



DOI 10.2478/sbe-2024-0057

SBE no. 19(3) 2024

FINANCE AND INEQUALITY IN WEST AFRICAN COUNTRIES: DOES SIZE MATTER?

Muhammad-Bashir Owolabi YUSUF

Al-Hikmah University, Ilorin, Nigeria

Nur Farhah MAHADI

IIUM Institute of Islamic Banking and Finance, Malaysia

Abstract:

This study delves into the intricate interplay between finance and income inequality within the context of 16 West African nations. It specifically scrutinizes the impact of the size of financial development on income inequality, drawing inspiration from Greenwood and Jovanovic's (1990) theory. The analysis spans a substantial period, from 2010 to 2020, and relies on panel secondary data. A comprehensive examination of the data employs various estimation techniques, including Pooled Ordinary Least Square, Random Effect Model, Fixed Effect Model, and the Generalized Method of Moments (GMM), to elucidate the relationship under investigation. The panel data analysis results strongly favor the Fixed Effect model. Furthermore, both the Fixed Effect model and the GMM reveal substantial support for an inverted U-shaped relationship, demonstrating remarkable robustness with slight variations in significance. Notably, the study highlights the significance of lagged Gini values, GDP per capita growth, trade openness, inflation, government consumption, and infrastructure in influencing income inequality.

Keywords: *Finance, Inequality, Size, West Africa*

1. Introduction

Income inequality is a globally recognized economic phenomenon that has surged to the forefront of international concerns, slated for resolution by 2030. The escalating rates of income inequality in developed economies and middle-income countries, including China and India, over the past three decades have precipitated this heightened attention. However, over the last two decades, several economies in Latin America, the Caribbean, and regions of Africa and Asia have witnessed a decline in income inequality, as reflected in reduced Gini coefficients. These developments underscore the pervasive and adverse impact of income inequality on lives worldwide. Income inequality has triggered economic unrest and job insecurity, prompting mass protests in both the North and the South. Disparities in income and limited opportunities for prosperity in our rapidly changing world perpetuate a volatile environment, fueling the growth of inequality and fostering widespread dissatisfaction among individuals. Thus, it is evident that income inequality has profound

repercussions, extending beyond the economic realm to sow social and political tensions, even in more stable countries (OXFAM, 2019, and World Social Report, 2020).

Africa, among the world's poorest continents, ranks as one of the most unequal regions, surpassed only by Latin America (AfDB, 2012). African countries collectively fall into the categories of low-income and low-middle-income nations, with inequalities on the rise in some and diminishing in others. Despite the concerted efforts of some economies to mitigate inequality, wealth and income continue to concentrate among the few. For instance, over 30 percent of West Africa's population survives on less than \$1.90 per day (OXFAM, 2019). In 46 of the 57 countries in the region, the richest 1 percent has seen its share of income increase, while in 92 countries, less than 25 percent of global income accrues to the bottom 40 percent, according to data spanning from 1990 to 2015 (SDG Report, 2019).

In West African countries, the top 1 percent of the population collectively possesses more wealth than the rest of the population combined. In Nigeria, the most populous and leading economy in terms of Gross Domestic Product (GDP), the combined wealth of five individuals surpasses the entire budget for the fiscal year 2017. With such extreme wealth concentration, approximately 60 percent of the population lives on less than \$1.25 per day, entrenching the scourge of poverty at an alarming intensity. In the region's second-largest economy, Ghana, the monthly income of one of the wealthiest citizens equals what one of the poorest might earn in a century. Meanwhile, between 2007 and 2016, the number of millionaires in US Dollars increased by 1,000 individuals, while the ranks of the impoverished swelled by an additional 1 million people (OXFAM 2019).

Over the past three decades, the countries in the region have generally witnessed a reduction in income disparity, with the notable exception of Nigeria, the largest economy. Statistical evidence reveals that wealth distribution in the region tends to favor the middle-income earners. The share of income held by the intermediate 60 percent increased by 3.1 percent, and the Gini coefficient declined by 3.6 between 1990-95 and 2014-17 in a study conducted across Burkina Faso, Mali, Niger, Senegal, and Ghana. Strikingly, Ghana remains an exception to these improvements, despite its status as the wealthiest country among those studied (Cavero, 2020).

Finance plays a pivotal role in addressing numerous human challenges, underscoring its significance in mitigating income inequality. African nations have instituted various reforms aimed at restructuring their economies and liberalizing financial markets to ensure the flow of finance across income groups and social strata. The development of the financial sector is critical for economic well-being, as it facilitates access to financial services and products. Efficient and robust financial intermediation is the cornerstone upon which most economies enhance the welfare of their citizens. To achieve sustained, long-term economic growth, it is imperative to bolster the financial sector by expanding financial intermediation in Africa. However, increased economic growth in the continent has not translated into a commensurate reduction in poverty (Asongu et al., 2020). The Growth-Inequality link suggests that despite impressive economic growth rates in Africa during the 2000s, this has not led to a significant reduction in income inequality or wealth redistribution (AfDB, 2012). This predicament is particularly pronounced in many Southern African countries and Comoros (Adeleye et al., 2017).

Although the financial sectors in ECOWAS states are on an upward trajectory, corporations and households encounter challenges in securing loans from financial institutions. Existing literature points to the inadequacies in developing the financial sector, either through market or institutional arrangements, which impede the potential benefits of foreign direct investment (FDI) and other forms of capital formation (Asongu et al., 2020).

In comparison to developed economies, Ola (2020) contends that access to financial instruments in emerging markets is hampered by deficiencies that largely arise from financial institutions' lack of trust in borrowers. Consequently, higher interest rates are charged, making it difficult for low-income earners to access financial credit from other financial institutions. The issue of monetary policy management is also salient, as a substantial portion of the region's population lacks bank accounts, thereby rendering the control of economic activities more challenging for central banks in the region.

1.2 Statement of the Research Problem

Finance and Income inequality's relationship have received much attention globally. In Latin America, sub-Saharan Africa and Asia, income inequality has been the main cause of unrest. African countries have been plagued with increasing poverty and income inequality. Arguably, the economic growth achieved so far has not reflected in the reduction of income inequality and poverty significantly. Moreover, the unease in poverty and income inequality reduction can be attributed to low level of financial intermediation in the continent which results to the inability of enterprises to have absolute access to financial facilities as compared to other developing economies (Demirgüç-Kunt and Klapper, 2012). A desirable threshold development of the financial sector would help improve income earned by the poor and thus dropping income inequality (Demirgüç-Kunt et al, 2007).

