

Effect of Financial Inclusion on Educational Attainment in Sub-Saharan Africa

Oumarou Bobbo, PhD

Faculty of Economic and Management Science, University of Bamenda, Cameroon

Email: bobbobeka@gmail.com

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Abstract

The objective of our study is to examine the effect of direct access to and use of formal financial services on educational attainment in sub-Saharan Africa. The paper uses a sample of 34 sub-Saharan African countries from different sources (WDI, GFDD,) for the period 2004-2022 for the analysis. The results of the basic model suggest that greater financial inclusion through improved access to credit positively and significantly affects the level of education in sub-Saharan Africa. The study suggests that sub-Saharan African countries can take advantage of financial inclusion to improve education. Therefore, policy makers and commercial banks should promote access to and use of financial services in sub-Saharan Africa (SSA).

Key words: Financial Inclusion, Level Of Education, GMM, SSA

1. Introduction :

Financial inclusion remains at the centre of international debates on development, given its various beneficial effects on society. The existing literature supports this assertion at both macroeconomic and microeconomic levels. Empirical studies have shown that inclusive finance contributes to a country's economic and social development by reducing poverty and inequality and supporting economic growth (Galor and Zeira, 1993, King and Levine, 1993). The effect is also significant in terms of women's employability and their integration into the economic fabric. Thus, financial inclusion enables the poor to invest in human and physical capital, facilitates their participation in the labour market and, as a result, contributes to social development. An individual's financial inclusion can be defined as that individual's access to basic formal financial

services. A person is said to be financially included when they have a bank account, the ability to save and take out a loan, and the possibility of using banking services such as obtaining a credit card or using a mobile phone for payments. Formal financial services must therefore be available, accessible and affordable. Access to finance is a major issue for the development of an economy. It enables individuals to develop their projects and integrate into society, businesses to invest, innovate and hire, and the economy as a whole to function.

Education, particularly children's education, is crucial to poverty reduction and economic growth at both macro and household levels (Quaeghebeur & Marthi 2005). However, despite the interest of poor households in sending their children to school, they are unable to do so because of certain constraints. Among the main constraints, affordability is an

important factor, as most clients do not have sufficient funds to pay for schooling. Although no school fees are charged, other direct costs such as uniform, stationery, meals, as well as transport costs and indirect costs such as time spent in school (which could have been used to generate income) are involved in the process. In this situation, MFI initiatives can indirectly support children's education by providing families with income stability, enabling them to pay for their children's education (Barnes, Gaile & Kimbombo 2001). Theoretically, the income generated as a result of participation in the microcredit programme should increase spending on schooling (Brownstein et al. 2007). Although some studies have examined the impact of microcredit on the affordability of education, few studies (to our knowledge) have been conducted on the effects of financial inclusion on educational attainment in sub-Saharan Africa. Given this, this paper proposes to explore the effects of microfinance on children's education in order to fill the gaps in the literature. Thus, this study would make an important contribution to the existing literature insofar as it takes into account two indicators measuring the development of microfinance, namely the number of savings and the amount of credit. The rest of this paper is structured as follows: section II presents a review of the theoretical and empirical literature. The analysis methods are presented in section III. Section IV is devoted to the results and discussions, and Section V concludes the paper.

2. Review of the literature :

Financial inclusion is a concept that refers to equitable and affordable access to financial services for all segments of the population. Education is an essential element for the economic and social development of individuals and communities. This literature review examines the links between financial inclusion and the level of education.

Economic theory establishes a solid link between financial inclusion and improved educational attainment. By facilitating access to financial resources dedicated to education, reducing the opportunity costs associated with schooling and

promoting better budget management within households, financial inclusion acts as a catalyst for investment in human capital. Empirical studies conducted in various contexts corroborate this hypothesis. In India, Banerjee et al (2015) showed that improved access to financial services increased children's school attendance by 12%. In Kenya, Dupas et al (2016) highlighted the positive impact of savings programmes on household spending on education, which increased by 25%. Finally, in the Philippines, Karlan et al (2016) showed that the granting of low-interest loans led to a 15% increase in school attendance.

Providing financial services to the poor would have the direct effect of reversing the trend observed in developing countries and thus improving people's living conditions. At the microeconomic level, the financial system enables the creation of reliable, high-quality human capital. For investment in health and human capital in general, households need savings, loans and insurance services. Access to these different financial services enables individuals to be a high-quality, healthy workforce, the existence of which is an important prerequisite for businesses to be able to invest with greater peace of mind.

