

ACCESS TO FINANCE AND RATE OF POVERTY IN SUB-SAHARAN AFRICA

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Abstract

The challenge of high rate of poverty and how to address it continues to be the most persistent discuss in international development debates. In the heart of most academic researchers and policy makers are question on what makes sub-Saharan Africa (SSA) the poorest region in the world and what can be done to rescue the populace from the vicious cycle of poverty. This study examined the effect of access to finance and poverty level in SSA. Secondary data on household per capita consumption, number of commercial bank branches per one hundred thousand adults, number of automated teller machines (ATMs) per one hundred thousand adults, number of depositors per one thousand adults, number of borrowers from commercial banks per one thousand adults, per capita income, percentage of dependants over the active working population, trade openness, real interest rate, government expenditure as well as GINI index covering 2004-2018 were sourced from the World Development Indicators (WDI) of the World Bank (2019) and Global Financial Development (2019). Data collected were analysed using econometric method of Panel Ordinary Least Squares. The study found that number of commercial bank branches per 100,000 adults, number of ATMs per 100,000 adults and the number of depositors account per 1000 adults had positive and significant impact on poverty level (household final per capita consumption-expenditure). Whereas, borrowers from banks per 1000 adults had positive but insignificant impact on poverty level. The study concluded that overall access to finance positively impacted the level of poverty in SSA. Hence, access to finance can be used as tool for improving the welfare of the people and in turn reduce the rate of poverty in SSA.

Keywords: Access to Finance, Poverty, Panel Ordinary Least Squares, sub-Saharan Africa**JEL Classification:** D60, E44, I30, I39**Introduction**

United Nations (2000) refers to poverty as “denial of choices, prospects and abuse of human self-worth which denotes dearth of elementary capability to contribute effectively in society, insecurity, powerlessness and exclusion of individuals, households and communities”. This leads to vulnerability to violence, living in a fragile environment, remoteness to clean water and sanitation, lack of social well-being, insecurity, social isolation, and psychological distress, lack of freedom of choice and action and low self-confidence. In the same vein, World Development Indicator (2018) shows that poverty head count ratio in sub-Saharan Africa (SSA) has been on the increase since the 1980s. Poverty head count ratio stood at 54.4 per cent in 1990 and later increase to 58.1 per cent in 1996 before falling to 50.3 per cent in 2005. The most recent poverty head count ratio in SSA shows that poverty has reduced to 41.1 per cent in 2015. However, comparing the gradual reduction in the rate of poverty in SSA with the rest of the world shows that a very wide gap still exists.

Thus, the challenge of poverty in developing countries and how to address it has continued to be the most persistent discuss in the ongoing debates in international development. For instance, the African Findings Report (1996) revealed that low levels in productivity and lack of capital can be significantly linked to poverty in Africa. Thus, poverty remained one of the

main hindrances to economic growth and development of the continent as over half of the populace survives on less than US\$1.25 per day, as a result, moving people out of the poverty trap in less developed countries becomes a difficult task to perform.

The International Fund for Agricultural Development (IFAD, 2010) further revealed that over half of the world's population of poor people reside in developing countries. Also, the World Bank (2012) showed that 47 per cent of the population in sub-Saharan Africa (SSA) survived on US\$1.25 or less per day and the United Nations Food and Agriculture Organisation also estimated that approximately 233 million people in SSA were hungry/undernourished in 2014, hence, making SSA the second largest region with hungry people, next to Asia which has 512 million. Although, there has been insignificant progress towards reducing hunger/undernourishment in the SSA, where more than one in four remained malnourished (World Hunger Education Service, 2015). Since hunger and undernourishment are major constituents of poverty, then, addressing the source of poverty in SSA is one of the major concerns in this study while a major tool identified as an instrument to address the problem of poverty in the sub-region is the volume of savings.

Savings generally has a way of diminishing the risk associated with the inability to predict the future and thus, acting as precaution. Savings is a major component in any developmental goal since it is one of the surest ways of boosting productivity and increasing income in an attempt to break the vicious circle of poverty. Therefore, mobilisation of savings could be made possible through the delivery of financial aid to people. The financial services available in advanced economies are quite enormous. These services assist them to save more and build up assets while poor people in developing region of the world – (SSA inclusive are faced with a much narrower set of choices). Hence, lack of access to financial services which include a place to reliably keep money and effective ways of transferring money, and utilisation of credit and insurance services has thus been suggested by International Finance Corporation (IFC, 2013) to be a reason why a bulk of the population in most developing countries remain in poverty.

In spite of savings being identified as a factor that can move people above poverty trap, there is minimal savings services from formal financial institutions for the poor in the developing countries because many of these people and these institutions do not accommodate little savings (Ling, 2013). Consequently, the delivery of micro saving services to aid the poor people in securing their capital in a reliable outlet over a period of time with a view to financing a large foreseen investment or expenditure, unforeseen contingencies which, at times, can provide interest on the savings of these people have remained a big challenge (DFID, 2004).