A good number of studies suggest the sophistication of the rich in determining what policy should be put in place, coupled with the fixed income earned by the middle class and poor engendered financial crises. Evidenced by the turning-point of global finance are; leverage deepening, corporations and households having more debt than can be repaid, and weakening of mortgage clauses (Rajan, 2010), all went to the few rich and gives room for lobbyist to put forward demands for non-state participation to avoid regulations which may not favor the rich (Acemoglu, 2011). A wide income gap between the rich and the poor can cause conflict due to lack of trust and social cohesion which would result to poor investment atmosphere. Conflict is more likely to occur where there is mismanagement of a common resource and the rise in inequality increases the grievances felt by the less favored group (Bardhan, 2005 and Lichbach, 1989). Income inequality affects the rate at which poverty reduction is significant due to improvement in economic growth (Ravallion, 2004). Economic growth is proven to be less efficient in reducing poverty rate in countries with a soaring inequality at earlier stage. Moreover, to the extent that economies are periodically subject to changes of various kinds that sabotage growth, when inequality is high, a good number of people will be exposed (International Monetary Fund, 2015). From the above stated problems, the following questions then arise:

1. What is the relationship between financial sector size and Income Inequality in the selected West African countries?

2. To what extent does financial sector size affects Income Inequality in the selected West African countries?

1.3 Objectives of the Study.

The main objective of the study is to examine if increase in financial sector size have substantial effect on income inequality. While the specific objectives are:

1. To examine the relationship between Finance and Income Inequality in the selected West African countries.
2. To examine the impact of size on the relationship between Finance and Income Inequality in the selected West African countries.

2. Literature Review

2.1 Conceptual Review

2.1.1 Financial development.

Financial development refers to some improvements in the provision of information about potential investments and allocating capital, monitoring firms and influencing corporate governance, trading, diversification, and management of risk, mobilization and pooling of savings, easing the exchange of goods and services. In other words, it is that part of the private sector development strategy to stimulate economic growth and reduce poverty. This process of reducing costs of acquiring information, enforcing contracts, and executing transactions results in the emergence of financial contracts, intermediaries, and markets (Demirgüç-Kunt and Levine, 2008; and IGI-Global, 2021). The widely used variable for financial development in economic literatures is the Total Bank credit to private sector to GDP ratio (Isah and Soliu, 2016). This is the total credit directed towards the improvement of the private sector by financial institutions in a given country.

2.1.2 Income Inequality

Income inequality is in the difference in income earned by groups in a society (OECD, 2022). Studies on finance-inequality relationship frequently use Gini coefficient as the dependent variable and it is derived from Lorenz curve frame work. The Lorenz curve depicts the percentage of aggregate income earned by the cumulative percentage of the population. The framework illustrates that in an equally income distributed society, the poorest 25% of the population would earn 25% of the total income. Also, the poorest 50% of the population would earn a share of income equal to their percentage and the curve follow the path line of equality at 45° line. This variable is the most widely used (Keely, 2015). However, other researchers like Mansour and Wendel (2015) and Mansoor (2018) use Estimated Household Income Inequality, nevertheless, the variable is measured in Gini format.

2.1.3 Inflation

Inflation is as a result of general rise in the price of goods and services. It is often measured using consumer price index; the cost of market basket of consumer goods and services relative to the cost of the same bundle in a particular base year. Inflation can be seen as a way through which income is redistributed between classes in the economy by the government since the effect is not uniform on an economy's households (Monnin, 2014 and Samuelson and Nordhaus, 2010). It has been used intensively in inequality research works. Brei *et al.* (2018) and Monnin (2014) have revealed that Inflation narrows income inequality with a significant effect. In contrast, Altunbas and Thornton (2020) documented a widening gap as inflation rises. However, the result is insignificant.

2.1.4 Trade Openness

This refers to the extent to which an economy is actively in the international market. It is measured as the total of imports and exports relative to the GDP (Alotaibi and Mishra, 2014). Trade openness has been examined to be a factor that affects inequality in many studies, it has been seen to reduce income inequality in developing and emerging economies disproportionately and increases inequality in developed countries going by Stolper-Samuelson theorem (Dorn *et al.*, 2021). Denk and Cournede (2015) and Asongu and Vo (2020) revealed that trade openness narrows inequality.

2.1.5 Broad Money

Broad Money also known as M2, comprises of M1 (currency at disposal of the public and deposits with banks) and savings that demands notification before withdrawals (WDI, 2020). In other words, it is the level of money in circulation which includes retail, wholesale banks and society deposits (Sloman *et al.*, 2015). This macroeconomic indicator has been used in several income inequalities. Related studies: Kocak and Uzay (2019) have found it to be reducing the level income inequality in turkey and contrarily, Adu (2019) and Azam and Raza (2018) reported an increasing impact of money supply to income inequality.

2.1.6 Growth of GDP per capita

Growth of GDP per capita is the percentage change in the income per capita of household in an economy, annually (World Development Indicators, 2020). This indicator is a measure of how healthy an economy is (World Health Organization, 2022). Isah (2021), Van Vethoven *et al* (2018), Adeleye *et al.* (2017) and Mansour and Wendel (2015) have revealed that an increase in the GDP per capita growth leads to decrease in income inequality.

2.1.7 Government Consumption

Government consumption to GDP ratio also known as public spending to GDP ratio refers to the the total government expenditure on the purchase of goods and services as a proportion of GDP. These spending are usually on education, healthcare, and other social amenities that would help foster growth (Corporate Finance Institute, 2021). In Mansoor (2018) and Isah (2019) the indicator widens income inequality. Conversely, Agnello *et al.* (2012) document that government consumption narrows inequality.

2.1.8 Infrastructure

This is stock of essential facilities and capital apparatus needed for the functioning of an economy. In this study it is measured by number of mobile subscription per 100 people. This refers to the subscriptions to a public mobile telephone service that provide access to the Public Switched Telephone Network using cellular technology (World Bank 2020). It has been used in a number of studies on different account. Bayar *et al.* (2021) found that increase access to mobile subscription help in increasing access to finance which help reduce inequality. Also, Asongu and Vo (2020) and Mansoor (2018) have shown that mobile subscription per 100 people has a negative impact on inequality; an increase mobile subscription per 100 people, drops income inequality.

2.1.9 Bank Credit to Private Sector

Solely, it is the total credit by commercial banks to the private sector. This comprises of loans and advances, purchases of non-equity securities, trade credits and other accounts receivable. This has been seen as a catalyst to economic growth in emerging economies and also a tool by apex banks and governments to reduce inequality (Olowofeso *et al.*, 2015). Brie *et al.*, (2018) revealed a narrowing effect of the indicator on income inequality.

2.2 Theoretical Review

2.2.1 The Inverted U-Shaped Theory

A number of theories have been developed in relation with finance and income inequality. The Greenwood and Jovanovich (1990) model was developed to explain the role of financial intermediaries in pooling risk across large number of individuals and allowing higher and safer returns in trades. It proposes that there are three stages in which financial development affects income inequality: at infancy stage, the cost of investment via intermediaries are higher and thus, the level of inequality is high and not many could have access to finances. At this point, the economy is at slow phase of growth; at the intermediate phase of financial development, financial intermediaries begin to develop. This is featured by the increase in savings and economic growth, and the widen gap between the rich and the poor. The poor at this instance have lower saving capacity and thus accumulate wealth at slower pace; At the advanced stage of financial development, the real sector grows and the financial sector development in response improve efficiency and drop down transactions cost as many people gain access to financial securities, thereby narrowing the inequality gap. With income inequality rising at the early stage and falling at the advanced stage of financial development, the inverted U-shaped relationship is inevitable (Tita & Aziakpono, 2016, Brei *et al.* 2018 and Altunbas & Thornton, 2020). This theory has been adopted by Mansoor (2018), however, the outcome of the research revealed a U shaped relationship.

