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Empirical Analysis of Financial Inclusion's Role in Economic Growth and Poverty Reduction in Sub-Saharan Africa

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ABSTRACT

This research aims to investigate the correlation between financial inclusion (FI), economic growth (EG), and poverty reduction in several Sub-Saharan African (SSA) countries throughout the period of 2014-2021. The research used the generalized method of moments (GMM) econometric methodologies. A financial inclusion (FI) composite index was constructed using principal component analysis (PCA) to include the many attributes of FI indicators. The findings indicate a positive and significant impact of financial inclusion on economic development and a reduction in poverty in Sub-Saharan Africa. These results emphasize the crucial significance of legislators and governments giving priority to policies that enhance the availability, utility, and accessibility of financial goods and services. The outcome will include a reduction in poverty and an increase in equitable economic progress throughout Sub-Saharan Africa.

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1. Introduction

The financial system plays a crucial role in the economy by performing several services, including facilitating savings, borrowing, payment processing, risk management, and permitting equity investments. These roles illustrate the profound importance of forming and growing financial institutions in SSA. The efficacy of the financial system may also be evaluated by its performance in each of these roles. Despite significant advancements achieved by financial organizations such as lending institutions, microfinance, savings, banks, credit unions, and cooperative societies in spreading financial services, a large proportion of the worldwide adult population still lacks access to formal financial services. According to the World Findex Report 2021, around 1.4 billion individuals remain excluded from the official financial system, and the financial services in the SSA fail to reach or serve around 45% of its adult population (Asli Demirgüç-Kunt, Leora Klapper, Dorothe Singer,

2021).

Financial Inclusion (FI) is the condition characterized by widespread and accessible provision of financial assistance, financial education, and complete financial services across all economic sectors, geographical areas, and social demographics (Kama and Adigun, 2013). The main objective of financial intermediation is to facilitate the growth of savings and investment in order to achieve stable and equitable economic growth. As a result, this allows for the effective distribution of resources from sectors experiencing scarcity to sectors experiencing excess in society. Financial inclusion (FI) ensures the accessibility of financial services, fosters the autonomy and independence of marginalized persons, and facilitates their inclusion in society (Imboden, 2005).

Financial inclusion (FI) is considered a crucial element in getting the Millennium Development Goals (MDGs) set by the United Nations in 2000. It is also acknowledged as a method to achieve the Sustainable Development Goals (SDGs) agenda established by the United Nations in 2015. The primary goals of this initiative are to eradicate poverty and alleviate economic inequality. Since 2000, most African countries have been carrying out Financial Inclusion (FI) activities in accordance with the Millennium Development Goals (MDGs).

Over the last two decades, African countries have achieved substantial advancements in their ability to get financial services. Due to the expansion of the financial sector in many African nations, families and companies now have access to a wider range of financial services, including savings, credit, and alternative payment methods. In addition, the financial industry has used innovative technology like mobile money and online banking to broaden the scope of savings and payment services. A number of African countries are now adopting deregulation and liberalization policies to eliminate restrictions on financial operations. Following the deregulation and liberalization processes, African countries shifted towards a market-oriented economy, which had a beneficial effect on the expansion of both state-owned and privately-owned financial sectors.

The efficacy of financial inclusion in driving economic growth and mitigating poverty has been established. It is essential to focus and prioritize the provision of affordable financial services to individuals in poverty and companies of all sizes. Financial inclusion (FI) has a vital role in promoting economic growth (EG), addressing disparities in income, reducing poverty by assuring fair access to financial services, and reducing the influence of exploitative financial institutions (Adedokun and Ağa, 2021; Honohan, 2004; Honohan, 2008; Sarpong et al., 2022).

