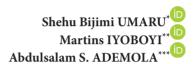**RESEARCH ARTICLE**

EFFECT OF FINANCIAL ACCESS AND INSTITUTIONAL QUALITY ON POVERTY: EMPIRICAL EVIDENCE FROM SUB-SAHARAN AFRICA

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Abstract

Financial access and poverty nexus has received extensive investigation. However, the moderating role of institutional quality in the financial access-poverty nexus, especially in the context of sub-Saharan Africa, has not been vigorously explored. Implementing the two-step system GMM technique, this study uncovers the moderating role that institutional quality has regarding the impact of financial access on poverty. The study covers a panel of 32 countries in sub-Saharan Africa from 2000 to 2023 and uses combined data of number of Automated Teller Machines (ATMs) per 100,000 adults and number of bank branches per 1000 adults to measure financial access. The empirical results show that financial access has reduced poverty in sub-Saharan Africa under the period of investigation. Additionally, the effects of the interaction of financial access and institutional quality (proxied by Control of Corruption, and Rule of Law) are negative, implying a reduction in poverty. The study recommends improved financial access through the establishment of more bank branches and Automated Teller Machines especially to remote areas, including enhanced institutions through intensifying the fight on corruption in sub-Saharan Africa.

Keywords: Financial access; Institutional quality; Poverty; System GMM technique

JEL Classification: C33, I30, P48, O55

1. Introduction

The incidence of poverty is a major concern across the world. Different approaches to tackling poverty over the years have been designed both at country, regional and global levels. This is evident in the efforts by the United Nations under the SDGs, which makes poverty eradication a

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major target (Babafemi, 2020). In this context, improving financial access has been demonstrated as one of the ways to address poverty. Generally, the effect of finance on poverty has gained considerable attention from economists in recent decades. The direct effect of finance on poverty can occur through the lowering of credit and transaction costs, information costs, promoting investment in human capital, expanding access to credit and improving micro-financing for the poor and vulnerable population (Wang, 2020). Costs induced by market imperfections constrain economic development, decelerate improvements in the standard of living and trigger poverty (Cihak et al., 2012). Financial access and development, including the rise of varieties of financial markets, contracts and other financial intermediaries are factors contributing to reduce these costs and market imperfections (Wang, 2020).

Sub-Saharan Africa (SSA subsequently) has experienced an improvement in its financial sector in recent decades while many of its countries have embraced financial liberalization (Fashina, 2022). SSA has recorded successes in financial sector development in the financial institutions and markets, although banking sectors in most of the countries are stronger than the financial markets. For instance, pension funds contribute significantly to the system assets within the nonbank financial sector, while stock exchanges are typically underdeveloped and cashless in less than 60% of the countries (International Monetary Fund, 2016). Additionally, only about 13% of individuals in SSA have mobile money accounts, while 45% rely only on mobile phones for conventional banking services (Asuming, Osei-Agyei and Mohammed, 2018). Moreover, although the usage of mobile banking has increased significantly in SSA, it is still considerably less in comparison to other regions (Siano et al., 2020). Adedokun and Aga (2023) have shown that despite the improvement in financial access in SSA, only 23% of the adult population has financial inclusion, in contrast to other emerging countries where the figure is 41%. In Africa, mobile money provides greater options for financial inclusion of the poor, youths, rural dwellers, and small businesses (Anarfor et al., 2019). World Bank (2018) reports that accounts ownership, digital payments, mobile money, credit, and savings are 42.5%, 34.4%, 20.9%, 8.4%, and 14.9% in SSA, compared to 69.6%, 27.8%, 4.2%, 7.8%, and 17.2% respectively in Asia. This suggests that, although the degree of financial access in SSA has increased, it is still comparatively low.

On a general note, the financial sector in SSA has evolved over time, having experienced major reforms such as financial liberalization, banking recapitalisation, mergers and acquisition, e-banking, cashless policies, financing small and medium scale businesses, market liberalization, among others. According to Bello and Oladunjoye (2020), although financial access in SSA compared with other developing countries is low, it has improved in recent times. Consequently, despite the advancements in financial access and the institutional setup in SSA, poverty has remained a major challenge. In 2018, about 40 percent of the people in SSA still lived in extreme poverty, with 18 of the 20 poorest countries in the world are situated in SSA (World Bank, 2020). Based on the global poverty line of $1.90 per day per person, Nwani and Osuji (2020) maintain that SSA surpassed Asia in 2019 as the region with the greatest concentration of the poor.

