and external debt market in a given year per 100,000 adults was used (Svirydzenka, 2016).

Efficiency is measured by the efficiency in intermediating savings to investment, as measured by the net interest margin (the accounting value of bank's net interest revenue as a share of its average interest-bearing assets) and lending-deposit spread; (ii) operational efficiency measures, such as non-interest income to total income and overhead costs to total assets; and (iii) profitability measures, such as return on assets and return on equity. Financial market efficiency sub-index relies on the stock market turnover ratio – the ratio of the value of stocks traded to stock market capitalization. A higher

turnover indicates higher liquidity and greater efficiency in the market. In the bond market, the most commonly used variable is the tightness of the bid-ask spread.

Theoretical Literature on Financial Development-Income Inequality Nexus

Inequality-widening and narrowing hypothesis

There are some controversies in the literature in predicting the effect of financial development on income inequality. For example, there are two sorts of hypotheses suggested by the finance-inequality sequence: the former is the inequality-widening hypothesis and the latter is inequality narrowing hypothesis of financial development. The former by Clarke, Xu, and Zou (2006), postulate that financial development might benefit the rich more than the poor, especially when institutional quality is weak. Nevertheless, when the financial system is developed, lots of financial services and products can be available. Their economy expands and the disadvantage people begin to access financial services and invest in high return projects. In the end, income inequality reduces between the rich and the low-income earners thus the disparity narrows down. Another crucial one is the income narrowing hypothesis, put forward by Galor and Zeira (1993) and Banerjee and Newman (1993). The income narrowing hypothesis proposes that the presence of financial market imperfections deters the poor from borrowing adequately to invest in human and physical capital, implying that financial development helps alleviate income inequality.

It is assumed that individual inherits a different amount of wealth and those with large wealth invest in education and take up skilled work. Those

with lesser initial wealth have to resort to borrowing for investment in human capital. In an underdeveloped financial market, borrowing is costly and those who are unable to borrow will remain unskilled and this goes on generation after generation. As the economy expands, the financial market develops to support the growing economy and with broader credit services, the poor have the opportunity to borrow for human capital investments and upgrade their earning potentials.

Accordingly, income inequality starts to reduce and this corresponds to the linear hypothesis that income inequality negatively relates to the development of the financial sector. Given a similar analysis, but differs from the perspective of basic ideas, Greenwood and Jovanovic (1990) present a theoretical model that has elements of both ideas from the linear relationships that are put together in a non-linear relationship.

At the early stage of economic development, only the rich can access and benefit from the financial system and hence, the income difference between the rich and the poor widens with the expansion of the financial system and the rapid economic growth. As economic growth improves, the financial sector becomes more developed to provide wider financial access to the economy including the poor. As the economy reaches a stable and steady-state, income inequality begins to shrink and hence this non-linear hypothesis suggests an inverted U-shaped theory. Concerning the impact of income inequality on financial development, there could be a trade-off between reducing inequality and growing the financial sector. As income distribution improves, demand for financial services increases which lead to growth in the financial industry.

Extensive and intensive margin theory

Most economic theories provide contradicting forecasts about the nature of the relationship between finance and inequality. For example, financial development may run on the extensive margin, improving the availability and the usage of various financial products by individuals who had not previously been engaged in those services because of price or other hindrances. Consequently, the improvement in the efficiency, accessibility, and depth of the financial system might expand the economic opportunities of disadvantaged groups and reduce the intergenerational persistence of relative incomes (Becker & Tomes, 1979; Greenwood & Jovanovic 1990).

On the other side, finance can also run on the intensive margin. That is, improving the availability of financial services of those already accessing the financial system, due to their high-income levels and their business potentials. In this manner, the direct effect of ameliorating the standard of financial services could fall disproportionately on the rich, worsening inequality and keep in existence, cross-line differences in economic opportunity (Greenwood & Jovanovic, 1990). The theory also stipulates that finance through indirect mechanisms can affect inequality. Changes in the financial system can affect both aggregate output and credit allocations, each of which may alter the demand for low-and high-skilled workers with attendant consequences on the distribution of income (Townsend & Ueda, 2006). For instance, enhancing the financial system could boost the demand for low-skilled workers and tend to tighten the distribution of income, expanding and equalizing economic opportunities. Thus, theory throws light on an array of direct and indirect

procedures via which changes in the performance of the financial system can escalate or lower the inequality of economic opportunity, propounded by (Amurgo-Pacheco & Pierola, 2008).

Theoretical Linkages of Government Expenditure on Income Inequality

Literature has revealed that government interventions have been one of the most effective ways of combating income inequality. Government social interventions remain the most preferred practice by the state to end extreme poverty and a high level of inequality (Altan, 2006). Government social spending can be applied in two ways: social insurance and social assistance system (Barr, 2004). The social assistance system is generally based on an income test developed to help low-income households. The broad aim of the social insurance system is to protect the income against adverse risks such as unemployment, disability, and illness or to redistribute the income throughout the life cycle (Danziger, Haveman, & Plotnick, 1981). The social assistance system affects income distribution positively since the financing is provided for all income groups. However, the continuous demand for these benefits affects negatively, capital accumulation and economic efficiency.

In the social insurance system, income inequality may increase if high-income groups reflect the financing shares of the system to low-income individuals through price mechanisms. Also, low-income groups have to participate in the financing, which reduces the positive impact of government social spending on income distribution in an economy in which indirect taxes are applied. The government does not have to be necessarily organised while redistributing income through social spending from the rich to the poor. In the

social insurance system, unemployment, disease or disability are more important than the individual's need for financial assistance.

Another theoretical model developed by Aghion and Bolton (1997), allow moral hazard as a source of capital market imperfection, by dividing the society into three classes: very wealthy, middle class, and poor, each of them with different abilities to invest. They conclude that government intervention aids at redistributing wealth from the rich to the poor and the middle class can lead to greater equality (in terms of opportunities). Moreover, they predict a non-linear relationship at the early stage of development. The capital accumulation process makes inequality higher, but eventually, it tends to reduce it.

Capital market imperfections

Benabou (2000) developed a stochastic growth model in which high-income inequality is associated with less redistributive government spending. In an imperfect market system along with heterogeneous individuals, it is often argued that redistribution, has some positive externalities. The popular view is that redistributive policies decrease income inequality. High inequality creates wide political support for redistribution so as not to allow income disparities to grow over time as a result of capital market imperfections. Furman and Stiglitz (1998) stated that capital market imperfections imply consumption fluctuations induced by business fluctuations are far greater than they would be with perfect capital markets, with correspondingly large effects on welfare. Briefly, when capital markets are imperfect, economic opportunities differ among individuals with low and high initial wealth and

these unequal investment opportunities generate income inequality that persists over time. Moreover, linearity exists between low redistribution and high inequality. A negative relationship is expected to prevail between inequality and redistribution.

Empirical Literature Review

The phenomenon of economic inequality is multi-dimensional issues (economic, social and political) and this is the reason why there is no single way of targeting it. However, the field of economics has received a significant empirical investigation to examining economic inequality. Thus, the early literature on income inequality principally focused on the effects/impacts of economic growth and income inequality (Kuznet, 1955; Williamson, 1965).

One strand of literature on income inequality focused on the financial development-inequality nexus. In a cross-country study, Clarke et al. (2006) investigate the relationship between finance and income inequality in 83 countries from 1960 to 1995. In the analyses, they employed ordinary least squares (OLS) and GMM respectively and find strong evidence in support of the negative linear hypothesis with some weak support for the Greenwood and Jovanovic (1990) hypothesis. Beck, Demirgüç-Kunt, and Levine (2007) establish that greater financial development induces the incomes of the poor to grow faster than the average per capita GDP growth, which will result in lower income inequality.

Kai and Hamori (2009) examine the effect of financial depth and globalisation on income inequality in 29 sub-Saharan Africa (SSA) countries from 1980-2002 using fixed and random effect models. Their empirical

evidence reveals that globalization worsens income inequality but this effect dampens with the economic development of countries. They argue that since globalisation is likely to benefit those with some basic level of education, there is an equalising effect of globalization in countries where the overall standards of education are high. Furthermore, they find that financial depth reduces income inequality but its effect declines with globalisation. That is, increased globalisation shifts financial resources towards the rich and hence the gap between the rich and the poor widens.

Alos, Batuo, Guidi, and Mlambo (2010) examine the impact of financial development on income inequality in 22 African countries from 1980-2004 by testing the various theoretical hypotheses. They find empirical support for the negative linear hypothesis that financial development reduces income inequality. This was also confirmed by Agnello and Sousa (2012) in their study of 62 OECD and non-OECD countries from 1980 to 2006. They emphasized that access to the banking sector helps reduce inequality and that inequality rises within some periods before a banking crisis and declines afterward.

Gries and Meierrieks (2010) also find in a group of SSA countries that weak institutional quality undermines the effectiveness of financial development to reduce income inequality in the region. Recently, an identical investigation by Shahbaz and Islam (2011) in Pakistan using the ARDL revealed that financial instability is found to aggravate income inequality while financial development reduces income inequality in Pakistan.

In a similar vein, Agnello, Mallick, and Sousa (2012) extend the works of Abiad and Mody (2005) with an unbalanced panel data on 62 countries

from 1973 to 2005 and find that financial liberalisation reduces income inequality. This confirms the findings of political-economy researchers that the existence of the minimum amount of lending to certain 'priority' sectors and trade openness exacerbates income inequality (Benmelech & Moskowitz, 2010; Rajan & Ramcharan, 2011).

Similarly, Asongu (2013) examines the channel through which investment affects inequality and which channels are good for the poor in 13 African countries. The overall results reveal that financial development in Africa does not help the poor. The results showed that financial depth and activity reduce income inequality, whereas financial efficiency increases income inequality which provides support for Greenwood and Jovanovic (1990) inverted u-shape hypothesis. That is, large average loan sizes and deposits per capita are likely to benefit the rich and well-established firms. Financial reforms can improve the efficiency of the domestic financial systems and influence the distribution of income, as rising inequality generally reflects unequal access to productive opportunities (Čihák, Demirgüč-Kunt, Feyen, & Levine, 2013).

Moreover, Rewilak (2013) establishes a negative and significant relationship between financial development and income inequality. However, a study by Tina and Aziakpono (2016) reports a non-linear relationship between financial development and income inequality after employing the Augmented Mean Group estimator.

Meanwhile, Batabyal and Chowdhury (2015) evaluate the effect of Financial Development, Corruption and Income Inequality in 30 Commonwealth countries throughout 1995–2008. They use panel data for the

regression analysis. Their findings reveal that the high rates of corruption in the Commonwealth countries are crowding out the return to financial development. The return to financial development on income inequality, at the level of higher corruption, is positive for all countries and significantly larger for the low- and middle-income countries compared to high-income countries. They suggest that there is a need to put in place a complementary policy measure to simultaneously reduce corruption and promote financial development.

