UNIVERSITY OF CAPE COAST

GOVERNMENT SPENDING INSTITUTIONAL QUALITY AND INCOME INEQUALITY IN ECOWAS

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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 fulfilment 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 original work and that no part of it has been published or presented for another degree in this university or elsewhere.

Candidate's Signature……Date……

Name: Eric Ofori Asante

Supervisors' Declaration

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

Principal Supervisor's Signature…… Date……

Name: Prof. Francis Andoh

Co-Supervisor's Signature…… Date……

Name: Prof. Isaac Bentum-Ennin

ABSTRACT

The study investigates the effect of government spending and institutional quality on income inequality for the period 1990 to 2019 using unbalanced panel data from 13 selected ECOWAS member countries. The results revealed that the effect of government final consumption expenditure on income inequality is negative and statistically significant suggesting that government final expenditure reduces income inequality in ECOWAS member states. Also, the study found both the coefficients of expenditure on education and health to be negative and significant. However, it was shown that expenditure on health was more effective than expenditure on education in regulating income inequality. Again, institutional quality has a significant positive effect on income inequality for both the fixed effect estimator and the system GMM estimator. In light of these findings, the study recommends allocating a higher share of the budget to health and education, as disaggregated government spending, particularly in these sectors, has proven to be more effective in reducing income inequality. Furthermore, the study recommends prioritizing institutional reforms, focusing on enhancing corruption control and ensuring strict adherence to the rule of law. Additionally, policymakers are urged to implement measures to attract Foreign Direct Investment (FDI) responsibly, ensuring a balance between increasing foreign capital inflows and protecting labour-intensive industries. This approach safeguards against the displacement of local industries by foreign investments, promoting sustained access to productive resources for citizens.

KEYWORDS

Income Inequality

Government Spending

Institutional quality

ECOWAS

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DEDICATION

To my dear wife, Miriam Morkuah Blay.

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LIST OF ACRONYMS/ABBREVIATIONS

CPI	Consumer price index
GDS	Gross Domestic Savings
GDP	Gross Domestic Product
GMM	General Method of Moment
GNI	Gross National Income
GS	Government Final Consumption
HIPC	Highly indebted poor country
IMF	International Monetary Fund
OECD	Organization for Economic Co-operation and Development
SSA	Sub-Saharan Africa
CRI	Commitment to Reducing Inequality
WDI	World Development Indicators
WGI	World Government Indicators

CHAPTER ONE

INTRODUCTION

Background of the study

The enduring issue of poverty and economic inequality is one of the most important concerns confronting economists and policymakers globally. Recent data indicates that a number of nations experiencing rapid economic expansion have also seen a rise in wealth disparity (Dulani et al., 2013; Jain-Chandra et al., 2016; Piketty, 2015). The reported high rates of economic development are not reaching the grassroots, which exacerbates the imbalance in the distribution of income and makes lived poverty worse. This has raised questions about the effectiveness of certain recommendations for economic policies that are meant to lessen the effects of poverty and income disparity. The world's inequality may have decreased over the past 30 years, but in regions like Latin America and sub-Saharan Africa, inequality within countries remains quite high (Alvaredo et al., 2018; Bourguignon, 2018; Easterly, 2007; Ravallion, 2019). For example, according to 2012 research by the African Development Bank, six out of the ten most unequal countries in the world are situated in sub-Saharan Africa. Countries like Botswana, South Africa, and Namibia have extremely unequal income payments, with Gini indices higher than 0.50. “Odusola et al., 2019” states.

In the spirit of high-income inequality experienced in ECOWAS, the institution becomes the area of interest and how institutional quality matters in the current state of income inequality among ECOWAS. An institution is a system of working norms that are seen as durable agreements that channel, limit, and govern the actions of companies, workers, and other stakeholders in

society, according to Campbell (2010), North (1990), and Ostrom (1990). As a result, they help a nation-state's economy function. The formal and informal norms that define acceptable behavior for different market actors, as well as laws and policies, make up these incentive systems. According to Acemoglu and Robinson (2013) and Ravallion (2014), the effectiveness of an institutional framework could be dictated by the general preferences that motivate its enhancements. Development policy talks in the past few years have placed a strong emphasis on strong institutions and effective governance. It is unclear how their instrumental value in improving growth performance and income distribution translates into short- to medium-term policy priorities, particularly for low-income and institutionally weaker countries, despite the fact that a large and ever-expanding body of literature has surfaced on the topic. This is true even though it is now widely accepted that they have intrinsic value as ends in and of themselves for development (Rodrik 2008).

It is worth to not that, income growth has reduced absolute poverty globally, but it hasn't done as well at lowering inequality. Policy and academic discussions on how to reduce inequality have been going strong for some time. Because market mechanisms are insufficient, governments around the world, particularly in developing countries, have increased their involvement to achieve this goal. Among the works that have looked into issues of inequality, Herrera (2017) and Erikson (2015) have demonstrated that inequality is the primary cause of persistent poverty. An institution, as defined by Campbell (2010), North (1990), and Ostrom (1990), is a set of rules for conducting business that serve as long-term contracts that regulate and oversee the activities of businesses, employees, and the general public.

Fiscal policy affects present disposable incomes and future earning potential, which in turn affects individual market income, hence having an impact on income distribution both directly and indirectly. Many believe that when economies improve, poverty declines but inequality increases in the early phases of development. Kim and Heshmati (2014). Fiscal redistribution measures are thus necessary to address the problem of inequality. A substantial amount of research has been done in an effort to comprehend the connection between fiscal policy and inequality. Research by Sarangi, Bhanumurthy, & Abu-Ismail (2015), García-Peñalosa & Turnovsky (2013), and Sánchez & Pérez-Corral (2018) has highlighted the significance of effective government expenditure in mitigating inequality. Martinez-Vazquez, Moreno-Dodson, and Vulovic (2012) showed that in many different areas and nations around the globe, government expenditure tends to reduce income disparities. By guaranteeing more equality of access to health care and education, well-targeted public investment will boost income distribution and transfer control of development variables. Even still, the complex relationship between public spending and inequality is well-known, and there are rising doubts about public spending's ability to redistribute wealth, especially in countries with low or medium incomes (Traore, 2019). This makes it worthwhile to investigate the many elements of government expenditure aimed at accomplishing this goal.

In ECOWAS countries the percentage of government gross expenditure has been undulating. The gross national expenditure from 1990 has generally been reducing (see figure 1). This is because in 1990 the average gross national expenditure stood at 107.20 proportion of GDP. In 1992 it

increased to 109.99 proportion of GDP. However, the subsequent years saw the gross national expenditure fall from 109.99 in 1992 to 108.79 proportion of GDP in 19969 (WDI, 2022). This further reduced to 100.9 in 1997. Gross national expenditure according to the World bank, (WDI, 2022) saw a pick up to 102 proportion of GDP in 2005 and further increased to 107.4 per cent of GDP in 2016 but lower than that of 1992 gross national expenditure. Unfortunately, the average gross national expenditure for ECOWAS countries declined again to 102.7 in 2021(see figure 1). This could be a result of COVID-19 and its catastrophic consequence on government revenue creation and cut in government operations.

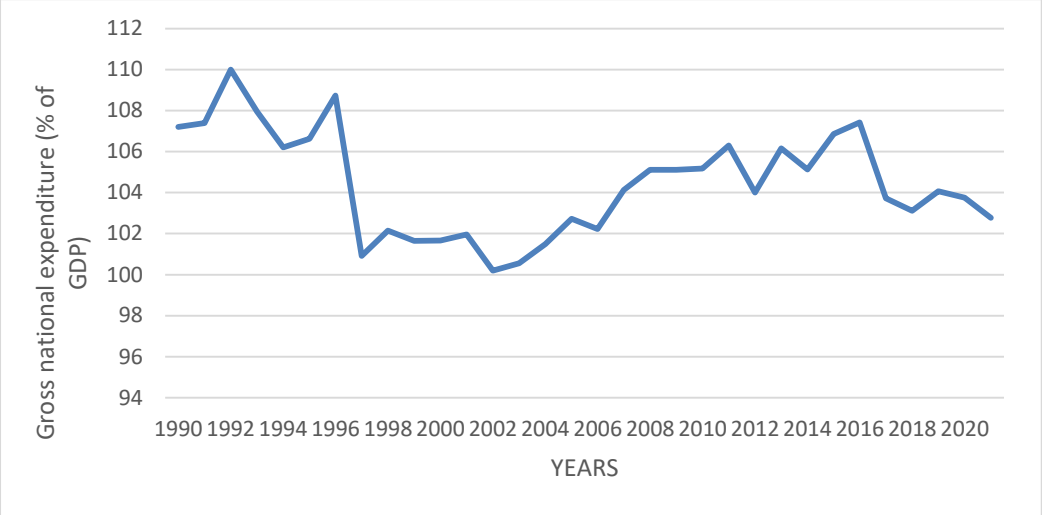

Figure 1: Gross national expenditure (% of GDP)
Source; Auther's construct, (2022) by using word development indicators dataset, 1990-2021

According to data from the WDI, 2022, expenditure on education in ECOWAS member states has been increasing since 1990 (see figure 2). The average expenditure as a percentage of GDP grew from 2.45 in 1990 to 2.7 in 2000. The average expenditure in education according to WDI, (2022) peaked at 4 per cent of GDP and has since hovered around 4.68 in 2018 and 4.69 in

2021. It can then be seen that ECOWAS member states have improved on education expenditure as more school-going children get access to school.

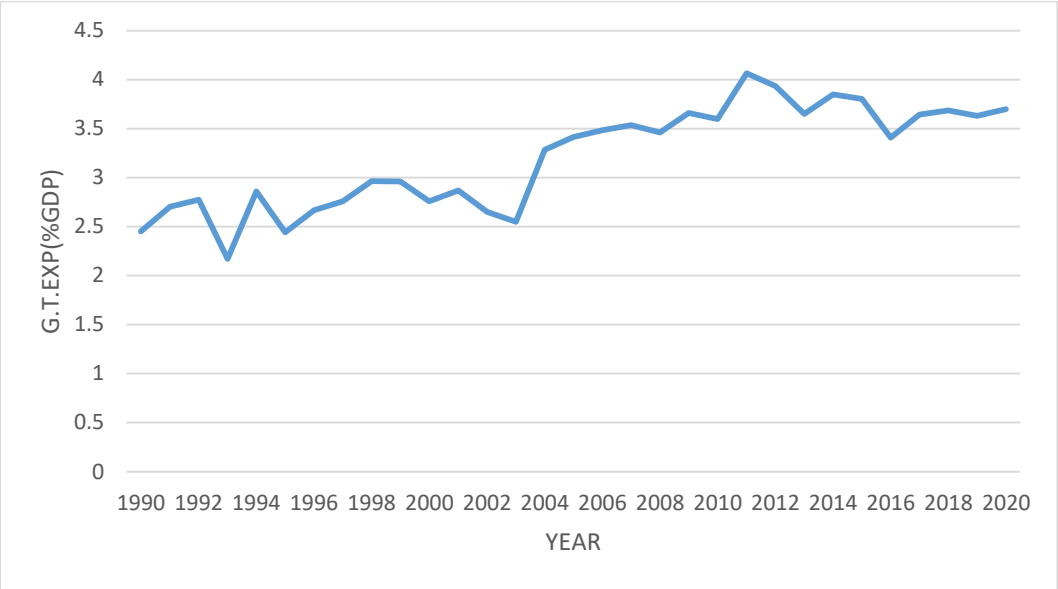

Figure 2: Government expenditure on education, total (% of GDP)
Source; Auther's construct, (2022) by using word development indicators dataset, 1990-2021

Nonetheless, government spending in ECPOWAS countries is mostly geared towards education and health which seeks to bridge the social classes in society. One other important aspect of government expenditure is the area of health care delivery and how that can help close the income inequality gap. In the ECOWAS sub-region, expenditure on health has fairly changed over the years (see figure 3). According to the WDI, (2022), government total expenditure as a percentage of GDP in 2000 stood at 4.9 and marginally increased to 5 per cent in 2004. This has been marginally stable until 2012 when current health expenditure was reduced to 4.7 percent of GDP (see figure 3). In 2014 current health expenditure increased to 5.7 but was short-lived as in decreased to 4.5 and 4.6 per cent in 2018 and 2019 respectively WDI, (2022).

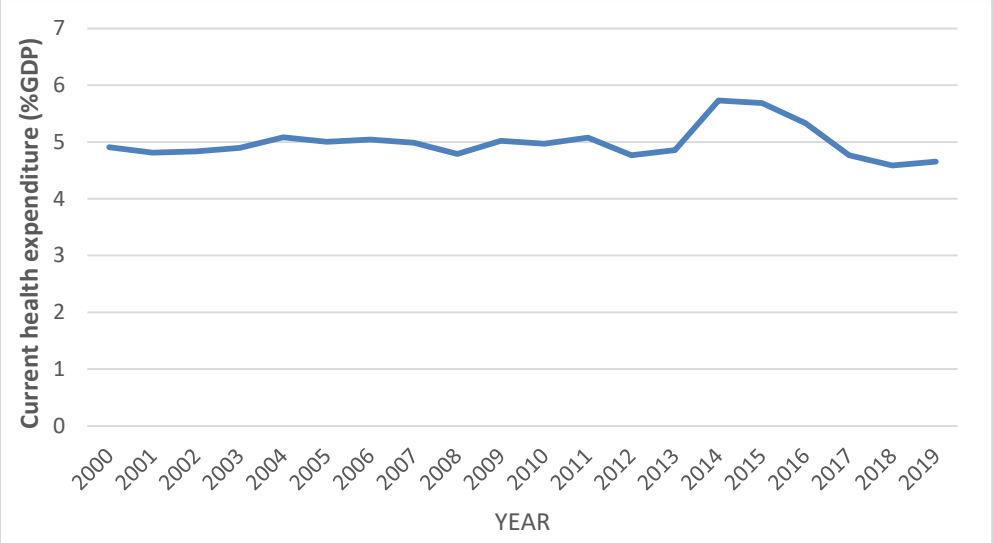

Figure 3: Current health expenditure (% of GDP)
Source; Auther's construct, (2022) by using word development indicators dataset, 2000-2019

The vast majority of recent studies of the effects of education and health expenditure on wealth disparities across economic agents are based on data from developed economies. (Köse&Güven, 2007; Sánchez & Pérez-Corral, 2018; Jianu, 2020), although in less developed or developed economies, inequality is of much higher and a more severe concern. As a result, more empirical studies and evidence are needed from developing nations to recommend stronger national education policies, which take into account income inequalities.