Connected to the effect of financial access on poverty reduction is the role of institutions. In recent times, particularly in the last two decades, the role of institutions has taken a center stage among scholars in the economic development discourse. To ensure order and minimise uncertainties in exchange, institutions have been designed by human authorities throughout history (North, 1991). The impact that institutional quality has on economic outcomes is documented in the literature. While some studies link institutions to reduced poverty (e.g., Singh, 2021; Akobeng, 2016; Dhrifi, 2013; Tebaldi and Mohan, 2010), others have reported the converse (e.g., Perera and Lee, 2013).

Against this background, this paper aims at examining the effect of financial access on poverty in SSA, with particular emphasis on the moderating role of institutional quality. The study thus extends the empirical investigation of the finance-poverty nexus and the moderating role of institutions in that context. The study is novel in a major respect. Whereas the effect of financial access (in all its dimensions) on poverty has been widely examined (e.g., Saha and Qin, 2022; Dogan and Guler, 2021; Koomson, Villano and Hadley, 2020; Bakari et al., 2019; Demirguc-Kunt et al., 2018; Ampah et al., 2017; Park and Mercado, 2015), the moderating role of institutional quality has been largely unexplored. In addition, by examining both financial access and institutional quality, this study differs from previous investigations which used either financial access or institutional quality. Importantly, the study takes a more holistic view by not only combining the two dimensions, but also exploring the role of their interactions on poverty, thus improving the understanding of how poverty can be curtailed. In the extant literature, only one study, Aracil et al. (2022) investigated the interaction of financial inclusion and institutional quality on poverty, applying the quantile regression technique. This study thus extends the literature by using the System GMM, a technique that is superior and robust in dealing with the problem of endogeneity, variable omission and autocorrelation in panel data. Finally, this study combines data on number of ATMs and bank branches, instead of single indicators used in several studies.

The remaining parts of this paper are structured as follows: section two is on the review of literature; section three is the methodology used; section four contains the empirical results and discussion; and section five is the conclusion.

2. Literature Review

2.1 Conceptual Literature and Theoretical Framework

Three main concepts are critical to this study. These are financial access, institutional quality and poverty. Financial access is conceptualized as the extent to which financial intermediaries are available and accessible by the populace. Access to financial services can be categorized into availability and usage. Access connotes the presence of functional, reliable and affordable financial services, while usage is the actual consumption of the financial services (Awunyo-Vitor,

2018). Asongu and Odhaimbo (2018) considered financial access as non-encumbrance to finance with regards to price and non-price impediments. Abraham (2018) viewed financial access as occurring when quality financial services are available at reasonable costs. Financial access is thus the extent to which individuals and firms can access and use financial services. On the part of institutions, they are defined as a society's systems of rules that shape its interactions, including norms, conventions and legal rules (Hodgson, 2015). According to North (1990), institutions are the limitations that humans have created to influence how people interact. In light of this, institutional quality is viewed as a society's ability to carry out civil and public functions (Lehne, Mo and Plekhanov, 2014). Consequently, the presence of effective and functional institutions can be referred to as institutional quality. The multidimensional nature of poverty makes it difficult to define. Due to countries or regional peculiarities, what is seen as poverty in one country or region might be different in another country or region. In the context of this paper, poverty is defined as population having $1.90 a day or lower, based on 2011 purchasing power parity.

This study is underpinned by two theories, complemented to explain the relationships among the variables of interest. The first is the McKinnon's hypothesis (McKinnon, 1973), referred to as the "capital conduit effect", which considers an economy where sources of external financing are difficult and individual/firms resort to self-financing. Since individuals/firms do not have enough funds to invest, they save until they have enough to invest in physical capital. This suggests that actual returns on investments increase, encouraging poor people to hold money and resulting in a sizeable fraction of investments that are self-financing. This illustrates how money is thought of as a "capital conduit" (Boukhatem, 2016). In McKinnon's usage, real interests on deposits may serve as a channel for capital formation. In this regard, deposits and capital become complementary. When deposits are available and are characterized by positive real rates of return, saving and capital accumulation is enhanced.

In summary, according to McKinnon (1973), liberalisation is related with higher real interest rates and has the potential to promote increased savings. The theory's major postulation is that savings are attentive to real interest rates. Greater saving rates would fund more investment, resulting in stronger economic growth. Eliminating interest rate ceilings and other types of regulation is a way of reforming a repressed financial sector which encourages higher real interest rates on deposits, enticing savers, thereby broadening financial intermediation and development.

The second theory is the "legal theory of finance" advanced by La Porta et al. (1997), which maintains that differences in financial development across countries could be explained by the differences in how the law protects investors and creditors, including the quality of legal enforcement. According to La Porta et al. (1997), the rights of the private property owners are protected by the common law against the state. The exchangeable financial contracts have worth and credibility because of these legal underpinnings. The main contribution of the literature on law and finance was to introduce systematic empirical analysis into the study of law and economics, and to demonstrate that investor rights are the main ways in which the law affects finance. Financial systems tend to be more advanced under legal regimes that better protect these

rights (Pistor, 2013). The law establishes and safeguards these contractual rights, thus bringing the study of financial access within the ambit of the institutional framework.