A recent study by Adeleye et al. (2017) looks at the role of institutions in the finance-inequality nexus in sub-Saharan Africa for 1996 to 2015 and employing the system GMM technique. They find no significant impact of financial development on inequality. Their study also finds a positive statistically significant relationship between corruption control and income inequality for the same period.

Other empirical studies on the inequality and financial development nexus suggest the existence of a threshold effect of financial development and institutional quality on income inequality. For example, Tan and Law (2012) find evidence of a below-threshold effect. Their results suggest that financial development will reduce income inequality at the early stage of financial development but this will only be sustainable below a certain threshold level. This plays in out in three phases: a phase where income inequality reduces with financial development, a phase of no change in income inequality with financial development, and the final phase of rising income inequality with further financial development, thus translating into a u-shape. Further financial development after the second phase will increase income inequality.

Again, Law, Tan, and Azman-Saini (2014) employ a threshold regression approach and found that financial development will reduce income inequality only after a certain level of institutional quality has been achieved. They conclude that, until such institutional quality has been reached, the relationship between finance and income inequality will not exist.

Besides studies on financial development and income inequality, there are also limited studies on the role of government expenditure as a potential driver of inequality. Roine, Vlachos, and Waldenström (2009) explore the determinants of income inequality in the sample of 16 countries spanning the whole of the twentieth century and they show that the amount of government spending does not affect the highest income earners but they document improvements in the income shares of bottom nine deciles. Kappel (2010) found that government spending reduces income inequality in high income but not in low-income countries. Milanovic and Ersado (2012) study the determinants of the income distribution (using decile shares) in the 26 transition economies during 1990-2005. According to their study, government expenditure is insignificant in explaining income inequality. The result contrasts with Aristei and Perugini (2014) who confirm that a higher share of government is associated with lower inequality in 27 transition economies. Kahanec and Zimmermann (2008) identify the negative correlation between inequality and government spending on a sample of 16 OECD countries.

Additionally, studies have also been conducted on the determinants of income inequality. Darma and Ali (2014) assess the effect of inequality on economic growth in West Africa for the period 1980-2011. For their econometric analysis, they employed fixed effect, random effect and

generalized method of the moment. Their results displayed that inequality and poverty have a significant and inverse effect on economic growth in West Africa while human capital and openness are positively related to economic growth in the region.

A study by Abida and Sghaier (2012) indicates that the long-run growth elasticity of income inequality is negative and significant. The results also show a negative and highly significant relationship between growth and initial income per capita. Fosu (2010) interrogates the impact of economic growth on poverty reduction with an emphasis on the role of income inequality. The researcher used fixed effect, random effect and the Generalized Method of Moment (GMM) models for the period between 1981 and 2005. The study covers both regional and country-specific data and brought into existence that on average, income growth has been the major driving force behind both the declines and increases in poverty and that high initial levels of inequality limit the effectiveness of growth in reducing poverty.

Barbier (2010) examines regional comparative analysis by including both African and Asian countries in the sample from 1970-2003. The empirical evidence reveals that corruption has been the major hindrance affecting Africa. Corruption plays an insignificant role in undermining growth due to its focus on resource-driven growth in Asia. Dandume (2013) empirically evaluates the effects of corruption and Inequality of Income on Economic Growth. The results suggest that inequality of income positively affects economic growth. This means that economic growth moves in the same direction with the inequality of income.

Ncube, Anyanwu, and Hausken (2014) survey the shapes of inequality, growth and income inequality in the MENA region using panel data for the period 1985-2009. The authors further interrogate the effect of income inequality on key societal development, namely economic growth and poverty in the region. The results demonstrate that income inequality reduces economic growth and thus increases poverty in the region.

Recently, a substantial number of studies have assessed the relationship between corruption and income inequality or even unequal economic opportunities within or across countries or regions to clarify how these phenomena interact. Understanding deeply and objectively this complex relationship can inform decision-makers in planning and programming in good governance, as well as the best and most appropriate methods of redistributing income fairly. Dwiputri, Arsyad, and Pradiptyo (2018) in their research work contribute to the body of knowledge by examining the effect of corruption on income inequality. They adopted the Ramsey Growth model and used the OLS, two Stage Least Square (2SLS) and the Tobit methods for the estimation techniques. They find evidence that there is a reciprocal relationship between corruption and income inequality in Asia. They also find that the higher the corruption level the larger the income gap.

Baymul and Sen (2018) highlight that most theoretical linkages between corruption and income inequality fail to adequately support empirical evidence for the relationship between income inequality and corruption and the conceptual difference between income inequality and its perception. The researcher demonstrates how systematic biases exist in individuals' perceptions of inequality. Failure to address these biases might be the cause of

the lack of supporting evidence for theories that link income inequality to corruption. A new conceptual framework was developed to shed light on the relationship between inequality perceptions and corruption. This study suggests that inequality increases corruption through how it is perceived by individuals, and policies aimed at reducing inequality should help fighting corruption if the public is made aware of the policy itself.

Studies also find inflation to significantly explain income inequality. Awe and Ojo (2012) conduct an empirical study and the result shows that inflation is one of the major and direct determinants of high-income inequality in Nigeria. Walsh and Yu (2012) see inflation as an aggravating factor of poverty and worsening income distribution. They conclude that in developing countries inflation and income distribution interact and influence each other. Thalassinos, Ugurlu, and Muratoglu (2012) assess the association between income inequality and inflation in 13 European countries for the period 2000 to 2009 using panel data methodology. The inflation rate, the growth rates, the employment level and the openness of the economy are used as an explanatory variable while the Gini index is used as a proxy of income inequality at the same time as the response variable. Their findings support the hypothesis that inflation has a positive and significant effect on income inequality.

Abrigo, Lee, and Park (2017) empirically argue that human capital investments have a direct effect on labor productivity and, hence, output. The direct effect is stronger for poorer households and, hence, beneficial for equity. Again, they also show that such investments can generate sufficient tax revenues to improve the fiscal balance. Overall, the entire portion of the human capital's literature strongly argues based on concrete evidence that

there is a positive effect of human capital on growth, equity, and fiscal balance.

Cerdeiro and Komaromi (2017) examine the effect of Trade Openness on Real Income and Inequality. They used panel data for the analysis for the period 1990-2015. To correct for the endogeneity problem, they used countries' geographic characteristics. Their results suggest that one-percentage-point higher openness causes the income of the top decile to decrease by about 4 percent relative to the income of the bottom decile of the income distribution.

Bukhari and Munir (2016) evaluate the impact of globalization on income inequality in a few selected Asian countries. Their findings show that trade and technological globalization in the selected Asian economies significantly contributes to reducing income inequality. Suci, Asmara, and Mulatsih (2016) investigate the impact of globalisation on economic growth in Asia. The result shows that globalisation level has a positive effect on economic growth and a negative impact on income equality.

Chapter Summary

Theoretical literature relevant to this study includes Extensive and Intensive Margin Theory, Capital Market Imperfections**,** Private-Public Capital Complementarity Inequality-Widening, and Narrowing Hypothesis. The chapter continues by providing details of empirical literature relevant to the study. Most of the studies reviewed indicate a mixed relationship between financial development and income inequality. However, previous literature could not examine the interactive effect of financial development and

government expenditure on income inequality in sub-Saharan Africa. To fill these gaps, the current study distinct itself by examining the interactive effects of financial development and government expenditure on income inequality in Saharan Africa. Also, the joint effect of financial development and government expenditure will be carried out with particular emphasis on how the effects of these variables differ in four sub-regional blocs in Sub Saharan Africa.

CHAPTER THREE

RESEARCH METHODS

Introduction

This chapter presents the methodology for the study. It discusses the research design, the data type, and sources, the methods and tools of analysis employed, theoretical and empirical specification of the model and the description of variables.

Research Design

This study adopts the explanatory research under the quantitative research design in addressing the hypotheses of the study. Furthermore, this study is also situated in the positivist tradition. The positivist tradition assumes that the objective knowledge systematically pursued by researchers is based on relational laws (Acquaah et al., 2013). Also, the positivist philosophy assumes that knowledge is externally objective and researchers take strictly neutral and detached positions towards the phenomenon being investigated. Such a stance ensures that the values and biases of the researcher do not affect the study and thus threaten its validity (Eberhardt & Teal, 2011). Reliability in the positivist philosophy encompasses the extent to which the result of a study's research is met. Positivist research exhibit a high likelihood of reliability, enabling confident replication or repetition in similar settings.

Empirical Model Specification

Following the (Greenwood & Jovanovic, 1990) model, this current study specifies the empirical models to be estimated based on the objectives and these are as follows:

$$Giniindex_{it} = \beta_0 + \beta_1 FDIndex_{it} + \beta_2 GOVEXP_{it} + \beta_3 HC_{it} + \beta_4 TradeGDP_{it} + \beta_5 CORR_{it} + \beta_6 INFL_{it} + \varepsilon_{it}) \quad (1)$$

$$Giniindex_{it} = \beta_0 + \beta_1 FDIndex_{it} + \beta_2 GOVEXP_{it} + \beta_3 RGDPGR_{it} + \beta_4 FDI * GOVEXP_{it} + \beta_5 HC_{it} + \beta_6 TradeGDP_{it} + \beta_7 CORR_{it} + \beta_8 INFL_{it} + \varepsilon_{it}) \quad (2)$$

Where,

$Giniindex_{it}$= Income Inequality

$FDIndex_{it}$= Financial Development index

$GOVEXP_{it}$= Government expenditure

HC_{it} = Human Capital

$TradeGDP_{it}$ = Trade Openness

$CORR_{it}$= Corruption

INF_{it}= Inflation

$RGDPGR_{it}$= Real GDP growth rate

$\boldsymbol{i}$ = index for countries.

$\boldsymbol{t}$ = index for the period which is in years.

ε_{it} is the error term which is made up of two components, α_i, the unobserved country-specific effects and the idiosyncratic error term v_{it} and the β_s represents the parameters to be estimated in both models.

Data Sources, Variables Description, and Measurement

The data used for this study were gathered from different sources to examine the effects of financial development and government expenditure on income inequality in Africa. This study uses an unbalanced panel data and sample space of 25 SSA countries and the period used is between 2000 and 2016.

Dependent variable

Gini coefficient

The response variable which is captured as disposable income inequality is measured by the Gini coefficient. It was sourced from the Standardized World Income Inequality Database (Solt, 2016). The Gini coefficient or Gini index is a measure of statistical dispersion intended to represent the income or wealth distribution of a nation's residents and is the most commonly used measurement of inequality. A Gini coefficient of zero expresses perfect equality, where all values are the same (for example, where everyone has the same income). A Gini coefficient of 1 (or 100%) expresses maximal inequality among values (e.g., for a large number of people, where only one person has all the income or consumption, and all others have none, the Gini coefficient will be very nearly one).