On average, all ECOWAS member countries spend 12.120, 3.474, and 1.135 per cent of GDP on final consumption, education, and health, respectively (WDI, 2021). This influenced the choice of the ECOWAS zone, where the proportion of education and health spending appears to be insufficient.

Easterly (2002), cited by Chong and Gradstein (2004), adds to this by carefully instrumenting for the possible endogeneity of the impact of inequality on growth and defining institutional efficiency as a significant

mechanism by which this effect manifests. This is also consistent with the findings of Berggren &Bjørnskov (2020), who discovered that political accountability, bureaucratic efficiency, and corruption were correlated with worsening inequalities. UNESCO (2016) emphasizes the role of labour institutions in ensuring that all workers have access to good and productive employment in conditions of equality, protection, and dignity, as well as the importance of these institutions in achieving these goals.

When considering economic inequality, most empirical research on inequalities has ignored institutional quality and governance. A number of previous studies have utilized institutional regularity as a model variable; for example, Chong & Gradstein (2004), Chu & Hoang (2020), and Kunawotor et al. (2020). No studies have looked into the connection between inequality, institutional efficiency, and disaggregated government spending in an ECOWAS setting as far as we are aware. Consequently, this research looks at how income disparity among ECOWAS nations is affected by institutional quality and disaggregated government spending.

This research aims to examine the relationship between income inequality and government spending, determine the influence of spending by governments on income inequality when broken down by category, and compare the effect of organizational efficiency on income inequality among ECOWAS nations. Understanding the expenditures of government and institutional quality is critical to the uneven distribution of income, despite its aggregate benefits, even if one believes that these issues are second-order compared to the first-order problems of reducing income inequality in ECOWAS. Inequality of income and the consequences for ECOWAS in the

past few years are empirically examined in this paper, which makes a substantial contribution to literature by doing so. Its goal is to help policymakers take the necessary steps by providing them with pertinent policy recommendations.

Problem Statement

Lower income inequality in West Africa, the Sahel, and the Mano River region than in their coastal neighbors is a sign of widening social and economic divides between emerging economies (such as Nigeria, Ghana, and Côte d'Ivoire) and slower-growing economies. Moreover, a north-south divide exists in many West African nations. Ghana's coastal regions are rapidly urbanizing, while the country's north is far less developed. The wealth of the urban megacities in the south of Nigeria, which are home to many of the continent's billionaires, scarcely compares to the socioeconomic status of the country's northeastern states. The United states Development Programme (2017) lists ten of the world's most unequal states as being located in Sub-Saharan Africa. For economic growth and development, robust institutions are certainly necessary in most wealthy nations, but this isn't always the case in poorer nations. Institutional mechanisms have fostered governmental clientelism, fraud, instability, and other abnormalities that threaten property rights and contribute to the increasing economic disparity in these nations, according to anecdotal evidence. Dolfsma (2013) cites the work of prominent institutional economists such as Trebing (1987) and North (1990) who demonstrated that market economies cannot function correctly without appropriate institutions that reflect societal norms. It is well-known that

income inequality is exacerbated by institutionalized inequality (Albertus and Menaldo, 2014; Wisman, 2013).

Also, evidence from Sánchez & Pérez-Corral (2018), Sarangi, Bhanumurthy, & Abu-Ismail (2015), and García-Peñalosa&Turnovsky (2013) have emphasized the importance of efficient government spending in bridging inequality. On average, all ECOWAS member countries spend 12.120, 3.474, and 1.135 per cent of GDP on final consumption, education, and health, respectively (WDI, 2021). While efforts have been made to address these concerns (Anyanwu, 2016; Anyanwu, Erhijakpor, & Obi, 2016; Brueckner, Norris, & Gradstein, 2015; Kunawotor, Bokpin, &Barnor, 2020), little success can be reported for African countries, particularly among ECOWAS member states, leaving more room for further research than desired.

Once again, the connection between government expenditure disaggregated and income inequality has received less attention in studies on government spending, institutional quality, and income inequality (Chong & Gradstein, 2004; Chu & Hoang, 2020; Kunawotor et al., 2020). Therefore, the goal of this research is to close this gap by examining how institutional quality and disaggregated government expenditures affect income disparities in ECOWAS nations.

Purpose of the study

The research aims to investigate the relationship between income disparity in ECOWAS and government expenditure and institutional quality.

Research Objectives

The specific objective of this research is to:

1. investigate the effect of government spending on income inequalities in ECOWAS countries.
2. estimate the disaggregated effect of government spending on income inequalities in ECOWAS countries.
3. assess the effect of institutional efficiency on income inequalities in ECOWAS

Hypotheses of the Study

Following the research objective, the study, therefore, seeks to test the following null hypotheses.

1. H_0: There is no significant effect of government spending on income inequalities in ECOWAS countries.

   H_1: There is a significant effect of government spending on income inequalities in ECOWAS countries.

2. H_0: There is no significant effect between the disaggregated government spending and income inequalities in ECOWAS countries.

   H_1: There is no significant effect between the disaggregated government spending and income inequalities in ECOWAS countries.

3. H_0: There is no significant effect of Institutional quality on income inequality in ECOWAS countries.

   H_0: There is a significant effect of Institutional quality on income inequality in ECOWAS countries.

Significance of the Study

Its paper adds to the economic literature on two key fronts with this research and, more importantly, the conclusions that it will provide. On the one hand, given the macroeconomic results and shock-resilience of the 48 nations that make up this monetary zone, it is a matter of renewed discussion over the viability of the SSA currencies. However, our approach is a continuation of the institutional economics research. According to this viewpoint, North & Thomas (1973) stress that variations in the political-institutional framework account for variations in economic performance across nations. In particular, the research will

1) Help Government and other policymakers: if the hypothesis is that a country's Institutional quality and government spending are relevant in mitigating income inequality, then it would be prudent for ECOWAS governments to invest in their institutions and also help streamline how governments should spend.
2) Add to academics and Research in this area: This research will add up to the prevailing research on institutional quality, government spending and income inequality which are usually tilted towards developed economies. It would, therefore, provide an opening for additional impetus into the minimum levels of institutional growth.
3) Guide investors and other industry practitioners: in the area of poverty reduction and improved living standards, this research is expected to provide empirical evidence of the level of government spending in fighting income inequality through strong Institutional quality in

ECOWAS, especially, investors who are interested in poverty reduction in ECOWAS

Organization of the Study

There are five sections to this study. As an introduction, the first chapter provides context by outlining the topic, the study's goals and significance, and its scope. The theoretical and empirical parts of the literature review are covered in Chapter 2. The methodology employed by the researcher is detailed in Chapter 3. The findings and discussion of the study are presented in Chapter 4. The study's outcomes, findings, and suggestions are detailed in Chapter 5. The groundwork for the research was laid forth in this chapter. This chapter gave a synopsis of the study's background by discussing the issue's breadth, the study's context, the study's aims and research hypothesis, the study's significance, and its design. In the following chapter, we will take a close look at the research objectives and evaluate the theories and data collected in light of them.

CHAPTER TWO

LITERATURE REVIEW

Introduction

The relevant empirical literature is reviewed in this chapter. This analysis focuses on the ECOWAS subregion and how income inequality, institutional quality, and government expenditure are related. It then formally evaluates the literature on the topics of income disparity and institutional effectiveness in the ECOWAS sub-region, as well as government spending and financial inequality. The literature review is organized under the following headings:

- Concepts
- Theoretical review
- Empirical review and
- Research gap

The Concept of Inequality

Depending on their background, readers and listeners associate different meanings with the word "inequality." According to some definitions, inequality deviates from what constitutes "equality" (Cowell, 2009). One can characterize inequality in terms of results, opportunities, or procedures. For example, disparities in income can lead to differences in educational opportunities or access to essential services like health care. Making the distinction between vertical and horizontal inequality is also important. Inequalities within groups are referred to as horizontal inequality, while those within individuals are referred to as vertical inequality. The subject of this study is horizontal income inequality. Although income and consumption have grown in importance, the distribution of (real) wealth has remained relatively

unnoticed. Economist and Nobel laureate Robert W. Fogel stated that, up until the late 1800s, equality of opportunity had been the field's primary focus. The following century saw a change in focus toward the equality with regard to material conditions, including food, clothing, housing, and other necessities. A combination of high progressive tax rates on the wealthy and government spending cuts for the poor might accomplish this. However, taxes eventually lost some or all of their ability to affect income distribution due to potential disincentives and the dominance of taxes on dependent labor. "Fiscal churning," the practice of redistributing funds in a way that slightly changes the distribution overall, is a trait they picked up. Concurrently, entitlement programs that helped all people, not just the poor, mostly took the place of the income transfers that had been directed towards the impoverished, specifically in the fields of health and education. According to Fogel (2000), the battle for greater equity or equality will eventually focus on the distribution of immaterial commodities as most people's total expenditure is increasingly composed of non-material products.

It is important to remember that, at a specific period of time and nation, in the absence of the government's present involvement via taxes, spending plans, and rules, the resulting income distribution would be mostly influenced by the following variables:

The bequest of material and monetary riches; The bequest of human capital, including intrafamily education and the bequest of perspectives regarding education, labor, danger, and so on. The inheritance of valuable assets that define an individual's social capital, such as positional rents and

helpful connections, is a contentious topic. Genetic variables may also play a part in this process.

Individual skill; Social structures and customs, such as the tendency for people to marry someone of a comparable wealth or educational background; Real or de facto caste systems, and so forth (see Tanzi, 2000); previous official policy.

Apart from the above-mentioned beginning circumstances, which are primarily influenced by cultural traditions and norms and heredity, there are other individually nested, or random, elements that are also significant. They are (a) the distribution of intellect, abilities, and even physical appearance that are not inherited, and (b) what is essentially luck—that is, the part that chance plays in setting wages in non-traditional and market-oriented economies. Government regulations or starting circumstances cannot guarantee that someone will develop the abilities or business sense of Warren Buffett, Bill Gates, or Tiger Woods.

It might be important to emphasize that the government has the potential to have a direct or indirect effect on how money is distributed, and that this distinction is somewhat influenced by the government's past and present actions. Taxes, expenditures, and other public policies are some of the ways that the government directly and currently impacts people. The most immediate influence is the rate and progressivity of taxes. The distribution of after-tax earnings may change from the pre-tax distribution and likely become more equal as a result of this factor alone. Nonetheless, there is no doubt that different types of "tax expenditures" that subtly support a number of private

spending categories, such as health, education, training, transportation costs, etc., will eventually affect how income is distributed.

Both direct and indirect consequences of governmental policies may be seen in their spending side. Whether it's through food stamps, housing subsidies, free childcare for mothers who work, funded tariffs for low levels of usage of public utilities, etc., public spending clearly affects the distribution of income because it puts money or value for money in the hands of individuals. If education expenditures increase the impoverished's relative access to human capital, the benefits to them may be disproportionate. People may remain healthy and participate in the workforce by having free access to medical services.

Indicators of inequality

1. Data on income distribution reflects the many measuring goals. The following eight income distribution indicators have been identified:
2. The most well-known metric is likely the Gini coefficient, where a smaller number denotes more equality and a high number indicates greater disparity.
3. Another often used metric is the income share per quintile, which is generally calculated by looking at the income shares of the two quintiles with the lowest incomes.
4. The percentage of the population having less than 50% (or any other percentage) of the median income is known as the poverty rate. Comparing these three measures across countries is also rather simple.
5. The percentage of the population that lives below a certain income level is known as the absolute poverty rate.

6. 6. Looking at the total income per capita of the lowest quintile or two is another alternative. All measures of poverty, including actual poverty among children, old age poverty, consumption basket poverty, buying power parity, etc., must be modified in order to be reasonably comparable. The Gini coefficient is used extensively in this study as a gauge of income disparity.

Measures of income inequality

Positive and normative measures are the two categories into which the measures of inequality can be divided. While normative measures of inequality explicitly base inequality on value judgment, positive measures of inequality describe the current pattern of income distribution and condense it into a single statistic (Kanbur, 1984). Range, relative mean deviation, Gini index, and so forth are examples of positive metrics. The Atkinson index and the Dalton measures are two popular examples of normative measurements. Sen (1973) added that a large number of positive measures are particular instances of normative measures. Statistics on income distribution illustrates the many measuring goals. Here are the eight income distribution indicators that have been identified:

A small number indicates more equality, whereas a high number indicates greater inequality. The most well-known metric is likely the Gini coefficient.

Typically, the income share of the lowest or the poorest two quintiles are analyzed. Another often used metric is the income share per quintile.

People with less than 50% (or any other percentage) of the median income are considered to be in poverty. Also, cross-country comparisons are made quite simple with the help of these three metrics.

Looking at the percentage of persons below a certain income criterion, the absolute poverty rate is calculated.

An additional option is to look at the actual per-capita income of the worst quintile(s) (or the two lowest). To be more accurate, the following comparisons may only be made: child poverty, absolute child poverty, old age poverty, and purchasing power parity, to mention a few. The Gini coefficient, which measures income disparity, is the focus of the researcher's investigation.

The Gini Coefficient

Corrado Gini, an Italian statistician and sociologist, created the Gini coefficient in 1921. This coefficient calculates the degree to which the distribution of income and expenses within a nation or a subpopulation differs from perfect equality. The inclusive range of values for the Gini coefficient is 0 (or 0%) to 1 (or 100%). A state of perfect inequality is represented by a Gini coefficient of 1, which shows that only one person or household has all of the income, as opposed to a Gini coefficient of 0, which implies perfect equality (i.e., even share of income or expenditure). Therefore, an economy is more equal when its Gini coefficient is closer to zero and more unequal when it is farther from zero.