2.2.2 Financial Market Imperfection

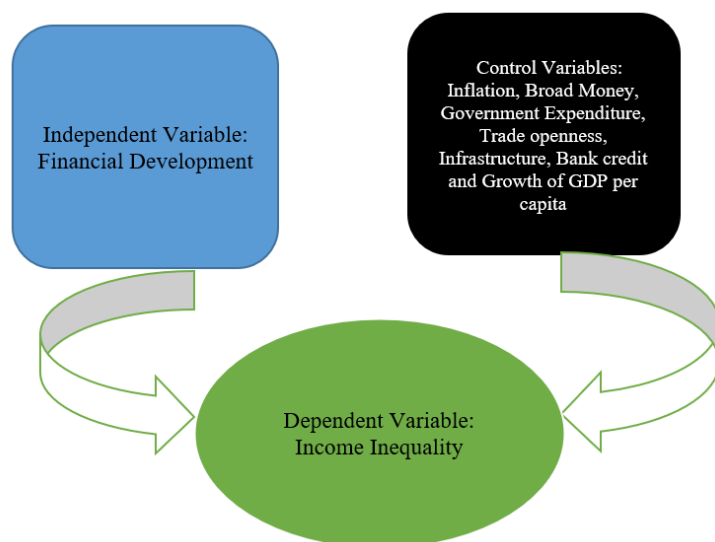
Information and transactions costs are the main cause of financial market imperfection as they adversely target the poor, who have disadvantageous credit records or lack collateral (Brei *et al.* 2018). In Galor and Zeira (1993) two sector model, it is proposed that income distribution is via family wealth (inheritance) between generations and/or

investment in human capital accumulation. Individuals can decide either to improve their skills so as to be skilled workers or not accumulate human capital and work as unskilled laborers. When individuals work as either skilled or unskilled workers; depending on their level of education, they spend their earnings and leave inheritances. Individuals' inheritance determines what they choose to be among the labor force; become skilled through human capital investment or remain unskilled. The key point here is, individuals who inherited fewer bequests can borrow to fund human capital development. To borrow, one has to offer collateral to lenders and borrowing incurs costs. Due to financial market imperfections, the poor have the tendency to under invest in human capital accumulation and end up being less skilled or unskilled and at the end leave less or no inheritance and the circle runs continuously unless one act otherwise.

Similarly, Bernejee and Newman (1993) occupational choices model, agents receive their initial wealth at maturity in the form of a bequest from their parents and they may apply for a loan which requires collateral. Contract enforcement is imperfect and borrowers can default the loan agreement. Thus, access to credit is limited and those (the poor) demanding a huge amount of loanable funds for an occupational choice are cut off. In this way, the poor will choose to work for the wealthier employers as wage earners, with this result they will end up with wage contracts instead of financial contract. This model breaks down into a situation where ones' choice of occupation is determined by initial wealth distribution and thus determines how much people earn, save and the risk involved in such decision. The two different model signify that if financial markets are perfect the society will achieve social efficiency (Tita & Aziakpono, 2016 and Altunbas & Thornton, 2020).

2.3 Conceptual Framework

Figure 1 Relationship among the Variables



Source: Author (2023)

Based on the above figure, this study is basically built on the basis of the relationship between finance (Independent variable) and income inequality (Dependent variable). However, other related economic variables are included in order to check the robustness of finance income inequality relationship and also to see how those variables affect income inequality. These variables are termed Control variables.

According to Gujarati (2004), dependent variable is that variable whose behaviour depends on one or more other variables. The dependent variable is income inequality. On the other hand, the independent variable refers to that variable which explains the behaviour of the dependent variable. Here, the variable of interest is financial development.

Control variable on another note, is a variable that is held constant in a research study. It is controlled in research because it is not central to the study but it could influence the results in the study (Scribbr, 2021). In this study, the control variables include: Inflation, Broad Money, Government Expenditure, Trade openness, Infrastructure, Bank credit and Growth of GDP per capita.

2.3 Methodological Review

Bearing in the mind the nature of the research that is being carried, the related empirical literature all used quantitative data from various secondary sources, for example the World Development Indicators (WDI). A number of techniques have used to arrive at the objectives of each study using panel data in cross-country studies [the likes of Nikolosky (2013) and Mansoor (2018)], and time series in a country's study [the likes of Adu (2019) and Isah (2021)].

With regards to theoretical underpinning, most of the researchers adopt/adapt to Greenwood and Jovanovic (1990) test for non-linear relationship using various techniques (mode of data estimation) to ascertain the relationship which includes; General Method of Moments (GMM), Auto-Regressive Distributed Lag (ARDL), Panel data estimation technique (Random Effect Model, Fixed Effect Model and Ordinary Least Square), Augmented Mean Group estimator among others.

2.3.1 Apriori Expectation

The summary of the expected relationship among the independent variables and the dependent variable are presented in Table 1.

Table 1: Variables and Expected Outcome

Variable	Proxy	Source	A priori Expectation
Income Inequality (Dependent Variable)	Gini	Standardized World Income Inequality Database	None
Financial Development	Domestic Credit to Private sector as a ratio to GDP	World Development Indicators	Negative

Bank Credit to Private Sector as a ratio to GDP	None	World Development Indicators	Negative
Money Supply (M2) as a ratio to GDP	None	World Development Indicators	Positive
Inflation	Consumer Price Index	World Development Indicators	Negative
Trade as a ratio to GDP	None	World Development Indicators	Positive
Growth of GDP per capita	None	World Development Indicators	Negative
Infrastructure	Number of Mobile Subscription per 100 people	World Development Indicators	Negative
Government Consumption as ratio to GDP	None	World Development Indicators	Negative

2.4 Theoretical Framework

The Greenwood and Jovanovic (1990) economic model on financial development and Income Inequality will best capture the objective of this study. It posits that financial development and income inequality has an inverted U-shaped relationship, implying a rise in income inequality at the early stage of financial development where loans are costlier. Subsequently, the intermediate stage described by increased savings and economic growth which deliberately increase the potential of the financial services although the poor has less wealth accumulation capacity. Lastly, the advanced stage where the real sector is revamped and therefore increasing the efficiency of the financial sector to have a wider coverage of services that would drop the cost involved in transactions and improve financial development, thereby, reducing the level of income inequality. This framework has been used or examined in Asongu and Vo (2020), Mansoor (2018), Nikoloski (2013), Mansour and Wendel (2015), Tita and Aziakpono (2016) and many others as the basis of Finance-Inequality argument.

2.5 Research Gap

The studies empirically reviewed lay more emphasis on global and continental implication of income inequality either as a result of financial development. This study will thus, focus on the impact and threshold of finance on/to income inequality and inclusion of certain control variable that would likely give a bigger picture of the actual impediment to income equalization in West African countries. Most of these countries are a fast growing

economy and have received less empirical studies targeting finance and income inequality in the region. This study will fill in the gap with the use of a more recent data (2010 to 2020) to contribute to the body of knowledge as well as for policy purpose.