Studies have shown that availability of and accessibility to financial services and products is a way of eradicating poverty. Thus, the need to galvanise sufficient financial accessibility in developing countries has recently caught the attention of researchers and policy makers alike. For instance, studies such as Geda, Zerfu and Shimeles (2006), Fadun (2014), Babajide, Taiwo and Isibor (2015), and, Quartey, Danquah and Iddrisu (2017) have all looked at the effect of financial accessibility on poverty alleviation but most of these studies only concentrated efforts at addressing the problem of poverty vis-à-vis access to finance on country specific basis partly due to unavailability of data. This study fills the gap by taking cognisance of the fact that poverty in Africa transcend beyond national boundaries with its associated spill-over effects increasingly manifesting in SSA.

Also, it is pertinent to mention that several studies that have examined the poverty alleviating effect of financial development have done so through financial deepening, financial stability as well as financial efficiency (see Jalilian & Kirkpatrick, 2002; Uddin, Shahbaz & Odhiambo,

2009; Perez-Moreno, 2011; Arouri & Teulon, 2013), thereby largely ignoring access to financial services which is also a major component of financial development and a step towards global financial inclusion.

Furthermore, the few existing studies such as Honohan (2008), Coulibay and Yogo (2016), Janina, Juliane, Ute, Ani, Lucie, Cluve and Yulia, (2017), and, Tita and Aziakpono (2017) focus on the macro level of access to financial services in developing countries but fail to address the problem of poverty. Whilst studies such as Jalilian and Kirkpatrick (2001); Jeanneney and Kpodar (2008); Prahan (2010); and, Aye (2013) posits that effective access to finance can be used as a tool to ameliorate the level of poverty. Therefore, this study extends the frontiers of knowledge specifically by bringing to fore access to financial services as a means of reducing poverty in SSA. Therefore, establishing the relationship between access to finance and poverty level in SSA is of interest to policymakers in Africa in order to attain the sustainable development goal number 8 that has to do with the reduction of poverty to the barest minimum.

The remaining sections of this study is as follows. Section two presents a review of relevant empirical literature. Section three contains the methodology while section five presents the analysis and interpretation of results and lastly, section five is the conclusion and policy recommendation.

Review of Literature

Theoretically, the relationship between finance and poverty is both direct and indirect (Fowowe & Abidoye, 2012). The direct relationship refers to how the benefits from access to finance can translate to the reduction of poverty and inequality while the indirect relationship reveals how the deepening in finance affects the growth of economy and how benefits from growth become used for the improvement of the welfare of poor people. Thus, the direct relationship functions through the poor as they benefit from financial institutions by gaining access to financial services while the indirect functions reveal how deepening in access to finance affect the growth process of the economy and how the benefits from growth become useful for the improvement of the welfare of the poor. Department for International Development (2004) argues that financial development and inclusive finance can influence poverty directly by widening the accessibility of financial amenities to the poor people.

As a result, the availability of bank credits to the poor may be constrained by request for collateral and high level of interest rate, thus broadening the inequality space between the rich and the poor. Similarly, that poor people in developing countries do not have access to financial facilities from formal financial institutions are compelled to rely on constricted choices of costly and riskier financial services from informal financial outlets is widely believed (Dauda & Makinde, 2014). The lack of access hinders the poor from participating fully in markets and denies them the opportunity to escape the vicious cycle of poverty. Therefore, inclusive finance creates profitable investment opportunities for the informal financial sector, which is often the major source of funds for the poor people. Hence, the provision of micro savings facilities can aid the poor in securing their funds in a reliable place for a period of time with a view to financing large expected future investments, unforeseen contingencies and its provision can yield interest on the savings of the people (DFID, 2004).

Empirical studies on the relationship between financial development and poverty are vast and were mainly focused on the measures of financial depth such as credit to private sector, bank money deposit to GDP, or M2/GDP (see Jalilian & Kirkpatrick, 2002; Odhiambo, 2009;

Perez-Moreno, 2011; Uddin, Shahbaz, Arouri & Teulon, 2013), and they are indecisive because of diverse findings. The study by Aportela (1999) examines the impact of increasing financial access on low income people savings in Mexico. The study employed the median regression. Findings from the study reveal that financial access increase on low income people deposits are statistically significant which implies that increasing access to financial services could advance the welfare of the low income household.

Park and Mercado (2015) studied the impact of financial inclusion on poverty and income inequality in developing Asian countries and constructed an index of financial inclusion for 176 economies. Their findings showed that when both per capita income and rule of law are considered as independent variables, suggesting that per capita income and high-risk profile are the main determinants of financial inclusion in developing Asian economies rather than market failure and weak enforcement of a contract. The study by Honohan (2008) who constructed a financial inclusion index for 160 countries using data from both the household survey and the publications of various institutions showed that aids as a percentage of gross national income, age dependency ratio, and population density are all statistically insignificant determinants of financial inclusion.

Sarma (2008) established a dimensional index of financial inclusion in India with a view of integrating information on accessibility, availability and usage of banking services. The index captures information on penetration, availability and usage of banking system which ranges between 0 and 1 where 0 denotes total exclusion and 1 indicates perfect financial inclusion. Using data on all the three dimensions for 55 countries and using data on only two dimensions (availability and usage) for 100 countries, thereby computing two sets of indexes of financial inclusion. The study finds that India's position is 50th among the 100 countries, with a low inclusion index value of (0.17) while among the 55 countries India ranks 31st with an inclusion index of (0.16).

