Financial Development, Income Inequality and Poverty Alleviation: Some Empirical Evidence

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Abstract

This study examines the relationship between financial development, income inequality and poverty reduction in a sample of 48 Sub-Saharan African (SSA) countries, observed during the 1980-2017 period. The results indicate that financial development, when proxied by private sector credit and liquid liabilities, reduces poverty. The results are mixed for the Claims on domestic real nonfinancial sector by the Central Bank. On the other hand, the results of the direct and cross-estimates showed a positive and significant effect of income inequality on poverty. We conclude that income inequality is such large that a larger proportion of the population is impoverished and the poverty gap is widening further. Moreover, income inequality seems to slow down the positive effects of financial development on poverty reduction. The findings allow us to recommend that monetary and public authorities in SSA countries support the development of the financial sector, particularly banks, encourage financial institutions to channel financial resources to the poor but with income-generating initiatives and enforce laws to control income inequality.

Keywords: financial development, income inequality, poverty, Sub-Saharan Africa countries

1. Introduction

In recent years, economists have shown an acute interest in fighting poverty (Levine J, 2009). The issue has received wide coverage in particular in developing countries. However, despite the continuing efforts to help the poor make their ends meet, still these latter face challenges to raise their earnings. One of the crucial challenges for the poor is how to finance their endeavors. This state of affairs still resonates as opportunities to access stock markets is exclusive to companies and shareholders, while access to credits is generalized to all. Then, with no collateral, the poor is doomed to remain poor. Differently put, banks and stock markets have a role to play in poverty alleviation by opening their doors to the poor. Odusola (2017) classified a group of countries according to poverty and inequality rates. Angola, Republic of the Congo, Democratic Republic of the Congo, Mozambique and Nigeria, which are known by their rich resources, come under this group.

The key features of Africa's poverty, and its causes, have been widely documented. But some of the challenges, such as climate change, fragility, and debt pressures, are gaining in importance. And although macroeconomic stability and growth are critical components for reducing poverty and improving well-being, they are not sufficient. Despite economic growth in Africa, the region's persistently rapid population growth, structural impediments (low human capital, persistent gender inequality, and large infrastructure deficits), and increasing reliance on natural resources continue to hold back poverty reduction. (Beegle & Luc, 2019).

It seems that promoting equal distribution of income is the solution to all economic and financial vices, as aptly put by Ncube & Anyanwa (2012): 'tackling the problem of income inequality is important because inequality negatively affects progress towards the attainment of MDGs and poverty reduction in general; it results in inefficient resource allocation, wasted productive potential, high dependency ratio and impaired institutional development'.

The literature on the effect of banking and stock market development on poverty is scarce. Then, this study tries to fill this gap by examining this effect on a sample of four groups of countries; low-income, middle-income, upper middle income and high-income countries.

Research on the relationship between financial development, income inequality and poverty is abundant, yet the results are inconclusive. Moreover, few studies have focused on SSA countries. Then, this study tries to fill this gap and examines the relationship between financial development, income inequality and poverty reduction in these countries.

Unlike previous studies, the contribution of this study lies in its inclusion of country-specific variables (African countries) in an international context using a panel data design. Moreover, previous studies did not consider poverty as consisting of income and inequality dimensions.

This article is structured as follows. In the second section, we conduct a review of the literature. In section three, we present our data and research methodology. In the fourth section, we specify our model and present our results. The last section concludes.

2. Review of the Literature

2.1 The Financial Development-Poverty Nexus

The empirical literature on the relationship between financial development and poverty is abundant. Ho & Odhiambo (2011) found that the causal relationship with poverty in China depends on the proxy used to measure financial development. Similarly, Perez-Moreno (2011), studying a sample of 35 emerging economies, found that when financial development is proxied by credit to the private sector as a GDP percentage, the relationship between financial development and poverty is null. However, when it is proxied by liquid assets (M3) as a GDP percentage or M2 as a GDP percentage, the relationship becomes significant. In a recent study, Ho & Njindan (2017) examined this causal link during the 1985-2014 period and found a bi-directional relationship between financial development and poverty.

African countries-wise, Yaya (2017) used an auto regressive distributed lag model (ARDL) to study the link between financial development, economic growth and poverty in a sample of 9 African countries. The author found that 8 countries show a long-term relationship, GDP and financial development positively affects poverty in 5 countries (Benin, Cameroon, Ivory Coast, Gabon and South Africa), decrease in poverty positively affects economic growth in 3 countries (Ghana, Nigeria and Senegal). Similarly, Yinusa & Alimi (2015) used the Johansen Cointegration test to check for the long-term and the error correction model to check for the short-term relationship between financial development, income inequality and poverty in Nigeria. The results indicate that there is no relationship between financial development and poverty, doubting thus Greenwood and Jovanovich's hypothesis. In the same Nigerian context, Ilori (2020) found that financial development, as proxied by access to credits, investment in high-return assets, funding SMEs, has a positive effect on the Human Development Index (HDI). Appiah et.al. (2020) proxied financial development in terms of liquid liability as a percentage of GDP and bank domestic credit as a percentage of GDP in a FMOLS model of a panel of 5 developing countries observed during the 1995-2015 period. The results conclude that the two proxies reduce poverty.