Independent Variables

Financial development

The financial development index developed by Svirydzenka (2016), is an aggregated measure that captures the level of financial development. The index is constructed based on the three-step standard approach to reducing

multidimensional data into one summary index: (i) normalization of variables; (ii) aggregation of normalized variables into the sub-indices representing a particular functional dimension; and (iii) aggregation of the sub-indices into the final index. The index comprises a total of nine indices, which assess at varying levels of abstraction of how developed financial systems are across countries. Six lower level sub-indices are constructed using a list of indicators to measure how deep, accessible, and efficient financial institutions and markets are. Financial market sub-indices are aggregated into the overall measure of financial development (FD index). The dataset is obtained from the IMF database and the period is from 2000 to 2016.

Rajan and Zingales (2003) posit that financial intermediaries conduct transactions only with the rich while the poor are excluded due to constraints such as collateral. Even with development in the financial sector, the rich would still have upper-hand in the financial transactions, which further widens the gap between the rich and the poor. On the other hand, an important aspect of financial development, financial inclusion reduces inequality of opportunity and mitigates the adverse effects of inequality on the level and durability of growth (Ostry, Berg, & Tsangarides 2014). This study expects financial development to affect income inequality negatively or positively.

Government expenditure

Government expenditure (% of GDP) is calculated as the sum of all cash payments for operating activities of the government in providing goods and services, including compensation of employees (such as wages and salaries), interest and subsidies, grants, social benefits, and other expenses such as rents and dividends. This data was obtained from the Historical

Government Spending GDP throughout 2000-2016. The dataset is downloaded from the WDI database and the period is from 2000 to 2016. It also includes most expenditure on national defense and security but excludes government military expenditures that are part of government capital formation. Income inequality may increase or decrease with government expenditure (Anyanwu, 2011). Thus the effect of government expenditure on inequality is inconclusive.

If most of the redistribution through the tax and transfer system is poor, government consumption might result in greater inequality. However, it could have opposite effects if government consumption is not developmental (it means not pro-poor). Boyd (1988), found the size of the public sector to be significant in reducing income inequality. Higher unemployment also results in higher income inequality. Higher-income inequality hurts workers. Theoretically, the effect of government spending on income inequality is not conclusive as this outcome depends on whether the government is spending on productive or nonproductive activities.

Control variables

The study includes a set of control variables that have been consistently found in the previous literature and play an individual significant role in explaining income inequality. These variables are inflation (INF), corruption and perception index, trade openness (% GDP), human capital index and real GDP growth rate and their definitions and measurement are as follows:

Inflation (INF)

Inflation, as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. It is often calculated as weighted averages of the percentage price changes for a specified set or basket of consumer products. This aspect is particularly important in developing countries, often characterized by highly unstable macroeconomic conditions. Inflation may have a strong redistribution effect which could be positive (through its effects on individual income wealth) or negative (through a progressive tax system). Since inflation erodes real wages and disproportionately affects those within the bottom percentiles of the income distribution, several papers found that high inflation is associated with higher inequality (De Mello & Tiongson, 2006; Lundberg & Squire, 2003). This study expects a positive effect of inflation on income inequality.

Corruption perception index

The CPI is an indicator that captures the level of corruption in government, business, civil society and the daily lives of people. The current international Corruption Perception index measures the perceived levels of public sector corruption. Drawing on 13 surveys of business people and expert assessments, the index scores on a scale of zero (highly corrupt) to 100 (very clean). The data set for this index of corruption and perception is obtained from Transparency International. Corruption is expected to affect income inequality positively.

Human capital development index

The human capital index is defined as the number of years of schooling and the returns to education. The human capital index is calculated based on average years of education and an estimated rate of return to education from the Mincer equation. The Importance of the level of human capital for income distribution was emphasized by (Mincer, 1958). Chiu (1998) found evidence that the higher level of human capital accumulated in society helps to improve income distribution between individuals. This study, therefore, expects the effect of human capital on income inequality to be negative. The human capital index was sourced from the Penn World Table (PWT9) by Feenstra, Inklaar, and Timmer (2016).

Real GDP growth (Annual percent change)

Real gross domestic product is an inflation-adjusted measure that reflects the value of all goods and services produced by an economy in a given year. The annual growth rate of real Gross Domestic Product (GDP) per capita is calculated as the percentage change in the real GDP per capita between two consecutive years. The real GDP data are generated from the International Monetary Fund database. This study expects a negative relationship between real GDP growth and income inequality.

Trade openness (% of GDP)

Trade may be defined as the welfare gains obtains from the free movement of goods and services across borders. Trade openness is calculated as the sum of exports and imports of goods and services measured as a share of gross domestic product. The source of the data is from World development indicators. The study expects a prior, a negative or no significant effect of

trade on income inequality based on the Stolper Samuelson theory. The justification based on the Stolper Samuelson theory is that trade openness connects developing countries to the developed ones thereby helping to reduce income inequality in either country. This is because developing countries are abundant in unskilled labour. Hence, the trade would lead to a rise in the wages of unskilled labor and subsequently a reduction in wage dispersion and income inequality and vice versa for skilled labor in developed countries.

However, the effect of trade openness on inequality can go both ways (Dabla-Norris et al., 2015), depending on the extent of trade creation and trade diversion. In many low-income countries, the transfer of low-skilled operations from advanced economies (outsourcing) can create opportunities in the manufacturing and services sector, but the overall impact on inequality depends on the extent of the shift from the informal to the formal sector, as well as the wage disparities. Similarly, the closure of industries due to cheaper imports can worsen income inequality. The relationship between trade openness and income inequality can, therefore, be positive or negative.

Table 1 presents a summary of the data source and the expected signs of the independent variables.

Table 1: Summary of Variables, Expected Signs and Data Source

Variables	Data Source	Expected Sign
Financial Development	IMF	Negative (-/+)
Government Expenditure	WDI	Negative (-)
Human Capital	Penn World Table	Positive (-)
Trade Openness	WDI	Negative (+/-)
Real GDP growth	WDI	Negative (-)
Inflation	WDI	Positive (+)
Corruption	Transparency International	Positive (+)
FDindex* Gov. Expenditure		Negative (-)

Source: Author's Construct, 2019

Estimation Techniques

The study employs two different panel data approaches to ensure the robustness of the results across various econometric techniques. Due to the presence of heterogeneity and endogeneity that come with the pooled Ordinary Least squares, this thesis adopts two approaches, namely the Static panel models of fixed effects/random effects. Two assumptions in the econometric literature of correlation between the time-invariant error term (μi) and the explanatory variables account for the Fixed Effects (FE) and the Random Effects (RE) models. The random effect model assumes that the unobserved country-specific, time-invariant effects are uncorrelated with the regressors. The model is used when the variations across countries are assumed to be random and uncorrelated with the explanatory variables; Thus, Cov ($\mu iXit$) = 0. In contrast to the random effects, the fixed effects (FE) model assumes that the country-specific, time-invariant effects correlate with the explanatory variables, and thus controls for them in the model.

The FE models are therefore used to assume that countries possess certain individual characteristics that are unique to them and are time-invariant. The presence of these country-specific, time-invariant effects leads to the problem of endogeneity and subsequently biases the estimates. The FE model eliminates the time-invariant effects from the estimation. Both the fixed effect and random effect estimator are models that handle the specific structure of longitudinal or panel data. That is, unobservable individual heterogeneity is taken into account by both models. The Hausman test is used in choosing between the RE and FE.

Fixed versus random effect models

The use of a panel data model examines fixed and/or random effects of individual or time. The main difference between the fixed effect and the random effect models lies in the role of dummy variables. A parameter estimate of a dummy variable is part of the intercept in a fixed-effect model and part of an error component in a random effect model. The slopes remain the same across a group or across time in both models. The functional forms of one-way fixed effect and random effect models are presented in equations 3 and 4 respectively.

fixed effect model

$$Y_{it} = (\beta_0 + \alpha_i) + X'_{it}\beta + v_{it} \quad (3)$$

random effect model

$$Y_{it} = \beta_0 + X'_{it}\beta + (\alpha_i + v_{it}) \quad (4)$$

Where, β_0 is the constant term α_i, a fixed or random effect specific to the individual or the time that is not included in the regression, and the errors are independent and identically distributed with zero mean and constant variance, $v_{it} \sim IID(0, \delta^2_v)$.

A fixed effect model examines individual differences in the intercepts, assuming the same slope and constant variance across individual (group and entity). Since an individual specific effect is time-invariant and considered part of the intercept, it is allowed to be correlated with other regressors. The fixed effect model is estimated by Least Square Dummy Variable (LSDV)

regression, that is, OLS with a set of dummy variables, and within effect estimation methods.

The random effect model assumes that the individual effect is not correlated with any regressors and also not correlated with the estimate error variance specific to groups (or times). Hence, α_i is an individual specific random heterogeneity or components of the composite error term. A random-effect model is estimated by the Generalized Least Squares (GLS) when a covariance structure of the individual is known. The Feasible Generalised Least Squares (FGLS) method is used to estimate the entire variance-covariance matrix when sigma is known. There are various estimation methods for FGLS including the maximum likelihood method and simulation (Baltagi & Chang, 1994).

A random-effect model reduces the number of parameters to be estimated but produces inconsistent estimates when the individual-specific random effect is correlated with regressors Hensher, Rose, and Greene (2008). Fixed effects are tested by the F test, while random effects, on the other hand, are examined by the Lagrange Multiplier (LM) test Breusch and Pagan (1980). If the null hypothesis is not rejected in either test, the pooled OLS regression is considered. The Hausman specification test Hausman (1978) compares a random effect model to the fixed effect model. If the null hypothesis of no correlation between the individual effects and the other regressors are not rejected, the random effect model is favoured over the fixed effect model. If one cross-sectional or time series variable is considered, it is called a one-way fixed or random-effect model. The two-way fixed or random-effect model has

two sets of dummy variables for individual and/or time variables and as such entails some issues in estimation and interpretation.

Estimating the fixed effect model

There are different approaches to estimating the fixed effect model. The Least Square Dummy Variable (LSDV) uses dummy variables whereas the "within" estimation does not. These strategies, however, produce the identical parameter estimates of regressors. The "between" estimation fits a model using individual or time means of dependent and independent variables without dummies. The LSDV with a dummy dropped out of a set of dummies is widely used because it is relatively easy to estimate and interpret. However, this LSDV becomes problematic when there are many individuals (or groups) in panel data. If T is fixed and $n \to \infty$ (n is the number of observations and T is the number of periods), parameters estimates of regressors are consistent but the coefficients of individual effects, $\beta_0 + \alpha_i$, are not (Baltagi, 2008).

Unlike LSDV, the "within" estimation does not need dummy variables, but it uses deviations from the group (or period) means. That is, "within" estimation uses variation within each individual or entity instead of a large number of dummies. The "within" estimation is given in equation 5,

$$(y_{it} - \bar{y}_i) = (x_{it} - \bar{x}_i)'\beta + (\varepsilon_{it} - \bar{\varepsilon}_i) \quad (5)$$

Where $\bar{y}_i$ is the mean of the dependent variable (DV) of the individual (group), $\bar{x}_i$ represents the means of independent variables (IVs) and $\bar{\varepsilon}_i$ is the mean of errors in the group.