Properties of the Gini Coefficient

- The majority of the ideal characteristics of an effective indicator of income (or consumption) inequality are met by the Gini coefficient. The Gini coefficient satisfies a few of these qualities, such as:

- Mean independence states that the measure of income disparity would remain unchanged if all income were doubled or modified by the same percentage.
- Independence of population size: Should the population fluctuate, the measure of income disparity would remain constant, all other variables being equal.
- Symmetry: This suggests that the measure of income disparity should remain unchanged if two persons were to switch incomes.
- Pigou-Dalton transfer sensitivity: In this case, money transfers from wealthy to poor people ought to lower measured income inequality, but money transfers from poor to wealthy people ought to be noted as increasing inequality.
- Decomposability: According to this criteria, disparities in income may be subdivided into groups based on any dimension, including within-group and between-group disparities.
- Testability in statistics: It should be possible to determine if changes in the index over time have a significant impact.

Measures of the Gini Coefficient

To compute the Gini coefficient or index, different calculation methods have been developed. A more mathematically convenient way for Dasgupta, Sen, & Starrett (1973) to derive the Gini coefficient is the one which estimates the income value for a population that is homogenous and is indexed with,y-i−1.≤,y-i.,i=1,2,…,n, and the Gini coefficient is provided by:

$$GC=\frac{1}{n}[n+1-2][\frac{\sum_{i-1}^{n}(n+1-i)y_i}{\sum_{i-1}^{y}y_i}]]$$

$$=\frac{2\sum_{i-1}^{n} iy_i}{n\sum_{i-1}^{n} y_i} - \frac{n+1}{n} \quad (1)$$

As shown by Berrebi & Silber (1985), the Gini coefficient may be calculated as:

$$GC=\sum_{i-1}^{n} y_i \left[\frac{n-i}{n} - \frac{i-1}{n}\right] \quad (2)$$

where n is the sample size and, assuming that,y-i.≤,y-2.≤…≤,y-i.≤…≤,y-. is the percentage of total income earned by the person or family whose income has the,i-th. rank in the income distribution.

An alternate estimation of the Gini coefficient was proposed by Chotikapanich & Griffiths (2000) and is defined as:

$$GC=\left[\sum_{i-1}^{n} x_i y_{i+1}\right] - \left[\sum_{i-1}^{n} x_{i+1} y_i\right] \quad (3)$$

where the cumulative proportions of the population and income are, respectively,,x-i. and,y-i., so that,x-n.=1 and,y-n.=1. In an ascending sequence, the income variable, Y-i, is organized such that y-i−1.≤,y-i.,i=1, 2,…,n.

The Gini coefficient of mean difference is another known estimate of the Gini coefficient, demonstrating that the Gini coefficient is a measure of dispersion provided by:

$$GC = \frac{\frac{1}{n^2}\sum_{i-1}^{n-1}\sum_{j-i-1}^{n} |y_i - y_j|}{2_\mu}, i \neq j \quad (4)$$

where,

μ = average income

y_i = levels of income

$\sum_{i-1}^{n-1}\sum_{j-i-1}^{n} |y_i - y_j|$ = the sum of the absolute difference of all pairs of income. The numerator of the estimator represents the mean absolute difference of all pairs of income.

Factors that influence income inequality

According to Charles-Coll (2011), there are two types of causes of income inequality: exogenous and endogenous. The endogenous or individual-specific causes of income inequality are the characteristics of an individual that can impact their comparative advantages, either through higher productivity or by having unique qualities that make them relatively more market-valuable and, more broadly speaking, more socially competitive. The fundamental category of endogenous factors contributing to income inequality consists of people's intrinsic capabilities. These could include charisma, intelligence, personality, and physical characteristics like strength, skill, height, and so forth.

It is possible to view a second category of endogenous causes as an essential supplement to innate abilities. Individuals' choices or preferences are involved in this. People's income is often determined by the decisions they make, regardless of their innate abilities. It has also been discovered that racial and gender disparities among individuals are endogenous sources of income disparity. As the name suggests, exogenous reasons have to do with external factors that affect income levels. Among the exogenous variables that Charles-Coll highlighted are the allocation of land, education, misguided educational programs, the labor market (or pay distribution), economic cycles, globalization, international recessions, and intergenerational inequality. The distribution of land is more closely related to rural areas, where having more land translates into higher productivity.

One of the main factors that determines income level has been education. The few members of a society with limited educational

opportunities may be assigned to jobs paying extremely high wages. Greater education typically translates into higher incomes. This causes differences in people's income levels, which affects income inequality. Inaccurate educational policies may have an impact on income inequality, particularly if the labor market's demand characteristics don't match the skills that students have learned. Income inequality is linked to globalization through trade and financial liberalization. It has also been discovered that individual variations in terms of gender and ethnicity are endogenous sources of income disparity. Exogenous reasons, as the name suggests, have to do with external factors that affect income levels. Charles-Coll listed a number of external factors, including the division of land, education, bad educational practices, the labor market (or pay distribution), economic cycles, globalization, international recessions, and intergenerational inequality.

Researchers have looked into additional potential causes of income inequality. For example, in Germany, it was discovered that changes in employment outcomes, market returns, and tax systems were the cause of the unanticipated rise in income inequality between 2000 and 2006 (Biewen & Juhasz, 2010). In addition to raising the likelihood of poverty, unemployment also adds to inequality (Saunders, 2002). Due to a rise in the number of students in Denmark, the majority of young people now work in low-paying jobs. For thirty years, income inequality rose as a result of this and other factors like women working full-time jobs and starting families (Neamtu & Westergaard-Nielsen, 2013). According to Bulíř (2001), price stability, state employment, fiscal redistribution, and development level are additional factors that contribute to income inequality. Lowering inflation is a major step toward

decreasing income disparity. This is because inflation seems to be a main factor contributing to economic disparity, especially in Africa (Anyanwu, 2011).

The labor market's structural and cyclical changes, the role of capital income increasing, and the governmental income distribution mechanism's declining effectiveness all contribute to an improvement in income disparity (Schmid & Stein, 2013). In Vietnam, a large amount of overall inequality was explained by the prevalence of white-collar employment, returns on education, and geographical disparity (Heltberg, 2012). Corruption is another factor that makes poverty and economic disparity worse in a country (Gupta, Davoodi & Alonso-Terme, 1998). It has been recognized that the supply of financial, health, education, and transportation services, as well as the execution of relevant development projects that would enhance the general public's income level, are necessary to reduce income disparity and poverty (Osahon & Osarobo, Remittances from both outside and domestic sources lessen the intensity and depth of poverty in Ghana. However, there is an inverse relationship between income disparity and both forms of remittances (Adams, 2008).

Overview of income inequality in ECOWAS countries

Economic disparity is clearly a major obstacle to both attaining steady and sustained development and reducing poverty (Dabla-Norris et al., 2015). (Berg & Ostry, 2011). Extreme levels of economic disparity have been established within the last fifty years. According to data conducted by Oxfam in January 2019, 26 people have as much wealth as the poorest half of humankind (Chan, et al. 2019). As part of a long-term widespread trend, the

wealthiest individuals on the planet are becoming richer and richer. Since the turn of the century, the world's wealth has increased globally, yet the wealthiest 1% have reaped half of the gains, while the poorest 50% have only shared in 1% of the gains.

In Africa, wealth disparity is also rising. Forty percent of the wealth on the continent is owned by the top 0.0001 percent (New World Wealth. 2018). Due to strong returns on their money and investments, the wealthiest Africans continue to prosper, but far too many others find it difficult to make a fair wage via their labor. In Africa today, there are 20 millionaires coexisting with 413 million people living in terrible poverty. Five of these billionaires and fifty thousand millionaires reside in South Africa (Forbes, 2019, March 5). (Shorrocks, Davies & Lluberas, 2018b).

Nigeria has the great distinction of being the lowest-ranked country in both our global and African rankings for the last two years out of all ECOWAS member nations. Based on its CRI score, the IMF gave the nation advice in 2018 on how important it was to address inequality. 68 Despite President Muhammadu Buhari's remarks at the UN General Assembly on September 19, 2017, regarding the need of addressing inequality in order to prevent "spiralling instability," the government's response has not kept pace.

The embarrassingly low level of social expenditure is stagnating, and the effects of underfunding education and health care are acutely felt. According to the World Bank (n.d.-b), one in ten children pass away before turning five, and over 10 million youngsters do not attend school. 71 Girls make up 60% of this group (Premium Times, 2015, August 18). Nigeria has a great deal of room to grow its tax collection (CRI; Premium Times, 2018, January 22). This

additional money might be used to fund redistributive policies. They could do better in terms of tax progressivity as well, since they are in the bottom third. Nigeria is also ranked in the middle of the pack in terms of labor and pay, but during the last year, there have been more instances of infringement of workers' rights (Lawson & Martin, 2018). Although there hasn't been a raise in the minimum wage since 2011, things might yet get better. Amidst fears of a statewide strike, the government decided to negotiate an increase in the minimum wage with labor unions, from ₦18,000 ($50) to ₦30,000, in November 2018. (Eboh, 2018).

Table 1: Rank of governments' commitment to reduce inequality in 13 ECOWAS countries

Country	Rank for Africa	Rank globally	Spending score	Tax score	Labour score
Senegal	21	112	103	85	122
Ghana	22	114	130	28	120
The Gambia	25	122	120	93	125
Côte d'Ivoire	26	123	109	115	129
Togo	28	125	121	59	134
Burkina Faso	29	126	88	79	153
Mali	30	128	105	101	145
Guinea	31	129	110	150	106
Benin	37	140	132	73	149
Guinea-Bissau	38	141	139	151	114
Niger	39	142	107	134	151
Sierra Leone	43	153	143	132	150
Nigeria	45	157	157	104	133

Source: adopted from Lawson & Martin, (2018).

Sierra Leone is ranked third from the bottom in the Africa CRI, but there is yet potential for progress. According to Oxfam (2019), the government of Sierra Leone has implemented a number of encouraging measures to address inequality, such as raising the personal income tax and minimum wage. The government has improved revenue collection under his direction by enforcing restrictions on needless tax breaks. Lastly, he has led

the charge on education reforms that, over the next five years, will see free education for all kids, from pre-primary through secondary school (Thomas, 2018). But alarming indications that Sierra Leone might allow education to be privatized could put the government's other anti-inequality initiatives in jeopardy. It is clear then that governments across ECOWAS public spending are critical in bridging the gap between the rich and the poor. For this purpose, the next section looks at the trends in government spending in ECOWAS.

Overview of government spending in ECOWAS countries

Any government's effectiveness is measured by how well its people are doing and how much better their lives are. It is impossible to overstate the government's continued participation in economic activity since the late 1930s (Prasetyo, & Zuhdi, 2013). Government spending has continued to be an essential tool for the provision of public goods and services, including health, education, transportation infrastructure, and security (Apanisile, & Okunlola, 2014; Edeme RK, Emecheta, & Omeje, 2017; Iheoma, 2014; Jaba, Balan, & Robu, 2014; Kofi Boachie, Ramu, PŁlajeva, 2018). Spending, being the traditional way that the government achieves its objective, has been the focus of many analytical and empirical investigations (Barro, 1990; Barro, Sala-i-Martin, 1992; King, & Rebelo, 1990). The average level of government expenditure in all African countries has remained high, and this has been done to provide public goods and services.

For a number of years, Sub-Saharan African governments have had more resources available to them due to a positive external environment (high commodity prices, in particular) and steady internal economic development, which averages at least 4.5 percent yearly. As one might expect, oil-producing

nations' economies have expanded at a rate of up to 15% annually. By implementing successful changes in policy and obtaining debt relief, non-resource-intensive nations were able to lessen the blow of rising oil prices. Despite their heavy debt loads, even the most impoverished nations had growth of 5.5% annually.

For resource-intensive nations, domestic income has been the main source of additional funding; for the poorest nations in the region, however, external grants have been the main source of funding. Numerous nations were able to increase their budgets due to the favorable external environment. Budgets for Sub-Saharan governments increased by nearly 1.9% of GDP between 2001 and 2005; the majority of this growth was driven by middle-income countries, as shown in table A. But not every nation profited. The budget of the Democratic Republic of the Congo increased by 9%, while Zambia's shrank by more than 8%. The increased financial resources made it easier for low-income nations that rely on assistance to increase capital expenditures, such as infrastructure. Capital investment grew by more than 1% of GDP in low-income countries between 2002 and 2005. Approximately forty percent of the extra funds went to infrastructure areas that were obviously preferred.

It is notable that middle-income and oil-exporting countries decreased their investment even though they had greater financial resources available. The average reduction in capital expenditures by oil-exporting countries was 3.3% of GDP. A significant decrease in infrastructure investment more than made up for the loss in budgetary spending in oil-exporting countries. This is essentially in line with what transpired in Nigeria, where infrastructure

investment fell by 2.2 percentage points of GDP throughout the study period. It seems that the middle-class countries have decided to spend more on maintenance. The chart shows that infrastructure received the lion's share of their new capital expenditure, rather than health and education.

Among other things, it is critical to guarantee more efficiency in the use of the spending instrument, raise government expenditure, or both in order to enhance socioeconomic results in Africa. Whatever option is selected, it is necessary to comprehend how efficiently government expenditure is allocated. Furthermore, there are additional (macro)economic barriers to government attempts to boost spending, and the tax base restricts how much the government can grow its expenditure pattern (Jayasuriya, & Wodon, 2003; Mohanty, & Bhanumurthy, 2018).

In light of this, the government must raise the standard of expenditure and demand more efficiency in order to provide goods and services (social goods) in Africa in an effective and efficient manner. Herrera and Pang (Herrera, & Pang, 2005) observed that poor levels of efficiency were found in government expenditures in some nations with high expenditure patterns. Niger, Sudan, Ethiopia, and Burkina Faso are some of these nations. Consequently, a little alteration in the component or factors responsible for a low degree of government expenditure efficiency might have a noteworthy effect on the results related to socio-economic and income distribution.