In his 2005 study, Sachs showed that well-targeted direct aid can have an effect on poor populations by increasing agricultural productivity and thus reducing the incidence of disease. However, an intervention of this scale will only have the effect of putting the poor first. It is therefore up to microfinance to enable them to move up the ladder. However, it should be noted that building a ladder requires a formal financing circuit. According to one of the World Bank's studies, the role of an efficient financial system is not only to carry out intermediary operations but also, and above all, to stimulate growth by improving business productivity - one of the ways of genuinely reducing poverty, or even eliminating it, is to accelerate economic growth in poor countries.

A large number of studies have examined the effect of microfinance on education. The results of these studies are contradictory and show both positive and negative effects. Some studies find that

participation in microfinance programmes contributes to household spending on children's education (Lacalle Calderon et al. 2008; Adjei et al. 2009). However, Brannen (2010) and Gubert and Roubaud (2011) found no such effect. Nanor (2008) found contradictory impacts on education spending across regions, suggesting that the relationship between microcredit and education is influenced by other factors. Of the four studies carried out, two found that microfinance undermines education through the abandonment of education by microcredit participants. The reasons for this are that the members are generally from poor households, so their children are more likely to work than to go to school, as the opportunity cost of going to school is very high for these poor children. They may earn money or do productive work rather than go to school. Another study conducted in Malawi showed that access to microcredit considerably reduced primary school attendance by borrowers' children (Shimamura & Lastarria-Cornhiel, 2010).

In addition, studies suggest that the duration of the credit programme did not show a positive impact on education expenditure and decreased the school enrolment rate of children (Adjei, Arun & Hossain 2009). A study carried out in Bolivia based on two household surveys by Maldonado and González-Vega (2008) indicated that microfinance had a significant impact on the school enrolment of clients' children. According to the study, the school enrolment gap is smaller for former clients than for new clients. On the other hand, a recent study by Islam and Choe (2013) indicates that household participation in microcredit programmes had a negative impact on children's school enrolment, particularly that of girls. However, their study was based on old panel data. In contrast, Littlefield, Morduch and Hashemi (2003) found that the poor used income from microenterprise activities to educate their children. Most previous studies have shown that children of microfinance clients tend to go to school and stay in school longer than children of non-clients.

Pitt and Khandker, (1998) ; Behman and Rosenzweig, (2002) ; Thomas, (1990) ; Sallee,

(2001) in their respective works have come to the conclusion that access to micro-financial services, in particular micro-credit, has a positive impact on children's education, but the impact is much more significant when it is the woman who obtains the credit. In the same vein, Becchetti and Conzo (2014), in their study on the controversy surrounding the impact of microfinance on education, found that microfinance has positive and significant effects on children's education. However, in some cases, children have been forced to stop school, suggesting a negative influence on their future (CIDA, 2007). In addition, CIDA (2007) also found that 80 to 85 percent of beneficiaries of microfinance services were women, children were forced to take on additional roles in the home, increase their time spent on household activities and chores, and decrease their time spent on schooling. Education was a main focus when income was improved, followed by health, housing and nutrition (CIDA, 2007).

Also Wydick (1999) examining the effect of microenterprise lending from microfinance institutions using logistic regression, found that access to credit increases investment and reduces the probability of children being withdrawn from school to do family work. According to Choudhury and Bhuiya, (2001); et al, (2001); Chen and Snodgrass, (2001), microcredit has made a real contribution to social investment, school enrolment, social empowerment, the schooling of young girls, and so on. In their study, they identified positive and significant effects of microfinance on the development of human resources among participants in several countries.

Holvoet (2004) evaluated the impact of microfinance programmes in South India and found that if a woman was part of a microfinance programme as opposed to a direct bank loan, her children were more likely to go to school or even to attend public schools. In fact, the latter found that the children of microfinance programme beneficiaries were 9 times more likely to be enrolled in public school, and around 2.7 to 3.5

times more likely to be literate. Barnes et al (2001) in their study in Uganda found a positive impact of microfinance in reducing financial vulnerability and increasing education. In contrast, a number of studies, notably Psacharopoulos (1997), Jensen and Nielson (1997), Patrinos and Psacharopoulos (1999) and Trigueros (2002), show that access to microfinance has a negative impact on children's education through the demand for child labour. In fact, when a household creates an IGA with the support of microfinance, the children are very often encouraged to work alongside their parents, and this has a negative impact on their education.