Overall, drawing from the theoretical construct of the capital conduit effect, financial intermediation such as availability of bank branches and ATM will help in channeling resources to the poor. Improvement in institutional setup (control of corruption and the rule of law) will facilitate financial intermediation and reduce poverty. Human capital development and a stable macroeconomy are essential conditions for development and poverty reduction.

2.2 Empirical Literature

2.2.1. Financial Access and Poverty

Several studies support the role of financial access on poverty reduction (e.g., Sahaand Qin, 2022; Dogan and Guler, 2021; Koomson et al., 2020; Opeyemi and Oladunjoye, 2020; Bakari et al., 2019; Abraham, 2018; Ampah et al., 2017; Bae, Han and Sohn, 2012). Some studies have considered the interaction effects of financial access on various other dimensions (e.g., Aracilet al., 2022; Asongu et al., 2020; Hussaini and Chibuzo, 2018).

Dogan and Guler (2021) examined the impact of financial inclusion on income inequality in Turkey, Colombia, Mexico, Indonesia and South Africa for the period 2005 to 2018, using the Dumistrescu and Hurlin panel Granger causality test. It was found that financial inclusion reduced income inequality in the study area over the period of investigation. Ampah et al. (2017) investigated the effect of financial access on poverty in central region of China. Using the multi-regression analysis, it was found that access to credit and financial resources reduced poverty. Similarly, Koomson et al. (2020) assessed the effect of financial inclusion and vulnerability on poverty in Ghana. Using the instrumental variable probit technique, the findings showed that financial inclusion reduced poverty over the period of study. Likewise, Opeyemi and Oladunjoye (2020) examined the effect of financial access on poverty in SSA using panel data from 2004 to 2018. Results from the panel OLS show that access to finance significantly reduced poverty. Similarly, Bakari et al. (2019) investigated the impact of financial inclusion on poverty in SSA from 1980 to 2017. Using the pooled OLS, it was revealed that access to finance reduced poverty.

Furthermore, Abraham (2018) assessed the effect of financial access on poverty in northern Nigeria. Result from the logit technique shows that financial access significantly reduced poverty. Likewise, Hussaini and Chibuzo (2018) examined the effect of financial inclusion on poverty in Nigeria. Using the partial least squares regression, it was found that financial inclusion reduced poverty. Additionally, Khaki and Sangmi (2017) studied the effect that financial access has on poverty in Kashmir region of India. It was found that access to finance reduced poverty. Nevertheless, Bae, Han and Sohn (2014) assessed the relationship between financial access, income inequality and poverty in the United States of America. Result from the fixed effects technique revealed that access to finance reduced both poverty and income inequality.

Asongu and Odhaimbo (2018) examined the effect of gender inclusion, ICT and financial access in the formal economic sector in Africa, using a sample of 48 countries from 2004 to 2014. Based on the GMM results, it was found that the interaction of ICT and financial access enhanced female formal economic sector participation. Tchamyou (2019) investigated the moderating role of information on the effect of financial access on inequality using a panel of 48 countries in SSA. The results revealed that the interaction of information sharing and financial access reduced inequality. In addition, Aracilet al. (2022) investigated the institutional quality, financial inclusion and poverty nexus in 75 developing countries from 2004 to 2017. Results from the quantile regression show that financial inclusion and quality institutions are complimentary in reducing poverty. Additionally, Saha and Qin (2022) empirically examined the relationship between financial inclusion and poverty alleviation in 156 countries comprising different income groups. Results from the GMM estimation show that in developing countries, financial inclusion has a negative and significant relationship with poverty.

2.2.2. Institutional Quality and Poverty

Making use of household and provincial levels data in Vietnam, Loi et al. (2022) examined the impact of institutions on multidimensional poverty reduction. Data was obtained from two sources, namely the Public Administration Performance Index and the Vietnam Household Living Standards Survey. Results from the probit model revealed that the likelihood of poor localities benefiting from institutional improvement is higher compared to rich localities. In a similar study, Zhao (2020) investigated the impact of tourism and institutions on poverty, using a panel of 29 provinces in China from 1999 to 2014. Results from the system GMM suggest that institutional quality positively and significantly influenced poverty reduction.

Dwumfour (2020) evaluated the impact of corporate regulations, policies, and institutions on poverty in SSA. The results of the GMM approach demonstrate how institutional quality raises well-being and lowers poverty. Saddique et al. (2016) studied the impact of governance and institutions on education and poverty alleviation in a panel of South Asian Association for Regional Cooperation economies. Using the Principal Component Analysis, it was found that quality institutions reduced poverty.