The concept of Institutional Quality

Increasing government spending, ensuring more efficiency in the use of the spending instrument, or doing both at once, are critical elements in improving socioeconomic results in Africa. But, whatever option is selected, it

is unavoidable to comprehend the effectiveness of government expenditure. More specifically, the tax base restricts how much the government can spend more, while other (macro)economic factors limit the government's ability to spend more money (Jayasuriya, & Wodon, 2003; Mohanty, & Bhanumurthy, 2018).

Given this, the government has to raise efficiency and enhance the quality of expenditure in order to provide commodities and services (also known as social goods) in Africa in an effective and efficient manner. According to Herrera and Pang (Herrera, & Pang, 2005), there are some nations with high spending patterns that have poor levels of government spending efficiency. These nations consist of Burkina Faso, Ethiopia, Sudan, and Niger. Therefore, the socioeconomic and income distribution results may be significantly impacted by a little change in the factor(s) that account for a low degree of government spending efficiency.

North (1990) argues that institutions should protect property rights, discourage predatory and wealth-destructive behavior, and encourage and reward constructive and wealth-increasing activities like innovation, capital and education acquisition (e.g., corruption, theft and rent-seeking). Furthermore, Rodrik (2000) highlights that institutions have an impact on other growth factors as well, including investment, technological advancements, and the accumulation of human and physical capital, all of which contribute to an economy's overall rate of development.

In order to increase economic production, the Solow-Swan neoclassical growth model places a strong focus on labor, capital, and technical advancement (Solow, 1956; Swan, 1956).

Mankiw, Romer, and Weil (1992) expanded this to include human capital development. This is no longer the case, though, because there are several elements that contribute to inclusive development that lasts, and among these, institutional quality has emerged as the most important. In their "institutions' quality hypothesis," Alexiou, Tsaliki, and Osman state that the framework of institutions that regulate the interactions between economic actors in an economy has an effect on income disparity. Economic development is affected by this framework (2014). According to this school of thought, the most important thing is a society's "rules that govern the game," which include its prevalent behavioral norms—both explicit and implicit—and its capacity to provide suitable incentives for desired economic behavior (Rodrik and Subramanian, 2003).

Institutions may thus be seen as an intertemporary contract that molds actions, or as a set of shared ideas about the equilibrium of a game that is regularly played (Aoki, 2001). As a result, organizations that encourage agent behavior with a high social return are seen to be good. Conversely, ineffective institutions are ones that encourage counterproductive or socially worthless behavior, such rent-seeking. In an unpredictable environment where actors make impulsive judgments based on incomplete knowledge, institutions address issues arising from social interaction. Institutions serve as a check on opportunism and discretionary behavior in this situation. Institutions also encourage group activity, which lowers coordination costs since they mold social behaviors. However, it cannot be assumed that institutions are always a cost-effective approach to address social transaction costs. They also serve as a vehicle for social actors to communicate their tactics.

North went on to say that institutional change influences how societies develop over time and, in turn, how economic performance and wealth redistribution are directed. Several empirical investigations have shown strong evidence in favor of the theory that suggests that variations in the caliber of institutions may significantly impact the distribution of wealth.

Institutions should protect property rights, discourage predatory and wealth-destructive behavior, and encourage and reward constructive and wealth-increasing activities like innovation, capital acquisition, and education, according to North (1990). (e.g., corruption, theft and rent-seeking). Furthermore, as stressed by Rodrik (2000), institutions have an impact on a number of growth drivers, including investment, technological advancements, and the amount of human and physical capital. All of these factors contribute to the overall development of an economy.

The Solow-Swan neoclassical growth model places a strong focus on labor, capital, and technical advancement as ways to increase economic production (Solow, 1956; Swan, 1956).

This was then amended by Mankiw, Romer, and Weil (1992) by adding the development of human capital. This is no longer the case, however, since there are now a number of factors that contribute to sustainable, inclusive development. Among these factors, institutional quality is one that has risen to the top. Income inequality, as proposed by the institutions' quality theory (Alexiou, Tsaliki, & Osman, 2014), is impacted by the structure of institutions that controls the interactions between economic actors in an economy. According to this theory, a society's "rules of the game" are paramount. The rules are established based on the prevailing behavioral

norms, both explicit and implicit, and their ability to incentivize the intended fiscal conduct (Rodrik and Subramanian, 2003).

Therefore, it is possible to see institutions as an intertemporary contract that influences actions, or alternatively, as a system of shared ideas about the equilibrium of a game that is repeatedly played (Aoki, 2001). Good institutions, therefore, will be those that encourage the actions of agents that have a high social return. Conversely, inadequate establishments are ones that incite counterproductive or socially pointless actions, such rent-seeking. Institutions react to issues arising from social interactions in an unpredictable environment where individuals make impulsive choices based on incomplete knowledge. In this regard, institutions function as a check on opportunism and discretionary behavior. Additionally, institutions lower coordination costs by promoting collective action by shaping social behaviors. It is important to remember that institutions are not always a cost-effective approach to offset social transaction costs. They serve as a vehicle for social actors to convey their tactics as well.

According to North, institutional changes also influence how societies develop throughout time and, therefore, how economies function and how money is distributed. The idea that variations in the quality of institutions may significantly impact the distribution of wealth is substantiated by a multitude of empirical investigations.

According to the 2022 world governance indicators, WGI, (2022) almost all member countries in the ECOWAS sub-region have a negative score (see figure 4). For instance, Benin had an average estimate of the six indicators of -0.3108 in 2018, -0.3606 in 2019, and -0.320 in 2020 (WGI,

2022). The Gambia also had a negative estimate of -0.4055 in 2018 -0.3302 in 2019 and -0.3373 in 2020.

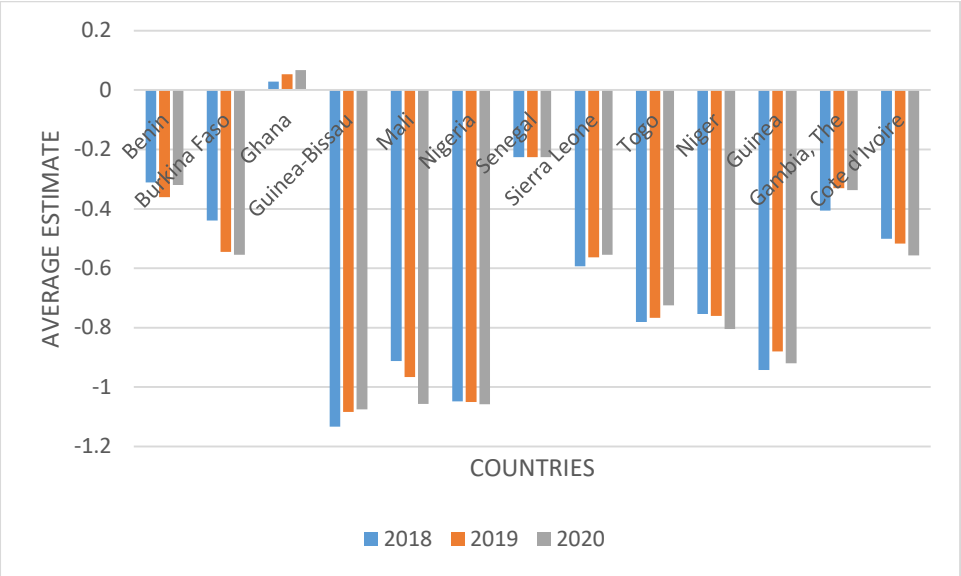

Figure 4: Average estimate of institutional quality in ECOWAS (1996-2020)

Nigeria, one of the giant economies in ECOWAS also has over the years scored negative in all six indicators. In 2018, the average estimate for Nigeria was -1.0477. it further decreased to -1.05064 in 2019 and in the recent data published by the WGI, 2022) Nigeria scored an average estimate of -1.0576 which shows a further deterioration of institutions in the country.

It must however be emphases that, Ghana in the last three years in a role has scored a positive estimate (see Figure 4). Ghana in 2018 scored and average estimate of 0.0288. This further increased to 0.0532 and 0.0670 in 2019, and 2020 respectively. For the sustainable and successful administration of economic policies, especially the management of government spending in the ECOWAS to the targeted sectors planned, it is crucial to investigate the existence of institutional flaws. Finding theories that can most effectively examine the link between these three indicators—government expenditure, institutional quality, and economic inequality—will be crucial in addressing

the ECOWAS region's widening income disparities. Thus, the hypotheses behind the research are examined in the next section.

Theoretical Framework

Median Voter Hypothesis and Functional Distribution of Income theory provide the theoretical groundwork for this study's fundamental concepts of income inequality, spending by governments, and institutional quality.

Functional Distribution of Income

The functional distribution of income is the total amount of revenue distributed to various people or households. An individual's income might originate from several sources. We are interested with the size distribution of income when income is categorized based on the amount of money each household receives, regardless of where that money comes from. To regulate this distribution, fiscal measures are put into action. The personal income distribution measures the inequality of a particular form of income, while the functional income distribution distinguishes between the proportions of income types utilized for various expenditure reasons (Giovannoni, 2010). Whereas the latter shows how evenly labor money is dispersed among people, the former shows how much labor income is available for sharing. Both assess the "distribution" of income, which is the same metric that they are connected to. From a historical standpoint, David Ricardo's writings provide the oldest, most developed version of functional income distribution theory (Giovannoni, 2010). Ricardo (1817) lays forth the major goal of his investigation in the opening line of the introduction to his magisterial work: "The principal difficulty in Political Economy is to identify the rules which control this

distribution [between rent, profit, and wages]." According to Ricardo, the whole "fruit of the earth" is split, with rent being paid first, in accordance with the declining marginal productivity concept (here, of land). According to Ricardo, the most productive acres are used first, leaving only less productive acres in the end, and the best acres are the most expensive. Therefore, the purpose of this research is to investigate how inequality is impacted by revenue distributed to various people or families via government expenditure.

Median Voter Hypothesis

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distribution [between rent, profit, and wages]." According to Ricardo, the whole "fruit of the earth" is split, with rent being paid first, in accordance with the declining marginal productivity concept (here, of land). According to Ricardo, the most productive acres are used first, leaving only less productive acres in the end, and the best acres are the most expensive. Therefore, the purpose of this research is to investigate how inequality is impacted by revenue distributed to various people or families via government expenditure.

Consequently, the median voter is anticipated to apply more political pressure for government action to redistribute income in increasingly unequal nations. This is due to the fact that the benefits of government redistribution to the ordinary person exceed the expenses incurred by taxes used to finance it. These models' primary presumptions are that taxes is progressive and that majority voting takes the interests of the median voter into account. In increasingly unequal nations, voters redistribute a greater share of money via a political process known as the institutional quality channel, which is the subject of this research.

Empirical Review

The impact of government expenditures and institutions on income disparity in the ECOWAS has been the subject of various studies. Few studies examined institutional quality or broken down government spending in the ECOWAS, with the bulk of the study concentrating on economic development in advanced nations. Before moving on to the literature from individual ECOWAS countries, the review first looked at works from other regions of the world under the following sections: government spending and income inequality, education and income inequality, health expenditure and income

inequality, and institutional quality and income inequality. The part is then concluded by the researcher with a discussion of the gaps in the literature and his plans to fill them.

Government Spending and Inequality

The link between government expenditure and inequality is explained by the functional distribution of income hypothesis. This theory of distribution will be used to analyze the magnitude of the income distribution in this research. Therefore, the role of fiscal policies (such public social investment) in lowering income disparity. Government spending, according to multiple research (e.g., Goni et al. 2011; Lustig 2011, 2015; Lustig et al 2013; Martinez Vazquez et al 2012), tends to narrow income differences in many nations and areas worldwide. Furthermore, it is well-known that, especially in nations with low or medium incomes, government expenditure isn't always the best way to redistribute wealth, and that the connection between the two is intricate.

For example, it is commonly believed that government spending on social transfers aids to reduce economic inequality. However, the actual effect will depend on how much of the budget goes toward helping those with lower incomes. If middle-class households take up most of the transfer payments for political and economic reasons, the impact on inequality might be minimal (Milanovic 1994). Indirect subsidies are no different; they consume a disproportionate share of public funds in many developing countries and disproportionately benefit those with higher incomes (Rhee et al. 2014). Furthermore, it has been proposed that government spending on education and health promotes a more equal distribution of human capital, thereby reducing

economic inequality. However, the effectiveness of such investment is a determining factor in the magnitude of the impact.

Research by Li, Xie, and Zou also looked at how government social expenditures affected the distribution of income using panel data. Li, Xie, and Zou (2000), p. 952. Only public expenditure on things like welfare, income per capita, education, social security, health, and infrastructure is included in their initial model. They then added factors related to population growth, openness, financial development, and terms of trade shocks to the model as independent variables. Their research has led to an empirical demonstration that public expenditure by the government and income taxes both lessen income disparity.

While Gregorio and Lee are examining how schooling affects income distribution, they have included government social expenditures into their model. Following study, they have determined that social expenditure by the government has decreased income disparity (Gregorio & Lee, 2002, 10- 15).

Another research attempted to explain the impact of trust and wealth disparity on government social expenditures by testing data compiled from many sources using panel data. Smeeding, Schwabish, and Osberg (2004), pp. 5–23. Three categories—social capital and inequality, social expenditure and median voter models of inequality, and social spending and economic growth—appear to have grouped the research conducted in this field. These three areas were expanded to include political and social expenditures in political science. The findings of the literature study demonstrate that poverty and income disparity are two distinct ideas. Furthermore, since social expenditure and economic inequality are correlated, it is critical to choose an

appropriate income inequality measurement in order to fully comprehend how income disparity affects social spending.

Similarly, Ulu's (2018) research using panel cointegration and causality analysis, spanning 21 OECD countries and the years 2004 to 2011, concludes that public spending on social and educational programs has a negative effect on income inequality.