However, Zahonogo (2017) found evidence in SSA countries indicating that the relationship between financial development and poverty takes the form of a U-shape when financial development reaches a given threshold. Indeed, a lower threshold negatively affects poverty while a higher threshold positively affects poverty. These results persist across poverty proxies and estimation models, suggesting a rigid relationship between financial development and poverty. Such a finding adds to the proposal that this relationship is not linear in SSA countries.

2.2 The Growth-Inequality-Poverty Nexus

Datt & Ravallion (1992) and Kakwani (1993) are among the first authors to comprehensively account for the effect of income distribution on decreasing poverty. However, extensive research pointed to specificity of countries and generalizability of findings is not possible. Nevertheless, a strand of research tried to compare countries to examine how economic growth translates into less poverty. For instance, Ali & Thorbecke (2000) found that poverty responds more to inequality than to income redistribution. Other similar studies put an emphasis on the

significance of inequality in making poverty respond to economic growth (e.g., Adams, 2004). These studies focused on the role of inequality in the efficiency of designed measures targeting a reduced inequality.

To support the pivotal nature of inequality in the link between economic growth and poverty, Fosu (2015) indicates that while increasing income significantly reduces poverty in SSA countries at large, inequality plays a major role in some countries. Generally, low income seems to hinder the efficiency of income and inequality measures implemented to decrease poverty in Africa. In this regard, Fosu (2017), conducted a covariance analysis to study separately a panel of African countries and a global panel of emerging economies. The results point to the significance role played by inequality in the relationship between economic growth and poverty. Another finding is that decreasing inequality leads to less poverty. The results also pointed to some outliers. For example, decreasing inequality in countries with lower income levels inversely increases poverty, as marginalized groups cannot benefit from these measures and find themselves ranking under the poverty line. Such poverty elasticity should inform future research to adopt a country-specific approach, supported by a more global approach.

Fanta & Upadhyay (2009), surveying household budgets in a sample of 16 African countries, gathered evidence indicating that economic growth decreases poverty in a range between -0.5 and -1.10.

3. Empirical Framework and Data

3.1 Baseline Regression and Variables

Because the studied countries belong to different income categories, we classified them into four groups using the World Bank's Atlas method. The model to be estimated to examine the effect of banking development and income inequality on poverty is as follows:

$$Pov_{it} = \beta_0 + \beta_1 FD_{it} + \beta_2 II_{it} + \beta_3 (FD*II)_{it} + \beta_4 GDP_{it} + \beta_5 School\_enr_{it\ it} + \beta_6 T\_Openness_{it} + \beta_7 F\_Openness + \beta_8 INF_{it} + \beta_9 POP_{it} + \beta_{10} Gov\_exp_{it} + \beta_i + \varepsilon_{it}$$

Table 1 shows the variable and their definitions. In order to determine the studied effect, we used four poverty scenarios: a poverty headcount ratio at \$3.20 a day PPP (%), a poverty headcount ratio at \$5.50 a day PPP (%), a poverty gap at \$ 3.20 a day (2011 PPP) and a poverty gap at \$ 5.50 a day (2011 PPP). Our estimation methods include the following: the Ordinary Least Squares (OLS), the Generalized Least Squares (GLS), the Fixed Effects model (FE), the Random Effects model (RE) and the Generalized Method of Moments (GMM) initially proposed by Arellano & Bond (1991) to control for endogeneity in our regression. We conduct our results on 1980-2017 period from an international sample, low income Countries, Middle-income countries, upper middle-income countries, higher income countries and Sub-Saharan Africa (SSA). (See Appendix 1).

Table 1. Variables Definition

Variable	Definition
Pov	The Poverty headcount ratio at $3.20 a day PPP (%)
	The Poverty headcount ratio at $5.50 a day PPP (%)
	poverty gap at $ $3.20 a day (2011 PPP)
	poverty gap at $ $5.50 a day (2011 PPP)
FD	Private_ C: Domestic credit to private sector (% of GDP)
	Liquid_L : Liquid liabilities (% of GDP)
	Central_B: the Claims on domestic real nonfinancial sector by the Central Bank
II	Income Inequality, Gini Index
GDP	GDP is Gross Domestic Product per capita
POP	Growth rate of Total Population
School_enr	High School enrollment (% gross)
INF	Inflation, GDP deflator (% annual)
T_Openness	Total exports and imports by GDP (%)
F_Openness	Financial openness, Kopen indicator
Gov_exp	Expenditure on government's final consumption (% of GDP)

3.2 Descriptive Statistics

The descriptive statistics and correlation coefficients of the variables under study are reported in Tables 2 and 3. The Mean, Standard Deviation and the maximum and minimum values are presented. The correlation matrix shows lower coefficients between our variables.