Cuestas and Intartaglia (2016) examined the impact of institutions on poverty in 69 countries over the period of 1984-2013. The system GMM was employed and the results show that institutional quality reduced poverty in the long-run. Akobeng (2016) assessed the relationship between institutions, gross capital formation and poverty in SSA using a panel data set of 41 countries from 1981-2010. Results from the two-step system GMM revealed that institutional quality interacted with fixed capital formation to reduce poverty.

Perera and Lee (2013) studied the impact of economic growth and institutional quality on poverty and inequality in Asia from 1998-2010. Using the GMM technique, the results show on one hand, that improvement in government stability and law and order reduced poverty. On the other hand, improvement in the fight against corruption, democratic accountability and bureaucratic quality tend to worsen poverty. Tebaldi and Mohan (2010) assessed the relationship between institutions

and poverty, using a panel of 53 countries. The instrumental variable method was used and the results show that control of corruption, government effectiveness, and a political system that is stable, promote economic growth, minimize conflicts in income distribution and lessen poverty.

3. Data and Methodology

The data used in the study encompasses a time dimension ('T' = 24) over larger number of cross-sections ('N' = 32), which is appropriate for the system GMM. The use of system-GMM is underscored on its strength to address the problem of weak instruments, which is typically brought on by system regressors in the case of differenced GMM. It considers country-specific effects and controls for endogeneity through the inclusion of the lagged dependent variables, measurement errors and missing or omitted variables. In implementing the system GMM, the standard practice is to treat endogenous variables, by using 2 lags and more lags for the transformed equation, while for the levels equation, 1 lag is used. The number of instruments should not be higher than the number of groups. A good way to achieve this is to instrument endogenous variables with fewer lags. A major problem encountered in the empirical research is proliferation of instruments, including weak tests. Roodman (2009) suggested that, to overcome this, the set of instruments could be restricted to certain lags, collapsed or the two approaches could be combined. In this study, the set of instruments was restricted to 2 lags and collapsed. The estimations were accomplished via the xtabond2 syntax in STATA 17. The description of the dataset is presented in Table 1.

Table 1: Variable Description and Measurement

Variable	Measurement	Source
Poverty (Pov)	Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population)	World Bank (2023)
Financial Access (FA)	Financial Access, combines data on number of ATMs per 100,000 adults and number of bank branches per 1000 adults	IMF (2023)
Institutional quality (IQ)	Control of Corruption (CoC). It is a composite indicator, which measures corruption on a scale of – 2.5 to +2.5 with higher scores indicating less corruption.	World Bank (2023)
	Rule of Law (RL), a composite indicator that measures rule of law on a scale of – 2.5 to +2.5 with higher scores indicating high rule of law.	World Bank (2023)
Human Capital (HC)	Percentage of the gross primary school completion rate	World Bank (2023)
Population (pop)	Natural logarithm of total number of people	World Bank (2023)
Inflation (Infl)	Consumer Price Index (2015), PPP	World Bank (2023)
GDP per capita (GDP)	Natural logarithm of GDP at constant prices or GDP in volume based on 2015, PPP	World Bank (2023)
Instability (Inst)	Standard Deviation of Real GDP	World Bank (2023)
Openness (Open)	Total trade (i.e., sum of exports and Imports) as proportion of GDP	World Bank (2023)

Source: Authors' compilation

To examine the effect of financial access on poverty, a baseline model is specified as follows:

$$Pov_{i,t} = \beta_1 Pov_{i,t-1} + \beta_2 FA_{i,t-1} + X_{i,t}\delta + \lambda_{i,t} + \eta_{i,t} + \varepsilon_{i,t} \quad (1)$$

where Pov represents poverty, FA represents Financial Access, X is a vector of control variables including human capital (HC), population (pop), inflation (Infl), GDP per capita (GDP), economic instability (Inst) and trade openness (Open); δ r epresents the vector of unknown parameters; λ represents time specific-effects; η are unobserved country-specific effects, ε is the observation-specific error, where *i* is the individual dimension of the panel (country) and *t* is the time dimension. To account for the dynamic process, the response variable is lagged ($Pov_{i,t-1}$) and included as an independent variable in the model. The study uses combined data of number of ATMs per 100,000 adults and number of bank branches per 1000 adults, as a proxy of Financial Access. Studies such as Fashina (2022) and Bello and Oladunjoye (2020) used the number of bank branches and ATM per 100,000 adults.