In the "within" estimation, the incidental parameter problem is no longer an issue. The parameter estimates of regressors in the "within" estimation are identical to those of LSDV. The "within" estimation reports correct the sum of squared errors (SSE). The "within" estimation, however, has several disadvantages. First, data transformation for the "within" estimation wipes out all time-invariant variables (e.g. gender, ethnic group & race) that do not vary within the entity (Kennedy, 2008). Also, the "within" estimation produces incorrect statistics. Finally, the R^2 of the "within" estimation is not correct because the intercept term is suppressed.

The "between groups" estimation uses variations between individual entities (groups). Specifically, this estimation calculates group means of the dependent variable and the independent variables and thus reduces the number of observations. The between estimation, therefore, is stated in equation 6 as;

$$\bar{y}_i = \alpha_i + \bar{x}_i + \bar{\varepsilon}_i \quad (6)$$

Where, $\bar{y}_i$ is the mean of the dependent variable, $\bar{x}_i$ represent the means of independent variables and $\bar{\varepsilon}_i$ is the mean of errors in the group.

Therefore, the empirical fixed effects models are expressed in equations 7 and 8.

$$Giniindex_{it} = (\beta_0 + \alpha) + \beta_1 FDIndex_{it} + \beta_2 GOVEXP_{it} + \beta_3 HC_{it} + \beta_4 TradeGDP_{it} + \beta_5 CORR_{it} + \beta_6 INFL_{it} + v_{it} \quad (7)$$

$$Giniindex_{it} = (\beta_0 + \alpha) + \beta_1 FDIndex_{it} + \beta_2 GOVEXP_{it} + \beta_3 RGDPGR_{it} + \beta_4 FDI * GOVEXP_{it} + \beta_5 HC_{it} + \beta_6 TradeGDP_{it} + \beta_7 CORR_{it} + \beta_8 INFL_{it} + v_{it} \quad (8)$$

Estimating random effect model

In the composite error term of a one-way random effect model, α_i is assumed independent of the traditional error term v_{it} and the regressors. This assumption is not necessary for a fixed-effect model. The model as presented earlier in equation 2 is

$$y_{it} = \beta_0 + X'_{it}\beta + (\alpha_i + v_{it})$$

Where $\alpha_i \sim IID(0, \sigma^2{}_\alpha)$ and $v_{it} \sim IID(0, \sigma^2{}_v)$.

The covariance elements of $Cov\,(\varepsilon_{it}, \varepsilon_{js}) = E\,(\varepsilon_{it}\varepsilon'_{js})$ are $\sigma_\alpha{}^2 + \sigma_v{}^2$ if $i = j$ and $t = s$, and $\sigma_\alpha{}^2$ if $i = j$ and $t \neq s$. Therefore, the covariance structure of the composite errors is $\Sigma = E\,(\varepsilon_i\varepsilon'_i)$ for individual i and the variance-covariance matrix of the entire disturbances or errors (V) are:

$$\Sigma = \begin{bmatrix} \sigma_\alpha{}^2 + \sigma_v{}^2 & \sigma_\alpha{}^2 & \dots & \sigma_\alpha{}^2 \\ \sigma_\alpha{}^2 & \sigma_\alpha{}^2 + \sigma_v{}^2 & \dots & \sigma_\alpha{}^2 \\ \vdots & \vdots & \vdots & \vdots \\ \sigma_\alpha{}^2 & \sigma_\alpha{}^2 & \dots & \sigma_\alpha{}^2 + \sigma_v{}^2 \end{bmatrix}$$

and $V = I_n \otimes \Sigma = \begin{bmatrix} \Sigma & 0 & \dots & 0 \\ 0 & \Sigma & \dots & 0 \\ \vdots & \vdots & \vdots & \vdots \\ 0 & 0 & \dots & \Sigma \end{bmatrix}$

A random-effect model is estimated by the GLS when the covariance structure is known, and by FGLS when the covariance structure of the composite error is unknown.The empirical random effect models based on the expression in equation 2 are expressed in equations 9 and 10.

$$Giniindex_{it} = \beta_0 + \beta_1 FDIndex_{it} + \beta_2 GOVEXP_{it} + \beta_3 HC_{it} + \beta_4 TradeGDP_{it} + \beta_5 CORR_{it} + \beta_6 INFL_{it} + (\alpha_i + v_{it}) \quad (9)$$

$$Giniindex_{it} = \beta_0 + \beta_1 FDIndex_{it} + \beta_2 GOVEXP_{it} + \beta_3 PRGDPR_{it} + \beta_4 FDI * GOVEXP_{it} + \beta_5 HC_{it} + \beta_6 TradeGDP_{it} + \beta_7 CORR_{it} + \beta_8 INFL_{it} + (\alpha_i + v_{it}) \quad (10)$$

Post Estimation Techniques

In ensuring that the estimates from the regressions are robust and consistent, the following post estimation tests were conducted;

Hausman specification test

$$LM = \left(b_{fixed} - b_{random}\right)' \widehat{W}^{-1} \left(b_{fixed} - b_{random}\right) \sim x^2 (k) \quad (11)$$

$$= Var\left[b_{fixed} - b_{random}\right] = Var\left(b_{fixed}\right) - Var\left(b_{random}\right) \quad (12)$$

Where $\widehat{W}$ is the difference in the estimated covariance matrices of the fixed and random effect estimates. This test statistic follows a chi-square distribution with k degrees of freedom. The Hausman test formula examines if "the random effects estimate is significantly different from the unbiased fixed effect estimate" (Kennedy, 2008). If the null hypothesis of no correlation is rejected, we conclude that individual effects (α_i) are significantly correlated with at least one of the regressors in the model and as such the random effect model is problematic. Therefore, the fixed-effect model is preferred. A drawback of the Hausman test, however, is that, the $\widehat{W}$ may not be positive definite.

Chapter Summary

The purpose of this chapter was to explain in detail the methodology used to analyse the data required for this study. The research design was first described where the positivist approach to research was adopted. This was followed by the data type and source. Empirical models encompassing all the variables (dependent, independent and control) were specified. Fixed and random effect estimation techniques were employed and a post estimation test of Hausman specification was stated to help in choosing the appropriate estimation technique between random and fixed effects.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

This chapter analyses and presents the findings of this study. It first presents the descriptive statistics of this study and then tests of the objectives of this study are presented in the form of tables, figures, and regression analysis.

Descriptive Statistics

This section presents descriptive statistics of the variables used in this study relating to twenty (25) countries in SSA for the period 2000-2016. The summary statistics help in describing the distribution of the data used. Table 2 reports mean, standard deviation, minimum and maximum values. The mean values indicate the average value of the variables used in the overall model. The standard deviation also captures the distribution of data around the average value. It also shows the closeness of data to the mean value over the period under consideration. More so, the spread of the data is indicated by the range and this is measured by the maximum and minimum values in each different model. The range is an indicator of the level of variations in the variables. The larger the range values, the higher the level of variations in a variable and vice versa.

Table 2: Descriptive Statistics

Variable	Obs.	Mean	Std.Dev.	Min	Max
Gini Index	350	44.59	7.007	31.8	61.6
Financial development	375	0.154	0.134	0.027	.637
Government Expenditure	296	26.985	7.777	8.982	57.778
GDP growth	424	5.017	4.021	-20.5	26.4
Human Capital	391	0.501	0.222	0.067	1.051
Trade Openness	414	67.621	28.248	20.723	165.646
Corruption	374	31.693	11.498	3	65
Inflation	414	10.629	36.031	-8.238	513.907

Source: Author's construct (2019)

From Table 2, on the average, income inequality index is about 44.805 with a standard deviation of 0.709. The maximum and the minimum values are 46.483 and 43.988 percent respectively. This shows that there is not so much variability in the income inequality values within SSA. The mean value of income inequality implies that, on average, 45 percent of the income inequality is found in SSA.

For the financial development index (FDIndex), Table 1 shows that the mean value is 0.154 with a standard deviation of 0.134 units. The minimum and the maximum values of financial development are 0.027 and 0.637 respectively. This shows that there is not much variability in the financial development variable. The mean value of government expenditure is 26.985 and with a standard deviation of 7.777 units. The minimum and maximum values of government expenditure are 8.982 and 57.778 respectively. This implies that there is not much variability in government expenditure.

On average, SSA experienced a 5 percent growth in GDP with a standard deviation of 4.021 and minimum and maximum growth stands out -

20.5 percent and 26.4 percent respectively. Since the standard deviation is below the mean it follows that growth in GDP of the countries under consideration does not show in much variability from their mean values.

Human capital has a mean value of 0.501 and a standard deviation of 0.222. The minimum and maximum values are 0.067 and 1.051 respectively. The statistic shows that the standard deviation is lower than the mean value of human capital so this implies that there is not much variability in the mean values of the countries under consideration as far as human capital development is concerned.

The mean value of trade openness is 67.621 and the standard deviation is 28.24. This shows that about 68 percent of GDP is accounted for by trade openness within the countries under consideration. The lower value of the standard deviation implies that the variation in the mean values of trade openness in SSA is less. The associated minimum and maximum values of trade openness are 20.723 and 165.646 respectively.

For corruption, the study shows that its average value in SSA is 31.693 percent and the standard deviation is 11.498 percent. The corruption value in SSA is as low as 3 percent and as high as 63 percent. This maximum value of corruption could be very worrying since corruption is regarded as a canker that affects every aspect of the economy.

The inflation rate, the measure of annual consumer price index has an average score of 10.629 percent and it deviates 36.031 away from the mean. This implies that there is much variability in the mean values of inflation for the countries under study, the minimum and maximum values of inflation are -8.238 percent and 513.907 percent respectively.

Financial Development and Government Expenditure across Countries in SSA

This section presents a trend analysis of financial development and government expenditure across countries. The trend in financial development and government expenditure is shown in Figures 2 and 3 respectively.