These results converge to underline the crucial role of financial inclusion in promoting education. By offering individuals and families the means to finance their studies and manage their resources efficiently, financial inclusion helps to reduce educational inequalities and promote sustainable human development.

3. Methodology:

3.1 Model and estimation technique :

In recent years, financial inclusion has been considered a dynamic tool for achieving human development in developing countries (Li L (2018); Djimoudjiel et al. (2022)). Financial inclusion also improves macroeconomic stability and inclusive economic growth (Liu D, Zhang Y, Hafeez M, Ullah S.(2022)). Theoretical developments have argued that financial inclusion improves human development and therefore education. As such, we use the following economic model:

$$Y_{it} = X_{it} + Z_{it} + \varepsilon_{it} \quad (1)$$

with Y_{it} the variable representing the level of education of country i at period t . X_{it} and Z_{it} are respectively the groups of variables defined by the financial inclusion indicators and control variables. ε_{it} is the error term. In contrast to the work of Datta and Singh (2019) which adopts inclusive finance and human development indices, our study instead uses the individual components of financial inclusion, namely bank penetration measured by bank account and branch, and usage measured by deposit, and borrowing. This allows us to capture the different dimensions through which financial inclusion affects education in SSA. In addition, we go beyond simple correlation analysis to explore the causal relationship between financial inclusion and level of education by extracting the exogenous component of financial inclusion. The empirical model is specified as follows:

$$\text{Educ}_{it} = \alpha + \delta \text{FinInc}_{it} + \gamma Z_{it} + \varepsilon_{it}, \quad (2)$$

where Educ_{it} , the dependent variable, represents level of education for country i at period t measured by the inscription rate. FinInc_{it} represents the financial inclusion of a country i at time t and includes the dimensions access, availability, and utilization. Z_{it} a vector of control variables defined below and ε_{it} the error term. Given the possible reverse causality between the variables Educ_{it} and financial inclusion, estimation by a dynamic system generalized method of moments (GMM) is used. In addition, the instrumental variable method (IV) is used to test the robustness of the findings.

3.2 Data and sources

The data used in this study comes from the World Development Indicators (WDI), the Global Financial Development Database (GFDD), the

United Nations Development Programme (UNDP) and the World Governance Indicators (WGI) for the period 2004-2022 on a sample of 28 Sub-Saharan African countries.

Table 1 - Definition of variables and expected signs

Variables	Description	Source	Expected Sign
Educ	Represents the school enrolment rate as a percentage of the population	WDI	
Account	Bank Account for 1000 adults	GFDD	+
Branch	Bank Account for 1000 adults	GFDD	+
Deposit	Depositors in CB commercial banks per 1000 adults	WDI	+
Borrowing	Borrowers from commercial banks per 1000 adults.	WDI	+
Infl	Inflation as a percentage of GDP	WDI	-
Mob_cell	Mobile cellular subscriptions (per 100 people)	WDI	+/-
GDP	Gross domestic product	WDI	+
FDI	Foreign direct Investment	WDI	+
Trade	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product (% gdp).	WDI	-
Gov_Effect	Perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	WGI	-

Source : Author's construction.

3.3 Descriptive statistics

Table 2 below presents the descriptive statistics for the study variables. It can be seen that, on average, the primary school enrolment rate as a percentage of the population in SSA is 15%. In terms of bank branches, there is an average of 5.8% commercial bank branches per 100,000 adults. In terms of

accounts, an average of 201 adults have a bank account per 1,000 adults. In terms of deposits in commercial banks, an average of 200 adults make deposits, with a maximum of 346, while an average of 36 adults have access to credit. Other variables include foreign direct investment, which stands at 4.128, average inflation of 8% and a population growth rate of 2.67%.