3. Research Methodology

3.1 Model Specification

This paper adapted Anyanwu et al. (2016)'s model specification. The multiple regression analysis model specifies income inequality as a function of financial sector size and its other determinants. Therefore, the basic model specification is given as;

$Gini = F(IV, CV) \dots\dots\dots$ [Equation 1]

Where: Gini is the measure of income inequality and the dependent variable; F is the function; (IV) the Independent variable and; (CV) Control Variables.

The dynamic panel econometric model is thus;

$\ln Gini_{ct} = \alpha + \beta_1 \ln Gini_{c, t-1} + \beta_2 Fd_{ct} + \beta_3 \ln Fd_{ct}^2 + \theta X_{ct} + \mu_c + v_{ct} \dots\dots\dots$ (Equation 2)

Where $\ln Gini_{ct}$ is the log of Gini coefficient, α is the intercept, $\ln Gini_{c, t-1}$ is the lagged value of Gini coefficient, Fd_{ct} is the financial sector size measured in terms of Total credit to private sector, X is a vector of controlled variables, μ_c is the country-specific effects, v_{ct} is the disturbance term, and the subscripts c and t index country and year respectively. In equation 2, we include financial development and squared financial development to capture potential non-linear relations between income inequality and financial sector size, in essence, investigate Greenwood and Jovanovic (1990) hypotheses. While the financial markets may be amicable to equal income distribution, we posit that the oversized financial markets can be harmful. β is the key parameter of the model to be estimated. The inclusion of Control variables in the model is to help determine the robustness of the effect of Finance on Income inequality. The CV would be used interchangeably and to some extent combined to attain that.

3.2 Sources of Data

Data used in this research work are panel data collated from two sources, namely; World Development Index (WDI, 2021) and Standardized World Income Inequality Database (SWIID); the most comprehensive and cross-country comparable income inequality data compiled by Solt (2020). The dependent; Gini coefficient is sourced from the SWIID. On the other hand, the explanatory variables are sourced from WDI which happens to be the major source of economic data for various purposes. This research encompasses data of all West African countries with regards to income inequality measured in terms of Gini coefficient, financial development measured as Total Credit to Private Sector as a ratio to GDP, Total Bank Credit to Private Sector, Trade Openness, M2, Inflation, GDP Per Capita Growth, Government Consumption and Infrastructure. The dataset is assumed to be sufficient given that most of the countries involved are among the largest in economic size and population. The data span from 2010-2020 to enable good number of observations on each country. The reason why panel data is being used in this study is the fact that it has so many advantages. It is the most suitable form of studying dynamics of changes, it allows the use of more complicated behavioral models and panel data also gives more informative data,

more variability, less collinearity among the variables, and more degrees of freedom hence more efficiency (Gujarati, 2004 and Hiestand, 2005).

3.3 Estimation Technique

The Generalized Method of Moments is a dynamic panel model estimator that is characterized by the involvement of lagged values of the dependent variable as part of the regressors. This is because the use of the instruments at levels rather than differences (i.e $Y_{i,t-2}$ than $\Delta Y_{i,t2}$) has lower variances and no singularities. This is as a result of the orthogonality condition of the technique which severs the connection between the lagged values of Y_{it} and the disturbance term (Baltagi, 2011). This method has been classified as linear, consistent, efficient with minimum variance. It is also termed Best Linear Unbiased Estimator (BLUE) (Gujarati, 2004).

The analysis of the estimation technique follows a unique process unlike most techniques. It is mostly used where the data are likely unknown and thus, other techniques cannot be used (Clarke and Windsmeijer, 2015).

This technique overcomes these problems; possible autocorrelation, individual heteroscedasticity and omitted variable bias. The consistency of the estimator is relative to the validity of the instrumental variables (explanatory variables) in the regression. This is ensured in two specification tests. The first test is the Sargan test used in determining over-identifying restrictions for overall validation of the instruments in the estimation by analyzing the sample analogy of the moments condition (Batou *et al*, 2017). There are 3 specific conditions in using the test. First, the probability value must be greater than 5%. Second, the P-value must not be less than 0.1. Third the P-value must be greater than 0.25% (Ujunwa, 2020). Accepting the null hypothesis approves the validity of the model. The second test of specification is the test for the error term serial correlation which follows the same hypothesis decision as the Sargan test where accepting the null hypothesis signifies the validity of the specification (Batou *et al*, 2017).

Following the work of Anyanwu *et al.* (2016), Louis and Christele (2019) and Mark *et al.* (2020) the Generalized Method of Moments (GMM) will be employed to ascertain the result of the relationship between “Financial development and Income inequality” in their context. For further checks, the Panel Least Square estimation will also be conducted in line with Mansoor (2018) where the Pool Ordinary Least Square, Fixed Effect and Random Effect model are examined for the study output.

4. Results and discussion

4.1 Presentation and Analysis of Results

4.1.1 Descriptive Statistics

This involves the presentation of the statistical properties of some selected key variables in the study. It helps in identifying the Mean, Standard deviation, Minimum and Maximum value of the selected variables which gives the bigger picture of the data collected.

Table 2: Descriptive Statistics of Gini Coefficients

Country	Mean	Std. Deviation	Minimum	Maximum
Benin	48.65455	1.162208	46.30000	49.8000
Burkina Faso	46.93636	2.530607	44.30000	51.6714
Cote'd Ivoire	54.33182	3.135030	48.08333	57.0000
Cape Verde	53.37727	1.046881	52.40000	55.48333
Ghana	45.67273	1.192217	43.08000	46.6000
Guinea	43.84545	1.775780	41.70000	46.76667
Gambia	45.71364	0.336965	45.20000	46.3000
Guinea Bissau	43.71818	2.442242	40.03636	47.4000
Liberia	39.21250	0.176975	39.0000	39.57500
Mali	40.43750	0.476765	39.71875	41.15625
Mauritania	40.53636	0.356935	40.1000	41.3000
Niger	41.87273	1.929518	40.1000	45.41429
Nigeria	45.52727	0.594198	44.33333	46.3000
Senegal	43.49091	0.317662	43.0000	43.9000
Sierra Leone	42.72727	0.822303	42.1000	44.9000
Togo	47.90000	1.911544	46.3000	51.6000

Source: Author's Computation 2023

Table 2 above presents the descriptive characteristics of the Gini coefficients data for the selected countries. Properties are measured along mean, standard deviation, minimum and maximum values of the variable; Gini coefficient. From the values, on average Cote'd Ivoire is the most unequal economy with a mean value of 54.33 and Liberia the least unequal economy among the selected economies accounting for an average value of 39.21. Liberia also happens to be the country that accounts for the least Gini value along with Mali at the minimum value of 39.00 and 39.72 respectively. As identified by the country with highest average value, subsequently Cote'd Ivoire has the highest income gap at a point in time which stands at 57.00. The standard deviation has an important role as it determines the level to which the series deviates from their mean values. Given that, the most spread series is that of Cote'd Ivoire with 3.14 and the least spread series is accounted by Liberia at 0.18.