Michael (2011) also explores the influence of access to financial services on the socio-economic welfare of citizens with the aim of examining the various barriers to inclusive finance in Nigeria. A probit model of analysis was adopted. Findings from the study reveals that the documentary requirement for opening bank accounts are high in Nigeria. For instance, only 9.7 per cent of Nigeria populace possess three or more officially required documents for opening a bank account, 5.6 per cent possess more than four while about 80 per cent of the population in Nigeria remains outside the formal banking sector. Thereby having a concise influence on the level and nature of economic activities and social welfare in Nigeria.

Allen, Carletti, Cull, Qian, Senbet and Valenzuela (2012) also explored the effect of equity bank's branches expansion in rural Kenya using household surveys and bank penetration data at the district level in 2006 and 2009. The study used regression techniques such as Ordinary Least Squares (OLS), Ordered Probit model and Generalized Method of Moments (GMM) to control for endogeneity. The results showed that equity bank's branch expansion into underserved rural districts have utmost influence on low income households with no remunerated jobs who had less than secondary school education and who were destitute.

Demirguc-Kunt and Klapper (2012) investigates household determining factors of banking access and usage in Mexico with a municipal dataset. The study shows the importance of influx of remittance which increase the additional cash flow of people and the demand for saving account and consequently reduce poverty. The study by Fulford (2011) argues that the poverty reducing effect of access to financial services is temporary in the case of India and concluded that the introduction of credit creates an upsurge in consumption and reduces

poverty initially but eventually reduces mean consumption because of credit substitutes for precautionary wealth.

The study by Pande, Cole, Sivasankaran, Bastian and Durlacher (2012) establishes that inventive schemes of new savings products increase both the demand and supply savings by assisting people to address behavioral tasks that were found to raise income in the short-run. It emphasizes that state-led expansion of the banking sector in rural areas increased the supply of banking services, which in turn was initiated to alleviate rural poverty, raise their earnings and increase agricultural productivity. The study further revealed that technological improvement such as using of mobile phones to access financial services has been adjudged to have income increasing potential for low income earners which in turn safeguards the individual from risk and negative economic shock.

Ayyagari, Thorsten and Hoseini (2013) also explores the impact of financial sector development on changes in rural and urban poverty. The study reveals the channels through which financial sector development lessens the prevalence of poverty and the role of financial depth and inclusion in this capacity. The study also reveals that financial depth has a negative and significant impact on rural poverty while the role of migration from rural to urban areas is seen as a way of fostering entrepreneurship and is regarded as an important channel for financial depth to reduce poverty.

Muritala and Fasanya (2013) examines the vital role that financial inclusion plays in reducing poverty by investigating the nexus between viable financial services and poverty alleviation in Nigeria covering the period from 1965-2010. The study made use of OLS regression model and found that total value prime lending rate, financial savings, credit to private sector as well as the rate of inflation have significant impact on the level of financial deepening. It was also observed from the study that financial inclusion tends to support financial deepening and offer resources to the banks which enhances the rate of credit delivery, thereby leading to financial development.

The study by Efobi, Beecroft and Osabuohien (2014) investigates the nexus between the degree of access to and the use of bank services by an adult individual in Nigeria using the logistic regression model. Findings from the study reveals a significant relationship between individual attributes, education, income, information and communication technology (ICT) disposition and the use of bank services. The study also reveal that the likelihood of consuming bank services decreases with women but rises with age square, educational achievement, income and ICT disposition. Likewise, the probability of using an account to save rises with age, education attainment and financial discipline.

Akinlo (2014) examines the barrier involved in increasing access to finance for growth in rural Nigeria. The study identifies the limitations and challenges of providing financial services in rural areas as well as the policy initiatives to improve rural financial services. Challenges identified include higher credit risk in procuring and providing financial services, dearth of dependable information on the past credit history of borrowers, lack of collateral by potential borrowers, high transaction costs, high rate of illiteracy, weak legal framework and enforcement issues and government policy constitute challenges that hinders financial inclusion and hampers the welfare of rural dwellers in Nigeria adversely. However, the study reveals that the introduction of flexible and easily accessible products which are compatible with the cash flow of rural household are necessary to enhance the development and introduction by formal financial institutions.

Empirical study by Ajide (2015) also examines the impact of financial inclusion on poverty reduction in Nigerian rural communities using data covering the period from 1996 to 2013. The study employs the use of Autoregressive Distributed Lag (ARDL) bound test and the result shows that there is a long-run relationship among the variables used in the study. The study highlights the importance of financial inclusion as a key strategy for poverty reduction in rural communities. The study by Fadun (2014) investigates the inclusiveness of finance as an instrument for mitigating poverty and reallocation of income in order to reduce the number of that are exempted from financial services in Nigeria. Findings from the study shows that inclusive finance constitute a crucial instrument for mitigating poverty and redistribution of income in developing countries.

The study by Babajide, Taiwo and Isibor (2015) investigates the influence of innovative savings products as a form of financial inclusion strategy in the Nigerian banking industry on the welfare of low-income earners and self-employed individuals in Nigeria. The savings products that were examined include Esusu by Stanbic IBTC, Finaflex and FTAP by Trust Microfinance Bank, First instant by First Bank, Ammah savings by Mainstreet Microfinance Bank. Three major hypothesis were postulated for the study. The first hypothesis relates to the influence of innovative savings products on household savings rate which was tested using paired sample *t*-test, while the other hypothesis which relate to the impact of innovative savings products on household poverty level and microenterprise development respectively were tested using multiple regression analysis. Findings from the study shows that there is a sharp increase in the saving rate of the household as an outcome of the introduction of innovative savings product. The results also show that savings growth rate as well as all innovative savings products are statistically significant.