Moreover, Doumbia and Kinda (2019) found that public spending had an indirect impact on income inequality using data from 83 countries for the years 1990–2000 and the Driscoll–Kraay fixed effects estimating approach. Samanta and Kayet (2020) verified this by using data from 15 Indian states between 1983 and 2012, Panel OLS, fixed effects, and random effects model estimates, and discovering an inverse relationship between public education spending and income disparity.

Inequality and Education

Among the most expensive public goods in the world is education. In 2017, high-income countries' governments spent an average of 4.9 percent of their GDP on education at all levels (UNESCO UIS database). The average enrollment rate of pupils in public schools throughout the OECD's primary and secondary education sectors in 2013 was more than 80%. (92 percent in the U.S.). According to the OECD (2015), 69 percent of students (or 72 percent in the United States) attended public universities on average in 2013. Since the year 2000, we have come a long way in our quest to make sure that every kid can go to elementary school. (The United Nations Development Programme, 2021). A total of 91% of students in developing countries enrolled in school in 2015. Sub-Saharan Africa's primary school enrollment

rate increased the most among growing regions, from 52% in 1990 to 78% in 2012. But there are still significant distinctions. The countryside and city still have a long way to go.

One of the most significant investments in human capital is education, which has received a lot of attention in the literature on economic development. The labor force's composition changes as education levels rise, making unskilled people more skilled. In fact, according to Sylwester (2002), increasing funding for education might be one strategy for reducing economic disparity in a nation. As the workforce becomes more educated and competent, the initial effect of greater income disparity is lessened and even reversed (Abdullah, Doucouliagos, & Manning, 2015)

Numerous scholarly works have shown a correlation between economic disparity and educational expenditures; nonetheless, the results indicate a complex connection. Diverse empirical findings support the hypothesis that economic inequality and public education expenditure are related (Artige & Cavenaile, 2021). For example, although Sylwester (2002) finds no statistically significant associations, Keller (2010) shows an inverse link between the amount of public education expenditure and economic disparity. Barro (2000) and Braun (1988) both noted a favorable association. According to Artige and Cavenaile (2021), the relation between public education and inequality is formed like a U. Government social expenditure as a proportion of GDP, secondary school enrollment rates, civilian labor force participation rates for unemployment, and population growth rates were all determined to be statistically significant by Ulu (2018). A number of variables have a negative correlation with one another, including openness, enrollment

in secondary schools rates, GDP percentage spent on education, and the proportion of people over 65 to the general population (Ulu, 2018). That is, income inequality declines as these factors rise.

One of the primary strategies to reduce educational disparity is via government investment on education (Seefeldt, 2018). (Seefeldt, 2018) said that in order to address economic disparity, ongoing government spending on education at all levels is necessary. However, based just on the theories, it might be difficult to say if a certain education expenditure program would reduce economic disparity when looking at education as a whole (Seefeldt, 2018). According to Seefeldt (2018), the overall redistributive importance of education investment may be hidden if the returns on education vary depending on the degree of learning. Consequently, it is significant to distinguish between the effects of spending directed at various learning stages when examining the impact of education spending on income disparity. (Heckman, 2011) contends that the root cause of differences in social and economic results is disparity in the human capacity to grow, which takes place before formal education.

To eliminate skills disparity, investment is necessary, and excellent primary and secondary education is important to sustain fairness (Heckman, 2011). Additionally, promoting secondary school completion policies would improve education equity, which will reduce economic disparity (Fournier and Johansson, 2016). Because of this, government financial aid and tuition support for elementary and secondary school are crucial, particularly for disadvantaged children who would subsequently benefit from better health, educational opportunities, and economic results (Heckman, 2011). The poorest

households gain from public investment on non-tertiary education since it is progressive in absolute terms. This expenditure, which covers Head Start, public daycare, and elementary and secondary school, represents a significant shift of income (Higgens et al., 2015). But this isn't necessarily a good thing, particularly if the progressivity is making rich families choose private schools over mediocre public ones. However, since expanded skill sets lead to better output, society as a whole will gain from public education investment that emphasizes creating an equal foundation and seeing it through to high-quality education at every level. The non-compulsory character of higher education in the majority of ECOWAS nations accounts for post-secondary education expenditure and its implications on income disparity. In contrast to elementary and secondary education, postsecondary education is voluntary, meaning that those who want to enroll must pay for it.

The majority of these advantages come to students in the form of better-paying employment that they otherwise would not be able to get without a degree. Developments in technology have strengthened this pattern and increased the need for trained workers (Sachs and Sanders, 2017). Because individuals who cannot afford the additional education necessary for these new professions lose out on the advantage, workers with a college degree enjoy better pay increase than those with just a high school education. Additionally, because of the rising expense of college, there is a greater demand for educated individuals than there is supply of educated workers (Atkinson, 2015), widening the pay disparity. Because of the underrepresentation of members of the poorer classes, increasing education

expenses have resulted in a shift of income from the lower to the middle and upper classes.

To eradicate skills disparity, investment is necessary, and to sustain fairness, excellent primary and secondary education is needed (Heckman, 2011). Additionally, increasing educational equality via measures to encourage secondary school completion would reduce economic disparity (Fournier and Johansson, 2016). Since disadvantaged children will eventually benefit from better health, education, and economic results, government cash transfers and tuition aid for elementary and secondary school are crucial (Heckman, 2011). Public investment on non-tertiary education is progressive in absolute terms, which means that the poorest households gain from it. This funding, which is a significant type of redistribution, covers Head Start, public daycare, primary and secondary education, and (Higgens et al., 2015). However, this isn't necessarily a good thing, particularly if rich families are choosing private schools over mediocre public ones because of the progressivity. In terms of public education investment, however, focusing on creating an equal foundation and seeing it through to high-quality education at all levels would be advantageous to society as a whole, as enhanced skill sets lead to improved production. Because post-secondary education is not mandatory in the majority of ECOWAS member nations, there are unintended consequences for post-secondary education expenditure on income disparity. Higher education is optional, thus those who want to go must pay for their tuition, unlike basic and secondary school.

Students mostly get these advantages in the form of higher-paying employment that they otherwise would not be able to get without a degree.

According to Sachs and Sanders (2017), the need for skilled labor has grown in tandem with the acceleration of this trend brought about by technological advancements. Because people who cannot afford to get the additional education required for these new jobs do not get to enjoy the benefits of higher wages, workers with only a high school diploma see slower wage growth compared to those with a bachelor's degree. The need for educated workers is outstripping the availability of educated people, which in turn widens the wage gap, due to the rising expense of higher education (Atkinson, 2015). The middle and higher classes have seen a rise in income due to growing education expenditures, while the poor have seen a decline in representation.

Health and Inequality

High levels of economic inequality damage the economy's human capital because low-income persons lack sufficient access to healthcare, education, and capital formation (Ray & Linden, 2018). Since 2000, the amount spent on health in emerging nations has quickly expanded (Barofsky & Younger, 2019). Barofsky and Younger (2019) report that in low-middle-income and low-income countries, health spending now accounts for 23% and 37%, respectively, of total government spending. Many developing countries have increased the coverage of health insurance, and researchers and multilateral institutions are increasingly supporting the goal of providing health coverage to everyone, even in the poorest countries (World Health Organization, 2010; Jamison, Summers, Alleyne, Arrow, Berkley, Binagwaho, & Ghosh, 2013). Barofsky and Younger (2019) argue that a thorough understanding of the distributional effects of government taxes and expenditure must include an appreciation of the benefits of publicly supported

health care. Since the benefits are in-kind rather than monetary, this section of the budget is more challenging than most others (Barofsky & Younger, 2019). We need a method for putting a monetary value on those advantages.

O'Donnell, van Doorslaer, and van Ourti (2013) assert that there are a number of ways—including the labor market—through which health may affect how income is distributed. People with specific illnesses have poorer labor productivity in this environment, which often translates into lower earnings. Income disparity between healthy individuals and those with impairments may also be exacerbated by discrimination. However, other studies have also shown a link between rising economic disparity and high rates of violence, murder, and death (Wagstaff & Doorslaer, 2000). (Lynch, Smith, Hillemeier, Shaw, Raghunathan, & Kaplan, 2001.). In this situation, a growth in income disparity would provide serious issues to the country due to the inverse causation link, which can only be resolved by enacting meaningful structural labor market changes (including education structural reforms)

According to Churchill, Yew, and Ugur (2015), one manner in which health directly impacts economic development is via increasing worker productivity. By seeing health as a capital good, Grossman (1972) posits that people are born with a baseline health endowment that declines with time but has the potential to increase with investments in health. More health capital means less time missed due to illness, which means more productivity, says Grossman. Investments in human capital and the mental and physical abilities of the workers influence output, claims Jack (1999). Strauss and Thomas' (1998) literature review presents a multitude of data that establishes the connection between health and productivity. Bloom and Canning (2000) also

found that physically and mentally healthy people tend to live in more productive communities.

Churchill, Yew, and Ugur (2015) state that raising worker productivity is one way that health directly affects economic development. According to Grossman (1972), who views health as a capital good, people have a starting point for their health that declines with time but could potentially increase with investments in health. According to Grossman, having greater health capital results in less time lost to sickness, which in turn enables more productive performance. According to Jack (1999), investments in human capital as well as the workforce's physical and mental capacities affect production. A number of data are presented in Strauss and Thomas' (1998) literature review to establish the link between productivity and health. Additionally, according to Bloom and Canning (2000), productive communities and people often have better physical and mental capacities.

Furthermore, Sorkin (1977) suggests that funding a robust national health program might operate as a catalyst to encourage growth and reduce inequality in regions where economic activity has stagnated due to unfavorable health conditions. This argument supports the claims made by Bryant (1969), who suggests that improvements in health and health services may enhance social and economic growth in developing nations.

Furthermore, a numerous studies have shown that wealth and health are positively correlated. Income disparity decreases as personal wealth levels rise within an economy. A correlation between future wealth and health is shown by Lillard & Weiss (1997) and Smith (1998). Moreover, because education and health are directly related, a greater level of education tends to

boost production, which in turn lowers wealth disparity (Churchill, Yew & Ugur, 2015). The body of research on the relationship between health and economic inequality is quite little when compared to that on the effects of education. According to Jamison, Lau, and Wang (2004), who used data from industrialized and developing nations between 1965 and 1990, advancements in health contribute for almost 10% of economic development. Using health spending as a percentage of GDP in OECD nations, Beraldo et al. (2005) and Rivera and Currais (1999a, 1999b) found a statistically significant relationship between health spending and growth. Only a small number of empirical research with a favorable effects on income inequality compare to the majority that find government health expenditures to be either not significant or negatively correlated.

Institutional quality and income inequality

Kyriacou and Roca-Sagalés (2013) studied a sample of 22 OECD nations over a ten-year period using several measures of geographic income disparities and government quality indices. In contrast, an eleven-year research by Ezcurra and Rodríguez-Pose (2014) looks at 46 countries with different levels of economic growth. The two previously stated research provide support to the hypothesis that improved governance leads to a decrease in regional inequality.

Sonin (2003) and Hoff and Stiglitz (2004) have developed analytical models to look at how the state of the economy affects the caliber of institutions. They argue that although weak institutions encourage more people to seek rent over public resources, a sound foundation for robust institutions is an equal income

distribution. In places where inequality is still growing, there have been reports of low-quality institutions.

Furthermore, Chong and Calderon (2000) provided evidence of the negative impact that wealth disparity has on the caliber of institutions. The study's model shows that when individuals face financial difficulties, they become less respectful of the country's institutions. Furthermore, strong institutions and little economic disparity set the economy on the road to sustainability and success.

Previous research conducted by Hoffman and Stiglitz (2004), Sonin (2003), Kyriacou and Roca-Sagalés, as well as Yusuf and Malarvizhi (2014), supported the institutional characteristics and economic development performance of Nigeria (2013). The RDL model was used in the study to address co-integration and causality. It has been shown that rising GDP and per capita income are linked to long-term development in top-notch institutions. The results of this study suggest that reverse causality exists.

The connection between Nigerian institutions, leadership, and economic output was also investigated by Udah and Ayara (2014). The research employed Ordinal Least Squares. A more equitable distribution of income, government performance, voice, and accountability, and economic success are positively and strongly correlated, according to the data.

And using real data from the Sudanese economy, Alexiou, Tsaliki, and Osman (2014) looked at the relationship between quality of institutions and economic progress. This study employs the ARDL limits testing methodology to cointegration, a method devised by Pesaran et al. (2001), 1972-2008. It

appears that the political liberty index, which stands in for the quality of the institutional environment, hinders economic growth, according to the results.

Furthermore, Josifidis et al. (2017) carried out an empirical study to examine the ways in which income inequalities in industrialized countries have been impacted by changes in institutional quality during the preceding 20 years. Although it is said that variations in the goals of social groups contribute to the growing income inequalities, it is difficult to evaluate the consequences of these differences since the distributional implications of creative disruptions are disregarded. Using a sample of 21 OECD countries, the research found that institutional change in these countries had a bigger effect on income redistribution than both unionization and elitization. It is emphasized that the large income disparities and inadequate redistribution are partially caused by institutional inertia, which refers to the gradual shifts in the institutional setting.

Furthermore, evidence supporting several panel data models was provided by Kotschy and Sunde (2017), indicating that the strength of economic institutions relies not just on income inequality and democracy but also on their interactions. This research adopts a novel approach when examining how democracy affects the standards of economic institutions to reduce income disparity. It is stated that democracy is not essential to construct high-quality economic institutions, even while rising income inequality undermines institutions notwithstanding democracy "to the point where democracies seem not to be able to implement strong institutional settings if inequality is too high."

In their 2014 study, Law et al. looked at 81 nations' institutional quality, economic inequality, and financial growth between 1985 and 2010. Using the threshold regression technique, we find that a certain level of institutional quality explains the link among financial development and income inequality. Without a certain minimum level of institutional quality, no amount of financial development would be able to help the sample nations' income disparity levels fall below the poverty line. It is proposed that stable institutional frameworks are inherently capable of resolving the issue of income disparity and fostering economic growth in the financial sector.