The use of the selected control variables is not without theoretical and empirical justification. First, human capital theory (see for example, Becker, 1967) postulates that human capital via education raises workers' productivity and efficiency, leading to increased incomes and thus a decline in poverty. On the empirical front, several studies including Arias, Gimenez and Sanchez (2016), and Ali and Hamad (2013) infer that human capital reduces poverty. Additionally, rising population can have direct impact on poverty as shown in previous studies including Ritonga and Wulantika (2020), Sari (2021), Putra et al. (2021) and Hilmi et al. (2022). Furthermore, for inflation, poverty is aggravated when prices of goods and services increase, and as argued in the literature, inflation increases poverty by reducing disposable real income, and that real wages fall when nominal wages rise less than the rise in the price of goods and services. Ultimately, high inflation negatively impacts the poor (Artuc et al., 2022; de Haan, Pleninger and Sturm, 2021; Zhang and Ben Naceur, 2019; Sehrawat and Giri, 2018; Inoue, 2018). However, some studies considered inflation as a stimulant of investment, which brings about more employment opportunities and income for the poor (Olaniyi and Odhiambo, 2023; Easterly and Fischer, 2001).

GDP growth (implying rising income) is thought to lead to poverty reduction as it trickles down to the poor (deHaan et al., 2021; Seven and Coskun, 2016; Jalilianand Kirkpatrick, 2002), and evidences from the developed countries indicate that higher income is associated with lower poverty (de Haan et al., 2021; Rashid and Intartaglia, 2017). Economic instability such as those resulting from adverse economic conditions brings about income inequality (de Haan and Sturm, 2017), which, in turn, may be detrimental to the poor (Jeanneney and Kpodar, 2011). Finally, trade openness can lead to higher wages and consequently poverty reduction (Friedman, 2001; Le Goff and Singh, 2014). Other studies including Coulibaly and Yogo (2016) however reported that openness significantly increases poverty. Dollar and Kraay (2004) found that, keeping the growth effect constant, the poverty reduction impact of openness is negligible.

To examine if the effect of financial access on poverty changes in the presence of institutional quality, equation (2) is specified:

$$Pov_{i,t} = \beta_1 Pov_{i,t-1} + \beta_2 FA_{i,t-1} + \beta_3 CoC_{i,t-1} + \beta_4 RL_{i,t-1} + X_{i,t}\delta + \lambda_{i,t} + \eta_{i,t} + \varepsilon_{i,t} (2)$$

The proxies of institutional quality used in the study are control of corruption (CoC) and Rule of law (RL).Corruption, being a major feature of bureaucracy (Justesen and Bjørnskov, 2014), benefits the elite at the expense of others (Gupta et al., 2002), and for developing countries, it disproportionately affects low-income earners (Nwabuzor, 2005). Thus, by adequately controlling corruption, a country is able to direct scarce resources for development and improve its economic outcomes and thus reduce the level of poverty of its people. In addition, rule of law is critical in a manner that ensures the right of citizens regarding access to justice and property right protection, including the enforcement and performance of contracts, while facilitating the creation and access to markets for the poor and marginalized sections of the population, all of which promote economic development and therefore leads to poverty reduction (see Hallward-Driemeyer and Hasan, 2012; Haggard and Tiede, 2011; UNDP, 2008).

To account for the interaction effects of financial access and institutional quality on poverty, the following is specified:

$$Pov_{i,t} = \beta_1 Pov_{i,t-1} + \beta_2 FA_{i,t-1} + \beta_3 CoC_{i,t-1} + \beta_4 RL_{i,t-1} + \beta_5 (FA * CoC)_{i,t-1} + \beta_6 (FA * RL)_{i,t-1} +$$
$$X_{i,t}\delta + \lambda_{i,t} + \eta_{i,t} + \varepsilon_{i,t} (3)$$

The specification in equation (3) is consistent with the empirical trend in the moderating role of a variable in the relationship between two variables. On *a priori* grounds, it is expected that $\beta_1 > 0$ and β_2-$\beta_4 < 0$. If the coefficient of the interaction term is less than zero, it implies that financial development and quality institutions are pro-poor and complementary. Conversely, if it is larger than zero, this suggests that financial access and quality institutions are substitutes.

4. Results and Discussions

The summary statistics of the variables used in the study are presented in Table A1 of the Appendix. From Panel B of Table A1, it is observed that all the variables, with the exception of inflation (Infl), economic instability (Inst) and population (Pop) are negatively correlated with poverty (Pov). A rise in financial access (FA), improvement in the control of corruption (CoC) and the rule of law (RL), increase in economic growth (GDP), quality and affordable education (HC), and favourable trade (Open) reduce poverty, although the negative correlation between poverty and rule of law and between poverty and openness is not statistically significant. As expected, large population that is not productive, high economic volatility (Inst) and high inflation rates (Infl) worsen poverty. The correlation among the variables ranges from low to moderate, the highest

being 0.72 between AF and GDP. As noted in Gujarati (2004), multicollinearity is serious if the correlation coefficient is 0.8 (or 80%) and higher.