The low presence of banks in Sub-Saharan African (SSA) nations may be addressed by leveraging the extensive use of mobile phones, which has the potential to enhance financial inclusion by providing access to financial services for people across all income levels. The GSMA 2023 research indicates that the use of mobile phones in African countries has seen an increase in financial inclusion. The current number of mobile subscribers in SSA is 489 million. Consequently, nations in the SSA region have taken advantage of this trend by using mobile phones to promote financial inclusion. Kenya has successfully deployed M-PESA services, Sierra Leone has adopted Orange Money, and Uganda and Zambia have embraced MTN Mobile Money, among other examples. Mobile phones have a significant influence on improving the exchange of information and offering affordable financial services to those who previously had no access to banking services. Therefore, it is expected that advancements in financial technology (FinTech) and mobile phone services may help promote financial inclusion, support economic growth, and reduce poverty (Andrianaivo and Kpodar

2012; Hassan et al., 2019). Multiple studies have shown that financial inclusion (FI) has a crucial role in enhancing economic growth (EG) and alleviating poverty (Baidoo and Akoto 2019; Bateman et al., 2019; Koomson et al., 2020; Thi et al., 2022).

Policymakers around the world are prioritizing the achievement of financial inclusion by including those who are currently not using banking services or have limited access to them into the official financial system. The issue has garnered significant attention and continues to be the subject of continuing debates in international forums because to its promising potential to alleviate severe poverty, promote economic growth, and reduce income disparity. Consequently, ensuring universal access to financial services has become a crucial goal in the development strategies of developing countries.

This research evaluates the influence of financial inclusion (FI) on economic growth (EG) and poverty reduction. Prior research has shown the importance of financial inclusion (FI) in reducing poverty as measured by income (Beck et al., 2007; Burgess et al., 2005). However, relying just on income as a measure of poverty is insufficient since it fails to include the lack of several essential human needs, especially those that cannot be obtained via money. Poverty encompasses not just economic inadequacy but also challenges in accessing healthcare, education, and other essential services.

To fill this gap, this research used the Human Development Index (HDI), a metric that measures poverty by considering several aspects such as health, education, and income (Park and Mercado, 2015; Omar and Inaba, 2020). Khan et al. (2021) have used it as a surrogate indicator for the decrease of poverty. The Human Development Index (HDI), as established by the United Nations Development Programme (UNDP), is a comprehensive composite indicator that assesses a nation's average achievements in three essential areas of human development: education, healthcare, and quality of living. Education is evaluated based on the adult literacy rate and the overall gross enrollment ratio for primary, secondary, and tertiary education. Health is measured by the life expectancy at birth, while the standard of living is determined by the GDP per capita, which takes into account the purchasing power in US dollars.

The ensuing portion of this article is organized in the following manner: Section 2 offers a comprehensive examination of both the theoretical and empirical research. Section 3 provides a thorough overview of the data and methodology used. Section 4 contains the results of the study and the subsequent discussions, while Section 5 is dedicated to the conclusion and suggestions.

2. Literature Review

Financial inclusion (FI) involves the availability and ease of access to a diverse range of financial services, including different payment methods, savings accounts, credit options, insurance coverage, and retirement plans. Financial inclusion (FI) is the state in which people have convenient access to a diverse array of financial services that are customized to their need and offered at affordable rates. The product range encompasses a variety of financial services, such as payments, savings, credit, insurance, and pensions. Financial goods and services should be easily available to all clients, without the need for strict Know-Your-Customer processes, extensive paperwork, or other restrictions often imposed by banks. It is essential to provide inexpensive access to a wide range of financial goods and services for customers who do not have access to conventional banking choices. Financial services that are readily accessible should be economically viable for persons with limited

incomes, especially when compared to informal alternatives.

In recent times, there has been a significant increase in the accessibility of financial services and products. Consequently, both individuals and companies have been able to benefit from the expanding array of financial services at their disposal. The percentage of adults who have accounts at official financial institutions increased from 51% in 2011 to 62%, 69%, and 76% in 2014, 2017, and 2021, respectively (Asli et al., 2021; Demirguc-Kunt et al., 2015; Demirgüç-Kunt et al., 2020; Demirguc-Kunt & Klapper 2012).