Table 3: Descriptive Statistics of Financial Development

Country	Mean	Std. Deviation	Minimum	Maximum
Benin	16.54104	0.668534	15.53712	17.61070
Burkina Faso	23.15361	5.221683	15.37034	29.26152
Cote'd Ivoire	19.10701	1.203900	16.74185	21.13696
Cape Verde	63.37841	3.812953	58.68224	73.19206
Ghana	14.02741	1.794698	10.87826	16.07731

Guinea	8.602375	2.340781	3.942702	11.82085
Gambia	8.872731	1.984974	5.664759	12.41966
Guinea Bissau	11.84801	3.233542	7.034745	16.20795
Liberia	13.76171	3.360895	9.366985	17.93955
Mali	22.95434	3.254801	18.00827	26.42642
Mauritania	19.58200	2.583077	16.31856	23.60285
Niger	10.67549	0.842705	9.034273	11.75705
Nigeria	12.18582	1.381921	10.24658	14.60804
Senegal	26.91585	2.719581	21.31375	29.66478
Sierra Leone	5.978565	1.012832	4.769306	7.823819
Togo	30.47126	5.449022	21.74895	40.16302

Source: Author's Computation 2023

Based on the statistics on the Table 3 above, on average, the selected economies are on different level of financial development regarding the variable in use. Cape Verde accounts for the largest share of the financial development followed by Togo and Burkina Faso with the values 63.38, 30.47 and 23.15 respectively. Nigeria, despite being the largest economy in the region has its financial sector size value below countries like Benin, Liberia, Mauritania and so on. However, the top three economies based on average values happen to have the highest Standard of deviation values, indicating a greater dispersion in their series. Subsequently, Cape Verde has the highest Financial sector size value at a point in time; 73.19 and Sierra Leone has the lowest; 4.76.

Table 4: Descriptive Statistics of GDP Per Capita Growth

Country	Mean	Std. Deviation	Minimum	Maximum
Benin	4.694479	1.985049	1.778151	7.191434
Burkina Faso	5.652427	1.700039	2.022385	8.446282
Cote'd Ivoire	5.849139	4.375845	-4.387255	10.70650
Cape Verde	1.160164	5.597800	-14.78341	5.667752
Ghana	6.195801	3.851850	0.414443	14.04712
Guinea	6.174796	2.417473	3.696542	10.82062
Gambia	2.600050	4.437201	-8.130444	7.234890
Guinea Bissau	3.354849	3.418019	-2.4	8.084780
Liberia	2.603837	4.400142	-2.870722	8.704028
Mali	3.842066	2.842484	-1.649261	7.084684
Mauritania	3.307392	2.098380	-1.488487	5.931442
Niger	5.742284	2.572397	1.50000	10.54894
Nigeria	3.154849	3.272422	-1.794253	8.005656
Senegal	4.4452463	2.242657	0.870409	7.407486
Sierra Leone	4.424351	10.29643	-20.59877	20.71577
Togo	5.355684	1.352226	1.752801	6.543507

Source: Author's Computation 2023

With regards to the growth in real GDP per capita, the mean values indicate that Ghana has the best measure. The economy accounts for approximately 6.196 growths in per capita income followed by Guinea and Cote'd Ivoire with 6.175 and 5.849 accordingly. Cape Verde records the lowest growth with a value of 1.160 growth of GDP per capita among the economies. At a point in time, Sierra Leone has the highest growth in GDP per capita 20.716 and at the same time has the lowest growth in GDP per capita -20.599. However, the standard deviation indicates a spread series in Sierra Leone data to be the highest 8.70 (Table 4).

4.1.2 Fixed Panel Outputs

The results from the panel estimation are reported in the Table 5 below. In the first column are the regressors, that is the independent variables; the second column is the pooled ordinary least square; the third column is the Random effect output, and; the fourth, the Fixed effect model output. The asterisks (*) indicates level of statistical significance; *** means the result is significant at 1%, ** at 5% and * at 10%.

Table 5: Panel Least Square

Variables	Pool	P-Values	Random	P-Values	Fixed	P-Values
Constant	0.08733	0.1041	- 0.26560***	0.0005	-0.66571***	0.0000
LGINI(-1)	0.97479***	0.0000	1.06160***	0.0000	1.16545***	0.0000
LFD	0.00228	0.4752	0.00959**	0.0205	0.01545***	0.0041
FDSQR	2.68281	0.1611	-4.51682	0.1232	-4.97714	0.3140
GROWTH	0.00021	0.3924	-3.81861	0.8337	1.76694	0.9248
INFL	0.00030	0.2104	0.00042*	0.0677	0.00033	0.1836
LTRD	-0.00028	0.9288	0.001284	0.7327	-0.00138	0.7563
Breusch Pagan LM Test: 77.00654***						
Hausman Test: 40.540320***						
Number of Observation: 160						

Source: Author's Computation 2023

Based on the result presented on Pool Ordinary Least Square (POLS) from table 5, the lagged value of the dependent variable [Gini (-1)] is significantly increasing the level of inequality in the selected countries which is also applied to all other estimations; Random and Fixed Effect model regression output. This outcome is consistent across all regression result used in the study. The squared and squared (the nonlinear value of FD) have shown that both variables (linear or nonlinear) tend to increase the level of inequality but with no significant effect. On the other hand, both Random and Fixed Effect regression model reveal a support for the Greenwood and Jovanovic (1990) theory which proposed that when financial development increases to a certain level, a fall in inequality is eminent. However, the level of significance of the variables favors the unsquared variable (squared financial

development) which emphasizes on the significance of the increasing effect of financial development in widening income inequality.

Growth rate of GDP per capita has an insignificant impact in widening inequality on Pool Ordinary Least Square and Fixed effect outcome whereas the Random variable has shown a decreasing effect of the variable but with no significance. With regards to the effect of inflation, the outcome of the estimations revealed a positive relationship with Gini, signifying a continuous rise in income inequality as inflation increases. However, only Random effect has revealed a significant effect. Trade Openness has revealed that it has decreasing effect in both Pool and Fixed effect, whereas Random effects indicated an increasing effect of Trade Openness insignificantly.

The constant refers to the intercept; it is the expected mean value when all predictors are equal to zero. Although the explanatory variables are not equal to zero, it indicates that it has a narrowing effect on inequality under Random effect and fixed effect model at 1% level of significance. Conversely, it has an insignificant widening effect on inequality as revealed in Pool Ordinary Least Square.

Despite all these, using the panel regression requires that one use the underlying tests which gives credence to a particular model either Pooled Ordinary Least Square and /or Random effect or Fixed effect model, so as to have the most statistically unbiased technique among the three. The Breusch Pagan LM test result revealed the use of other models (Random or Fixed effect model) other than POLS due to the presence of heteroscedasticity in the model as indicated by 1% level of significance of the result. Further test to choose between the Random and Fixed effect model, the Hausman test, revealed a support for the Fixed effect model as the most fitted model.

