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FINANCIAL INCLUSION AND INCOME INEQUALITY IN WEST AFRICA

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Abstract

The study investigated the effect of financial inclusion on inequality in West Africa. The study used data from 13 West African countries for which data were available. Data on Gini coefficient, human development index, financial inclusion index, per capita income, government expenditure, inflation, dependency ratio, mean school years, voice and accountability and trade openness was used in the analysis. Also, the study constructed a financial inclusion index using data on credit to the private sector, Number of bank brancher per 100000 of the population and bank account ownership per thousand of the population. Empirically, the study applied Panel OLS Panel Fixed effect and Panel Random effect estimators to evaluate the objectives of the study. Evidence from the study indicate that Financial inclusion has a negative relationship with inequality in West Africa, however the effect of financial inclusion on inequality reduction was found to be insignificant indicating that financial inclusion may have marginal effect at best on inequality in the West Africa Sub region. The findings from the study has some policy implications. Firstly, the negative but insignificant effect of financial inclusion on income inequality may have resulted from low levels of financial inclusion in West Africa. This implies that at higher levels of financial inclusion, the effect may become more pronounced.

Keywords: financial inclusion, inequality, Panel OLS.

1. Introduction

Developing countries all over the world are often characterized by high level of inequality and poverty (Todaro and smith, 2006). Several studies have shown that despite relative improvement in economic growth in recent times, Inequality and poverty is still high in the West Africa sub region (Hallum and Obeng, 2019; UNECA, 2022; Khan, Khan, Sayal, & Khan, 2021; Kouadio and Gakpa 2022; Okafor et al, 2023), with the region accounting for the highest number of people suffering from extreme poverty in sub-Saharan Africa (Kouadio and Gakpa, 2022).
The goal of inequality reduction is crucial for developing countries because it lays the foundation for a more inclusive, equal, resilient and prosperous Economy (UNECA, 2023). Also, rapid increases in human development ensures a steady pool of skilled manpower necessary to drive to drive sustained economic in an increasingly competitive global economy. Furthermore, the objectives of poverty and inequality reduction is highly complementary to other sustainable development goals, thereby acting as a crucial link to achieving other sustainable development goals.

Over the last few decades, global and national policymakers have embraced financial inclusion as an important tool and a priority for inequality and poverty reduction (Adeleke and Olamola, 2022; Omar and Inaba, 2020). As a result, there has been a lot of financial sector reforms driven by policymakers and Central banks, aimed at promoting financial Inclusion. This movement has gained momentum since the 2007 global financial crisis and its attendant effects on national economies across the world (Agyemang-Badu, Agwei & Dua, 2018; Adeleke and Olamola, 2022).

Financial Inclusion is achieved when adults have easy access to a broad range of financial products designed according to their needs and provided at affordable costs. These products include payments, savings, credit, insurance and pensions (CBN, 2012). Policy makers are convinced that financial inclusion would help lift the poor out of poverty by gradually improving their lives and spurring economic activities that create wealth. Sadly, the west African sub region, as a region has consistently underperformed over the years, when compared to other regions of the world, on measures of financial inclusion.

Table 1.1 Selected indicators of financial inclusion in West Africa

Countries	Account ownership in a financial institution (%)	Saved at a financial institution (%)	Owns a credit card (%)	Borrowed from financial institution (%)
Nigeria	**45**	**18**	**2**	**6**
Ghana	**39**	**21**	**1**	**12**
Benin	**24**	**5**	**1**	**8**
Burkina Faso	**21**	**8**	**3**	**7**
Côte D'Ivoire	**21**	**6**	**2**	**4**
Guinea	**14**	**5**	**1**	**6**
Liberia	**29**	**13**	**3**	**15**
Mali	**28**	**11**	**6**	**11**
Mauritania	**20**	**9**	**3**	**11**
Niger	**9**	**3**	**1**	**3**
Sierra Leone	**14**	**5**	**1**	**4**
Senegal	**28**	**9**	**5**	**12**
Togo	**25**	**12**	**2**	**7**
Average	**24.3846**	**9.615385**	**2.384615**	**8.153846**

Sources: Global Findex, 2023.