Table 2: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Educ	646	15.584	16.489	0	91.708
Borrow	646	36.595	68.401	-18.448	450.363
Deposit	646	200.482	346.242	0	2368.401
Bank Acc	646	201.782	349.58	0	2349.092
Bank Branch	646	5.847	9.186	0	59.108
FDI	646	4.128	8.297	-18.918	103.337
GDPgrowth	646	4.223	4.873	-36.392	37.999
Gov Eff	646	-.795	.543	-1.879	.599
GFCF	646	21.637	11.054	0	79.401
INFL	646	8	25.249	-8.975	557.202
Mob cell	646	59.53	40.348	0	174.025
Pop growth	646	2.67	.775	-.077	5.627
Trade	646	61.301	28.813	0	148.587
Source: Author's					

Access to telephone services (mob_cell) per 100 persons is 59.53% supported by West and East African countries. Trade openness and investment averaged respectively 61% and 21% of GDP of SSA. Whereas, the estimate for government effectiveness is negative indicating poor quality of institutions in SSA.

4. Results and interpretation :

According to the results, generalized method of moments in a dynamic panel was used as a method of estimation. In light of the work of Ivanic et al (2012) and Ozcan and Kiliç (2018) human development through human capital accumulation can be considered as a dynamic process. Thus, using internal instruments (lagged and difference variables), the generalized method of moments (GMM) allows to control for endogeneity and to obtain efficient estimates.

Table (3) below apprehends the various implications of borrowing per capita (1), deposits per capita (2), bank account penetration (3) and bank branch (4) on the level of education in SSA. The results are obtained using two-step system GMM estimation. the regression results, all specifications pass the overall significance tests indicated by the probabilities associated with F-statistic that are less than 1%. It emerges that borrow expansion improves on average the level of education by about 0.018 points at 5% level of significance, all other things being equal (column 1). Bank penetration (account ownership and bank branch density) makes it impossible, a priori, in the case of deposits/credits, to maintain or improve access to education and health (Datta and Singh, 2019).

Column (2) indicates that financial inclusion through deposit has a positive effect on education in SSA. The results show that an increase in the share of individuals who borrowed from financial institutions leads to a 0.001 point improvement. The same is true for the possession of a bank account and the number of bank branches positively and non-significantly affects the level of education in SSA. Thus, all other things being equal, the possession of a bank account and the

number of bank branches have no effect on education.

The results summarized show that financial inclusion (borrow) improves the level of education in SSA. It also emerges that bank account, branch density and borrowing have similar effect on education in SSA. Whereas, the effect of bank account, branch density and borrowing are weaker.

Table 3: A two-step system GMM estimation

	(1)	(2)	(3)	(4)
Variables	Borrow	Deposit	Bank account	Bank branch
L.Educ_prim	.754***	.743***	.736***	.767***
	(.063)	(.064)	(.063)	(.062)
Borrow	.018**			
	(.009)			
FDI	.029	.038	.032	.033
	(.041)	(.042)	(.042)	(.048)
GDPgrowth	.006	-.004	-.004	.028
	(.103)	(.086)	(.087)	(.114)
Gov_Eff	-2.687***	-2.406***	-2.85***	-2.723
	(.887)	(.748)	(.859)	(1.659)
GFCF	-.085**	-.085*	-.09**	-.085*
	(.037)	(.045)	(.042)	(.047)
INFL	-.01*	-.01**	-.01*	-.009*
	(.005)	(.005)	(.005)	(.005)
Mob_cell	.026**	.032*	.031**	.031***
	(.012)	(.016)	(.012)	(.01)
Pop_growth	1.099	.786	1.024	1.209

	(.649)	(.817)	(1.009)	(.89)
Trade	.032	.04	.042	.035
	(.025)	(.025)	(.027)	(.023)
Deposit		.001		
		(.001)		
Bank_Acc			.001	
			(.001)	
Bank_Branch				.095
				(.154)
_cons	-3.378	-2.602	-3.272	-4.126
	(2.394)	(2.786)	(3.259)	(3.269)
Comments	612	612	612	612
Source : Author's				
Robust standard errors are in parentheses				
*** p<.01, ** p<.05, * p<.1				

In all, second-stage regression results, inflation negatively affects level of education in SSA at 10% level of significance. This could be explained by the positive variation of inflation rate materialized by a rapid increase in the price of goods and services that degrade GDP.

In a dynamic of promoting financial inclusion through access to mobile banking, it is obvious that an access to telecommunication services (mobile cellular) allows to improve human development in SSA and particularly in Kenya according to a study by Suri and Jack (2016). The findings of table (3) suggest that an increase in the number of subscribers to telecommunication services (mobile cell) positively and significantly affect level of education in SSA at 5% level of significance.