Table 6: Fixed-Effect Results Estimation with Additional Controlled Variables

Regressors	1	P-Values	2	P-Values
LGINI(-1)	1.175977***	0.0000	1.176314***	0.0000
LFD	0.009335*	0.0713	0.009052*	0.0822
FDSQR	-9.140046*	0.0533	-8.97878*	0.0585
GROWTH	0.000174	0.3272	0.000160	0.3707
INF	0.000416*	0.0705	0.000439*	0.0604
LTRD	-0.006414	0.1372	-0.005752	0.1969
LM2	0.021826***	0.0003	0.020608***	0.0013
LGOV	0.014503**	0.0163	0.015376**	0.0136
LINFRA	–	–	2.799258	0.5447

Source: Author's Computation 2023

Table 6 is the robustness check for the selected panel model. Model 1 excluded Infrastructure and extended the model with Broad Money Supply and Government Consumption. Model 2 of the extension model added the omitted control variable; Infrastructure. The lagged value of the dependent variable exhibits same behavior as in all baseline outputs which have shown consistency of the variable in widening income gap. The financial development and squared financial development, which are the major key indicators of the study maintained their effect and thus are robust in upholding the baseline

result. However, the significance of the effect has slide difference. This is signified by the effective significance of the squared in both model 1 and 2 of the Fixed Effect estimation. Growth, inflation and trade have also maintained their effect from the Fixed Effect baseline model with inflation having a significant impact.

4.1.3 Generalized Method of Moments Baseline Output

Table 7 presents the baseline result of the study which shows the relationship between Income Inequality which is measured in Gini and Financial Development measured as Domestic Credit to Private sector as a ratio to GDP and other regressors as depicted in the table. The baseline result has neither correlation among variables nor between variables and error term and thus, the model is valid with no over specification. The probability value of both the Sargan test and the serial correlation are above 0.25 value. The asterisks (*) indicates level of statistical significance; *** means the result is significant at 1%, ** at 5% and * at 10%.

Table 7: GMM Result for the Baseline Model

Regressors	Coefficient	P-Values
LGINI(-1)	0.9851***	0.0000
LFD	0.0225	0.1560
LFDSQR	-0.0032	0.6982
GROWTH	-9.1357**	0.0127
INFL	0.0003***	0.0006
LTRD	0.0046	0.1834
Serial Correlation Test (AR2): 0.9994		
Sargan Test: 0.3693		

Source: Author's Computation 2023

From the result provided in Table 7, the lagged value of the dependent variable; Gini (a measure of inequality) [LGINI (-1)] revealed an increasing effect on inequality and therefore for every percent increase in the lagged value of the dependent variable, inequality level up by 0.99 significantly. Linear value of financial development (LFD) revealed a widening effect of financial development on income inequality with no significant impact. Conversely, the squared value of Financial Development (LFDSQR) narrows income inequality in the region, however the impact is insignificant. Both Growth in GDP per capita (GROWTH) and Inflation (INFL) have significant impact on Income inequality with GROWTH reducing income inequality and inflation increasing it. Trade Openness (LTRD) insignificantly increases inequality.

The form of relationship revealed by financial development and financial development squared signifies that there exists an inverted U-Shaped relationship between Income inequality and financial development, thereby upholding the Greenwood and Jovanovic (1990) theory of financial development despite being insignificant. Thus, we accept null hypothesis which implies that there is no significant impact of Financial Development on Income Inequality. Also, it has revealed that financial development has to

reach a certain stage before it reduces the level of inequality in the West African region despite the significance.

4.1.4 Robustness Check

As required by the objectives of the study, there is need to check for robustness of the result in the baseline, which necessitate addition and reduction of a variable which is presented in the table below with 1 and 2 representing the output of the extended baseline model.

Table 8: Extension of the Baseline Model

Regressors	1	P-Values	2	P-Values
LGINI(-1)	1.0151***	0.0000	1.0068***	0.0000
LFD	0.0653	0.1611	0.0407	0.5294
LFDSQR	-0.0295	0.2022	-0.0213	0.5615
GROWTH	0.0002	0.1429	-8.6269	0.6532
INF	0.0004	0.4819	0.0010	0.1823
LTRD	-0.0010	0.9256	0.0031	0.6961
LM2	0.0275***	0.0039	0.0132	0.2981
LGOV	0.0003	0.9805	0.0242	0.3983
LINFRA	–	–	0.0147*	0.0910
Serial Correlation Test	1.0000	–	0.9998	–
Sargan Test	0.3269	–	0.2935	–

Source: Author's Computation 2022

From table 8, extended model 1 omitted Infrastructure (LINFRA) while extending it with Money Supply (M2) and Government Consumption (LGOV). The model is robust in depicting a consistent outcome of financial development and financial development squared which is central to the study by revealing a non-significant impact of both measures and also retaining the respective positive and negative impact they have on Income Inequality. Also, the lagged value of Gini maintained the positive and as well, the significant impact it has on widening income inequality from the baseline model. The control variables from the baseline output have varied in effect and significance; growth of GDP per capita and inflation has positive and insignificant impact whereas, trade openness has negative and also insignificant impact on inequality. Among the extension variable, broad money supply has positive and significant impact meaning that increase in money supply increases inequality in the West African community while government consumption positively but insignificantly widens income inequality.

The second extension model, 2, adds Infrastructure (LINFRA) and the indicator revealed a widening effect of infrastructure in spreading or increasing inequality. With the exception of the change in effect of some of the indicators, the specification upholds the baseline impact of financial development and squared financial development. Also, the extended models are valid going by the Serial correlation and Sargan test which both revealed satisfying modeling.

4.2 Discussion of Result

From both the baseline result in table 7 and the extended model output in Table 8, the result of the relationship between income inequality and financial development is consistent with a number of studies; de Haan and Sturm (2016), Jauch and Watzka (2012) and Denk and Cournede (2015), who documented income unequalizing effect of financial development on inequality. On the other hand, Asongu and Vo (2020), Louis and Christèle (2019) and Adeleye *et al.* (2017) have contrary outcome that financial development does reduce income inequality. Using inverted U-shaped theory based article, the study is contrary to what Mansoor (2018) and Adu (2019) which have significantly reported decreasing effect of financial development on inequality and an increasing effect of squared financial development on the dependent variable.

Altunbas and Thornton (2020) documented a widening gap of inequality as inflation rises which is consistent with the outcome of this study, whereas Brei *et al.* (2018) and Monnin (2014) have revealed that Inflation narrows income inequality with a significant effect which opposes the outcome of this result, however, it is consistent with the Fixed Effect extended model. From the baseline result, Trade outcome is increasing inequality in emerging economies which is contrary to the claim of Stolper-Samuelson theorem as reported in Dorn *et al.* (2021) that Trade decreases inequality in developing nations and increases inequality in developed economies. In the extended model 1 of the GMM, the result is similar to what Denk and Cournede (2015), Asongu and Vo (2020) and Adu (2019). However, the fixed effect model outcome upholds Stolper-Samuelson claim of the decreasing effect of trade in developing economies but with no significant effect in both the extended models and the baseline model. Growth is significantly effective in reducing inequality from the initial GMM model. Unanimously, this is consistent with Van Vethoven *et al.* (2018), Adeleye *et al.* (2017) and Mansour and Wendel (2015).