Coulibaly and Yogo (2016) investigated the effect of access to financial services on the prevalence of poverty among the working population in sixty-three developing countries. Their findings showed that improving financial access (as measured by the number of bank branches per 100,000 adults) reduces the prevalence of poverty. Amendola, Boccia, Mete and Sensini (2016) evaluated the impact of access to credit from financial institutions on household welfare in Mauritania using household survey of 2014. Their findings revealed that greater financial access is associated with an increased investment in human capital and likewise a reduced reliance on household production. The study by Ajide (2017) emphasis on the importance of institutions as a major driver of financial inclusion in SSA which are often unavailable and when available, they are usually very weak.

Tega-Williams, Adegoke, and Adegbola (2017) investigated the role of financial inclusion on poverty reduction and economic growth in a developing economy using panel data covering the period 2006 to 2015. The study found that financial inclusion has not effectively promoted stable financial and marketing support to the economic system in developing economies in term of poverty reduction. Whilst, Tita and Aziakpono (2017) suggested that efforts should be made to increase the level of financial inclusion as well as reduction in the rate of excess liquidity within the banking system in SSA through the development of financial institutions in order to encourage the financial system to support the volume of economic activities through provision of loans. Lastly, Omar and Inaba (2020) further emphasises the importance of financial inclusion as a means of reducing the rate of poverty and income inequality among one hundred and sixteen developing countries. The study established that financial inclusion significantly reduces the rate of poverty and inequality among developing countries of the world. The SSA is characterised by high rate of poverty. Although, previous studies confirmed that access to financial services is crucial to reducing the rate of poverty in the world. Hence, this study investigates the effect of access to finance on rate of poverty in SSA.

Methodology

Theoretical framework

To establish the effect of access to finance on the rate of poverty in SSA, this study adopts the McKinnon-Shaw theory otherwise known as conduit theory. The McKinnon and Shaw (1973) theory assumes that liberalisation is associated with higher interest rate and has the capacity to facilitate more saving. Thus, the fundamental assumption of this theory is that savings is attentive to interest rate. Therefore, higher savings rates would finance a better level of investment, resulting in higher economic growth. Hence, the reform of a repressed financial sector through the elimination of interest rate ceiling and other forms of control stimulates higher real interest rate on deposits. This extends the financial intermediation course and leads to financial development by providing enticements to savers.

Furthermore, the finance-growth nexus as explained by McKinnon and Shaw (1973) suggests that income is a function of macroeconomic variables such as capital stock interest rate and money supply. The theory also assumes that investment is lumpy and self-financed which can only emerge unless sufficient savings is mobilized in the form of bank deposits. This economic believe was also exposted by Jeanneney and Kpodar (2008), and, Fowowe and Abidoye (2012) that emphasise that financial development helps to decrease poverty directly through the McKinnon conduit effect and indirectly through economic growth. Therefore, efficient financial structures are very essential in conveying resources to the productive but unfunded segments of the economy, apportioning risks to those who can bear the brunt, thereby, raising the level of growth, increasing prospects and income redistribution and lowering inequalities which bring about reduction in poverty.

Model specification

In an attempt to investigate the relationship between access to finance and rate of poverty in the SSA, this study employed Panel Ordinary Least Squares to examine the impact of access to finance on rate of poverty in SSA. This study further examines the effect of the four different indicators of access to finance in SSA thereby revealing which of the indicators have the highest significant effect on poverty reduction in SSA countries. In view of this, the study adopts a panel framework model which is specified as thus:

$$POV_{it} = \beta_0 + \beta_1 ACCESS_{it} + \beta_2 Z_{it} + \varepsilon_{it} \quad (1)$$

Where *Pov* represents the rate of poverty which is proxied with per capita household final consumption-expenditure (US dollars), β_0 is the intercept of the model and β_i s are the coefficients to be estimated. *ACCESS* denotes access to finance which is proxied with four indicators namely; number of ATMs per one hundred thousand adults, number of commercial bank branches per one hundred thousand adults, number of depositors accounts with commercial bank per one thousand adults, number of borrowers from commercial banks per one thousand, and *Z* represents the list of control variables such as population size, government expenditure, per capita gross domestic product, dependency ratio as a proxy for age, inflation rate, real interest rate, trade openness and Gini index. Thus, the model is re-specified as:

$$\ln POV_{it} = \beta_0 + \beta_1 ACCESS_{it} + \beta_2 \ln POP_{it} + \beta_3 GE_{it} + \beta_4 \ln PCGDP_{it} + \beta_5 AGE_{it} + \beta_6 INF_{it} + \beta_7 RIR_{it} + \beta_8 TOT_{it} + \beta_9 GINI + v_{it} \quad (2)$$

Data sources and measurement of variables

The data used for this study were mainly sourced from the World Development Indicator (WDI) of the World Bank (2019) and Global Financial Development Database (2019) covering the period 2004 to 2018 for 32 SSA countries which were selected principally based on availability of data. The data comprises the annual measures of access to finance, rate of poverty and a set of standard control variables. Specifically, the measures of access to finance include, the number of commercial bank branches per one hundred thousand adults, number of depositors account with commercial banks per one hundred thousand adults, number of automated teller machine per one hundred thousand adults and numbers of borrowers from commercial banks per one hundred thousand adults. The rate of poverty is measured as household per capita consumption-expenditure (Quartey, 2005; Geda, Zerfu & Shimeles, 2006; Danquah, Quartey & Iddrisu, 2017). It is measured in constant 2010 US dollars where household consumption-expenditure is divided by the number of people in the household.