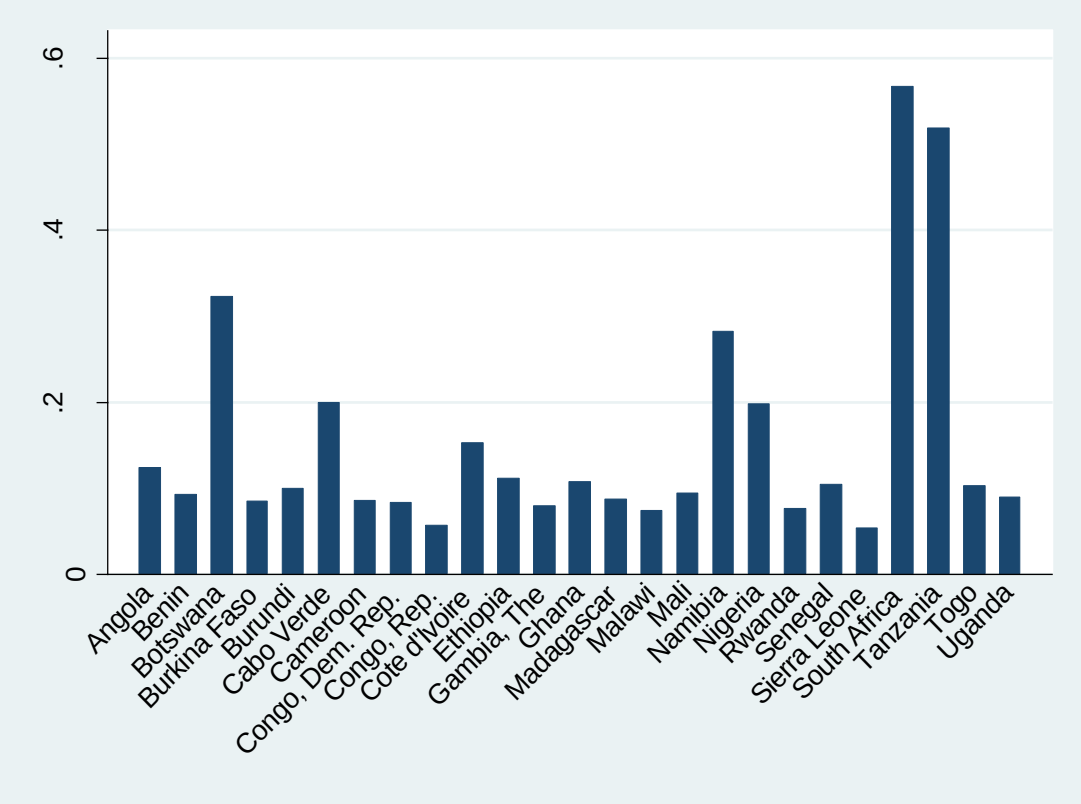

Figure 2: Overview of Financial Development across Countries in SSA
Source: Author's Construct (2019)

From Figure 2, the graph reveals that countries like South Africa, Tanzania, Namibia, and Botswana have high values for financial development while countries like the Congo Republic, Sierra Leone, and Malawi have low values for financial development. This implies that the financial system is more developed in countries like South Africa, Namibia, Botswana and Tanzania than other countries in the SSA. From the analysis, the graph also shows that the financial sector is more developed in the southern part of Africa as compared to the rest of the region. This could be explained by the presence

of financial services and products in the southern region.

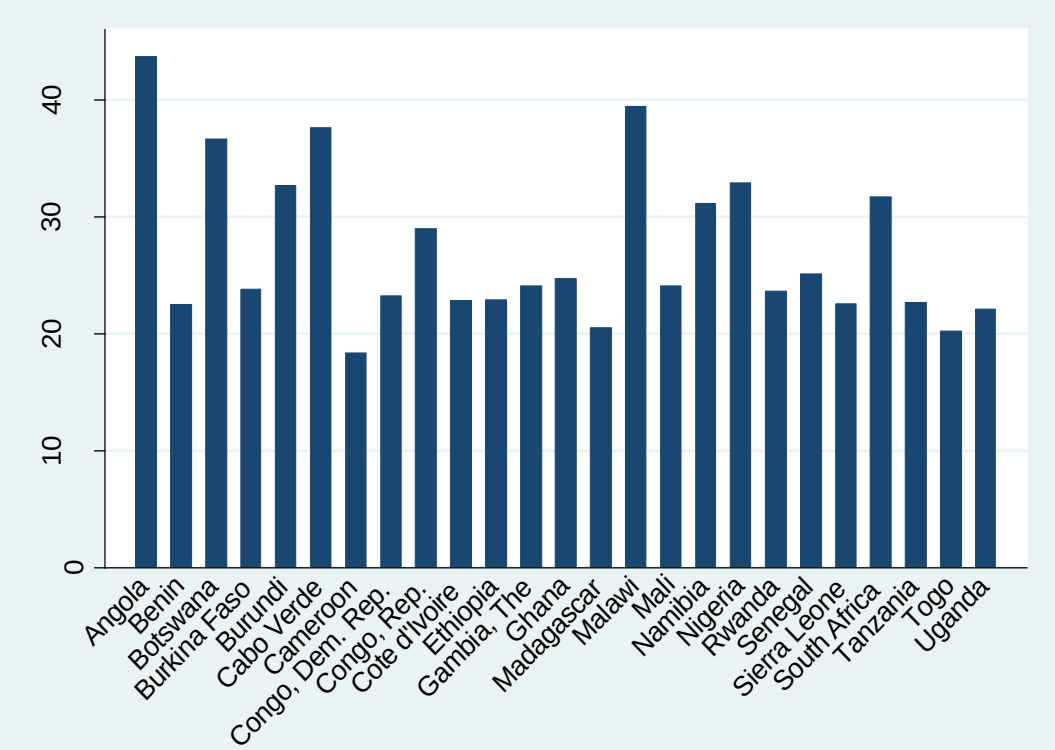

Figure 3: Government Expenditure across Countries in SSA
Source: Author's construct (2019)

Figure 3 shows that, Angola, Malawi, Cape Verde, and South Africa are associated with high levels of government expenditure as compared to Cameroon and Madagascar which are associated with low levels.

Pre Estimation Tests

Multicollinearity test

The multicollinearity test is carried out to check if there exists a strong correlation among the variables. A possible degree of multicollinearity among the regressors was tested using a correlation matrix. Table 3 presents the correlation matrix of the dependent and independent variables from which, it has been observed that the highest simple correlation between the variables was 0.715, and that was between the Gini index and corruption. Judge (1985)

and Bryman and Cramer (1997) suggest that a simple correlation between independent variables should not be considered harmful until they exceed 0.80 or 0.90. Simple correlations of 0.80 or 0.90 are usually associated with Variable Inflation Factors (VIF) of between 6 and 10. The VIF above 10 should be considered an indication of harmful multicollinearity (Neter et al., 1989).

As shown in Table 3, the financial development index, Government expenditure, human capital development, trade openness & corruption positively correlate with Income inequality (Gini index). However, Income inequality (Gini index) has a negative but insignificant correlation with real GDP growth rate. On the whole, the magnitude of the correlation coefficients indicates that the issue of multicollinearity is not a problem.

Table 3: Correlation Matrix

Variable	Gini Index	Financial Development	Gov. Exp	GDP growth rate	Human Capital	Trade Openness	Corruption	Inflation
Gini Index	1							
Financial development	0.626**	1						
Gov. Exp	0.364**	0.256*	1					
GDP growth rate	-0.122	-0.0679	0.128	1				
Human Capital	0.681**	0.443***	0.104	-0.0833	1			
Trade Openness	0.387**	-0.0613	0.346***	-0.103	0.378**	1		
Corruption	0.715**	0.513***	0.147*	-0.217**	0.620***	0.223**	1	
Inflation	0.0322	-0.0706	0.349***	0.0341	-0.100	0.310**	-0.142*	1

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

Source: Author's construct (2019)

Empirical Estimation and Discussions

This section presents the estimation results of the effect of the explanatory variables on income inequality using the Fixed Effect and Random Effect. Hausman test results to choose between fixed and random effects are presented in Table 4. The results are presented in Tables 5, 6 and 7. Specifically, Table 5 presents the results of the effect of financial development and government expenditure on income inequality. Table 6 presents the interactive effect of financial development and government expenditure on income inequality. Table 7 shows the effect of financial development and government expenditure across regional blocks of SSA. The choice between the random effect and fixed effect is determined by the Hausman test.

Hausman Test to Choose Between Fixed or Random Effect

The Hausman specification test examines if the individual effects are uncorrelated with other regressors in the model. If individual effects are correlated with any of the regressors, the random effect model violates the Gauss-Markov assumption and it is no longer Best Linear Unbiased Estimator (BLUE). Therefore, if the null hypothesis were rejected, the fixed-effect model would be preferred over the random effect model. In a fixed-effects model, the individual effects are part of the intercept and the correlation between the intercept and the regressors does not violate any Gauss-Markov assumption; the fixed effects estimates are always consistent (BLUE) but inefficient compared to the random effects estimates.

This test, under the null hypothesis of orthogonally, is Chi-Square distributed with degrees of freedom equal to the number of regressors in the

model. A $p < 0.05$ is taken as a conventional level of significance. Table 4 shows the Chi-Square probabilities for each of the 3 regression models. The p-values are 0.0018, 0.0041 and 0.0000 respectively. Therefore, by the conventional significance level of $p < 0.05$, we reject the null hypothesis in all three specifications. Hence, the study concludes that the fixed effect model is the preferred estimation model.

Table 4: Hausman test to Choose between Fixed and Random Effect

Test summary	Chi Sq. statistic	Chi-Square d.f	Probability
Table 4	22.84	7	0.0018
Table 5	22.48	8	0.0041
Table 6	57.14	7	0.0000

Source: Author's construct (2019)

Table 5: Effects of Financial Development and Government Expenditure on Income Inequality in SSA

Variables	Fixed Effect Income inequality	Random Effect Income inequality
Financial Development	8.932***	8.697***
	(2.218)	(2.395)
Gov.Expenditure	-0.0185*	-0.0157
	(0.0100)	(0.0115)
Human Capital (Log)	-7.417***	-4.973***
	(1.495)	(1.622)
Trade %GDP	-0.0140***	-0.0130***
	(0.00446)	(0.00505)
Corruption Index	0.0259**	0.0284**
	(0.0126)	(0.0143)
Inflation	0.00706***	0.00734***
	(0.00196)	(0.00225)
Constant	48.10***	45.64***
	(0.707)	(1.169)
Observations	201	201
R-square	0.202	

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Source: Author's construct (2019)

Table 5 shows that the coefficient of financial development is 8.932. This coefficient is positively related to income inequality and it is highly and statistically significant at the one percent since the p-value of 0.000 is less than a one percent level of significance. This implies that high financial development increases income inequality by 8.932 all other things being equal. This finding confirms the works of Stiglitz and Weiss (1981), Galor and Moav (2001), Aghion and Bolton (1997) and Mookherjee and Ray (2003). They propose that income levels of the rich and poor will not converge in the end, more especially in economies with capital market imperfections and indivisibilities in investment in human or physical capital. This is contrary to the prediction of convergence made by the neoclassical.

This can be explicitly explained by the fact that the nature of financial market imperfections such as asymmetric information and moral hazard makes financial development aggravates the conditions of the poor and increase income inequality between the rich and the poor (Ang, 2008). The borrowing constraints faced by the poor do not give them access to enough credit to finance high yielding investment projects and human capital development that can facilitate their transition from low-income level to higher income level and reduce their poverty level. The cost and requirements of borrowing funds are high and banks normally require collaterals from borrowers. In an economy with imperfect credit markets, economic conditions do not allow an efficient allocation of resources for that matter reduces low-income households' ability to make investments in education and physical capital. It also limits income mobility (Corak, 2013).