Table 2. Summary Statistics (1980-2017)

Variables	Minimum	Maximum	Mean	Std. Deviation
The Poverty headcount ratio at $3.20	2.5	98.50	67.06	22.26
The Poverty headcount ratio at $5.50	6.6	100	82.19	19.42
poverty gap at $ $3.20 a day	0.7	77.10	34.00	15.91
poverty gap at $ $5.50 a day	2.4	100	52.26	17.40
Private_ C	0.40	1,921	17.34	49.92
Liquid_L	0.02	903.8	31.14	59.99
Central_B	2.62	234	8.381	15.15
II	28.90	65.80	44.36	7.004
GDP	-47.59	140.4	1.263	6.882
school_enr	2.48	116	33.00	24.08
Gov_exp	9.83	79.17	15.37	7.922
T_Openness	-123	258.7	9.65	29.27
F_Openness	-1.89	2.38	-0.85	1.04
INF	-31.57	26,766	43	683.6
POP	63,261	1.909	1.392	2.213

Table 3. Matrix Correlation

	Pov 3.20$	gap3.20$	Pov5.5$	gap5.50$	GDP	INF	Gov_exp	School_enr	Pop	T_open	F_open	Priv_C	Liqu_L	Centr_B	II
Pov 3.20$	1.0000														
Povgap 3.20$	0.0054	1.0000													
Pov 5.50$	0.0117	0.9927	1.0000												
Povgap 5.50$	0.0165	0.9364	0.9584	1.0000											
GDP	-0.0564	0.0606	0.0598	0.0644	1.0000										
INF	0.0620	0.0637	0.0786	0.0853	-0.1083	1.0000									
Gov_exp	-0.2169	-0.0831	-0.1063	-0.1044	0.0073	-0.1745	1.0000								
School_enr	-0.6430	-0.0068	-0.0157	-0.0004	0.1450	-0.0968	0.3605	1.0000							
POP	0.1368	0.1285	0.1198	0.0923	0.0400	0.0929	-0.3085	0.0398	1.0000						
T_openness	0.0730	0.0170	0.0161	0.0178	0.3175	0.2144	0.0365	-0.0326	-0.0192	1.0000					
F_openness	-0.4158	0.0934	0.0779	0.1112	0.0540	-0.0828	0.2427	0.3975	-0.0870	-0.0044	1.0000				
Private_C	-0.4614	-0.0851	-0.1031	-0.0917	-0.1746	0.2079	0.5777	-0.0147	-0.0799	0.2982	-0.0851	1.0000			
Liquid_L	-0.5170	0.1060	0.0933	0.1359	0.0968	-0.1418	0.3770	0.6748	-0.1264	-0.0463	0.4863	0.7112	1.0000		
Central_B	-0.0772	0.2048	0.2191	0.2045	-0.0875	0.1591	0.0379	-0.0505	-0.1353	-0.0494	-0.0114	-0.1853	0.1052	1.0000	
II	0.0572	-0.2725	-0.2761	-0.2508	0.0108	-0.0677	0.3516	0.3589	0.0663	-0.0191	-0.0153	0.2299	0.1385	-0.2170	1.0000

4. Results

4.1 Some International Evidence

The results of 45 regressions are summarized in each of the tables 4, 5, 6 and 7 below, yet full Tables are available upon request. Regressions specify the relation between the financial development (*Private-C, Liquid_L, Central_B*) and poverty (*The Poverty headcount ratio at $3.20 a day, the poverty headcount ratio at $5.50 a day, poverty gap at $ $3.20 a day and poverty gap at $ $5.50 a day*)

Table 4 summarizes our estimation of a poverty headcount ratio at $3.20 a day PPP (%). All our regressions point to a negative and a significant effect of banking development on poverty, across estimation methods and countries, clearly showing the role played by banks in alleviating poverty. However, the results of the Central_B variable are mixed.

Table 4. The Poverty Headcount Ratio at $3.20 a Day PPP (%)

	international sample		low income countries		Middle-income countries		upper middle-income countries		higher income countries		Estimation Method
Private_C	(-)***		(-)**		(-)***		(-)		(-)***		
Liquid_L	(-)***		(-)		(+)		(-)**		(-)***		OLS
Central_B	(-)		(-)		(-)**		(+)		(-)		
Private_C	(-)***	FE	(-)	GLS	(-)***	RE	(-)	RE	(-)***	FE	
Liquid_L	(-)***	FE	---	---	(-)	RE	(-)***	GLS	(-)**	FE	
Central_B	(-)	FE	(-)	GLS	(-)	FE	(+)	RE	(-)	RE	
Private_C	(-)***		(+)		(-)		(-)		(-)***		
Liquid_L	(-)**		---		(-)*		(-)*		(-)**		GMM
Central_B	(-)		(+)**		(-)**		(+)*		(+)		

Note: Signs between blankets are those of financial development indicators. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Table 5 presents our estimation of a poverty headcount ratio at $5.50 a day PPP (%). We notice a negative and a significant effect in almost all countries., i.e. when the banking sector develops, the poverty headcount ratio at $5.50 a day PPP (%) is reduced.