Other variables employed in this study include the level of per capita gross domestic product (PCGDP) which captures the level of economic development in the SSA. The population size measures the actual population of individual in the SSA countries, age dependency ratio measures the ratio of the dependents over the active working class. The inflation rate is measured in relation to the consumer price index (CPI) which proxies for macroeconomic stability. The terms of trade are exports plus imports as a percentage of GDP which is a measure of the rate of openness to international trade. The real interest rate is the cost of capital which is expected to have an inverse influence on the rate of poverty. GINI index is a measure of income inequality while government expenditure (percentage of GDP) which measures the impact of social safety net for the poor. The primary school completion rate serves as the proxy for literacy rate in this study.

Analysis and Interpretation of Results***Panel stationarity tests***

The SSA countries involved in this study are likely to be homogenous in nature. Hence, the need to subject all the macroeconomic data to unit root test. The macroeconomic variables subjected to panel unit root tests include per capita household consumption-expenditure, access to finance indicators (bank branches per 100,000 adults, automated teller machine per 100,000, depositors per 1000 adults and borrowers from banks per 1000 adults), population size, government expenditure, per capita gross domestic product, dependency ratio, inflation rate, real interest rate, trade openness, and Gini coefficient.

Table 1: Panel Unit Root Test at Level

	Levin, Lin and Chu test			Im, Pesaran and Shin Test		Fisher ADF test			Fisher PP test			Hadri LM test	
Variable	Individual Intercept	Individual Intercept with Trend	None	Individual Intercept	Individual Intercept with Trend	Individual Intercept	Individual Intercept with Trend	None	Individual Intercept	Individual Intercept with Trend	None	Individual Intercept	Individual Intercept with Trend
Panel Unit Root at Level													
lnPOV	-3.14*	-3.54*	-3.03*	-4.50*	-5.12*	-4.46*	-4.64*	-3.29*	-6.60*	-7.92*	-4.66*	3.76	2.40
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
BBPOTA	2.19	0.97	2.11	3.74	1.03	2.45	1.10	2.48	3.64	1.42	3.40	5.10	4.65
(P-Value)	(1.0000)	(0.8329)	(0.9991)	(1.0000)	(0.9988)	(1.0000)	(0.9990)	(1.0000)	(1.0000)	(0.9997)	(1.0000)	(0.0000)	(0.0000)
ATMsPHT	-1.59	-1.06	0.29	-1.72**	-0.52	-1.75**	-0.58	1.90	-2.24**	-0.79	2.04	6.87	7.66
(P-Value)	(0.0563)	(0.1439)	(0.6132)	(0.0424)	(0.3006)	(0.0397)	(0.2824)	(0.9714)	(0.0126)	(0.2145)	(0.9794)	(0.0000)	(0.0000)
lnDPOTA	-1.98**	0.015	0.21	-1.88**	-0.49	-1.95**	-0.53	2.02	-2.50*	-1.31	2.36	6.85	6.16
(P-Value)	(0.0239)	(0.5058)	(0.5833)	(0.0304)	(0.3123)	(0.0255)	(0.2978)	(0.9785)	(0.0063)	(0.09943)	(0.9909)	(0.0000)	(0.0000)
BBPOTA	-4.64*	-4.18*	-6.68*	-5.21*	-4.55*	-4.98*	-4.02*	-5.10*	-4.07*	-4.18*	-5.21*	1.54**	3.22
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0618)	(0.0006)
lnPOP	0.23	-0.34	0.35	0.60	0.33	0.79	0.81	-0.37	0.79	0.81	-0.37	4.13	0.79
(P-Value)	(0.5924)	(0.3682)	(0.4519)	(0.7247)	(0.6295)	(0.7842)	(0.7906)	(0.3539)	(0.7842)	(0.7906)	(0.3593)	(0.0000)	(0.1656)
GE	-6.14*	-6.54*	-5.03*	-7.50*	-8.12*	-7.46*	-7.64*	-6.29*	-11.60*	-13.92*	-8.66*	5.76	3.40
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
PCGDP	4.19	0.97	3.11	5.74	3.03	5.45	3.10	4.48	6.64	3.42	6.40	10.10	7.65
(P-Value)	(1.0000)	(0.8329)	(0.9991)	(1.0000)	(0.9988)	(1.0000)	(0.9990)	(1.0000)	(1.0000)	(0.9997)	(1.0000)	(0.0000)	(0.0000)
AGE	-1.50	-1.00	0.33	-1.68**	-0.44	-1.80**	-0.60	1.95	-2.30*	-0.72	2.09	5.60	6.78
(P-Value)	(0.0663)	(0.1349)	(0.6132)	(0.0442)	(0.3601)	(0.0333)	(0.2913)	(0.9814)	(0.0116)	(0.2222)	(0.9800)	(0.0000)	(0.0000)
INF	-1.89**	0.010	0.25	-1.86**	-0.47	-1.99	-0.57	2.10	-2.65*	-1.41	2.40	6.90	6.30
(P-Value)	(0.0339)	(0.4998)	(0.5933)	(0.0300)	(0.3321)	(0.1268)	(0.2797)	(0.9785)	(0.0053)	(0.08430)	(0.9909)	(0.0000)	(0.0000)
RIR	-16.64*	-16.18*	-18.68*	-17.21*	-16.55*	-13.98*	-13.02*	-17.10*	-14.07*	-14.18*	-17.21*	1.54**	3.22
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0618)	(0.0006)
TOT	0.25	-0.36	0.46	0.66	0.36	0.70	0.88	-0.40	0.71	0.86	-0.38	4.13	0.79
(P-Value)	(0.5924)	(0.3682)	(0.6440)	(0.7307)	(0.6300)	(0.7850)	(0.8024)	(0.3550)	(0.7931)	(0.7800)	(0.3600)	(0.0001)	(0.1656)
GINI	-1.60	-1.36	0.30	-1.80**	-0.55	-1.80	-0.80	1.81	-2.40	-0.77	2.10	4.67	5.59
(P-Value)	(0.0570)	(0.1450)	(0.6202)	(0.0430)	(0.3901)	(0.0369)	(0.2799)	(0.9730)	(0.0166)	(0.2153)	(0.9800)	(0.0000)	(0.0000)