The structure of the data used in the study satisfies the requirements for the implementation of the GMM estimator, i.e., small 'T' (24) and large 'N' (32). To explore the nature of the data, the test for endogeneity (see Table A2 of the appendix) shows that the probability values of the Durbin and Wu-Hausman are low and significant, thus rejecting the null hypothesis of exogenous variables, implying that there is a problem of endogeneity.

To avoid the risk of spurious regression which can arise when a non-stationary series or variable is regressed on a set of other non-stationary variables, the test of unit root was considered necessary. In this study, unit root was examined using the Pesaran (2007) approach. This test is suitable for heterogeneous panels with cross-section dependence. The results are shown in Table A3 of the appendix. As observed in Table A3, the null hypothesis of non-stationarity is rejected in each case. In particular, the hypothesis is rejected at 1% for Povhc, FA, CoC, Pop, Infl, Inst and Open, while in the case of RL, HC and GDP, the rejection is at 5% level. Thus, all the variables are integrated of order zero (i.e., I/0) or are stationary.

Each of the three models is estimated using OLS and GMM. The estimated results are presented in Table 2.

Table 2: Estimated Results

Variable	OLS			System GMM		
	(1) **Baseline model**	**(2)** With IQ	**(3)** With Interaction term	**(4)** **Baseline model**	**(5)** With IQ	**(6)** **With Interaction term**
Pov (-1)	0.9063***	0.9063***	0.9013***	0.9294***	0.9558***	0.9167***
	(0.0074)	(0.0074)	(0.0076)	(0.0499)	(0.0521)	(0.0508)
FA	−0.2417**	−0.2380**	0.0022	−0.1053*	−0.0308	−0.0718*(0.0425)
	(0.1105)	(0.1111)	(0.0278)	(0.0575)	(0.0623)	
CoC		−0.0286	0.1718		−0.1165**	0.3972**
		(0.0690)	(0.1223)		(0.0515)	(0.1609)
RL		0.1329	0.0460		−1.1556*	−0.7477
		(0.2351)	(0.2783)		(0.6470)	(1.2365)
FA*CoC			−0.0462*			−0.0984*
			(0.0276)			(0.0559)
FA*RL			0.0101			−0.2376
			(0.0430)			(0.2325)
HC	0.0014	0.0013	0.0393	-0.0283**	0.0398***	0.0206
	(0.0050)	(0.0050)	(0.2749)	(0.0112)	(0.0147)	(0.0213)
Pop	0.5427*	0.5458*	0.2313	0.8305**	0.3529	0.0136
	(0.3998)	(0.3005)	(0.2937)	(0.3813)	(0.3589)	(0.2943)
Infl	−0.0113*	−0.0112*	−0.0086	0.0021	−0.0007	0.0033
	(0.0058)	(0.0058)	(0.0059)	(0.0084)	(0.0066)	(0.0246)
GDP	−0.4839***	−0.4924***	−0.6387***	−0.6304	−0.3491	−0.6469
	(0.1610)	(0.1720)	(0.1744)	(0.6172)	(0.7032)	(0.6768)
Inst	−0.0019	−0.0624	−0.1227	−0.0014	0.1299	0.4192
	(0.0048)	(0.1130)	(0.1127)	(0.0104)	(0.3779)	(0.4228)

Open			−0.8702***			−0.4790
			(0.2173)			(0.7846)
Constant	−1.7706	−1.5525	8.1531	−8.0265**	−5.4039	6.0389
	(4.6286)	(4.6775)	(4.6053)	(3.4459)	(3.9751)	(7.8428)
R^2	0.97	0.97	0.97			
F-stat.	0.000	0.000	0.000			
Instruments				16	22	18
Hansen P.val				0.46	0.71	0.58
AR(1) P-val				0.00	0.00	0.00
AR(2) P-val				0.41	0.55	0.57
Observations	704	704	704	704	704	704
Group	32	32	32	32	32	32

Source: Authors' computation

Note: *,** and*** denote significance at 10%, 5% and 1% levels respectively; Values in parentheses are standard errors.

An examination of the diagnostic statistics indicates that the instruments used are valid. The Hansen p-values signify that the instruments are not correlated with the residuals, given that the null hypothesis that there is no correlation between the instruments and the error term is not rejected. Consequently, the instruments satisfy the orthogonality requirements. This result is complemented by the Arellano and Bond second-order AR (2) serial correlation test, which indicates absence of serial correlation with regard to the non-significant p-values across all the specifications.