Chang (2002, 2011) argues that emerging countries should emulate the model that the industrialized world has adopted. His historical research indicates that although today's industrialized countries have flourished because of their interventionist policies, their institutions were not adequately established in their formative years. However, in order to speed up growth, emerging countries are increasingly placing more emphasis on building stronger institutions and removing restrictive policies.

CHAPTER THREE

RESEARCH METHODOLOGY

Introduction

This chapter outlines the study's methodology. As a result, it talks about the methodology, information, and estimation strategy applied to meet the study's goals. The goal is to support the researcher in approaching the research problem in a methodical manner.

Research Philosophy

Every researcher is guided by certain worldviews, values, and beliefs while doing research (Adjei, 2015). According to Guba, they are often known as paradigms or philosophical presumptions that are made before to the commencement of a research (1990). A set of beliefs and assumptions on the development of knowledge is called a research philosophy (Saunders, Lewis, and Thornhill, 2016). Researchers typically employ a robust qualitative, quantitative, or mixed-methods strategy in their study according to their beliefs on these features (Creswell & Creswell, 2018). The five primary ideologies that have impacted social scientific research throughout time are positivism, interpretivism, postmodernism, pragmatism, and critical realism, according to Saunders et al. (2016).

The positivist method is used in this investigation. Saunders et al. (2016) state that positivism is a philosophical philosophy that accepts problems that can be proven scientifically, hence providing a foundation for generalization. This indicates that positivists concentrate on methods that produce facts free from the effect of subjective interpretation. Its foundation is the creation of hypotheses using accepted theory. These theories would be

investigated, verified in whole or in part, or disproved, resulting in the formation of new theories that may then be investigated further (Creswell, 2009; Saunders et al, 2016). In the realm of management sciences, positivism is said to allow for objective reality and strive for a universal truth that addresses human activities (Saunders et al., 2016; Sekaran and Bougie, 2016). It is a suitable guide for this research since linkages will be formed and hypotheses investigated using the theory of rational choice.

Research Design

In order to detect changes and their possible causes, this study used a longitudinal research methodology, which involves following the same sample at regular intervals across time. Exploring the modifications and differences of an individual unit and enabling future outcome predicting based on past circumstances are the goals of this design.

The study used a four-stage research approach, which included issue recognition, selection of samples, gathering of data, and data analysis for inference. Additionally, the study uses a quantitative research technique to look at how government expenditures and institutions affect income disparity in a few ECOWAS nations. This is in line with the positivist worldview, which maintains that the only reliable information is that which is obtained by observation and measurement. As a result, it encourages the use of research that is often observable or measurable (Thyer, 1998).

Model Specification

In order to account for differences within and between groups, the panel estimation method is employed. Compared to time series analysis, panel data provides better results for testing hypotheses, more information, more

degrees of freedom, less cross-variable collinearity, and greater variance (Gujarati, Bernier, & Bernier, 2004).

In addition, the panel method to economic phenomena analysis facilitates the study of individual dynamics, offers understanding of the temporal ordering of occurrences, and gathers information on the greatest number of entities (or countries). It is also possible to examine more intricate behavioral models via panel analysis. Additionally, it permits the accounting of some unknown, time-invariant elements of specific countries that can lead to fluctuations in the link between trade and income inequality.

Wan, Lu, and Chen's (2006) work served as the basis for the model that was employed in the analysis. The research used an econometric model using the Gini co-efficient as the dependent variable. This is so because the Gini coefficient is the variable that illustrates the disparity in the distribution of income. Along with other control factors like the inflation rate, population density, foreign direct investment (FDI), unemployment rate, and natural resource, the independent variables in the econometric model created in this framework include government expenditure and institutional quality. The panel models that need to be estimated statically and dynamically are indicated by equations (5), (6), (7), (8), (9) and (10), in that order. This is how the empirical model that has to be estimated is shown.:

$$G_{it} = \gamma_0 + \gamma_1 GOVEXP_{it} + \gamma_2 UNEMP_{it} + \gamma_3 POPD_{it} + \gamma_4 INF_{it} + \gamma_5 FDI_{it} + \gamma_6 NR_{it} + \mu_{it} + v_{it} \quad (5)$$

$$G_{it} = G_{it-1} + \gamma_1 GOVEXP_{it} + \gamma_2 UNEMP_{it} + \gamma_3 POPD_{it} + \gamma_4 INF_{it} + \gamma_5 FDI_{it} + \gamma_6 NR_{it} + \mu_{it} + v_{it} \quad (6)$$

$$G_{it} = \gamma_0 + \gamma_1 EXPEDU_{it} + \gamma_2 EXPH_{it} + \gamma_3 UNEMP_{it} + \gamma_4 POPD_{it} + \gamma_5 INF_{it} + \gamma_6 FDI_{it} + \gamma_7 NR_{it} + \mu_{it} + v_{it} \quad (7)$$

$$G_{it} = G_{it-1} + \gamma_1 EXPEDU_{it} + \gamma_2 EXPH_{it} + \gamma_3 UNEMP_{it} + \gamma_4 POPD_{it} + \gamma_5 INF_{it} + \gamma_6 FDI_{it} + \gamma_7 NR_{it} + \mu_{it} + v_{it} \quad (8)$$

$$G_{it} = \gamma_0 + \gamma_1 INS_{it} + \gamma_2 UNEMP_{it} + \gamma_3 POPD_{it} + \gamma_4 GOVEXP_{it} + \gamma_5 INF_{it} + \gamma_6 FDI_{it} + \gamma_7 NR_{it} + \mu_{it} + v_{it} \quad (9)$$

$$G_{it} = G_{it-1} + \gamma_1 INS_{it} + \gamma_2 UNEMP_{it} + \gamma_3 POPD_{it} + \gamma_4 GOVEXP_{it} + \gamma_5 INF_{it} + \gamma_6 FDI_{it} + \gamma_7 NR_{it} + \mu_{it} + v_{it} \quad (10)$$

where, G_{it}= Income Inequality, G_{it-1}= Lag of Income inequality, $GOVEXP_{it}$ = Government Final Consumption Expenditure, $EXPEDU_{it}$ = Expenditure on education, $EXPH_{it}$= Expenditure on health, GDP_{it}= GDP, $UNEMP_{it}$= Unemployment rate, $POPD_{it}$ = Population density, INF_{it}= Inflation, FDI_{it}= Foreign Direct Investment, NR_{it}= Natural resources, μ_{it} = represent fixed effect by country, v_{it} = the error term, i = index for countries, and t = index for the time which is in years.

Table 2: Summary of Variables, Expected Signs and Data Source

Variables	Expected Sign	Data Source
Government exp. on Education	Negative (-)	WDI
Government exp. on Health	Positive (-)	WDI
Government expenditure	Negative (-)	WDI
Institutional quality	Negative (-)	WGI
Foreign Direct Investment	Negative (-)	WDI
Population density	Positive (+)	WDI
Inflation	Positive (+)	WDI
Natural resources	Negative (-)/Positive (+)	WDI
Unemployment	Positive (+)	WDI

Source: Authors' Construct, 2021

The System-GMM Technique

Using the GMM estimate approach, the dynamic panel model may be more accurately computed in order to overcome the endogeneity problem under the Fixed Effect. The GMM performs better than other estimators for simple cross-section regressions and more intricate panel data models. This is because the method eliminates biases brought about by measurement error, endogenous right-side factors, initial efficiency exclusion, and missing variables. The underlying premise of the Arellano & Bond (1991) technique is that not all of the information included in the survey would be used by the instrumental variables method. This makes it possible to incorporate more instruments, which may greatly increase efficiency. It creates the original and modified versions of the GMM system, a double-equation structure (Campante & Do, 2007). (Rodman, 2009). Known as the difference GMM, it is based on the 1982 work of Hansen and Bond and is used to e-recession analysis. It is the most effective method for computing the dynamic panel model's efficient estimates, as shown by the dynamic panel model. Given

$$y_{it} = \emptyset + x'_{it}\beta + \varepsilon_{it} \quad (11)$$

where *i*=1, …, n t = 1,…,T

Differencing equation (5) in order to apply the differenced GMM yields the following equations:

$$y_{it} - y_{i,t-1} = \emptyset_1(y_{i,t-1} - y_{i,t-2}) + \emptyset_2(x_{it} - x_{i,t-1}) + (v_{it} - v_{i,t-1}) \quad (12)$$

Equation (12) can be simplified as:

$$\Delta y_{it} = \Delta y_{it-1} + \Delta x'\beta_{it} + \Delta v_{it} \quad (13)$$

The peculiar effect of the fixed country is remedied by transforming the regressors by first differentiating; hence the inconsistency and prejudices

arising from the endogeneity of the explanatory variables can be dealt with, by using lagged values of the endogenous explanatory variables. Also with its previous levels, the first differenced lagged dependent variable is measured. The differentiated GMM estimator is based on the following parameters, if the retrogresses are slightly exogenous and that the term is not autocorrelated.

$$E\left[y_{i,t-1}\left(v_{it} - v_{i,t-1}\right)\right] = 0, \text{ for t =2, 3, …, T} \quad (14)$$

$$E\left[x_{i,t-1}\left(v_{it} - v_{i,t-1}\right)\right] = 0, \text{ for t =2, 3, …, T} \quad (15)$$

The two-stage GMM system provides effective estimation and is more robust to heteroscedasticity and autocorrelation than the one-stage estimation. The study applied the Hansen J test to determine limitations and verify the effectiveness of the tools used. Too many instruments can adapt endogenous regressors and fail to eliminate endogenous elements that undermine Hansen J test strength. To solve this problem, the research followed the Roodmans Stata procedure to unlock all internal instruments.

Measurement of Variables

A brief description of each of the 11 variables used in the study is provided as follows:

The Gini Index

Corrado Gini, an Italian statistician and sociologist, created the Gini coefficient in 1921. It gauges how far a nation's income or spending patterns diverge from a distribution that is exactly equal among its citizens or households. The Gini index quantifies how much an economy's income or consumption distribution from a fully equal distribution deviates from that of individuals or households. A Gini index of 100 indicates complete inequality, whereas an index of 0 indicates perfect equality. The information is sourced

from SWIID, which is Solt's (2009) Standardized World Income Inequality Dataset. A standardized dataset on income inequality is produced by the SWIID by combining data from multiple sources.

Gross Domestic Product (GDP)

A country's gross domestic product is the market worth of all the products and services produced there during a certain time period, usually a year. The research employs the real GDP, which is computed in real terms at a constant 2000 US dollars, to account for inflation. The GDP information for the selected ECOWAS countries was obtained from the World Development Indicator Database.

Foreign Direct Investment

A foreign direct investment in the domestic economy is defined as an ownership of 10% or more of an enterprise's equity by a foreign investor. This variable is used to assess whether the introduction of foreign companies into the ECOWAS countries lessens income disparity. As a result, the actual FDI figure is given as a GDP percentage. The data about FDI comes from the World Development Indicator Database.

Government Final Consumption Expenditure

Government spending is called the government's final consumption expenditure in this research. The current government expenditure on products and services, particularly wages for employees, is measured by it. Government military expenditure that is included in capital creation is not included, although the bulk of spending on national security and defense is. Government consumption also has an impact on income disparity. Income disparity may decrease or increase as a result of government consumption.

Government Expenditure on Education

The overall expense of government on education represented as a proportion of GDP. When the government allots sufficient funds for educational expenses, it suggests that the nation's income level has increased and that these funds are being dispersed to enhance the nation's human capital. It is anticipated that education spending will lessen inequality.

Government Expenditure on Health

The total amount of money spent on health care by the government expressed as a percentage of GDP. A common perception of government health spending is that it is a pro-poor policy targeted at the most vulnerable members of society. Therefore, efforts by the government to raise health-care spending will contribute to the reduction of inequality. As a result, we anticipate an inverse relationship between income inequality and government spending on health.

Institutional Quality

Kaufmann, Kraay, and Mastruzzi's Worldwide Governance Indicators (WGI) data collection of institutions was used for the study (2008). Higher values of the institutional quality indicators indicate better governance results. The indicators are assessed in units ranging from around -2.5 (poor) to 2.5 (strong). These six variables are averaged into a single, more comprehensive index to determine the WGI institution indicators (see Easterly 2002; Langbein & Knack, 2010; Méon & Weill, 2005).

Inflation

Kaufmann, Kraay, and Mastruzzi's Worldwide Governance Indicators (WGI) data collection of institutions was used for the study (2008). Higher values of

the institutional quality indicators indicate better governance results. The indicators are assessed in units ranging from around -2.5 (poor) to 2.5 (strong). These six variables are averaged into a single, more comprehensive index to determine the WGI institution indicators (see Easterly 2002; Langbein & Knack, 2010; Méon & Weill, 2005).

Unemployment Rate

The International Labor Organization (ILO) estimates of unemployment, which are expressed as a percentage of the labor force overall, were used in this study. The purpose of this is to investigate how unemployment affects income inequality in Western Africa. The World Development Indicator online database is the source of the unemployment rate data.

Population Density

The population density of the countries in the sample is determined by their geographic area. People per square kilometer of land area is the unit of measurement. Population density is a measure of the relative strain on domestic carrying capacity and the relative scarcity of national resources, according to Midlarsky & Roberts (1985). Therefore, we incorporate population density control into our model as well. This variable, which is expressed as the population density per square kilometer of land area, is taken from the World Development Indicators (WDI) online database.

Natural Resources

A nation's naturally occurring elements or materials that can be used for economic advantage are referred to as natural resources. These consist of a nation's resources, such as its land, water, energy, minerals, and forests. The online database World Development Indicators (WDI) is the source of data on

natural resources. It is anticipated that natural resources will either positively or negatively impact income inequality.

Data and Data Sources

The study employs unbalanced panel data from 15 countries in ECOWAS consisting of 30 annual observations covering the period 1990-2019. The lack of data on the Gini coefficient taken as a measure of income inequality limits the coverage of the study beyond 2019. The data on the variables were obtained from the Standardized Income Inequality Database and the World Development Indicators. The study used 13 ECOWAS countries over 30 years from 1990-2019. Table 2 presents the countries selected for the study. The sample selection of 13 ECOWAS countries was based on the availability of data on key variables such as the Gini coefficient and government expenditure and institutions.