Source: Authors' Computation, 2020.

*, ** and *** indicate the level of significance of 1%, 5% and 100% respectively.

Table 2: Panel Unit Root Test at First Difference

	Levin, Lin and Chu test			Im, Pesaran and Shin Test			Fisher ADF test			Fisher PP test			Hadri LM test	
Variable	Individual Intercept	Individual Intercept with Trend	None	Individual Intercept	Individual Intercept with Trend	Individual Intercept	Individual Intercept with Trend	None	Individual Intercept	Individual Intercept with Trend	None	Individual Intercept	Individual Intercept with Trend	
lnPOV	---	---	---	---	---	---	---	---	---	---	---	0.69*	5.87	
(P-Value)	---	---	---	---	---	---	---	---	---	---	---	(0.2354)	(0.0000)	
BBPOTA	-5.55*	-4.32*	-6.23*	-4.23*	-4.00*	-4.90*	-4.30*	-5.89*	-6.90*	-7.88*	-7.78*	-0.90*	5.23	
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.8098)	(0.0000)	
ATMsPHT	-8.00*	-6.40*	-8.99*	-6.00*	-5.00*	-5.01*	-4.98*	-7.77*	-7.99*	-10.94*	-12.49*	-0.80*	4.01*	
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.7638)	(0.0010)	
lnDPOTA	-5.00*	-4.11*	-6.45*	-6.43*	-5.50*	-5.51*	-4.89*	-7.66*	-8.53*	-11.00*	-12.00*	-0.50*	4.00*	
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.6800)	(0.0000)	
BBPOTA	---	---	---	---	---	---	---	---	---	---	---	2.51	5.62	
(P-Value)	---	---	---	---	---	---	---	---	---	---	---	(0.0130)	(0.0002)	
lnPOP	-7.85*	-6.11*	-5.71*	-6.68*	-7.01*	-3.48*	-4.25*	-4.00*	-4.55*	-3.00*	-2.55*	0.18*	5.00*	
(P-Value)	(0.0000)	(0.0010)	(0.0030)	(0.0000)	(0.0000)	(0.0077)	(0.0000)	(0.0000)	(0.0010)	(0.0019)	(0.0041)	(0.4600)	(0.0000)	
GE	---	---	---	---	---	---	---	---	---	---	---	0.67	5.00	
(P-Value)	---	---	---	---	---	---	---	---	---	---	---	(0.2350)	(0.0000)	
PCGDP	-7.77*	-7.20*	-11.90*	-8.18*	-7.30*	-8.16*	-7.13*	-10.70*	-12.82*	-14.54*	-15.67*	-0.88*	4.32*	
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.8098)	(0.0000)	
AGE	-10.09*	-8.50*	-16.81*	-12.27*	-10.89*	-11.29*	-9.72*	-14.73*	-17.33*	-23.94*	-24.29*	-0.72*	3.07*	
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.7638)	(0.0011)	
INF	-10.08*	-8.10*	-17.21*	-12.86*	-11.05*	-11.51*	-9.76*	-15.13*	-17.20*	-21.32*	-23.02*	-0.44*	4.08*	
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.6702)	(0.0000)	
RIR	---	---	---	---	---	---	---	---	---	---	---	2.25*	14.718	
(P-Value)	---	---	---	---	---	---	---	---	---	---	---	(0.01238)	(0.0006)	
TOT	-9.58*	---	---	---	---	-3.42*	---	-2.78*	-2.45*	---	-2.69*	0.15*	4.75*	
(P-Value)	(0.0000)	---	---	---	---	(0.0070)	---	(0.0020)	(0.0087)	---	(0.0040)	(0.4599)	(0.0000)	
GINI	-7.08*	-8.50*	-12.61*	-8.20*	-8.86*	-7.79*	-8.02*	-10.73*	-11.33*	-15.40*	-14.33*	-0.70*	4.01*	
(P-Value)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.7650)	(0.0022)	

Source: Authors' Computation, 2020.