Table 5. The Poverty Headcount Ratio at $5.50 a Day PPP (%)

	international sample		low income countries		Middle-income countries		upper middle-income countries		higher income countries		Estimation Methods
Private_C	(-)***		(-)		(-)***		(-)		(-)***		
Liquid_L	(-)		(-)		(+)**		(-)		(-)***		OLS
Central_B	(-)		(+)		(-)*		(+)		(+)		
Private_C	(-)***	FE	(-)	GLS	(-)***	FE	(-)***	FE	(-)***	FE	
Liquid_L	(-)***	FE	---	---	(-)***	FE	(-)***	RE	(-)**	FE	
Central_B	(-)*	FE	(+)	GLS	(-)	FE	(-)	RE	(-)	RE	
Private_C	(-)		(+)		(-)		(-)		(-)*		
Liquid_L	(-)		---		(+)		(-)***		(-)*		GMM
Central_B	(-)*		(+)		(-)**		(+)		(+)		

When estimating a poverty gap at $ 3.20 a day (2011 PPP), table 6 shows that the estimation method affects the results. Indeed, the effect of private credits as a percentage of GDP on poverty is negative when we use OLS, FE, RE and GLS. However, the GMM yields a positive effect for the low, middle and upper middle-income countries. The effect of Liquid_L is negative, yet positive for the middle-income countries group when we use the OLS and GMM methods and for the upper middle income group when we use the FE model. Similarly, the results on the effect of Central_B are mixed.

Table 6. The Poverty Gap at $ $3.20 A Day (2011 PPP)

	international sample		low income countries		Middle-income countries		upper middle-income countries		higher income countries		Estimation Methods
Private_C	(-)***		(-)**		(-)		(-)		(-)***		
Liquid_L	(-)***		(-)		(+)		(-)***		(-)***		OLS
Central_B	(-)		(-)		(-)*		(+)*		(-)		
Private_C	(-)***	FE	(-)**	GLS	(-)***	FE	(-)	RE	(-)***	FE	
Liquid_L	(-)***	FE	---	---	(-)	RE	(+)	FE	(-)**	FE	
Central_B	(-)	FE	(-)	GLS	(-)***	FE	(+)	FE	(-)	RE	
Private_C	(-)***		(+)		(+)		(+)**		(-)**		
Liquid_L	(-)**		---		(+)		(-)***		(-)***		GMM
Central_B	(+)**		(+)		(-)*		(+)*		(-)		

In Table 7, we notice that the Private_ C Variable retained the same coefficient across almost all regressions. The effect of this variable on a poverty gap at $ 5.50 a day (2011 PPP) for all groups of countries is negative when we use OLS, GLS and the FE models and the GMM method for the international sample, for the middle-income countries it is significant at the 10% level and for the upper middle-income countries it is significant at the 5% level. The effect of Liquid_L on poverty remains negative in all groups of countries only when we use the FE model. However, the results of the Central_B variable are mixed.

Table 7. Poverty Gap at $ $5.50 A Day (2011 PPP)

	international sample		low income countries		Middle-income countries		Upper-middle-income countries		Higher-income countries		Estimation Methods
Private_ C	(-)***		(-)**		(-)***		(-)		(-)***		OLS
Liquid_L	(-)		(-)		(+)**		(-)		(-)***		
Central_B	(-)		(-)		(-)		(+)		(+)		
Private_ C	(-)***	FE	(-)	GLS	(-)***	FE	(-)***	FE	(-)***	FE	
Liquid_L	(-)***	FE	---	---	(-)**	FE	(-)	FE	(-)**	FE	
Central_B	(-)**	FE	(-)	GLS	(-)	FE	(-)	FE	(-)	RE	
Private_ C	(-)		(+)		(-)*		(+)		(-)**		GMM
Liquid_L	(+)*		---		(+)*		(+)		(-)***		
Central_B	(+)		(+)		(-)***		(+)		(+)**		

4.2 Evidence from SSA Countries

The results on the relationship between financial development, income inequality and poverty are reported in Tables 8, 9, 10 and 11. The results of models 1, 2 and 3 which measure the effect of financial development and poverty are presented first. Model 4 measures the effect of income inequality on poverty, while models 5, 6 and 7 measure the interaction of income inequality with the relationship between financial development and poverty.