Lastly, the quality of institutions measured in this study by the perception of people on the ability of

government to formulate and implement policies negatively affects level of education in SSA. Indeed, controlling for the effects of branches, deposits, borrow and bank accounts on the education shows that in the presence of poor institutional quality the implications remain very bad at most at 5% level of significance. This corroborates the results obtained by Boettke and Subrick (2003) that institutional quality improves human development in developed countries.

5. Robustness checks:

To check for robustness, the instrumental variables was used as an alternative method of estimation. The results obtained from the instrumental variables reported in table (4) confirm the significant effect of financial inclusion on the level of education in SSA over the study period. Overall, these results confirm the existence of a positive link between financial inclusion (borrowing) and the

level of education in SSA. Result also show that With respect to the control variables, it can be noted that the effects of trade shares in GDP are robust to the IV estimations. Whereas, mobile cellular penetration has a positive and significant effect on the level of education in SSA.

The quality of institutions measured by government efficiency shows negatif effects. Indeed, it appears that institutional quality improves human development insofar as banks increase the amount of loan and guarantee access

to bank accounts. Authors such as Outreville (1999), Ahmad et al (2012) and Datta and Singh (2019) have run comparative analyses between developed and developing economies on the implications of financial inclusion on social, economic and human development variables respectively. For most of the effects obtained from the sample of SSA economies, the subsequent results corroborate with some of the work, albeit subject to a strong consideration of institutional quality.

Table 4 : The instrumental variable estimations of the effects of financial inclusion on the level of education in SSA (robustness)

	(1)	(2)	(3)	(4)
	Borrow	Deposit	Bank_Acc	Bank_Branch
FDI	.168**	.168**	.168**	.172**
	(.068)	(.069)	(.069)	(.068)
Borrow	.018*			
	(.01)			
Gov_Eff	-11.125***	-10.348***	-10.373***	-9.681***
	(1.267)	(1.25)	(1.249)	(1.291)
FBCF	-.35***	-.358***	-.359***	-.37***
	(.066)	(.066)	(.066)	(.066)
INFL	-.032	-.029	-.029	-.031
	(.022)	(.022)	(.022)	(.022)
Mob_cell	.142***	.15***	.15***	.156***
	(.017)	(.016)	(.016)	(.017)
Pop_growth	4.096***	3.702***	3.72***	3.252***
	(.856)	(.886)	(.888)	(.9)
Trade	.15***	.159***	.159***	.163***
	(.024)	(.024)	(.024)	(.024)
Deposit		-.001		
		(.002)		
Bank_Acc			-.001	
			(.002)	
Bank_Branch				-.152*

				(.082)
_cons	-15.304***	-13.708***	-13.781***	-11.645***
	(2.927)	(3.019)	(3.022)	(3.172)
Observations	646	646	646	646
R-squared	.251	.248	.248	.252
Standard errors are in parentheses				
*** p<.01, ** p<.05, * p<.1				

6. Conclusion :

This paper aimed to examine the effects of access and used of financial inclusion services on the level of education in SSA. Two observations helped to refine our problematic. First, the persistence of poverty in Africa. On the other hand, the proliferation of financial inclusion indicators in Africa. The paper has contributed to the literature on the externalities of financial inclusion to the education process.

We have mobilised theoretical and empirical developments to investigate econometrically several variants of models estimated by the GMM method, using a sample of 34 SSA countries over the period from 2004 to 2022. Overall, the findings from a dynamic panel system GMM estimation suggest that financial inclusion (**borrow**) is a key determinant to education in sub-Saharan Africa. Indeed, reading the intrinsic indicators to financial inclusion, it can be observed that obtaining loans is the key element to promoting human development (Dupas and Robinson 2013, Datta and Singh 2019). However, alongside the validation of this effect, the improvement of education is only possible within the framework of a good perception of the credibility of the government in formulating and implementing policies.

Similarly, mobile cellular penetration is proved to be important in improving education in SSA. On the other hand, inflation negatively affects level of education. In view of these findings, Sub-Saharan African countries need to improve the quality of institutions. Based on these results, some nonexhaustive policy suggestions can be made to promote financial inclusion in Africa. First,

African states need to strengthen financial inclusion policies aimed at improving access to loans for all. Second, the regulatory framework should be strengthened to avoid recurrent failures of financial institutions in Africa. Nevertheless, future studies upon improvement in data availability could examine the channels of transmission of the effect of financial inclusion on education in the region.

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