Broad Money, Government Consumption and Infrastructure increase the level of inequality, with Broad Money and Infrastructure having significant impact in increasing inequality. Kocak and Uzay (2019) mention a decreasing effect opposing the outcome we have here whereas Azam and Raza (2018) have similar outcome with this study with regard to money supply. The infrastructure effect is contrary to Bayar *et al.* (2021) and Mansoor (2018) who significantly shows the equalizing effect of the variable. Government consumption is in line with Isah (2021) but in contrast with Agnello *et al.* (2012). This could be pointing to less commitment made by government in the Western region of Africa in combating inequality and thus their consumption is directed towards none income equalizing investments and expenditure in the consumption is directed towards none income equalizing investments and expenditure in the respective economies.

With regards to the theme of the study, the study as stated earlier is in line with Greenwood Jovanovic (1990) Inverted U-shaped theory although the GMM result varies in significance. Subsequently, the research questions have been answered where we have financial development having a positive relationship with inequality and the squared financial development having a narrowing effect which upholds the stance of Greenwood and Jovanovic (1990) that reduction in inequality is achieved when financial sector grows further. However, in consideration with the hypothesis of the study, the alternative hypothesis (Financial sector size does have significant impact on income equalization) was rejected due

to the fact that financial development is not significant in reduction of income inequality and thus accept the null hypothesis (Financial sector size does not have significant impact on income equalization) in the GMM models. On the contrary, the extended Fixed Effect model has shown a significant effect of the variable in narrowing inequality and thus, the null hypothesis is acceptable on this stance.

5. Conclusion and Recommendations

5.1 Conclusion

The study is conducted to determine the existing relationship between financial sector size, in other words financial development and Income inequality in the 16 West African countries between 2010 and 2020, using panel data. On one hand, Income inequality is seen as a global economic phenomenon which deters inclusive growth in both developed and developing economies. On the other hand, financial development is seen as the most effective tool that can help narrow down income inequality which has, in one way or the other been examined in different studies to determine how well indicators of financial development and other intriguing variables can affect inequality. This study therefore looked into some components of financial development as captured in some theories and other authored works which helped in establishing the relationship that was revealed in the context of the study area. The variables used are Broad Money Supply, Inflation, Growth of GDP Per Capita, Trade Openness, Government Consumption and Infrastructure which are sourced from World Development Index and the dependent variable; Gini, from Standardized World Income Inequality Database (SWIID), a number of techniques were applied to obtain the relationship between the dependent variable, the independent variable of concern and the controlled variables. Also, robustness check has been established for consistency purpose using the General Method of Moments (GMM) and Panel Least Square (Pool Ordinary Least Square, Random Effect and Fixed Effect Model).

The major findings of the estimation from the GMM revealed the existence of an inverted U-shaped relationship between income inequality and financial development; an increased adverse effect of financial development on inequality at the early stage with the coefficient; 0.0225 and a decreased inequality effect of financial development at developed stage with the coefficient; -0.0032. The GMM in both the baseline and extended model revealed no significant impact of the major variables of the study in either increasing or decreasing inequality. In the Panel Least Square models, Fixed Effect model appeared to be more statistically fit and the result also revealed an inverted U-shaped relationship just like the previous variable but at early stage of financial development the impact was significant. Subsequently, the technique extension revealed a significant inverted U-shaped relationship of the major variable. The bottom line of the study is, the study supports the Greenwood and Jovanovic (1990) theory which has been adapted for the study and using different technique other than the main technique introduced in the study, the relationship is found to be significant.

The result from the study fulfilled the objectives and thus revealed the existence of the relationships between all the independent variables; one of which was the major reason

why early stage development was assumed in finance widened income inequality whereas a more advanced stage development narrows it. The main result of the study is in line with Nikoloski (2013) and Isah (2021). The impacts of other selected variables mostly differ in significance but are majorly consistent in effect. The study, based on the techniques employed has varied in hypothesis testing where the GMM result revealed an acceptance of the null hypothesis and the Fixed effect model in support of the alternative hypothesis.

5.2 Recommendation

From the result obtained, this study recommends that;

1. Policy reforms should be put in place to facilitate inclusive growth in the countries under study which would help in increasing the level of growth desired by intended policy makers.
2. Governments should revisit their expenditure and channel its consumption by committing its policies to inequality reduction and utilize policies in favor of the less privileged group to help avoid widening inequality which spurs crime and deter growth.
3. Strict measures should be put in place by respective governments in collaboration with the governing financial bodies to ensure smooth and less exhaustive process of managing credits to private sectors and ensure that key player indicators are put in place for track recording of progress.

6. References

- Acemoglu, D. (2011). *Thoughts on Inequality and the Financial Crisis*. Presentation at the American Economic Association Annual Meeting, January 7.
- Adeleye, N. O. (2017). *The Role of Institutions in the Finance-Inequality Nexus in Sub-Saharan Africa*. Journal of Contextual Economics 137, 173-192.
- Adu, R. (2019). *The Effect of Financial Development on Income Inequality in Ghana: An Application of ARDL Approach*. COLLEGE OF HUMANITIES: UNIVERSITY OF GHANA, 1-106.
- AfDB. (2012). *Income Inequality in Africa*. Accessed September 23, 2021. <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/FINAL%20Briefing>
- African Development Bank. (2014). *Revised-Income inequality in Africa*. AfDB Group.
- Agnello, L., Mallick, S. K., & Sousa, & R. (2012). *Financial Reforms and Income Inequality*. NIPE, 1-11.
- Alatoibi, A. R., & Mishra, A. V. (2014). *Emerging Markets and Global Economy*. Academic Press, 749-771.
- Allen, F., Demirguç-Kunt, A., Klapper, L. & Martinez Peria, M. S. (2012). *The Foundations of Financial Inclusion: Understanding Ownership and use of Financial Accounts*. Policy Research Working Paper No. 6290. Washington, DC: World Bank.
- Altunbas, Y., & Thornton, J. (2020). *Finance and income inequality revisited*. The Business School, Bangor University, 1-27.
- Anthanasius Fomum Tita & Meshach Jesse Aziakpono. (2016). *Financial Development and Income Inequality in Africa: A Panel Heterogeneous Approach*. Economic Research Southern Africa:1-28.
- Anyanwu, J. C., Erhijakpor, A. E., & Obi, E. (2016). *Empirical Analysis of the Key Drivers of Income Inequality in West Africa*. African Development Review, 18-38.