Table 8. Financial Development, Income Inequality and Poverty: The Poverty Headcount Ratio at $3.20 a Day PPP (%)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
L.Pov	0.222*	0.226***	0.156*	0.353***	0.483***	0.291***	0.307***
	(0.127)	(0.0544)	(0.0850)	(0.107)	(0.109)	(0.0575)	(0.0578)
GDP	-0.324***	-0.132***	-0.102*	-0.349***	-0.414***	-0.0378	-0.132***
	(0.113)	(0.0434)	(0.0542)	(0.0984)	(0.117)	(0.114)	(0.0403)
INF	0.000410**	0.000854	0.0166	0.00594***	0.00653***	0.00367	0.00986
	(0.000195)	(0.0190)	(0.0302)	(0.000178)	(0.000224)	(0.0107)	(0.0114)
Gov_exp	-0.286*	-0.0837**	-0.230	-0.0289	-0.615	-0.352***	-0.537***
	(0.381)	(0.0643)	(0.264)	(0.124)	(0.633)	(0.0889)	(0.0990)
School_enr	0.213**	0.0109	0.251***	0.108*	0.131	0.103***	0.116***
	(0.107)	(0.0259)	(0.0697)	(0.0595)	(0.111)	(0.0270)	(0.0333)
POP	-0.00185***	-0.001988	-0.00125***	-0.00466*	-0.00548	-0.00606***	-0.00381***
	(0.00537)	(0.0629)	(0.00198)	(0.0251)	(0.00594)	(0.00104)	(0.001)
T_Openness	-0.0744*	-0.0106	-0.00646	-0.119***	-0.137***	-0.000595	-0.00367
	(0.0411)	(0.0117)	(0.00958)	(0.0381)	(0.0482)	(0.00589)	(0.00681)
F_Openness	-45.56***	-0.408*	-37.50*	-29.38	-21.70**	-5.743**	-9.427*
	(39.90)	(4.022)	(20.90)	(21.11)	(28.15)	(2.595)	(9.109)
Private_C	-0.415**	-	-	-	-	-	-
	(0.170)						
Liquid_L	-	-0.0819**	-	-	-	-	-
		(0.0392)					
Central_B	-	-	-0.829***	-	-	-	-
			(0.182)				
II	-	-	-	0.477***	-	-	-
				(0.173)			
Private_C*II	-	-	-	-	0.00663	-	-
					(0.000557)		
Liquid_L*II	-	-	-	-	-	0.000500**	-
						(0.000233)	
Central_B*II	-	-	-	-	-	-	0.00329***
							(0.00102)
N	752	738	732	762	734	724	718
Wald test	252770	710112.18	384444.98	22475.11	80741.83	5828.61	608246.74
P_value Wald Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P-value AR(2) test	0.479	0.754	0.287	0.503	0.93	0.852	0.545
P-value Sargan test	0.107	0.220	0.82	0.550	0.82	0.170	0.91

The 3 models show statistically significant estimates; the Wald test coefficient is way below 5%, the p-values of the Sargan test and AR (2) test of Arellano & Bond (1991) are way beyond 5%, confirming thus our findings. The results indicate that the proxies of financial development, (Private_ C), (Central_B) and (Liquid_L), show negative and significant estimates, replicating the results of Rewilak (2017) which confirm that financial development positively affects poverty decrease. Rashid & Intartaglia (2017) examined data during the 1985-2008 period to study the relationship between financial development and poverty and found that financial development significantly decreases poverty in emerging countries. Similarly, Zheng et al. (2021) found that financial development reduces poverty of fishermen through the indirect effect of economic growth. Zameera et al. (2020), using jointly an augmented DEA model and GMM to study data observed during the 2007-2018 period, found that financial development is a factor explaining poverty reduction. However, the results of Olohunlana & Dauda (2019) in Nigeria, using data observed during the 1996-2017 period and an ARDL model, are insignificant. Nevertheless, the results of this study replicate those of Appiah et.al. (2020) and Yaya (2017). Concerning the effect of income inequality on poverty, the results of model 4 show that income inequality positively and significantly affects poverty and this for all ratios, the $3.20 a day PPP (%), the $5.50 a day PPP (%), the $ 3.20 a day (2011 PPP) and the $ 5.50 a day (2011 PPP). This significant finding suggests that income inequality in Sub Saharan Africa (SSA) causes poverty. Indeed, we conclude that higher income inequalities necessarily lead to such high poverty levels. It turns out that in SSA countries, income inequalities are a catalyst for poverty. This can be explained by the fact that the wider the inequality becomes, the less a minority takes the largest share of national wealth and vice versa, the more a majority of the population benefits from a reduced share of this wealth. As a result, the poverty rate worsens and the poverty gap widens further. In order to conclude on the net direct and positive effect of financial development on poverty, and the indirect positive effect of income inequality on poverty, we believe it is useful to consider the cross effect between financial development and income inequality on poverty. Therefore, we introduced an interaction variable in models (8), (9), (10) and (11). The results show a positive interaction effect on the poverty variables whatever the definition chosen. The results indicate that despite the positive effects of financial development on poverty, the negative effects of income inequality prevail. Finally, SSA countries do not benefit sufficiently from financial development due to the negative effects of income inequality on poverty. In part I, we discuss the role of control variables.