Columns 1–3 of Table 2 present the OLS estimates while columns 4–6 are from the system GMM. However, due to the shortcomings of OLS when applied on panel data, the GMM results are the focus of the study. The baseline model is presented in column 4. In column 5, control of corruption (CoC) and rule of law (RL) (the institutional quality indicators) are added, while in column 6, the interaction terms are included.

First, we examine the effect of past levels of poverty on its current state. As seen in Table 2, results across all six columns show a positive and significant effect of the present poverty level and its 1-lagged (previous) period, an indication that poverty is persistent in the SSA context. Financial access (FA) in columns 4 – 6 has a negative effect on poverty. The effect is significant when we consider the baseline model (column 4) and when we control for institutional quality and the interaction terms (column 6). For instance, a unit increase in financial access brings about 0.11 (column 4) and 0.07 (column 6) percentage point decreases respectively in poverty and it is significant at 10%.

When the institutional variables are considered (column 5), control of corruption (CoC) has a negative effect on poverty, and it is significant at 5%. A unit increase in control of corruption is associated with a fall in poverty by about 0.12 percentage point. The same is true with rule of law (RL) which has a significant negative effect on poverty. Consequently, an increase in the rule of law reduces poverty. The implication of these results is that by improving control of corruption and the rule of law, poverty reduction can be ensured. It needs to be noted however, that poverty reduction occurs even when the institutional variables are not interacted with financial access

(column 5). With the interaction terms (column 6), it can be seen that the effect of the interaction between financial access and control of corruption (FA*CoC) is negative and significant at 10%, while control of corruption in itself raises poverty as seen by the CoC coefficient of 0.3972. This result is important, in that it suggests that control of corruption reduces poverty through financial access. However, the interaction between financial access and the rule of law, has a negative but not a significant effect on poverty, whether in itself (from the coefficient of RL in column 6) or when it is interacted with financial access (FA*RL). In essence, it is instructive to note that the interactions of financial access (FA) and the institutional quality indicators each has a negative effect on poverty, with the former having a significant effect at 10%. In this context, a rise in financial access and improvement in institutional quality will reduce poverty. To sum it, an increase in financial access and control of corruption (FA*CoC) on one hand, and financial access and rule of law (FA*RL) on the other hand are complementary in poverty reduction in SSA. This is consistent with the earlier finding of Fashina (2022). On the whole, the interaction effect of financial access and institutional quality are also in line with earlier findings (Fashina, 2022; Aracil, Gomez-Begoechea and Moreno-de-Tejada (2022).

The result of the effect of human capital on poverty is illuminating. Considering column 4, human capital has a negative and significant effect on poverty. A 1 percentage point rise in primary school completion rate (proxy of human capital) brings down the level of poverty by about 0.03 percentage point. This effect changes when we control for institutional quality (columns 5 and 6), in which case, the coefficients are positive. This is an indication that institutional quality can alter the negative effect of human capital on poverty. Furthermore, population has a positive and significant (at 5% level) effect on poverty, as shown in column 4. 1% increase in population is linked to 0.83 percentage point rise in poverty. When the institutional variables are brought to bear (columns 5 and 6), it is observed that while the effect of population is positive, it is not significant. The implication of this is that if corruption and rule of law are effectively controlled, it can mitigate the impact of higher population on poverty.

Other variables such as inflation (Infl), real income (GDP), instability (Inst) and openness (Open) are not significant factors affecting poverty in SSA, as seen in columns 4 – 6, in both the baseline and extended models. However, they follow *a priori* expectations. For instance, in column 6, it is observed that the effect of inflation is positive, an indication that poverty worsens poverty, consistent with the prior findings of Inoue (2018), and Artuc et al. (2022). Moreover, real income (GDP) is inversely related to poverty, which supports earlier findings (e.g., Rashid and Intartaglia, 2017; de Haan et al., 2021), while economic instability raises poverty, in line with the literature linking adverse economic conditions to deteriorating life of the poor (Jeanneney and Kpodar, 2011). Finally, openness has a negative but not a significant effect on poverty. Given that the model controls for real income (or economic growth), this result echoes previous empirical findings by Dollar and Kraay (2004), which showed that the impact that openness exerts on poverty is insignificant when the growth effect has been accounted for.

5. Conclusion

Sub-Saharan African has experienced persistent poverty for several years, including poor financial development and institutional environment. The effect of financial access on poverty, and the moderating role of institutional quality in that regard, was tested in this study, using a sample of 32 countries in SSA from 2000 to 2023. As proxy of financial access, the study used combined data of number of Automated Teller Machines and number of bank branches, while poverty headcount was deployed to capture poverty. *Control of Corruption* and *Rule of Law* were used as indicators of institutional quality. The study also controlled for human capital, population, inflation, real GDP per capita, economic instability and openness.