Model Diagnostic tests

Test for Over-Identifying Restrictions

The GMM system estimates that the number of instruments will increase exponentially with the number of periods that lead to overfitting. The instrument must be valid for consistent and effective evaluation. We used Hansen's test to check the effectiveness of the tool to determine the limitations of over-identification.

Test for Autocorrelation

Since there is a lagged dependent variable as an explanatory variable, there is an autocorrelation problem. If AR (2) statistics are found, the second lag of the endogenous variable does not apply to its current value. Check the p-value of the AR (2) statistic to determine whether there is autocorrelation.

Test for Heteroskedasticity

Heteroskedasticity is an estimation problem related to cross-sectional data. According to Wooldridge (2008), the existence of heteroskedasticity invalidates the parameters and makes the conclusions of the t and F tests unreliable. This method produces regression coefficient standard errors that are robust to heteroskedasticity.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The empirical findings and comments are presented in this chapter. There are three parts in this chapter. The GMM model's findings about how government expenditure affects income inequality in the ECOWAS regions are presented and discussed in the first section. The findings on the disaggregated impact of government expenditure on income disparities in the ECOWAS area are shown in the second part. The last part evaluates how institutional efficiency affects income inequality in the ECOWAS. These estimates relate to the study's goals and hypothesis.

Descriptive Statistics

For the years 1990–2019, thirteen (13) ECOWAS nations are covered by the descriptive data. The mean, standard deviation, and lowest and highest values of the variables are the statistics that are being examined. The standard deviation quantifies the degree to which the mean values deviate from the mean, whereas the mean value indicates the average value of the variables. Table 3 presents the descriptive statistics.

Table 3: Summary Statistics of the Variables

Variable	Mean	Std. Dev.	Min	Max	Observation
Inc. Inequality	49.3829	4.9396	40.57	61.53	390
Expenditure on education	3.5348	1.4615	0.6225	8.1410	390
Expenditure on health	1.2839	0.7864	0.4905	3.6129	390
Institutions	-0.5142	0.8323	-2.4367	1.2192	390
Gov. expenditure	12.4923	4.4616	0.9112	26.0649	390
FDI	3.4209	7.1906	-6.8979	103.3374	390
Pop. Density	84.9224	120.2054	1.7183	622.9621	390
Inflation	52.5783	761.7038	-9.6162	23773.13	390
Natural resources	11.6535	10.6865	0.0007	59.6196	390
Unemployment	0.8629	0.7596	0.03	4.4157	390

Source: Authors' construct, 2021

Using panel data from Table 3 that spans more than 30 years, this study discovered that every variable had positive values (means). For example, the average of income inequality (also known as Inc. Inequality) was 49.3829. This indicates that there is an average annual growth in income inequality of almost 49.4%. Over the time, the average GDP percentages allocated to health and education were 1.2839 and 3.5348, respectively. This means that the average expenditure on education and health within the ECOWAS sub-region averages around 3.5 and 1.28 per cent of GDP with a standard deviation of 1.4615 and 0.7864 per cent over the period 1990 to 2019 respectively. The maximum expenditure on education and health values indicates that the region spends less on education and health; thus, out of their economic activities,

only 8.15 and 3.61 per cent were contributed towards education and health respectively. Conversely, when considering the annual average change in the Consumer Price Index (CPI) ranging from -9.62 (minimum) to 23773.13 (maximum), inflation displays the highest standard deviation of 761.71 and a mean value of 52.58. This indicates a high degree of price instability over the period spanning from 1990 to 2019. Throughout the time, government consumption spending averaged 12.49%, with lowest and greatest values of 0.91 and 26.06 percent, respectively. All other factors have mean values that are not too bad: natural resources (11.65), population density (84.92), unemployment (0.86), foreign direct investment (3.42), institutions (-0.5142), and other statistics.

Estimation Results

Tables 4, 5, 6, 7, and 8 show the empirical findings of our estimates on income inequality. Tables 5, 7, and 8 column 4 use the system GMM estimator, while Tables 4, 6, and 8 columns 2 and 3 regard errors as fixed and random.

In this study, the fixed and random effect models were evaluated using the Hausman specification test to determine which estimator was more accurate and effective (Appendix A, B and C). Due to a 1% rejection of the null hypothesis in the Hausman test, the fixed effects estimator was selected for research. In order to prove that the system GMM estimator is efficient, the author compares the static and dynamic panels and gives the standard estimators. This is because the endogeneity problem, which arises from the correlation between income disparity and expenditures, makes the usual estimators biased and inconsistent. With a p-value of 1%, the fixed effect estimator met the criteria for statistical significance according to the F

statistics, which evaluate the overall significance of the model. Figure 4. Table 5 shows the findings for the System GMM estimators, whereas Table 4 shows the results for the random effect, and the p-value for the chi-square test indicates a significance level of 1%. Assuming the variables are independent, this demonstrates that the observed distribution of the model's data matches the expected distribution.

Research objective one: the Effect of Government Final Consumption Expenditure on Income Inequality

Table 5 shows the results from the dynamic estimator, whereas Table 4 shows the results from the static panel estimators. These results show that the impact of government final consumption spending on income inequality is not as strong or as connected as the researchers had hoped.

Table 4: Static Panel Regression of the Effect of Government Final Consumption Expenditure on Income Inequality

Income inequality	Fixed	Random
Government final expenditure	-0.0024**	-0.0010**
	(0.0010)	(0.0005)
Unemployment	0.0051***	0.0017**
	(0.0012)	(0.0007)
Population Density	-0.0001***	-0.0000***
	(0.0000)	(0.0000)
FDI	-0.0029*	-0.0013
	(0.0015)	(0.0010)
Natural resources	-0.0016***	-0.0018***
	(0.0006)	(0.0004)
Inflation	0.0034***	0.0029***
	(0.0004)	(0.0004)
_cons	3.8437***	3.8383***
	(0.0043)	(0.0032)
R^2	0.4171	
P	0.000	0.000
Hausman test	0.0000	
N	370	370

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: Authors' construct, 2021

An increase in government spending on general consumption is expected to reduce income inequality based on past expectations. Consequently, there is a negative correlation between income inequality and government spending on general consumption. The fixed effect estimate in Table 4 revealed a statistically significant and negative correlation between government final consumption expenditure and income inequality in the ECOWAS, indicating the impact of this spending on income disparity. This is in line with the study's assumptions. But because the system GMM estimator handles the possible endogeneity of the regressors, it is somewhat more consistent and dependable, therefore that's where our thoughts will be focused. Table 5 below displays the GMM estimator's findings:

Table 5: System GMM Regression of the Effect of Government Final Consumption Expenditure on Income Inequality

Income inequality (Gini)	GMM
Lag Gini	0.2575***
	(0.0671)
Government expenditure	0.052**
	(0.0033)
Unemployment	0.0016
	(0.0076)
Population density	-0.0081***
	(0.0022)
FDI	-0.0045
	(0.0023)
Natural resources	-0.0042
	(0.0033)
Inflation	0.0072
	(0.0044)
_cons	2.8848***
	(0.2519)
P	0.000
Number of instruments	11
Number of groups	13
AR (2)	0.564
Hansen test	0.104
N	368

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: Authors' construct, 2021

In accordance with an earlier prediction, income inequality will decline as government spending on general consumption rises. Consequently, government spending on general consumption and income inequality are negatively correlated. Table 4's fixed effect estimator revealed a statistically significant and negative correlation between government final consumption spending and income inequality in the ECOWAS region. This correlation helped us determine the impact of government spend on final consumption. That aligns with what the research was expecting. The system GMM estimator, which handles the possible endogeneity of the regressors, will, however, form the foundation of our talks since it is relatively more consistent and dependable. Below in Table 5, you can see the GMM estimator findings.

Research objective two: the Effect of Expenditure on Education and Health to GDP on Income Inequality

The findings from the static panel estimators (Table 6) and dynamic estimator (Table 7) demonstrated disparities in terms of significance and association between spending on education and health on income inequality, which is consistent with the study's second goal and hypothesis.

Table 6: Static Panel Regression of the Effect of Expenditure on Education and Health to GDP on Income Inequality

Income inequality	Fixed	Random
Expenditure on Health	-0.0044***	-0.0013*
	(0.0009)	(0.0007)
Expenditure on Education	-0.0022**	0.0000
	(0.0009)	(0.0006)
Unemployment	0.0042***	-0.0018***
	(0.0013)	(0.0007)
Population density	-0.0001***	-0.0000***
	(0.0000)	(0.0000)
FDI	0.0038*	0.0018*
	(0.0015)	(0.0010)
Natural resources	-0.0021***	-0.0018***
	(0.0006)	(0.0004)
Inflation	0.0036***	0.0029***
	(0.0004)	(0.0004)
_cons	3.8409***	3.8380***
	(0.0038)	(0.0030)
R^2	0.4281	
P	0.000	0.000
Hausman test	0.0000	
N	370	370

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: Authors' construct, 2021

Table 6 breaks down government spending into GDP-adjusted categories for health and education. The spending on health care was statistically significant at 1%, and the expenditure on education at 5%. We also observed that the coefficients of expenditure on education and health care were both negative. owing to the expense variables' possible endogeneity, once again. Richer nations, for example, are more likely to allocate resources to enhance their health and education systems, which will help them lower inequality, but poorer nations may not do so. Therefore, there is a feedback relationship between spending and inequality that occurs simultaneously, biasing the static assessments. Because it is somewhat more consistent and dependable, the system GMM estimator will form the foundation of our talks. This is seen in the following table 7.

Table 7: System GMM Regression of the Disaggregation Effect of Expenditure on Education and Health to GDP on Income Inequality

Income inequality (Gini)	GMM
Lag Gini	0.3996***
	(0.0588)
Expenditure on health	-0.0744**
	(0.0172)
Expenditure on education	-0.0681*
	(0.0104)
Unemployment	0.0105
	(0.0073)
Population Density	-0.0012
	(0.0025)
FDI	-0.0038**
	(0.0007)
Natural resources	-0.0045
	(0.0036)
Inflation	0.0074**
	(0.0028)
_cons	2.3164***
	(0.2273)
P	0.000
Number of instruments	11
Number of groups	13
AR (2)	0.299
Hansen test	0.115
N	368

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: Authors' construct, 2021

The education and health spending factors in Table 7 displayed their typical signs. According to the percentages, they were statistically significant at 5 and 10%. It becomes evident that, in comparison to education spending, the GDP's impact on income disparity is greater and more detrimental when it comes to health spending. In other words, the findings show that a 1% rise in health spending translates in a 0.0744 percent decrease in income disparity and a 0.0681% increase in education spending. This suggests that investing in health care has a greater overall effect on decreasing inequality than investing in education. This disparate effect may be explained by the fact that government spending on health in developing nations helps

almost all people, but expenditure on education mostly benefits middle-class urban populations and may thus have less of an influence on decreasing inequality. Nevertheless, the findings show that when governments boost their spending on education, the effect is felt by the whole population, increasing the pool of skilled workers and narrowing the gap in wages between skilled and unskilled workers. Additionally, Table 7 makes it clear that, on average, government final consumer expenditure, as shown in Table 5, has less of an influence on decreasing inequality than spending on health and education. This might be the case because, in comparison to overall government consumer expenditure, spending on health and education is often seen as being more "pro-poor" aspects of government spending. This is consistent with Ulu's (2018) and Sylwester's findings (2002). In OECD member nations, the author discovered an inverse link between health and education spending and income disparity. Our findings, however, conflict with those of Jianu (2020), who discovered a beneficial correlation between health care spending and education levels and wealth disparity. Table 7 further shows that the inflation coefficient is positive and statistically significant at 5%. Our hypothesis that greater inflation is linked to a worsening of income distribution is confirmed by the data, which demonstrates that a one percent rise in inflation causes a 0.0074 percent increase in income disparity. A high rate of inflation indicates that although many people are impoverished, others are becoming richer, leading to a rise in economic disparity. Our findings concur with those of Albanesi (2007) as well as Siami-Namini and Hudson (2019). Additionally, FDI dramatically lowers income inequality. More specifically, a five percent

increase in FDI inflows results in a 0.0038 percent reduction in income disparity.

Research objective three: the effect of Institutional quality on Income Inequality

The findings from the static panel and dynamic estimators (Table 8) demonstrated disparities in terms of significance and the association between institutional quality and income inequality, which is consistent with the study's second aim and hypothesis.

Table 8: Static and System GMM Regression of the Effect of Institution on Income Inequality

Income inequality (Gini)	Fixed	Random	GMM
Lag Gini			0.4359***
			(0.0403)
Institutional quality	0.0216**	0.0012**	0.0047***
	(0.0003)	(0.0003)	(0.0008)
FDI	-0.0016**	-0.0022**	-0.0058***
	(0.0003)	(0.0003)	(0.0008)
Unemployment	0.0043***	-0.0012*	0.0022
	(0.0013)	(0.0006)	(0.0016)
Population density	-0.0001***	-0.0000***	-0.0020**
	(0.0000)	(0.0000)	(0.0009)
Natural resources	-0.0013*	-0.0016***	-0.0015
	(0.0007)	(0.0004)	(0.0014)
Inflation	0.0031***	0.0027***	0.0024**
	(0.0004)	(0.0004)	(0.0008)
_cons	3.8347***	3.8344***	2.1523***
	(0.0029)	(0.0027)	(0.1551)
R^2	0.4234		
P	0.000	0.000	0.000
Hausman	0.0000		
Number of instruments			13
Number of groups			15
AR (2)			0.498
Hansen test			0.101
N	370	370	368

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Source: Authors' construct, 2021

According to Table 8's findings, institutions significantly reduce income inequality—by 1% for the system GMM estimate and 5% for the fixed

effect estimator, respectively. Thus, the ECOWAS region's institutions are part of the growing wealth disparity. More precisely, in the ECOWAS sub-region, institutions increase inequality by around 0.008%. This result might be explained by the inadequate institutions of ECOWAS member nations, which lead to intra-group discrimination. For example, in some of these nations, the high degree of political unpredictability, corruption, and the application of the law in a biased manner all lead to an increasing disparity in wealth. An further factor contributing to economic disparity is institutional inertia, a characteristic that is prevalent in emerging nations. Research has shown a significant correlation between rising levels of corruption and economic disparity. This is due to the fact that in African nations, corruption harms the impoverished more than the wealthy (Udah & Ayara, 2014). The results are consistent with research from studies like (Josifidis, Supić, & Beker-Pucar, 2017; Udah & Ayara, 2014).