Estimation method is one-step GMM-in-System estimator. AR (2): test of null of zero second-order serial correlation, distributed N (0, 1) under null. The numbers in parentheses are t-statistics. Sargan-statistics is the test of over-identifying restrictions. *, **, and *** indicate statistical significance at the 1%, 5%, and 10% level.

Table 9. Financial Development, Income Inequality and Poverty: The Poverty Headcount Ratio at $5.50 a Day PPP (%)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
L.Pov	0.725***	0.303***	0.408***	0.354***	0.660***	0.557***	0.467***
	(0.0416)	(0.0986)	(0.0805)	(0.121)	(0.0451)	(0.0673)	(0.0689)
GDP	-0.0706***	-0.101*	-0.0185	-0.137**	-0.109***	-0.103**	-0.109**
	(0.0273)	(0.0534)	(0.0636)	(0.0665)	(0.0283)	(0.0436)	(0.0510)
INF	0.000154*	0.000381	0.00101	0.000115	0.000163**	0.000331	0.00648
	(8.27e-05)	(0.0159)	(0.0158)	(0.000112)	(8.00e-05)	(0.0141)	(0.0149)
Gov_exp	-0.0167	-0.451***	-0.579***	-0.0984	-0.236***	-0.329***	-0.320***
	(0.0556)	(0.124)	(0.146)	(0.0639)	(0.0672)	(0.0892)	(0.114)
School_enr	0.00385	0.363***	-0.393***	-0.00677	0.0639**	-0.0451	0.0945
	(0.0236)	(0.0776)	(0.116)	(0.0440)	(0.0250)	(0.0396)	(0.107)
POP	-0.00211***	-0.00592***	-0.00846***	-0.0011	-0.00895	-0.00325	-0.00419*
	(0.00727)	(0.00162)	(0.00307)	(0.00787)	(0.00701)	(0.00938)	(0.00227)
T_Openness	-0.00517	-0.0312*	-0.0148	-0.0348	-0.00155	-0.00164	-0.0319*
	(0.00375)	(0.0174)	(0.0158)	(0.0244)	(0.00396)	(0.0155)	(0.0184)
F_Openness	-1.452	-32.60***	32.49**	-5.168	-5.063**	-5.758*	-29.30
	(1.986)	(11.68)	(15.00)	(20.88)	(2.115)	(8.185)	(18.97)
Private_ C	-0.0570**	-	-	-	-	-	-
	(0.0284)						
Liquid_L	-	-0.240***	-	-	-	-	-
		(0.0584)					
Central_B	-	-	0.255*	-	-	-	-
			(0.133)				
II	-	-	-	0.258**	-	-	-
				(0.102)			
Private_ C*II	-	-	-	-	0.000487**	-	-
					(0.000203)		
Liquid_L*II	-	-	-		-	0.00172*	-
						(0.000980)	
Central_B*II	-	-	-	-	-	-	0.00292**
							(0.00126)
N	737	792	721	747	719	709	707
Wald test	1.39e+06	24230.12	759012.38	1.40e+06	1.38e+06	1.13e+06	931041.86
P_value Wald Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P-value AR(2) test	0.348	0.411	0.240	0.503	0.339	0.509	0.836
P-value Sargan test	0.80	0.175	0.82	0.82	0.82	0.80	0.91

Estimation method is one-step GMM-in-System estimator. AR (2): test of null of zero second-order serial correlation, distributed N (0, 1) under null. The numbers in parentheses are t-statistics. Sargan-statistics is the test of over-identifying restrictions. *, **, and *** indicate statistical significance at the 1%, 5%, and 10% level.