- Asli Demirgüç-Kunt & Ross Levine. (2008). *Finance, Financial Sector Policies, and Long-run Growth*. The World Bank Development Research Group and Finance and Private Sector Team, 1-79.
- Asongu, S., & Vo, X. (2020). *The Effect of Finance on Inequality in Sub-Saharan Africa: Avoidable CO2 Emissions Threshold*. Munich Personal RePEc Archive, 1-27.
- Azam, M. K., & Raza, S. A. (2018). *Financial Sector Development and Income Inequality in ASEAN-5 Countries: Does Financial Kuznets Curve Exist?* Global Business and Economics Review, 88-114.
- Baltagi, B. H. (2011). *Econometrics*. New York: Springer.
- Banerjee, A., and Newman, A. (1993). *Occupational choice and the process of development*. Journal of Political Economy, 101, 274-298.
- Bardhan, P. K. (2005). *Scarcity, Conflicts, and Cooperation: Essays in the Political and Institutional Economics of Development*. Cambridge, Massachusetts: MIT Press.
- Batuo, E., Mlambo, K., & Asongu, S. (2017). *Linkages between financial development, financial instability, financial liberalisation and economic growth in Africa*. MPRA, 1-29
- Bayar, Y., Gavriltea, M. D., & Paun, D. (2021). *Impact of Mobile Phones and Internet Use on Financial Inclusion: Empirical Evidence from The EU Post-Communist Countries*. Technology and Economic Development of Economy, 722-741.
- Beck, T., Demirguc-Kunt, A., & Levine, R. (2007). *Finance, Inequality and the Poor*. Journal of Economic Growth, 12, 27-49.
- Brei, M.; Ferri, G. & Gambaeorta, L. (2018). *Financial Structure and Income Inequality*. BIS Working Papers, 1-40.
- Carter. (2007). *Income Inequality*. Retrieved from Britanica: Britanica.com/topic/income-inequality
- Cavero, T. (2020). *Analysis of Multidimensional Inequalities in West Africa and a Strategy for Inequality Reduction*. DEVCO, AFD, AECID and Oxfam Research Project.
- Clarke, P. S., & Windmeijer F. (2015) *Estimating Structural Mean Models with Multiple Instrumental Variables Using the Generalized Method of Moments*
- Control Variable. (2021, November 2). Retrieved from Scribbr: www.scribbr.com/methodology/control-variable
- de Haan, J., & Sturm, J.-E. (2016). *Finance and income inequality: A review and new evidence*. KOF Swiss Economic Institute, 1-37.
- Denk, O., & Cournède, D. (2015). *Finance and income Inequality in OECD Countries*. OECD, 1-41.
- Dorn, F., Fuest, C., & Potrafke, N. (2021). *Trade Openness and Income Inequality*. Cesifo Working Papers, 1-20.
- Galor, O., & Zeira, J. (1993). *Income distribution and macroeconomics*. Review of economic studies, 60(1), 35-5.
- Greenwood, J. & B. Jovanovic. (1990). *Financial Development, Growth and the Distribution of Income*. Journal of Political Economy 98 (5): 1076 – 1107.
- Gujarati, D. (2004). *Basic Econometrics*. The McGraw-Hill Companies.
- Hiestand, T. (2005). *Using pooled model, random model and fixed model multiple regression to measure foreign direct investment in taiwan*. International Business & Economics Research Journal, 37-52.
- Iheonu, C. O., Asongu S. A., Odo, K. O., & Ojiem, P. K. (2020). *Financial sector development and Investment in selected countries of the Economic Community of West African States: empirical evidence using heterogeneous panel data method*. Springer Open, 1-15.
- Isah, A. (2021). *Analysis of the impact of financial sector development on income inequality: evidence from Nigeria, 1980–2018*. Nile University Department of Economics, 1-21.
- Isah, Abdulasheed; & Soliu, H. (2016). *Financial Development and Income Inequality: A Review of Literature*. The International Conference on Social Sciences and Law.

- Jauch, S., & Watzka, S. (2012). *Financial Development and Income Inequality: A Panel Data Approach*. CESifo Working Papers 3687.
- Jenkinson. (2021). *Quality of Life*. Retrieved from Britanica: Britanica.com/topic/quality-of-life
- Keeley, B. (2015). *Income Inequality (OECD): The Gap Between Rich and Poor*. Paris: OECD.
- Kocak, E., & Uzay, N. (2019). *The Effect of Financial Development on Income Inequality in Turkey. Review of Economic Perspective*, 319-344.
- Lichbach, M. I. (1989). *An Evaluation of 'Does Economic Inequality Breed Political Conflict? Studies. World Politics* 41 (4): 431–70.
- Louis, B. T., & Christele, A. (2019). *Financial Development and Income Inequality: Evidence from African Countries in the Franc Zone*. Scientific Research Publishing, 120-136.
- Mansoor, I. (2018). *Finance and Inequality in Eight Asian Countries: Does Size Matter*. Bulletin of Monetary Economics and Banking, 33-56.
- Mansour, M. S., & Wendel, M. (2015). *Finance and Inequality – Evidence from East Asia*. Eurasian Journal of Economics and Finance, 1-16.
- Mark, E., Kunawotor, G., Alufar, B., & Charles, B. (2020). *Drivers of Income Inequality in Africa: Does Institutional Quality Matters? African Development Review*, 718-729.
- Monnin, P. (2014). *Inflation and Income Inequality in Developed Economies*. Council on Economic Policies, 1-23.
- Nikoloski, Z. (2013). *Financial Sector Development and Income Inequality: Is there a Financial Kuznets Curve? Journal of Internal Development* 25, 897-911. OECD. (2022). Retrieved from Income Inequality: data.oecd.org/inequality/income-inequality.htm
- Olowofeso, E. O., Adeleke, A. O., & Udoji, A. O. (2015). *Impact of Private Sector Credit on Economic Growth in Nigeria*. CBN Journal of Applied Statistics, 81-101.
- Rajan, R.G. (2010). *Fault Lines*. Princeton, New Jersey: Princeton University Press
- Ravallion, M. (2004). *Pro-Poor Growth: A Primer*. Policy Research Working Paper Series 3242, World Bank, Washington.
- Samuelson, P. A., & Nordhaus, W. D. (2010). *Economics*. Boston: McGraw-Hill/Irwin.
- Sloman, J., Wride, A., & Garrat, D. (2015). *Economics*. Edinburgh: Pearson Education Limited.
- Solt, F. (2020). *Measuring Income Inequality Across Countries and Overtime: SWIID*. Social Science Quarterly.
- IGI Global (2021). *The Relationship Between Financial Development Innovation*
- Ujunwa, A. (2020). *How to Interpret Sargan Test for the Difference GMM Estimator?* Retrieved from <https://www.researchgate.net/post/How-to-interpret-sargan-test-for-difference-GMM-estimator/5f3e675709af827479066cf4/citation/download>
- United Nations. (2020). *World Social Report; Inequality in the Rapid Changing World*. United Nations.
- Van Velthoven, A., De Haan, J., & Sturm, J-E. (2018). *Finance, Income Inequality and Income Redistribution*. Applied Economics Letter, 1-8.
- OXFAM (2021). *West Africa: Extreme Inequality Numbers*. (Retrieved from OXFAM: <http://www.oxfam.org/en/west-africa-extreme-inequality-numbers>
- World Bank Group & UNDESA. (2019). *Sustainable Development Goal 10 – Reduced Inequalities: Progress and Prospects. An Expert Group Meeting in preparation for HLPF 2019*, (pp. 1-15). Geneva.
- World Development Indicators (2021). *Data Bank*. Retrieved from World Bank Development Indicators: databank.worldbank.org/source/world-development-indicators
- World Health Organization (2022). Retrieved from WHO: [who.int/data/nutrition/nlis/info/gross-domestic-product-\(gdp\)-per-capita-and-gdp-per-capita-annual-growth-rate](http://who.int/data/nutrition/nlis/info/gross-domestic-product-(gdp)-per-capita-and-gdp-per-capita-annual-growth-rate)