The poor do not have collateral to secure enough credit to finance their human capital investment and high yielding investment such that increases in financial development make the rich better off. The poor have limited access to credit from formal financial markets and institutions because of barriers imposed by lenders and relatively high transaction costs for small-size loans that discourage lending to the poor (Khandker, 2005; Pitt & Khandker, 1998; Campaign, Rao, & Daley-Harris, 2007). Credit constraints constitute an obstacle on the credit supply side, the reason being the lenders evaluate their client's creditworthiness to sort out potential borrowers.

In SSA, most microenterprises want to expand their investments to generate more income. Unfortunately, they face a challenge when it comes to credit accessibility because formal creditors consider them not creditworthy. Demirguc-Kunt and Klapper (2012) indicate that the majority of small and medium enterprises in Africa are unbanked and access to finance is a major obstacle. The current study confirms the findings of Daniels et al. (1995) who find that lack of capital is the main problem for entrepreneurs in Kenya because 32.7% do not get credit, while only about 10% had ever received credit. The result concludes that small and medium enterprises in Africa are less likely to use formal financing, which suggests formal financial systems are not serving the needs of enterprises with growth opportunities.

Many similar empirical findings support our results, first an investigation conducted by Sehrawat and Giri (2015) in India, their ARDL test results provide evidence that financial development worsens income inequality in both the short-run and long-run by widening the gap between poor and rich. Again, other recent empirical works by Uddin, Shahbaz, Arouri, and Teulon

(2014) confirm that financial development contributes to make the rich better off and keep the poor worse off. Moreover, Kai and Hamori (2009) were the first to conduct a similar investigation in Africa and they find that financial development polarizes the income level between the two extremes. In the absence of an inclusive financial system, the poor have to rely on their limited savings to invest in their education or become entrepreneurs and small enterprises must rely on their limited earnings to pursue promising growth opportunities. This can contribute to persistent income inequality.

However, there are some controversies in the literature. Banerjee and Newman (1993), Galor and Zeira (1993) and Batuo et al. (2010) predict that a well-developed financial system will reduce economic inequality. They assert that if the financial system is developed, poor people will adequately access credit at the lowest cost and invest it into a highly productive venture.

Besides, Table 5 shows that the coefficient of government expenditure is -0.0185. This coefficient is inversely related to income inequality and weakly significant at a ten percent level of significance since the p-value is less than a ten percent significance level. Thus an increase in government expenditure reduces income inequality by 0.0185 all things being equal. This result confirms the theoretical model developed by Benabou (2000) which posits that there is an inverse association between redistributive spending and income inequality. The finding of this study is similar to some empirical findings by Ostry, Berg, and Tsangarides (2014), Bhatti et al. (2015), and De Mello and Tiongson (2003) who found that government expenditure reduces income inequality. This result is expected because, to maximize the welfare of a country, any responsible government must create wealth and prosperity for

their people based on equity and equality with an adequate and appropriate redistribution of income. Government revenues and expenditures have been found to reduce overall income inequality by diminishing the gap between those at the top and the bottom (Beramendi & Cusack, 2009; Hayes & Vidal, 2015).

The result of this study is also consistent with that of Bajar (2015) who found that government spending in the form of social facilities or infrastructures create more opportunities for the poor and enhance their income in various channels. Even though the finding shows a negative relationship between government expenditure and income inequality, the significance is very weak. This could be explained by the fact in SSA, the institutional capacity to mobilize domestic resources in the forms of taxes, fines and fees are weak. The ability of governments to redistribute income from the rich to the poor in the form of transfer payment is weak because generally, developing countries and SSA, in particular, have the challenges to administer an efficient tax system and hence little taxes are collected for many developmental and public project and programs. Other plausible reasons why the government could not achieve a significant reduction in income inequality in SSA are weak institutions, corruption, and inefficiencies in the public sectors, which hinder the campaigns in favour of income equality in the region.

The second objective of this study seeks to estimate the interaction effect of financial development and government expenditure on income inequality. Table 6 presents the results of this objective. The results of the

fixed effect regression will be discussed since the Hausman test favours a fixed effect model over random effect.

Table 6: Interactive Effect of Government Expenditure and Financial Development on Income Inequality

Variable	Fixed Effect Gini index	Random Effect Gini index
FDIndex	2.017	3.194
	(3.558)	(3.931)
Gov.Expenditure	-0.0509***	-0.0423**
	(0.0166)	(0.0190)
Rgdpg	-0.00237	-0.00131
	(0.0144)	(0.0166)
LnHuman Capital	-7.639***	-5.257***
	(1.480)	(1.615)
Tradeopenness	-0.0141***	-0.0132**
	(0.00455)	(0.00517)
Corruption	0.0259**	0.0285**
	(0.0124)	(0.0142)
Inflation	0.00763***	0.00784***
	(0.00197)	(0.00227)
FDIndex Gov.Exp	0.192**	0.156*
	(0.0772)	(0.0884)
Constant	49.36**	46.67***
	(0.863)	(1.299)
Observations	201	201
R-square	0.230	
Chi sq.		22.48
P-value		0.0041

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1
Source: Author's construct (2019)

From Table 6, the coefficient of the interactive effect of financial development and government expenditure is 0.192. This coefficient is statistically significant at 5 percent. This implies that financial development and government expenditure significantly explains income inequality. The net effect is 7.19812 as shown in Appendix A. Given that, government expenditure is held at the mean of 26.985, a unit increase in financial sector development will increase income inequality by approximately 7.19.

On the other hand, holding financial development at the mean value of 0.154; a percentage increase in government expenditure will reduce income inequality by -0.0231 percentage point. This is plausible because the government, through its role of meeting the necessities of its citizenry engages in social expenditure, which tends to stimulate the economy. A viable economy promotes economic activities which in turn promote the activities of the financial sector as credits and other financial products become readily available and accessible to both the poor and the rich alike even at a reasonable cost. When access to funds and the cost of borrowed credits are low, the poor household could access funds to enable them to undertake the economic activity thereby reducing income inequality.

With the effects of the control variables on income inequality, Table 6 shows that the coefficient of the human capital development index is -7.639. This is highly statistically significant at one percent. This implies that holding all other things constant, an additional level of education reduces income inequality by approximately 0.074%. All other things being equal. This result supports the evidence that the development of human capital via better education significantly contributes to the reduction of poverty and the improvement of wages and the standards of living hence reduce income polarization. The finding confirms the theory of inverse association existing between human capital and income disparity by Galor, Moav, and Vollrath (2009). Bhorat et al. (2017) report that the concentration in human capital is among the basic structural drivers of inequality in Africa, especially in the economies of Eastern and Southern Africa. The result also confirms the finding of Jaumotte, Lall, and Papageorgiou (2013) and Gaku (2015) who find

that an adverse relationship exists between human capital and income inequality.

The reduction in the number of illiterates, thus an improvement in education could be one of the plausible explanation that human building capacity in Africa is reducing income inequality in recent times. The region together with other international development collaborates focuses attention on access to education as an objective in reducing poverty and inequality. The improvement in literacy rate tends to increase the wage of the population at the bottom end of the income distribution. The development of human capital is a key equalizing factor especially when it is accompanied by other measures such as the building of infrastructures (roads network, electricity, telecommunications, water & sanitation, and health facilities) including schools that can greatly enhance the living standards of the poor. Knowledge is a stock of wealth. When poor individuals are educated, they can search for a better employment opportunity to earn a higher income. Human capital development increases the level of technological advancement and economic productivity of the poor and finally their income increase.

Besides, the coefficient of trade openness is -0.0141 and it is significant at one percent level of significance. This implies that the more open an economy, its income inequality reduces by 0.0141 all other things being equal. This is possible because trade openness enhances international trade, which involves easy outflows and inflows of goods and services. This confirms the study of Dollar and Kraay (2003) that lower trade openness is associated with an increase in income inequality and vice versa.

Again, corruption positively and statistically explained income inequality. The coefficient of 0.0259 reveals that lower corruption increases income inequality by 0.0259 units. In conformity with the above finding, Chong and Calderon (2000) find that for poor countries, a fall in corruption (measured by institutional quality) is associated with a rise in income inequality. The study by Andres and Ramlogan-Dobson (2011) also found that lower corruption increases inequality. This is because a reduction in corruption and formalization generate additional transaction cost on the informal sector through the improvement of tax collection mechanisms, the imposition of new taxes and new regulations. This finding, however, contradicts the findings of many empirical studies (Mauro, 1995; Gupta, 1998; Gyimah-Brempong, 2002; Gyimah-Brempong & de Gyimah-Brempong, 2006).

For inflation, this study shows that the coefficient of inflation is 0.00763. This coefficient is statistically significant at one percent level of significance. It implies that a rise in the rate of inflation increase income inequality by 0.00706 all other things being equal. This result is expected because inflationary tends to reduce the value of incomes in general. Given that SSA is characterized by low-income earners, inflation affects these people more than the high-income earners since these rich people can protect themselves against the effect of inflation than the poor. The finding of this study confirms the studies of Li and Zou (2002) who found in a global analysis that countries with high inflation rates have high or extreme income inequality. Awe and Ojo (2012) also conduct a similar empirical study and the

result shows that inflation is one of the major and direct determinants of high-income inequality in Nigeria.

Financial Development and Government Expenditure across Sub-Regional Blocs in SSA

Figure 4 presents a graph of financial development across various regions in Sub Saharan Africa. From figure 4, the graph shows that Southern Africa has a well-developed financial system as compared to others since it records the highest financial development index. This is not surprising because countries like South Africa, Mauritius and Botswana have a more developed financial system as compared to many African countries. Eastern Africa records the second highest financial development index. West Africa and central Africa, however, placed third and fourth respectively as far as financial development is concerned. A similar study by Demirgüç-Kunt and Klapper (2012) on financial inclusion in Africa confirms the same trend across sub-Saharan regional blocs.