Table 10. Financial Development, Income Inequality and Poverty: Poverty Gap at $ $3.20 a Day (2011 PPP)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
L.Pov	0.420***	0.348***	0.359***	0.355***	0.264**	0.333***	0.262***
	(0.0578)	(0.0748)	(0.0591)	(0.105)	(0.117)	(0.0693)	(0.0630)
GDP	-0.0858**	-0.0988	-0.0502	-0.202	-0.400*	-0.00768	-0.227
	(0.0395)	(0.0822)	(0.0385)	(0.158)	(0.232)	(0.0498)	(0.189)
INF	0.00403***	0.00299	0.0168	6.41 e-04**	-1.11 e-04	0.0239	-0.0296
	(1.48 e-04)	(0.0180)	(0.0120)	(0.000262)	(0.000437)	(0.0153)	(0.0295)
Gov_exp	-0.155*	-0.237**	-0.277***	-0.0724	-0.171	0.150	-0.201*
	(0.0879)	(0.102)	(0.0866)	(0.157)	(0.174)	(0.107)	(0.104)
School_enr	0.0277	0.0755	-0.0628*	0.0142	0.269	-0.0509	-0.0971***
	(0.0428)	(0.0568)	(0.0360)	(0.0980)	(0.225)	(0.0466)	(0.0363)
POP	-0.00689***	-0.00788***	-00107***	-0.00481	-0.00904**	-0.00111***	-0.00113***
	(0.00128)	(0.002)	(0.0014)	(0.00367)	(0.004)	(0.00176)	(0.00138)
T_Openness	-0.00233	-0.0537	-0.00148*	-0.211***	-0.0530	-0.00266	-0.0104
	(0.00617)	(0.0372)	(0.00608)	(0.0686)	(0.103)	(0.00803)	(0.00723)
F_Openness	-2.992*	-13.72**	-2.599*	-54.49	-103.9**	-0.542***	-0.514*
	(2.637)	(12.43)	(2.461)	(33.22)	(49.98)	(3.940)	(2.603)
Private_ C	-0.268***	-	-	-	-	-	-
	(0.0463)						
Liquid_L	-	-0.106**	-	-	-	-	-
		(0.0438)					
Central_B	-	-	0.200**	-	-	-	-
			(0.0969)				
II	-	-	-	1.226***	-	-	-
				(0.258)			
Private_ C*II	-	-	-	-	0.00125*	-	-
					(0.000739)		
Liquid_L*II	-	-	-	-	-	0.00362*	-
						(0.00205)	
Central_B*II	-	-	-	-	-	-	0.00213*
							(0.00122)
N	787	777	771	816	787	777	771
Wald test	75715.26	68328.42	81419.38	27429.89	24111.45	63675.87	83010
P_value Wald Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P-value AR(2) test	0.056	0.129	0.055	0.513	0.311	0.106	0.098
P-value Sargan test	0.80	0.83	0.82	0.82	0.82	0.80	0.91

Estimation method is one-step GMM-in-System estimator. AR (2): test of null of zero second-order serial correlation, distributed N (0, 1) under null. The numbers in parentheses are t-statistics. Sargan-statistics is the test of over-identifying restrictions. *, **, and *** indicate statistical significance at the 1%, 5%, and 10% level.

Table 11. Financial Development, Income Inequality and Poverty: poverty gap at $ 5.50 a day (2011 PPP)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
L.Pov	0.162	0.160***	0.133*	0.238**	0.334***	1.243***	0.262***
	(0.116)	(0.0533)	(0.0739)	(0.0947)	(0.0963)	(0.268)	(0.0586)
GDP	-0.225**	-0.0972***	-0.0732*	-0.274***	-0.319***	-0.333	0.115***
	(0.106)	(0.0368)	(0.0412)	(0.0802)	(0.0929)	(0.282)	(0.0344)
INF	0.000358**	0.00455	0.0240	0.000511***	0.000574***	0.0283	0.0113
	(0.000177)	(0.0163)	(0.0233)	(0.000137)	(0.000167)	(0.0497)	(0.00983)
Gov_exp	-0.0768**	-0.0840	-0.0430*	-0.0236**	-0.381*	-0.482	-0.397***
	(0.367)	(0.0543)	(0.199)	(0.0981)	(0.479)	(0.365)	(0.0843)
School_enr	-0.163*	0.00146	-0.165***	0.0875*	0.0705	0.0575	0.102***
	(0.0861)	(0.0220)	(0.0517)	(0.0478)	(0.0841)	(0.0517)	(0.0285)
POP	-0.0015***	-0.00195	-0.00943***	0.00563***	-0.00314	-0.0056	-0.00386***
	(0.00413)	(0.00545)	(0.0014)	(0.0019)	(0.0044)	(0.00526)	(0.00872)
T_Openness	-0.0624*	-0.0108	-0.00906	-0.0938***	-0.108***	-0.0373	-0.0003
	(0.0375)	(0.00979)	(0.00737)	(0.0307)	(0.0371)	(0.0428)	(0.00589)
F_Openness	-50.99**	-0.576*	-25.57***	-19.53*	-4.939*	-2.951**	-10.63*
	(35.17)	(3.470)	(15.83)	(16.82)	(21.91)	(5.538)	(7.819)
Private_C	-0.311**	-	-	-	-	-	
	(0.141)						
Liquid_L	-	-0.0784**	-	-	-	-	-
		(0.0339)					
Central_B	-	-	-0.555***	-	-	-	-
			(0.132)				
II	-	-	-	0.438***	-	-	
				(0.131)			
Private_C*II	-	-	-		0.00711*	-	-
					(0.000418)		
Liquid_L*II	-	-	-	-	-	0.00121	-
						(0.00167)	
Central_B*II	-	-	-	-	-	-	0.00298***
							(0.000880)
N	752	738	732	762	734	724	718
Wald test	184575.16	594863.24	395870.79	215605.56	188977.84	141089.47	423409.67
P_value Wald Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000
P-value AR(2) test	0.680	0.852	0.394	0.462	0.846	0.107	0.553
P-value Sargan test	0.279	0.404	0.82	0.399	0.82	0.933	0.91

Estimation method is one-step GMM-in-System estimator. AR (2): test of null of zero second-order serial correlation, distributed N (0, 1) under null. The numbers in parentheses are t-statistics. Sargan-statistics is the test of over-identifying restrictions. *, **, and *** indicate statistical significance at the 1%, 5%, and 10% level.