FDI also contributes to the decrease in wealth disparity. It gauges the reaction of inequality to variations in FDI inflows with a negative coefficient of 0.0058. According to this, there would be a 0.0058 percent reduction in income disparity for every 1% rise in FDI inflows. The results show that FDI in the ECOWAS is raising labor demand, facilitating the transfer of technology, and creating job possibilities, all of which contribute to a reduction in the distribution of income inequality within the economy. These results agree with the research conducted by Teixeira and Loureiro (2016), Kaulihowa and Adjasi (2018), and Ucal, Haug, and Bilgin (2016). (2019). According to both research, foreign direct investment (FDI) either lowers levels of income inequality or is linked to less uneven income distribution.

Post Estimation Test

The findings of several diagnostic tests that were run to determine what adjustments needed to be made in order to get consistent and trustworthy results are shown in this section. The diagnostic tests conducted, which were covered in the previous chapter, include the Hansen test for instrument validity, the Hausman test to choose between random and fixed effects models, and tests for heteroskedasticity and serial correlation (autocorrelation). Verifying that the data matches the model and that the outcomes of the system GMM estimates are accurate and dependable is the major goal of these tests.

To ascertain whether or whether individual heterogeneity is connected with the regressors in our regressions, we run the Hausman test. The Hausman test results are shown in Appendices A, B, and C. By rejecting the null hypothesis favoring the random effects model at the one percent significance level, the Hausman test result further supports the suitability of the Fixed Effects model. But because the system GMM estimation method produces more consistent and trustworthy estimates than the (Fixed and Effect Model) FEM, it was also applied to the model in equation (9). As previously mentioned, the model generates more consistent and trustworthy estimates when the system GMM is used since it has detected the existence of endogeneity for the relationship between spending and income disparity. The research therefore uses the Fixed Effects model and the GMM approach, respectively, to estimate equations (8) and (9) based on the aforementioned circumstances.

Owing to the study's sample of nations and their disparate cultures, geographies, and economies, the model used in this research would probably

have heteroscedasticity issues. Thus, in order to account for potential heteroscedasticity in Tables 5, 7, and 8 column 4, the research employed robust standard errors.

The Arellano-Bond test for serial correlation in first differenced errors is used to perform the autocorrelation test. The findings are shown in Tables 5, 7, and 8 above together with the estimate results. The findings indicate that the effect of government final consumption expenditure on income inequality has an AR (2) p-value of 0.564, the effect of health and education expenditure to GDP on income inequality has an AR (2) p-value of 0.299, and the effect of institutions on income inequality has an AR (2) p-value of 0.498. Since the p-values are more than 0.05, we can't rule out the possibility of second-order autocorrelation, thus we conclude that the errors are unrelated. In addition, whilst the second lag does not exhibit any autocorrelation, the first lag does according to the Arellano-Bond autocorrelation test for the first difference.

Government final consumption expenditure had a p-value of 0.104, education and health expenditures had an impact of 0.115 on GDP, and institutions had an impact of 0.101 on income inequality, according to the Hansen J test of over-identifying restrictions, which evaluates the validity of the instruments used in the system GMM estimator. This indicates that the test accepts the null hypothesis, which states that the instruments are valid and come from outside the system. Tables 5, 7, and 8 showed the result of the Hansen J test.

Chapter Summary

The study's results were given in this chapter, and they aligned with the goals of the investigation. Estimating the impact of government final consumer spending on income disparity was the first goal. When examining the

relationship between trade openness and income inequality, the Hausman specification test using the fixed and random effects showed that the fixed effect was preferable. Based on the results, it was determined that there is a substantial and negative relationship between government final consumer spending and income disparity.

Additionally, the second goal calculated the impact of health and education spending on GDP and income disparity. Once again, using the fixed and random effects, the Hausman specification test revealed that, when examining the impact of health and education spending on GDP and income inequality, the fixed effect was favored. According to the fixed effect results, spending on health and education both considerably lowers income disparity. On the other hand, compared to education spending, health spending as a proportion of GDP has a more substantial influence on lowering economic disparity.

Furthermore, the final aim examined how institutions affect income disparity. According to the Hausman specification test, the fixed effect was the most desirable option. Based on the results, it was concluded that institutions had a negative and substantial impact on income disparity.

The findings from all estimate methodologies did not refute the premise that government final consumption spending reduces income disparity, even if the system GMM was the recommended model. However, it was shown that the negative impact was greater and more substantial for health expenditures as a proportion of GDP than for education spending, indicating that many residents in ECOWAS member nations benefit much from public health investment. There none of the model's parameters exhibited autocorrelation, and the tools employed to address endogeneity were genuine and exogenous, according to

the system GMM post-estimation results. It was found again that inflation and economic disparity go hand in hand, whereas natural resource depletion goes hand in hand with population density. Finally, there is no association between income inequality and unemployment that we can discern.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The research set out to accomplish three (3) goals in assessing the impact of government spending and institutions on income inequality for a subset of ECOWAS nations between 1990 and 2019. Examining how government final consumption spending affects income disparities in ECOWAS member nations was the first goal. Finding the distinct impact of government expenditure on income disparities among ECOWAS nations was the second goal. Determining the impact of institutional quality on income disparities in ECOWAS nations was the third goal.

Unbalanced panel data was estimated using fixed and random effect estimators in order to meet the aforementioned goals. Government spending on health and education as a percentage of GDP, institutional quality, and final consumption expenditures were all able to be examined in relation to income inequality. When deciding between fixed and random effects, the study used the fixed effect estimate, as shown by the Hausman specification test.

However, since there are several factors that may be both directly and indirectly connected with income and inequality as well as with spending, the relationship between government final consumption expenditure and income inequality may lead to the endogeneity issue. The endogeneity issue in the spending and income inequality model was subsequently addressed by the research using the Blundell-Bond system GMM estimate approach, which produced consistent and trustworthy findings.

The results showed that government final consumption spending had a substantial and negative impact on income inequality, as shown by the fixed effect estimators. This was in line with the system GMM estimator, which showed that government final consumption spending had a substantial and adverse impact on income inequality. The study's expectations were met by these outcomes. This indicates that a rise in public consumption spending by the governments of ECOWAS member nations will reduce income disparity. Once again, for the system GMM, there was a substantial and negative correlation between population density and income disparity.

Furthermore, the results of the fixed effect analysis, which separated government spending into two categories—health and education—showed that the coefficients for both categories were significant and negative. This was in line with what the research had anticipated. Additionally, it was shown that there was a substantial and negative association between income inequality and foreign direct investment (FDI) for the fixed effect.

The research discovered that the coefficients of spending on health and education were both significant and negative for the system GMM estimator. Nonetheless, it was evident that compared to education spending, health spending as a percentage of GDP had a greater impact on lowering income disparity. Additionally, it was discovered that there was a strong and negative correlation between income inequality and FDI's influence on it according to the system GMM estimator. Furthermore, there was no significant correlation found between natural resources, unemployment, or population density and inflation and income disparity, although there was a positive and substantial association with inflation.

Finally, institutional quality significantly reduces income inequality for both the system GMM estimator and the fixed effect estimator. Thus, the ECOWAS region's institutions are part of the growing wealth disparity. This result is indicative of poor institutions across Africa, particularly in the ECOWAS subregion. Additionally, it was shown that although inflation expands the gap in income inequality in the ECOWAS, foreign direct investment (FDI) has a lowering influence on income inequality for both the fixed effect and system GMM. The fixed effect model also showed that income disparity is lowered by the availability of natural resources whereas unemployment dramatically widens the gap in inequality.

Conclusions

The study's results were used to draw the following conclusions. The research's primary goal was to look at how government final consumption spending affected income disparities in ECOWAS member nations. After selecting 13 ECOWAS members, the study found a negative correlation between income inequality and government final consumption expenditure.

Furthermore, the results of the second goal, which examined the separate effects of government spending on income disparities in the ECOWAS member states, indicated a noteworthy inverse relationship between government spending on health and education and income disparity. Nonetheless, compared to education spending, it was shown that health spending relative to GDP had a greater impact on lowering income disparity.

Lastly, the research discovered that institutional quality considerably expands the income inequality gap in ECOWAS member nations, fulfilling the third purpose, which aims to ascertain the impact of institutional quality on

income disparities in ECOWAS countries. This result may be explained by the sub-poor region's institutions as well as institutional inertia, a phenomena that is typical of developing nations.

Recommendations

The study's findings are that there is a statistically significant and robustly negative correlation between government spending and income disparity. In comparison to government final consumer expenditure in the ECOWAS, the research found evidence to support the idea that disaggregated government spending has a stronger impact on decreasing income inequality; nevertheless, the effect is highest for investment on health. In this regard, the governments of these chosen ECOWAS nations, through the Ministry of Finance and other stakeholders, ought to work harder to raise the proportion of GDP that they spend on health and education since the aggregated spending has a bigger effect on decreasing income inequality than government final consumption expenditure.

Furthermore, the research showed that in the ECOWAS sub-region, low institutional quality increases income inequality. Therefore, in order to ensure an equal distribution of revenue across ECOWAS, efforts to increase corruption control and strict respect to the rule of law should be taken into account, even if strengthening ECOWAS institutions as a whole is crucial. To further increase the well-being of ECOWAS members, human capital should also be developed, money should be employed properly, and natural resources should be managed wisely.

The research also shown a negative correlation between income inequality and FDI. This means that in order to ensure that citizens have full access to

productive resources, the Ministries of Trade and Industry in these countries should take the appropriate steps to attract foreign direct investment. Additionally, the ECOWAS countries should increase but regulate the flow of foreign capital to ensure that foreign direct investment does not displace labor-intensive industries.

Furthermore, the research demonstrated a negative correlation between income inequality and population density. This suggests that new districts should be established in densely populated regions by the governments of the different ECOWAS member states. Decentralization, in particular, gives these regions access to opportunities and financial resources that contribute to the reduction of income disparity.

Additionally, the research discovered a negative correlation between economic disparity and natural resources. This suggests that the Ministry of Lands and Natural Resources in each of the ECOWAS member states should have the much-needed ability to manage natural resource rents and other associated income as well as to negotiate beneficial contracts and obtain greater rents. A fresh approach to administering natural resources is necessary in order to enhance governance, linkages between sectors, and the development of human capital, capacity, and infrastructure. It is also necessary to guarantee strong legislative laws, supervision, and representation at every stage of the value chain for natural resources.

Ultimately, a quick examination of how inflation affects income disparity points to an increase in income inequality due to inflation. This suggests that in order to maintain a low rate of inflation and boost export competitiveness, the central banks of the chosen ECOWAS nations should implement monetary

measures. In order to lower inflation and preserve strong macroeconomic stability, ECOWAS nations that have implemented inflation-targeting policies should concentrate on it as well.

This research had several limitations, but they had no impact on the caliber of the conclusions drawn from it. The research focused on the scarcity of yearly data for a few important variables. Regarding health and education spending, some ECOWAS nations lacked statistics.

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APPENDICES

APPENDIX A: HAUSMAN SPECIFICATION TEST FOR FIXED AND RANDOM EFFECT

Dependent variable=Income Inequality

Explanatory Variables	(b) Fixed	(B) Random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Government final expenditure	-0.00241	-0.00102	-0.0014	0.000808
Unemployment	0.0051	-0.00167	0.006775	0.001057
Population density	-0.00014	-1.1E-05	-0.00013	8.61E-06
FDI	0.002877	0.001349	0.001528	0.001104
Natural resources	-0.00161	-0.00183	0.00022	0.000505
Inflation	0.003427	0.002894	0.000534	0.000195

b = Consistent under Ho and Ha

B = Inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

chi2(7) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)

= 382.08

Prob>chi2 = 0.0000

APPENDIX B: HAUSMAN SPECIFICATION TEST FOR FIXED AND RANDOM EFFECT

Dependent variable=Income Inequality

Explanatory Variables	(b) Fixed	(B) Random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Institutional quality	-0.00158	-0.00216	0.000579	0.000147
FDI	0.001621	0.000275	0.001346	0.00115
Unemployment	0.004281	-0.00118	0.005464	0.001121
Population density	-0.00012	-1.3E-05	-0.00011	8.92E-06
Natural resources	-0.00128	-0.00164	0.000358	0.000563
Inflation	0.003083	0.002665	0.000418	0.000239

b = Consistent under Ho and Ha

B = Inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

chi2(8) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)

= 415.24

Prob>chi2 = 0.0000

APPENDIX C: HAUSMAN SPECIFICATION TEST FOR FIXED AND RANDOM EFFECT

Dependent variable=Income Inequality

Explanatory Variables	(b) Fixed	(B) Random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Health exp. % GDP	-0.00436	-0.00128	-0.00308	0.000567
Education exp. % GDP	-0.00224	-6.63E-06	2.23E-03	0.000706
FDI	0.003788	0.001765	0.002023	0.001052
Unemp1oyment	0.004187	-0.00178	0.005971	0.001057
Population density	-0.00014	-1.1E-05	-0.00013	8.61E-06
Natural resources	-0.00213	-0.00184	-0.00029	0.000518
Inflation	0.003572	0.002906	0.000666	0.000189

b = consistent under Ho and Ha

B = inconsistent under Ha, efficient under Ho

Test: Ho: difference in coefficients not systematic

chi2(8) = (b-B)'[(V_b-V_B) ^ (-1)] (b-B)

= 421.91

Prob>chi2 = 0.0000