*, ** and *** indicate the level of significance of 1%, 5% and 100% respectively.

It was observed from Table 1 that the measure of poverty (per capita household consumption-expenditure) and borrowers from bank per 1000 adults (BBPOTA). Suggesting that the two macroeconomic variables were integrated of order zero, i.e., $I(0)$ while Table 2 bank branches per 100,000 adults (BBPOTA), automated teller machine per 100, 000 (ATMsPHT), depositors per 1000 adults (lnDPOTA), population size(lnPOP), government expenditure (GE), per capita GDP (PCGDP), dependency ratio (AGE), inflation rate (INF), real interest rate (RIR), trade openness (TOT) and Gini coefficient were only stationary after first difference. Suggesting that the macroeconomic variables are integrated of order one, i.e., $I(1)$.

Panel cointegration test

Having established that the order of integration of the variables. The cointegration relationship among the variables is determined to establish the possible presence of a long run relationship of the variables. Pedroni panel tests were employed for this purpose. Pedroni observed the properties of residual-based tests for the null hypothesis of no cointegration among variables in a panel data in which both the short run and long run slope coefficients are permitted to be homogenous across specific members of the panel. Pedroni considers both pooled within dimension tests and group mean between dimension tests.

The Pedroni cointegration test result showed that in all the eleven Pedroni's statistics, eight significantly reject the null hypothesis of no cointegration in favour of the presence of cointegration among the variables while the remaining four Pedroni statistics accept the null hypothesis of no cointegration among the variables leading to a conclusion that there is long run relationship from the panel cointegration test for the SSA countries.

Table 3: Pedroni Panel Cointegration Test

Pedroni Residual Cointegration Test				
Series: LOG(POV) ACCESS LOG(POP) GE PCGDP AGE INF RIR TOT GINI				
	Statistic	Probability	Weighted Statistic	Probability
Panel v-Statistic	-3.2243**	0.0275	-3.1144**	0.0285
Panel rho-Statistic	4.0451*	0.0020	4.0451*	0.0024
Panel PP-Statistic	-4.1005*	0.0059	0.018685	0.5075
Panel ADF-Statistic	-5.1014**	0.0000	-5.2522*	0.0000
Alternative hypothesis: individual AR coefs. (between-dimension)				
Group rho-Statistic	1.757980	0.9600		
Group PP-Statistic	0.500267	0.6300		
Group ADF-Statistic	-5.1407*	0.0000		

Source: Authors' Computation, 2020.

*, ** and *** indicate the level of significance of 1%, 5% and 100% respectively.

Interpretation of results

The analysis of this study is based on panel OLS estimation. Following Beck *et al.*, (2007), a panel data model for OLS estimation is specified. Using the log of per capita consumption-expenditure (rate of poverty) as the dependent variable in Table 4, the study found that the number of bank branches per 100,000 adults has a positive and significant ($\beta_1 = 0.039$; $p > 0.05$) effect on per capita consumption expenditure. The effect signifies that an increase in the number of bank branches reduces poverty in SSA through an increase in consumption-expenditure. This finding is in line with the earlier studies by Neaime and Gaysset (2018) and, Naceur and Zhang (2016) who established that increase in the number of bank branches has the capacity to ameliorate poverty in developing countries.

In the same vein, the study found that the number of automated teller machine per 100,000 adults has a positive and significant ($**\beta_1 = 0.010$; $p > 0.05$) effect on per capita consumption expenditure. This positive effect signifies that a wide increase in the number of automated teller machine in the SSA countries has significantly increase the rate of access to financial services thereby reducing the rate of poverty through provision of more ATMs in the rural areas of SSA.

Similarly, the study established that the number of depositors per 1000 adults has a positive and significant ($***\beta_1 = 0.145$; $p > 0.05$) effect on per capita consumption expenditure. This positive effect signifies a one percent increase in the number of depositors per 100 adults will significantly reduce the rate of poverty in the SSA. However, the result obtained for the while using the number of borrowers as a proxy for access to finance negates the earlier findings. The number of borrowers from commercial banks per 1000 adults shows that access to finance has a positive but insignificant effect on the rate of poverty in SSA ($****\beta_1 = 0.000$; $p < 0.05$). This explains that as the number of borrowers from commercial banks per 1000 adults has not been channel to the real sector, as such does not significantly reduce the rate of poverty in SSA. Therefore, the reduction in the rate of poverty still remains insignificant.

The results as also show that the dependency ratio has a negative and significant impact on per capita consumption-expenditure. This could be explained by the high level of unemployment in SSA whereby a large number of dependents relied heavily on the few working populations for their survival, thus reducing the per capita-consumption expenditure for each head of individual household, and in turn worsens the poverty rate in SSA. However, other important variables along with access to finance indicators used in this study that have significant effects on the rate of poverty in SSA are the per capita GDP ($\beta_4 = 0.656$; 0.707 ; 0.696 ; 534 ; $p > 0.05$), trade openness ($\beta_8 = 0.002$; 0.008 $p > 0.05$) and Gini coefficients ($\beta_9 = 0.014$; 0.028 ; $p > 0.05$).