Poverty was found to be persistent in the SSA context. Financial access was shown to exert a negative effect on poverty, in both the baseline model and when the institutional quality and the interaction terms were considered. Without controlling for institutional quality, human capital has a negative and significant relationship with poverty. This relationship changes when we control for institutional quality, which raises poverty, an indication that weak institutions can alter the negative effect of human capital on poverty. When the institutional variables are considered, control of corruption was found to have a negative effect on poverty and it is significant. The same is true about rule of law which has a significant negative effect on poverty. It needs to be noted however, that the poverty reduction impact of the institutional variables occurs without the interaction variables, an indication that the institutional quality in itself are critical towards poverty reduction. Other variables such as inflation, GDP per capita, instability and openness were found not to be significant factors affecting poverty in SSA within the period of investigation.

Two major policy implications arise from the findings. First, the need to prioritize financial access in SSA cannot be overemphasized if the objective is to address persistent poverty. Second, effectual policies that strengthen the institutional environment to address poverty should guide public policymakers.

Findings in this study call for actionable recommendations. Improvements in financial access, depth and efficiency are required. Based on the findings, it is recommended that policies that encourage financial access be made and implemented such as the provision of more ATMs to remote areas by monetary authorities, including promoting cashless transactions through increased use of mobile banking in SSA. There is also the need to improve financial depth in terms of liquidity and size of the financial sector, through increased domestic private credit to the real sector by deposit money banks in SSA. Furthermore, enhancing financial efficiency is recommended in order to reduce the cost of financial services through policies that lower bank lending interest rates.It is equally recommended that strong institutions, including fighting corruption and strengthening the rule of law should be intensified by the government in order to significantly reduce poverty in SSA. Overall, efforts at tacking poverty must combine financial

access with institutional strengthening, if the persistent poverty experienced in SSA is to be curtailed.

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APPENDIX

Table A1: Summary Statistics

Panel A: Descriptive Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
Pov	736	39.24218	21.06327	.2	86.2
FA	736	.1084783	.1234465	0	.72
CoC	736	−.1581656	2.015426	−1.597468	13
RL	736	−.5096483	.5782564	−1.802306	1.07713
HC	736	68.32237	19.43321	16.56425	112.522
Pop	736	15.87491	1.543371	13.03517	19.20249
Infl	736	7.642968	15.36026	−9.616154	324.9969
GDP	736	1948.87	2215.695	110.4609	11643.46
Inst	736	20.34196	10.13721	3.234466	85.80166
Open	736	67.86863	28.52574	23.98087	175.798

Panel B: Correlation Matrix

Variable	Pov	FA	CoC	RL	Infl	GDP	Inst	Open	HC	Pop
Pov	1.00									
FA	−0.61*	1.00								
CoC	−0.01**	0.09	1.00							
RL	−0.46	0.66**	0.23*	1.00						
Infl	0.05***	−0.01	−0.09	−0.16	1.00					
GDP	−0.65**	0.72	0.05	0.52**	−0.09***	1.00				
Inst	0.12*	0.03	−0.05**	0.03	−0.06	−0.07**	1.00			
Open	−0.30	0.41	−0.01	0.27	0.08*	7	−0.05*	1.00		
HC	−0.45*	0.59	0.20	0.54*	−0.20	0.49*	0.04	0.35*	1.00	
Pop	0.15	−0.09	−0.13	−0.18	0.20*	−0.09	0.12	−0.05	0.004*	1.00

Source: Authors' computation

Note: The variables in the summary statistics are in their raw form. *, ** and *** denote significance at 10%, 5% and 1% levels respectively

Table A2: Test of Endogeneity

H0: Variables are exogenous

Test	Statistic	Probability Value
Durbin (score) chi2(2)	727.14	0.0000
Wu-Hausman F(2,724)	29709.6	0.0000

Source: Authors' computation

Table A3: Unit Root Test Results

Variable	t-Bar	Z[t-bar]	p-value
Povhc	-2.223	-2.701	0.003
FA	-2.430	-3.910	0.000
CoR	-2.449	-4.815	0.000
RL	-2.043	-1.649	0.050
HC	-2.108	-2.030	0.021
Pop	-3.039	-7.462	0.000
Infl	-2.460	-4.080	0.000
GDP	-2.217	-2.049	0.012
Inst	-2.799	-6.058	0.000
Open	-2.610	3.872	0.002

Source: Authors' computation

Note: Intercept is included in the test. The critical values are –2.04 (for 10%), –2.11 (for 5%) and –2.23 (for 1%) respectively.