Table 1.1 shows that only about 24.3% of adults in west Africa own a bank account compared to about 83% in East Asia and Pacific and 74% in Latin America (Global Findex, 2023). Only about 9.6% saved in a financial institution while only about 2.4% of the population owns a credit card. In terms of access to credit, only about 8.2% borrowed money from a financial institution indicating a very low access to credit in the sub region.

Empirical results from previous studies on the impact of financial inclusion on inequality in developing countries have remain mixed (Neaime & Gaysset, (2018); Zia & Prasetyo, (2018); Park and Marcedo, (2018)) and not much is empirically known about the effect of financial inclusion on inequality in West Africa in particular. Studies like Omokanmi and Ogunleye (2020); and Abdulghafar, Emam and Samak (2023) have also empirically examined the relationship between financial inclusion and other determinants of development around the world. However, in the light of recent data, there is need for more studies on the effect of financial inclusion on inequality in the West Africa sub region creating a gap in the literature that we seek to fill. In the light of the above discussion, this study will investigate the impact of financial inclusion on inequality in West Africa.

2. Empirical Literature Review

In the last two decades, there have been an increase in studies examining the determinants of financial inclusion as well as its effect on indicators of economic development. These studies which have spanned across almost all countries of the world, both developed and developing, have produced a number of interesting findings as seen below.

Neaime & Gaysset (2018) applying the Generalized Method of Moments (GMM) and Generalized Least Squares (GLS) with a sample of eight MENA countries over the period 2002–2015, assessed the impact of financial inclusion on income inequality, poverty, and financial stability. They found that financial inclusion decreases income inequality, while population size and inflation are found to increase income inequality. Also, the empirical results show that financial inclusion has no effects on poverty, whereas population, inflation, and trade openness were all found to significantly increase poverty.

Agyemang-Badu, Agyei and Duah (2018) sought to understand the nexus among financial inclusion, poverty and inequality in 48 African countries. Following Sarma (2008) and Park and Mercado (2015), the study constructed a financial inclusion index taking into consideration country specific indicators to depict the state of financial inclusion in 48 African countries. Using panel fixed effects panel estimation techniques The study found that financial inclusion is inversely related to both poverty and income inequality in Africa. The study recommends, among other things, that policies and programs that will enhance the inclusion of the poor and marginalized in the financial sector should be pursued in the selected African countries.

Park and Mercado (2015) sought to understand the link between financial inclusion, poverty, and income inequality in developing Asian Economies. The study constructed a financial inclusion indicator to assess various macroeconomic and country-specific factors affecting the degree of financial inclusion for 37 selected developing Asian economies. Data on poverty rates, income inequality measured by Gini index, Age dependency ratio, Inflation, Per capita income, Literacy rate, Rule of law, Primary education completion rate and GDP Growth rate were employed to capture the objectives of the study. Using a Panel OLS estimation technique, estimated models show that per capita income, rule of law, and demographic characteristics significantly affect financial inclusion in developing Asia. Furthermore, we find that financial inclusion significantly reduces poverty; and there is also evidence that it lowers income inequality. Findings suggest that the provisions for young and old-age populations, e.g., retirement pensions; and stronger rule of law, including enforcement of financial contracts and financial regulatory oversight, will broaden financial inclusion, thereby contributing to poverty reduction and lower income inequality.

Ajide (2017) examined the determinants of financial inclusion by specially accounting for the role of institutions in a panel of eighteen (18) sub-Saharan Africa (SSA) countries using a dynamic system of Generalized Method of Moments (SYS-GMM). The study employed a balanced data set covering 18 countries3 in sub-Saharan region is used, covering the period 2004-2010. Three measures for capturing financial inclusion were employed in the study, namely: Automatic Teller Machines (ATMs) per 100,000 Adults; Bank Branches per 100,000 Adults and ATMs per 1000km2. The emanated findings consistently stress the importance of institutions together with other control variables like GDP per capita, inflation, bank concentration and z-score as key drivers of FI.

In the final analysis, the paper emphasizes the importance of using dimension by dimension indicators of governance as well as a composite governance index instead of relying solely on the latter as a basis of informing policy decisions as both yield different policy outcomes. Park & Mercado (2018) analysed the relationship between financial inclusion and inequality using

data from 176 countries including 37 from Asia. The study constructed a new financial inclusion indicators to evaluate several macroeconomic and country-specific factors affecting the degree of financial inclusion for the selected countries. When the study tested the effect of financial inclusion on poverty and inequality, the study found that financial inclusion is significantly inversely correlated with poverty and income inequality. The study found that the finding was true for the sample of all 176 countries, however, when the 37 developing Asian countries were estimated the study found no link between financial inclusion and income inequality.