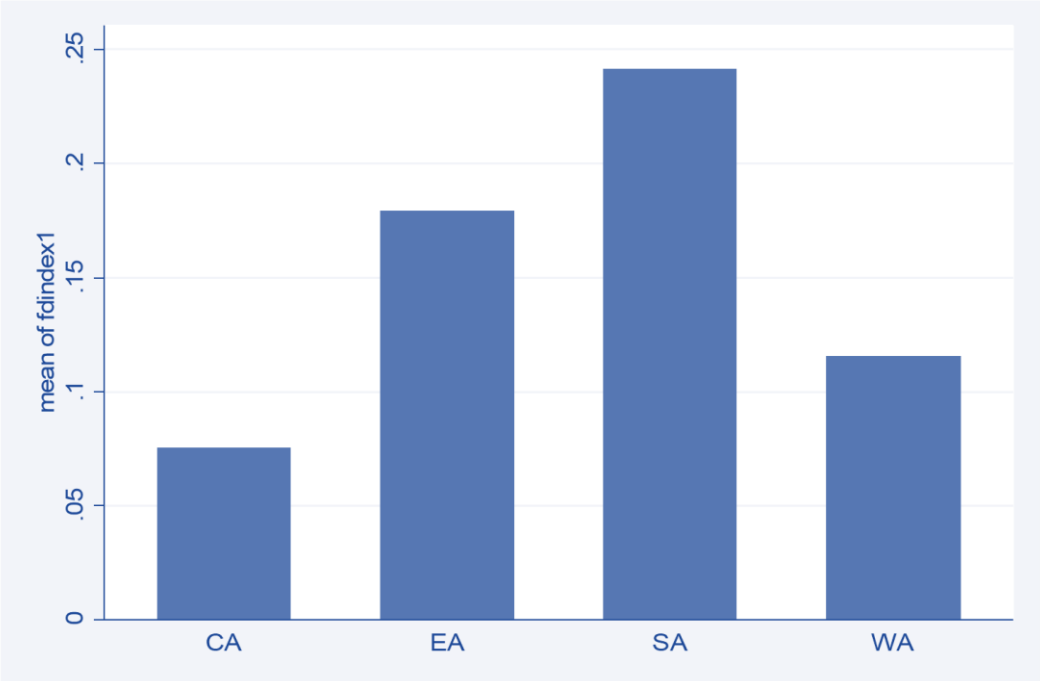

Figure 4: Financial Development across Sub-Regional Blocs
Source: Author's Construct (2019)

The graph for government expenditure across the four regional blocs shows that the southern region has high government expenditure compared to the other regions with a seemingly almost equal level of government expenditure across these three regions. This means that except for the SADC sub-region the remaining three sub-regions share similar characteristics as far as government consumption expenditures are concerned.

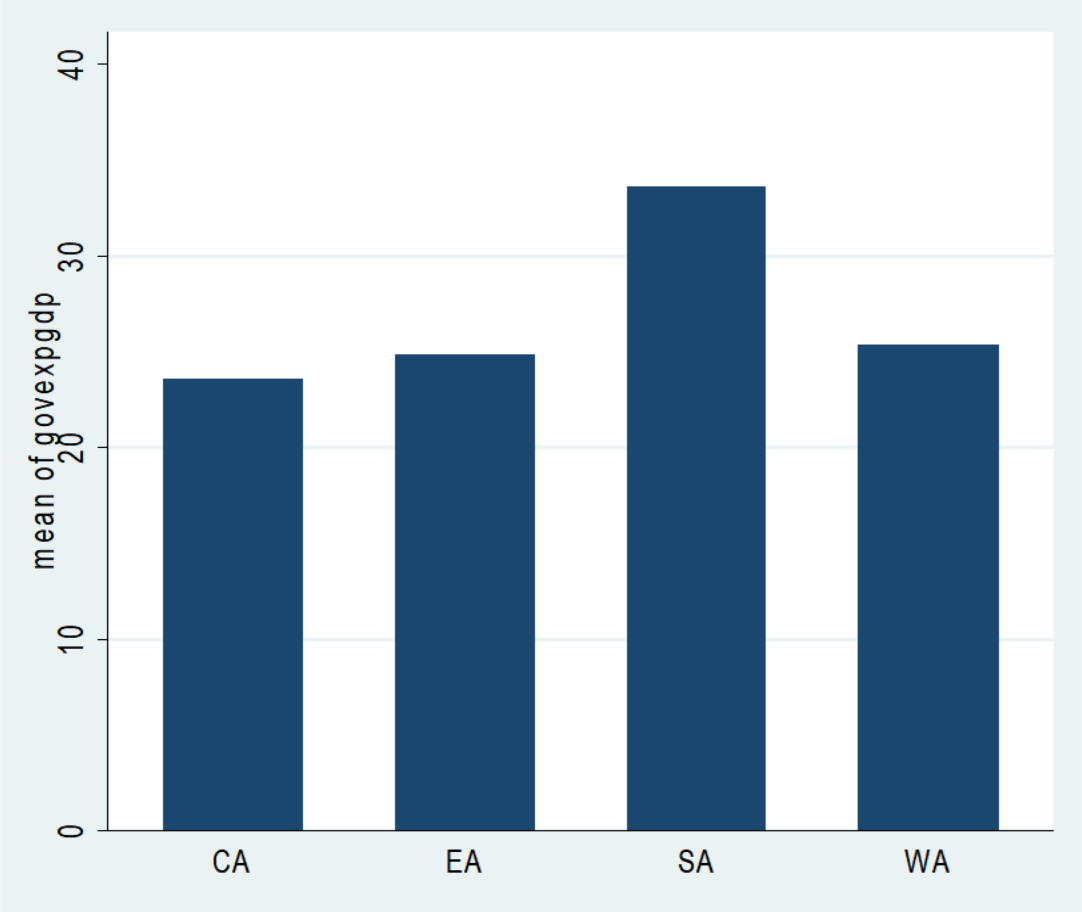

***Figure 5*: Government Expenditure across Regional Blocs**
Source: Author's construct (2019)

Effects of Government Expenditure and Financial Development on Income Inequality across Sub-Regional Groups in SSA

In answering the second objective, which seeks to compare the effects of financial development and government expenditure across Sub-regional blocks, the study considers 4 regions namely southern Africa, West Africa, East Africa, and central Africa. In deciding between the fixed effect and the random effect, the Hausman test favours the fixed effect since the null hypothesis, which states that the preferred model is a random effect, hence, the null hypothesis rejected and the fixed effect is the preferred model in this analysis.

Table 7: Effects of Financial Development and Government Expenditure across Sub-Regional Blocs in SSA

Variables	(SA) Gini index	(WA) Gini index	(EA) Gini index	(CA) Gini index
FDIndex	9.018***	24.01**	4.258***	0.200
	(3.152)	(9.470)	(1.298)	(2.567)
Gove.Exp	-0.0390***	-0.0236	0.0213**	-0.0311**
	(0.0121)	(0.0208)	(0.008)	(0.0119)
REAL GDP	-0.0177	0.0135	0.0539***	-0.0134
	(0.0144)	(0.0333)	(0.0150)	(0.0211)
LnHumanCapital	-7.255***	-17.15***	-3.948***	13.37***
	(2.584)	(3.682)	(1.027)	(2.386)
Trade GDP	-0.0253***	-0.0252***	0.0302***	-0.00507
	(0.00639)	(0.00939)	(0.00679)	(0.00492)
Corruption	0.0504**	0.0162	-0.0186**	-0.0259
	(0.0191)	(0.0322)	(0.00793)	(0.0221)
Inflation	0.00905***	-0.0241	-0.00453	0.00478
	(0.00170)	(0.0191)	(0.00710)	(0.00956)
Constant	56.35*	47.55*	41.32*	37.50*
	(1.503)	(1.592)	(0.430)	(1.329)
Observations	62	72	39	28
R-square	0.579	0.339	0.816	0.734

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Author's construct (2019)

From Table 7, for southern Africa, the coefficient of financial development is 9.018 and this is statistically significant at one percent. This implies that an improvement in financial development induces a 9.018 increase in income inequality. For West and East Africa, a similar result found, in that financial development is statistically significant with coefficients of 24.01 and 4.258 respectively. This implies that high financial development increases income inequality in both west and east Africa by 24.01 units and 4.258 units respectively. This reiterates the direct link between financial development and income inequality as found earlier for the whole sub- Saharan Africa region where financial development tends to increase income inequality. One plausible reason, as already alluded earlier could be

the fact that the development in the financial sector in SSA only benefits the rich due to capital market imperfections such that the poor could not easily access funds to undertake economic activities. Coupled with that, the cost and requirements for borrowing funds are very high as banks and other lending institutions normally require collaterals from borrowers of which the poor cannot afford. Therefore, only the rich could access funds because they can afford the collaterals. This credit constraint constitutes a major obstacle to the poor's ability to access funds. As this happens, the gap between the rich and the poor continues to widen leaving the poor vulnerable in society.

This finding is in line with the outcomes of a few authors including Stiglitz and Weiss (1981), Galor and Moav (2001), Mookharjee and Ray (2003, 2006). They assert that the income levels of the rich and poor will not converge in the end more especially in economies with capital market imperfections and indivisibilities in investment in human or physical capital contrary to the prediction of convergence made by the neoclassical. However, the finding of this study is inconsistent with the study of Batuo et al. (2010).

For central Africa, financial development has an insignificant effect on income inequality. This confirms the fact that Central Africa, compared to other regions in SSA, lags as far as financial development is concerned as seen in Figure 4.

From Table 6, the study reports a negative and statistically significant relationship between government expenditure and income inequality for Southern Africa and Central Africa. It, therefore, follows that an additional increment in government expenditure reduces income inequality in both Sothern and central Africa by 0.0390 and 0.0311 respectively. This follows

that in these two regions, government expenditure plays a significant role in reducing inequality. This is expected and in line with Keynesian theory, which suggests that increases in government spending boost economic growth by enhancing purchasing power in the economy. Consequently, this tends to reduce income inequality as the government through its interventionist policies tries to provide some level of support to the poor.

While there is no significant effect of government expenditure on income inequality for West Africa, a positive and statically significant effect is found for East Africa. The result for East Africa implies that an increase in government expenditure increases income inequality by 0.0213 units. For East Africa, even though government expenditure is significant it rather tends to increase inequality. This could be possible since government involvement in the region through its interventionist policy geared towards reducing income inequality may rather create the opportunity for those at the helm of affairs to benefit from such policies and not allowing the poor to benefit. This creates a situation where the rich get richer and the poor get poorer thereby widening the gap between the rich and the poor.

Chapter Summary

This chapter presents the descriptive statistics, correlation analysis, and panel unit root test then followed by the empirical examination of financial development, government expenditure and income inequality across the region. Secondly, the study assesses the joint effect of financial development, government expenditure on income inequality across the region. Thirdly, the study examines the comparative analysis of financial development and

government expenditure across the sub-regional block in SSA. Finally, the chapter concludes by employing the Hausman test to choose between the fixed effect and random effect.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the major findings of the study by summarizing the outcome of the study in light of a brief overview of the problem statement, objectives, research questions, methodology, and hypotheses tested. The chapter also provides conclusions based on the major findings of the study. Finally, it suggests policy recommendations to relevant bodies.

Summary

This study aims at finding the effects of financial development and government expenditure on income inequality in Sub-Saharan Africa. Secondly, the study investigates the interactive effects of government expenditure and financial development on inequality in Sub-Saharan Africa. Again, the study presents a comparative analysis of the effects of financial development and government expenditure on income inequality across sub-regional blocs in sub-Saharan Africa. The study employs a static panel data approach based on a random effect and fixed effect estimation on twenty-five (25) Sub-Saharan African countries over the period 2000 to 2016. The theories of persistent income inequality, capital market imperfection and extensive market theories are used for the theoretical model.