Studies indicate that financial services have a crucial role in promoting economic growth (Williams et al., 2017). Moreover, individuals and organizations with the capability to utilize financial services demonstrate a greater ability to withstand financial disruptions and are more skilled at reducing poverty compared to those without such access (Asli et al., 2021; Suri and Jack, 2016). Hence, the presence of a complete financial system is vital for the economic expansion and long-term development of any country. It ensures that all sections of society, particularly those facing economic difficulties, have access to affordable financial services.

2.1 Selected Empirical Literature

2.1.1 Financial inclusion (FI) and economic growth EG

Adedokun and Ağa (2021) conducted an empirical study to evaluate the relationship between financial inclusion (FI) and economic growth (EG) in Sub-Saharan African (SSA) countries from 2004 to 2017. The researchers used Gaussian Mixture Model (GMM) and Dumitrescu-Hurlin's causality test for their investigation. The researchers used Principal Component Analysis (PCA) to construct a comprehensive metric of financial inclusion, taking into account many dimensions of financial inclusion. Their study demonstrates that financial inclusion has a positive and significant impact on the economic growth of the social security administration. Additional research suggests a direct link between EG and FI in the immediate term.

Ugwuanyi et al. (2022) performed an extensive study to evaluate the impact of foreign investment (FI) on the economic growth (EG) of 29 countries in Sub-Saharan Africa (SSA). The research conducted a thorough examination of the impacts of both digital money and conventional finance, using data from 2012 to 2020. The research used generalized least squares and system GMM approaches, together with the panel vector autoregression Granger causality test. The results suggest that both digital and conventional financial inclusion have a beneficial and significant effect on economic growth. Nevertheless, conventional financial inclusion has a more significant influence compared to digital financial inclusion, as shown by the many aspects of accessibility. The researchers propose that while digital banking is a novel notion in underdeveloped nations, it is imperative to not overlook the existing financial infrastructure.

Ifediora et al. (2022) analyze the influence of financial inclusion (FI) on economic growth (EG) using panel data from 22 sub-Saharan African countries covering the period from 2012 to 2018. The research used the Generalized Method of Moments (GMM) technique. The researchers discovered that the existence, extent, and overall attributes of FI had a significant and advantageous influence on EG. Nevertheless, the impact of the use component shows only marginal enhancement and lacks significance. Bank branches and ATMs have a positive and substantial impact on economic development. While deposit accounts and outstanding loans have a beneficial impact on EG, their influence is not considered substantial. Conversely, exceptional deposits have an adverse impact on

EG. Furthermore, studies have shown that the presence of mobile money agents impedes economic development, but the availability of mobile money accounts and transactions fosters economic growth.

Van et al. (2019) undertook a comprehensive examination of the correlation between financial inclusion (FI) and economic growth (EG) in emerging nations. The index was constructed using the multidimensional index approach first presented by Sarma and Pais (2011) and later by Park and Mercado (2015). Following the creation of the index, they used the panel econometric approach, which included combining fixed effects and GMM, to evaluate the influence of FI on EG. Their study uncovers a clear correlation between financial independence (FI) and entrepreneurial growth (EG). Countries with low incomes and poor financial infrastructure have a stronger correlation in their links.

Sharma (2020) investigated the relationship between foreign investment (FI) and economic growth (EG) in the emerging Indian economy. The findings demonstrate a direct relationship between EG and many dimensions of financial inclusion, including the extent of banking accessibility, the availability of banking services, and the use of banking services in terms of deposits. The data indicate a robust correlation between the expansion of geographical reach and economic progress, suggesting a reciprocal influence between the two. Furthermore, there is a direct link between the increase in geographical coverage and the progress of EG. Nevertheless, there exists a one-way association between the number of deposit and loan accounts and the GDP. The results endorse the adoption of social banking initiatives in India, which would strengthen the robustness of financial institutions.