Sukmana and Ibrahim, (2018) examined the nexus between financial inclusion and inequality. Specifically, the study sought to ascertain whether whether financial access reduces income inequality at different levels of inequality. Using a data set of 73 countries and applying quantile regression econometric technique, the study established that financial access reduces income inequality when inequality of a country is low. Findings from the study shows that at high levels of inequality, financial access have little or no impact whatsoever on income. Furthermore, the study showed that trade openness and infrastructure in significantly reduces income inequality at low and high inequality levels.

Zia & Prasetyo (2018) Examined the nexus between financial inclusion and poverty alleviation on one hand and financial inclusion and income inequality in Indonesia. Using time series data running from 2014 to 2016 across 33 province in Indonesia, the study employed both Panel OLS regression and correlation analysis to evaluate the data. Financial inclusion index was constructed using measures of banking penetration, banking services availability, and the use of banking services. Findings from the study showed that financial inclusion significantly reduces poverty and that financial inclusion has a positive but insignificant effect on income inequality in Indonesia

Omar and Inaba (2020) investigates the impact of financial inclusion on reducing poverty and income inequality, and the determinants and conditional effects thereof in 116 developing countries. The analysis was carried out using an unbalanced annual panel data for the period of 2004–2016. A novel index of financial inclusion was constructed using a broad set of financial sector outreach indicators. Evidence from the estimated panel data showed that per capita income, ratio of internet users, age dependency ratio, inflation, and income inequality significantly influence the level of financial inclusion in developing countries. Furthermore, the results provide robust evidence that financial inclusion significantly reduces poverty rates and income inequality in developing countries. The findings are in favor of further promoting access to and usage of formal financial services by marginalized segments of the population in order to maximize society's overall welfare.

Wong, Badeeb & Philip (2020) evaluated the effect of financial inclusion on poverty and income inequality in selected ASEAN countries (Indonesia, Malaysia, Philippines, Thailand, and Vietnam) also, the study sought to establish whether financial innovation enhances financial inclusion's impact in these relationships. The econometric technique employed was the augmented autoregressive distributed lag technique. This was used to estimate cross sectional data from selected countries and comparisons made afterwards. Evidence from the study indicate that financial inclusion has a significant negative effect on poverty. Also, the study established that when financial inclusion interacts with financial innovation, financial innovation increases income inequality.

Huang, Gu and Lin (2023) examined the impact of financial inclusion and income inequality on human capital in sub-Saharan African countries. The study employed panel data from 36 sub -Saharan African countries ranging from 2004 to 2019 to empirically test the impact of

financial inclusion on human capital development in the selected sub-Saharan African countries. The estimation technique adopted by the study includes both Panel OLS and the Generalized method of moment (GMM) technique to control for endogeneity in the explanatory variables. After Controlling for other economic indicators, the study found that a high level of financial inclusion and a reduction in income inequality improve human capital development in the countries under consideration.

Segning, Djiogap and Piabuo, (2023) examined the effect of financial inclusion on income inequalities in sub-Saharan African countries, taking into account cultural particularities. Using data from 27 sub Saharan African countries, the study divided the selected countries into 4 groups based on religion (Christianity and Islam) and official language spoken (English and French). Employing a panel dataset that ranged from 2002 to 2015, the study utilized the the dynamic panel method generalized method of moments (GMM) to analyze the data. Evidence from the study indicate that financial inclusion is inversely related to income inequality in the Christian-dominated and French-speaking countries. However, the same result was not found in Islamic-dominated and English-speaking countries. Furthermore, the study established the presence of a an inverted U-shaped relationship in all the Sub-Saharan African countries considered and in Christian-dominated countries only.