The study finds that financial development has a positive relationship with income inequality. This implies that when financial development is highly developed income inequality increases. Besides, Government expenditure has a negative and statistically significant effect on income

inequality. Besides, the study finds the interactive effects of government expenditure and financial development to significantly affect inequality. Lastly, the study compares the effects of government expenditure and financial development on income inequality across sub-regional groups. In the sub-regional analysis levels, the financial development of West, East and Southern Africa has a positive and significant relationship with income inequality. Financial development, however, affects income inequality negatively in Central Africa. Moreover, government expenditure of the Southern, Western and Central Africa has a negative relationship with income inequality. This implies that governments in Southern and Central African sub-regions make some significant efforts to reduce income inequality. On the other hand, an increase in government expenditure increases income inequality in Eastern Africa.

Conclusions

The study shows that financial development increases income inequality in Africa. Thus, the first null hypothesis that financial development does not affect income inequality was rejected. Besides, the study finds that government expenditure is significant in lowering income inequality in Sub-Saharan Africa. This implies that government expenditure has a significant impact on reducing the level of income inequality from Sub-Saharan African countries. Thus, the second null hypothesis was also rejected. The study also finds that government expenditure and financial development jointly explain the income inequality of Sub Saharan Africa. Finally, financial development shows a positive and significant relationship with income inequality across

sub-regions, except for Central Africa which has an insignificant relationship. On the other hand, government expenditure also shows a negative relationship with income inequality across sub-regions except for Eastern Africa.

Recommendations

Because financial development substantially and considerably contributes to widening the income gap in SSA. The study recommends that the monetary regulatory authorities of financial institutions and markets should continuously promote financial sector development since it has numerous benefits for an economy most especially real GDP growth rate (Paun, Valeriu, Musetescu, Topan, & Danuletiu, 2019).

However, these policies should be preceded by an inclusive financial system in such that low-income groups or in other words poor people without collateral could also easily have access to financial services and products that help them engage in high return investment hence their income. Furthermore, these policies may include relaxing credits, interest controls, improving banking and securities market supervision.

On the other side, the government of Sub-Saharan African countries should increase government expenditure by targeting projects and programmes that can help enhance the income of low-income groups in the region. This can be achieved by reallocating expenditure to social protection, education, and infrastructure, which are particularly more equalizing. Prioritising this public expenditure through the constructions of the road network, electricity, schools, clinics and telecommunication services in both rural and urban will help reduce income inequality.

Finally, the study recommends that the government of the East Africa countries should reallocate resources to benefit the poor than the rich. This will prevent the rich from becoming richer, and the poor poorer to bridge the income inequality gap in this East African sub-region.

Limitations of the Study

This study did not get enough cross-sectional units and data points for the analysis and so only 25 countries were considered. This was due to missing observations on some of the variables. Besides, the financial development index was not disaggregated into its various components (access, depth & efficiency). The study fails to capture various income groups in the region, investigate which group is worse off, and better off. Despite these limitations, the findings of this study are still valid and relevant to policy analysis.

Areas for Future Research

Although it is crucial to find out the effect of financial development, government expenditure and income inequality in Sub-Saharan Africa, there is a necessity for deepening the investigation on the topic at the country-specific level. Future studies could also consider grouping the countries according to their income status for comparative analysis. Again, future studies could consider disaggregating government expenditure to find out, which is more income equalizing.

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APPENDICES

A: Net Effect

Calculation of the effect of the interaction between government expenditure and financial development

In this section, the study demonstrates how the interaction between government expenditure and financial development is calculated.

Gini = 49.36 - 0.0509Govexp + 2.017 FDIndex+ 0.192FDGovexp

$$\frac{dgini}{dfindex}(govexp) = 2.017 + 0.192Gov.Exp$$

Using the mean value of Gov.Exp (26.985), we obtain,

$$\frac{dgini}{dfindex}(govexp) = 2.017 + 0.192(26.985)$$

$$= 7.19812\ \%$$

Gini = 49.36 - 0.0509Govexp + 2.017 FDIndex+ 0.192FDGovexp

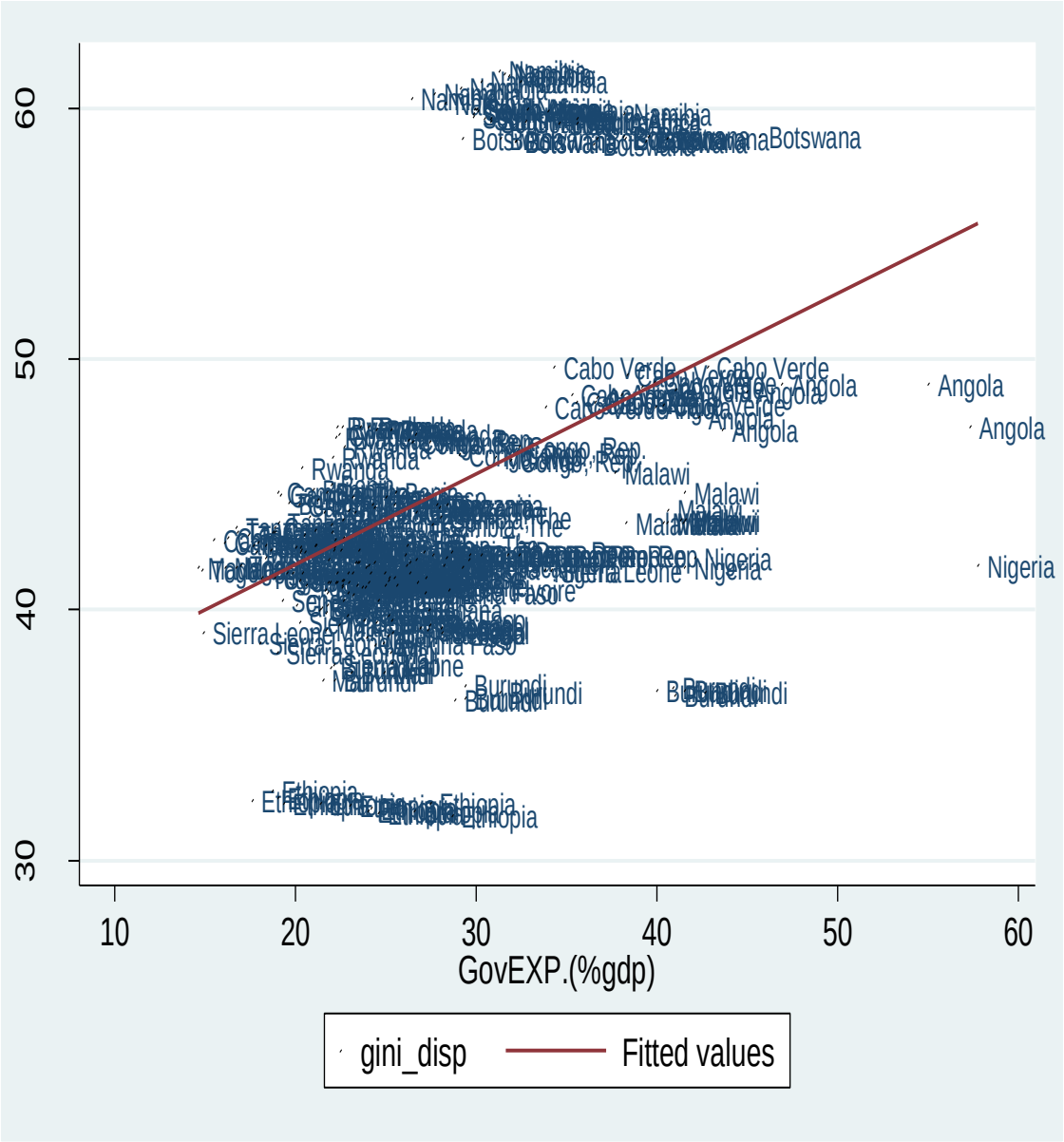
$$\frac{dgini}{dgovexp}(FDIndex) = -0.0509 + 0.192 \text{ FDIndex}$$

Using the mean value of FDIndex (0.154), we obtain,

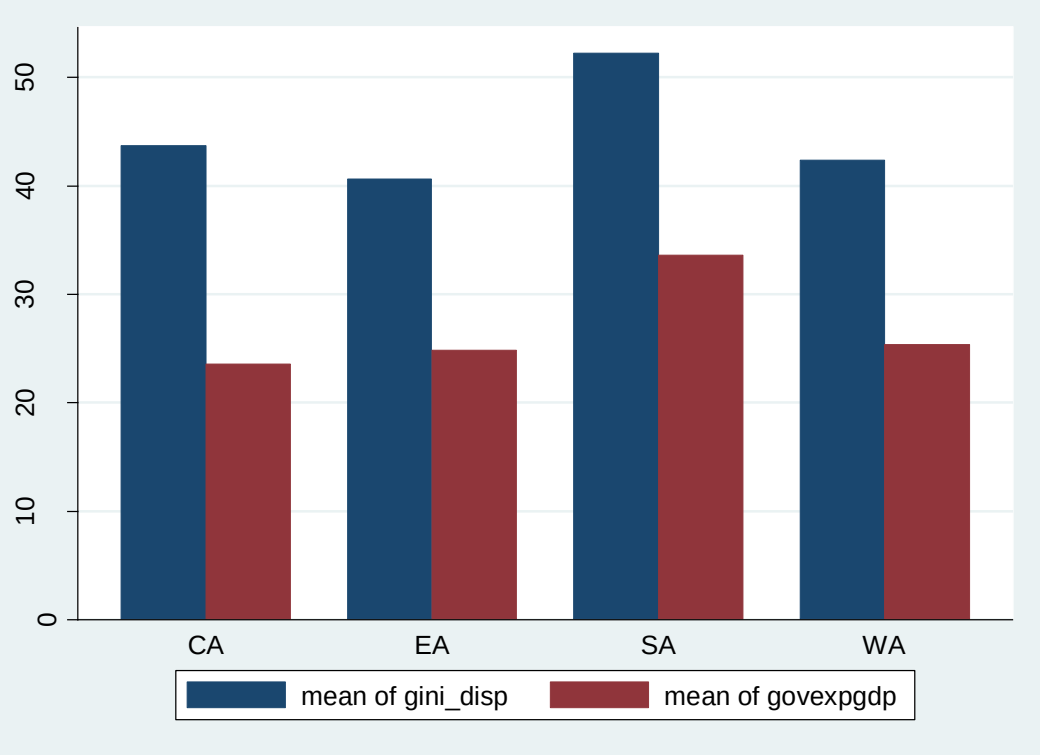
$$\frac{dgini}{dgovexp}(FDIndex) = -0.0509 + 0.192(0.154)$$

$$= -0.0231\ \%$$

B: Scatter plot of Gini Index



C: Trend in Financial Development and Income Inequality across Regions



D: List of Countries used for this study

The sample includes twenty-five African countries and these are Angola, Benin, Botswana, Burundi, Cape Verde, Cameroon, Cote d'Ivoire, DR Congo, Congo Republic, Ethiopia, Ghana, Gambia, Mali, Malawi, Namibia, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, and Uganda.