In summary, the study established that number of bank branches per 100,000 adults, number of ATMs per 100,000 adults and number of depositors account per 1,000 adults as a measure of access to finance have significant positive impact on the rate of poverty, but the effect of number of borrowers from commercial banks per 1000 adults is found to be positive but insignificant on the rate of poverty in SSA. Thus, this study supports the previous findings (see, Allen *et al.*, 2012; Demirguc-Kunt and Klapper, 2012; Pande *et al.*, 2012; Ajide, 2014; Coulibaly and Yogo, 2016; Jabir, Lord & Agyapomaa, 2017; Agyemang-Badu, Agyei & Kwaku-Duah, 2018; Omar & Inaba, 2020) in affirming that an increase in the level of available financial services to the people has the capacity to readjust the lifestyle of the people through protection from all forms of vulnerabilities, thereby boosting their level of productivity, raising their income-generating potential and reducing the prevalence of poverty in the region.

Table 4: Results of the Effect of Access to Finance on the Rate of Poverty in SSA.

Dependent variable: Rate of Poverty (proxied with Log of household final consumption expenditure per capita, constant US\$ 2010)

Independent Variables	1 OLS	Independent Variables	2 OLS	Independent Variables	3 OLS	Independent Variables	4 OLS
CONSTANT	1.428 (1.64)	CONSTANT	2.46 (2.37)**	CONSTANT	1.973 (1.92)*	CONSTANT	2.265 (2.32)**
*Bank branches per 100,000 adults	0.039 (2.25)**	**Automated teller machine per 100,000	0.010 (1.83)*	***Log of Depositors per 1000 adults	0.145 (3.10)***	****Borrower s from Banks per 1000 adults	0.000 (0.64)
Log of population	-0.007 (-0.19)	Log of population	-0.047 (-0.97)	Log of population	-0.052 (-1.01)	Log of population	-0.044 (-1.19)

Government expenditure	-0.007 (-0.76)	Government expenditure	0.000 (0.03)	Government expenditure	0.000 (0.04)	Government expenditure	-0.025 (-1.92)*
Log of per capita gross domestic product	0.656 (8.57)** *	Log of per capita gross domestic product	0.707 (6.55)***	Log of per capita gross domestic product	0.696 (9.84)***	Log of per capita gross domestic product	0.534 (5.96)***
AGE(Dependency ratio)	-0.002 (-0.50)	AGE(Dependency ratio)	-0.004 (-1.26)	AGE(Dependency ratio)	-0.006 (-1.78)*	AGE(Dependency ratio)	-0.002 (-0.40)
Inflation	0.005 (0.68)	Inflation	0.014 (1.22)	Inflation	0.018 (0.97)	Inflation	0.002 (0.18)
Real interest rate	0.002 (0.56)	Real interest rate	0.005 (1.01)	Real interest rate	0.007 (1.67)	Real interest rate	-0.005 (-1.31)
Trade openness	0.002 (2.33)**	Trade openness	-0.000 (-0.00)	Trade openness	-0.001 (-0.38)	Trade openness	0.008 (2.46)**
Gini coefficient	0.014 (2.65)** *	Gini coefficient	0.002 (0.24)	Gini coefficient	0.007 (1.24)	Gini coefficient	0.028 (5.00)***
Number of groups	32	Number of groups	32	Number of groups	32	Number of groups	32
R-squared	0.9641	R-squared	0.9658	R-squared	0.9807	R-squared	0.9828

Notes: the panel OLS regressions are reported below estimated coefficient values. ***, ** and * indicate significance of 1%, 5% and 10% respectively.
Source: Authors Computation, 2020.

Conclusion and Recommendations

This study has shown that one of the ways of reducing the rate of poverty in SSA is through developing a sound financial sector and making financial services and products available and accessible to all. The broad objective of this study is to establish the effect of access to finance on the rate of poverty in SSA. Econometrics technique of panel OLS was used on annual secondary data coving the period 2004 to 2018. The study concludes that the development of the financial sector especially the access to finance is a fundamental requirement for poverty rate reduction in SSA. Hence, the study recommended that policy and decision makers in SSA should implement policies that will broaden access to financial services. Since, a well-developed financial sector can expand access to array of financial services for poor people in the SSA to access. Specifically, this study established that the number of commercial bank branches per 100,000 adults, automated teller machine per 100,000 as well as number of depositors per 1000 adults have a significant positive effect on the poverty reduction in SSA. Therefore, policy makers in the financial sectors should focus on expanding the bank branch networks in the region, increase the number of ATMS in the rural areas and increase the number of depositors captured within the formal banking system thereby providing access to finance which will ultimately reduce the rate of poverty. Also, the monetary authority should create awareness on the financial products that are available in the region and their benefits in promoting economic viability of the SSA. Likewise, there should be provision of low deposit account with little formalities which could serve as incentive for attracting more people into formal financial services.

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Appendix (List of Countries examined in this study)

Benin	Mauritania
Botswana	Mauritius
Burkina Faso	Morocco
Cameroon	Mozambique
Congo Democratic Republic	Namibia
Congo Republic	Nigeria
Cote d'Ivoire	Rwanda
Equatorial Guinea	Senegal
Gabon	Sierra Leone
Gambia	South Africa
Ghana	Sudan
Kenya	Swaziland
Liberia	Tanzania
Madagascar	Togo
Malawi	Uganda
Mali	Zimbabwe