Okafor, Olurinola, Bowale & Osabohien (2023) empirically examined how financial development affects income inequality in Africa. The study considered key dimensions of financial development namely: access, depth, efficiency, and stability to achieve the study's objective. The study applied the system generalized method of moments (SGMM) to analyse data and the findings showed that each dimension of financial development had a varying impact on income inequality. Access, stability and efficiency components of financial development reduce income inequality, while the depth dimension of financial development exacerbates income inequality in Africa. Therefore, the study recommends that policymakers should not neglect other dimensions of finance in facilitating economic development

3. Methodology

Financial inclusion index

To measure financial inclusion in the selected countries, the study will compute a financial inclusion index (FII) in line with the works of Sarma & Pais, 2011; Sethy, 2016 and Segning, Djiogap, Piabuo, Noupie, 2023. Consequently, we calculate the FII based on selected dimensions (di) of financial inclusion. Four aspects of financial inclusion will be used: banking penetration measured by the number of bank accounts per 1000 inhabitants, use of financial services measured by bank deposits or savings, availability of financial services measured by the number of branches per 10,000 inhabitants, and finally, the indicator of banking activity performance, credit to the private sector as a percentage of GDP. The dimension di is calculated as follows

$$\boldsymbol{d_i = \frac{A_i - m_i}{M_i - m_i}} \quad \textbf{.....(1)}$$

$$\boldsymbol{X_1 = \frac{\sqrt{d_1^2 + d_2^2 + d_3^2 + \cdots + d_n^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2 + \cdots + w_n^2}}} \quad \textbf{.....(2)}$$

$$\boldsymbol{X_2 = \frac{\sqrt{(w_1 - d_1)^2 + (w_2 - d_2)^2 + \cdots + (w_n - d_n)^2}}{\sqrt{w_1^2 + w_2^2 + w_3^2 + \cdots + w_n^2}}} \quad \textbf{.....(3)}$$

$$\boldsymbol{I = \frac{1}{2}(X_1 + X_2)} \quad \textbf{.....(4)}$$

Where: A_i= is the current value of dimension i w_i= the weight given to dimension i between 0 and 1 M_i=the maximum value of dimension i m_i= minimum value of dimension i d_i = dimension of financial inclusion of i**.**
Depending on the value of FII, the study period will be considered as: Weakly included if 0 ≤ FII ≤ 0.35, Moderately included if 0.35≤ FII ≤ 0.60 and Strongly included if 0.6≤ FII ≤ 1

Model specification
The study will employ panel data estimating methods to capture the impact of financial inclusion on inequality and poverty in West Africa. In particular, the study will employ panel OLS, Panel Fixed effect and Panel random effect as well the Generalized method of moment to estimate the collected data.
To capture objective one which is to determine the impact of financial inclusion on inequality, the following modification of the model of Segning, Djiogap, Piabuo and Noupie, (2023) was specified.

$$Gini_{it=}\beta_o + \beta_1 FII_{it} + \beta_2 Gdppc_{it} + \beta_3 TOP_{it} + \beta_4 Inf_{it} + \beta_5 Gexpgdp_{it} + \beta_6 meansch_{it} + \beta_7 gfcfgdp_{it} + \beta_8 voi\_acct_{it} + \beta_9 Dep\_ratio_{it} + \mu_{it} \ldots (5)$$

Model description and source

Variable	Description	Source
Gini	Gini Coefficient Index (Measure of inequality)	UNDESA
FII	Financial inclusion index (Authors computation using data from Global financial development database)	World Bank Global financial development database
Gdppc	Gross domestic product per capita	WDI
Gexpgdp	Government expenditure as a percentage of GDP	WDI
Inflation	Inflation rate	WDI
gfcfgdp	Gross fixed capital formation as percentage of GDP	WDI
Meansch	Average years of schooling	UNDESA
Voi_acct	Voice and accountability	UNDESA
Depratio	Population dependency ratio	UNDESA
TOP	Trade as a percentage of GDP	WDI

Where Gini = gini coefficient, Gdppc = gross domestic product per capita, FII = financial inclusion index, Gov_exp = government expenditure, sse =secondary school enrollment, Inf = inflation, Gfcf = gross fixed capita formation, Top =trade openness and i.t stands for country i at time t.

Scope of the Study
This study will focus on the impact of financial inclusion on inequality in West Africa. The study will cover the period 2004 to 2019. The years of study were selected based on the time when the majority of the countries have data available for financial inclusion, Inequality and Human development index. The countries selected are, Benin, Burkina Faso, Cape Verde, Côte D'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo . The variables of interest in this study are an financial inclusion index (FII), Gini coefficient (measure of inequality) and human development index (HDI). The data will be obtained from the World Bank world development indicators, International monetary fund financial development indicators, and the United Nations Development Programme database for each country.