5. Conclusion

This study examines the relationship between financial development, proxied by banking indicators, income inequality and poverty reduction in SSA countries. To this end, this study uses income-based groups of countries taken from the typology of the World Bank, low income, middle-income, upper middle-income and higher income countries. This study contributes to previous research by estimating the effect of financial development, as proxied by (Private_ C), (Central_B) and (Liquid_L), on each poverty ratio, the $3.20 a day PPP (%), the $5.50 a day PPP (%), the $ 3.20 a day (2011 PPP) and the $ 5.50 a day (2011 PPP) ratios. The effect is found to be negative and significant for the entire sample and the sub-samples. Our results are consistent with those of Beck et al. (2007), Jeanneney & Kpodar (2008), Sehrawat & Giri (2015), and Abdin (2016). However, we found mixed results for (Liquid_L), making the conclusion to its negative effect on poverty reduction hard to make. The results also indicate that the relationship between (Private_ C) and (Central_B) and poverty ratios in low-income and middle-income SSA countries is negative.

However, we found evidence indicating that the impact of income inequality on poverty in SSA countries is positive and significant. This implies that the greater income inequality, the higher poverty rates. It is recommended that public authorities ensure that income inequality is kept to a minimum in order to guarantee low poverty headcount ratios and poverty gaps. At the same time, the authorities should work on developing the financial sphere. The positive role of banks in SSA countries in reducing poverty should be reinforced by good banking governance in order to better allocate financial resources to the neediest categories of the population, and this in terms of financing micro-projects that provide income to meet their most basic needs. The results of this study show that financial development coupled with wide income inequalities would increase poverty. To curtail poverty a necessary mix of policies are needed that on the one hand would promote financial development and on the other hand would reduce income inequalities. In addition, we recommend that policy makers promote financial markets as a source of financing that would enable mobilizing the resources for small and medium enterprises in particular to obtain the means they need to invest, grow and produce benefits. Increasing the GDP is the component to which authorities should devote a lot of attention. Our results show that the higher the GDP, the more poverty narrows. Bearing on the above, as public authorities are aware of the important role played by the financial sector, mainly banks, we recommend a monetary policy that promotes the financing of the poorest categories. This financing should be well invested in projects to raise production and control poverty levels in all its ratios.

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Appendices

Appendix 1: Samples, World Bank Classification by GNP

Sample	Countries
Low-income countries	Burkina Faso, Costa Rica, Madagascar, Guinea-Bissau, Mali, Nepal, Níger, Ruanda, Tanzania, Uganda.
Middle-income countries	Armenia, Bangladesh, El Salvador, Georgia, Ghana, Honduras, Ivory Coast, Kenya, India, Indonesia, Nigeria, Lesotho, Mauritania, Morocco, Moldova, Nicaragua, Senegal, Philippines, Guatemala, Tajikistan, Sri Lanka, Ukraine, Uzbekistan, Vietnam, Zambia.
Upper-middle income countries	South Africa, Albania, Belarus, Belize, Botswana, Brazil, China, Colombia, Kazakhstan, Ecuador, Iran, Islamic Republic of, Mongolia, Jamaica, Jordan, Panama, Macedonia, the former Yugoslav Republic, Malaysia, Tunisia, Mexico, Paraguay, Romania, Peru, Thailand.
Higher-income countries	Argentina, Chile, Croatia, Estonia, Ethiopia, Russia, Hungary, Lithuania, Poland, Slovenia, Slovakia, Turkey, Uruguay, Venezuela.

Source: World Bank 2020

Appendix 2: List of SSA countries

Angola	Cote d'Ivoire	Madagascar	Seychelles
Benin	Djibouti	Malawi	Sierra Leone
Botswana	Equatorial Guinea	Mali	Somalia
Burkina Faso	Eritrea	Mauritania	South Africa
Burundi	Ethiopia	Mauritius	South Sudan
Cameroon	Gabon	Mozambique	Sudan
Cape Verde	The Gambia	Namibia	Swaziland
Central African Republic	Ghana	Niger	Tanzania
Chad	Guinea	Nigeria	Togo
Comoros	Guinea-Bissau	Rwanda	Uganda
Republic of the Congo	Kenya	Sao Tome and Principe	Zambia
Democratic Republic of the Congo	Liberia	Senegal	Zimbabwe

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