4. Model Estimation and Analysis

Table 4.1 **Financial inclusion and inequality in West Africa**

	(1)	(2)	(3)
VARIABLES	FE	RE	OLS
FII	-0.036	-0.050	-0.050
	(0.207)	(0.201)	(0.320)
gexpgdp	-0.063	-0.064	-0.064
	(0.042)	(0.041)	(0.085)
lgpdpercapita	-0.767*	-0.712*	-0.712
	(0.417)	(0.407)	(0.864)
top	-0.010	-0.011	-0.011
	(0.009)	(0.009)	(0.010)
depratio	-0.377***	-0.378***	-0.378***
	(0.049)	(0.047)	(0.069)
meansch	-0.851***	-0.822***	-0.822*
	(0.251)	(0.240)	(0.465)
inflation	0.028	0.028	0.028**
	(0.017)	(0.017)	(0.012)
voi_acct	-0.101	-0.094	-0.094
	(0.403)	(0.392)	(0.589)
gfcfgdp	-0.004	-0.003	-0.003
	(0.016)	(0.016)	(0.013)
Constant	84.428***	84.813***	84.813***
	(5.313)	(5.339)	(7.196)
Observations	118	118	118
R-squared	0.554		
Number of id	13	13	13

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

Table 1 shows the regression of Financial inclusion index (FII) and other control variables on income inequality in using Fixed effect, Random effect and Panel OLS estimation techniques. Evidence from the estimated model indicate that financial inclusion is negatively related to inequality in west Africa. This implies that higher levels of financial inclusion reduces income inequality. However, the effect of financial inclusion on inequality is statistically insignificant indicating that financial inclusion is not a determinant of inequality reduction in West Africa. One reason for the negative insignificant effect could be the low levels of financial inclusion in the sub region. For instance, data from Global Findex 2021 indicate that the average account ownership the region still stands at 16% in the subregion while only about 8% of the population accessed credit through the formal financial system in the sub region as at 2021(Global Findex 2021). The finding is also in line with the result obtained by Agyemang-Badu, Agyei. & Duah (2018) in a study of the impact of financial inclusion on inequality and poverty in Africa.

On the other hand the study found that mean school years is negatively related to financial inclusion and the impact is also statistically significant indicating that the higher the average schooling age in the region the lower the level of inequality. The variable is also statistically significant indicating that education has an significant effect on financial inclusion in the study. Again, the study found that the dependency ratio has a negative and statistically significant effect on inequality. The finding which is contrary to appriori economic expectation may be caused by a number of factors. High levels of poverty means that children as young as 10 years are already in the labour, working, hawking and helping out in the farms there by contributing to family income. Also, the study found that GDP per capita has a negative effect on inequality. The effect is also statistically significant at the 10% significance level.

Other factors that reduces income inequality in the estimated models include government expenditure as a percentage of GDP (gexpgdp), gross fixed capital formation as a percentage of GDP (gfcfgdp) and Voice and accountability(voi_acct) which was used a proxy for the level of accountability and transparency in government institution . The variables were however, found to be statistically insignificant.

5. Conclusion

The study is an attempt to investigate the effect of financial inclusion on inequality in West Africa. The study used data from 13 West African countries for which data were available. Data on Gini coefficient, human development index, financial inclusion index, per capita income, government expenditure, inflation, dependency ratio, mean school years, voice and accountability and trade openness was used in the analysis. Also, the study constructed a financial inclusion index using data on credit to the private sector, Number of bank brancher per 100000 of the population and bank account ownership per thousand of the population. Empirically, the study applied Panel OLS Panel Fixed effect and Panel Random effect estimators to evaluate the objectives of the study. Evidence from the study indicate that Financial inclusion has a negative relationship with inequality in West Africa, however the effect of financial inclusion on inequality reduction was found to be insignificant indicating that financial inclusion may have marginal effect at best on inequality in the West Africa Sub region.

The findings from the study has some policy implications. Firstly, the negative but insignificant effect of financial inclusion on income inequality may have resulted from low levels of financial inclusion in West Africa. This implies that at higher levels of financial inclusion, the effect may become more pronounced. This calls for targeted financial inclusion drive that aims at ensuring more poor and underserved people are giving access to financial services so as to bridge the income gap in West Africa.

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