Thorough analysis of research on the connection between financial inclusion (FI) and economic growth (EG) demonstrates that progress has been made in multiple aspects of this field. This includes the development of key concepts, addressing specific issues and difficulties related to the economy, and ultimately creating an index for assessing financial inclusion. The current study elucidates the methodology used in constructing an index and the influence of said index on EG. An in-depth analysis of the relationship between finance and economic growth allows us to understand the many aspects of this connection and emphasizes the crucial importance of formal financial institutions in promoting financial development. The literature study has facilitated the formulation of research inquiries and the identification of suitable approaches to tackle present concerns.

2.2 Financial inclusion and Poverty Reduction

The United Nations has designated the elimination of poverty in all its manifestations as a primary goal to be accomplished by 2030, as deliberated at the summit in 2015. African countries have a significant challenge in tackling poverty, which is characterized by a lack of financial resources to maintain a basic standard of living. The prevailing consensus among the majority is that poverty is an abhorrent state that presents itself in various forms, including hunger, malnutrition, financial insufficiency, inadequate housing, subpar education, underdeveloped infrastructure, dysfunctional healthcare facilities, widespread diseases, insecurity, and numerous other factors (Koomson et al., 2020; Tita and Aziakpono, 2017).

Churchill and Marisetty (2020) analyze the impact of FI on poverty. The researchers construct a comprehensive measure of financial inclusion (FI) and examine its influence on several poverty indicators, including household deprivation scores, the poverty line, and the Household Poverty

Probability Index. The researchers used ordinary least squares (OLS), two-stage least squares (2SLS), and propensity score matching approaches. Financial inclusion (FI) has been shown to have a significant impact on reducing poverty. This discovery remained consistent across several poverty indices and varied methodologies for assessing financial inclusion.

Alimi and Okunade (2020) investigate the impact of financial inclusion (FI) and information and communication technology (ICT) adoption on reducing poverty in 27 Sub-Saharan African (SSA) countries between 2004 and 2017. The researchers used a method called non-stationary heterogeneous panel estimating, specifically using fixed effect estimators, pooled mean groups, and mean groups. The results obtained using the pooled mean group estimator demonstrate that there is a consistent impact of financial inclusion, as defined by the ratio of commercial branches per 100,000 persons, in reducing poverty. However, it does not have an immediate impact on the reduction of poverty.

Khan et al. (2021) investigated the impact of financial inclusion (FI) on poverty rates, financial stability, and income inequality in 54 African nations. The research used the Human Development Index (HDI) as a metric to assess the alleviation of poverty. The research employs panel-fixed effects and the system GMM approach. The research used commercial bank deposits (per 1000 persons) and ATM density (number of ATMs per 100,000 adult population) as indicators to assess financial inclusion. The researchers discovered a robust correlation between these characteristics and a decrease in income inequality and poverty, as well as an improvement in financial stability.

Nsiah et al. (2021) investigated the influence of Financial Inclusion (FI) on the alleviation of poverty in Sub-Saharan Africa (SSA) through an analysis of the threshold effect. The research used data from 2010 to 2017 to determine the point at which the amount of financial inclusion decreases poverty rates. The researchers used Hansen's estimate and other Generalized Method of Moments (GMM) approaches for their examination. Moreover, the research analyzed the variables that influence food insecurity. The data suggest that when the degree of financial inclusion surpasses 0.365, it leads to a reduction in poverty. Moreover, an increase in the money supply has a beneficial and substantial effect on alleviating poverty. The results also showed that an escalation in domestic lending targeted at the private sector has a beneficial effect on the expansion of financial institutions.

An exhaustive examination of the literature on financial inclusion (FI) and poverty reduction unequivocally demonstrates that FI has been very successful in mitigating poverty. Nevertheless, the scholars in the field have used many elements of financial inclusion. Hence, the literature assessment has facilitated the selection of suitable variables and models for examining the correlation between poverty reduction and financial inclusion in Sub-Saharan Africa.

3. Data and Methodology

3.1 Data

The empirical analysis of this research included data from four distinct sources: the UNDP for HDI data, the World Development Indicators for EG and control factors, the Global FI Database (Findex) for the FI variables, and the Worldwide Governance Indicator. Information was collected from 18 nations in Sub-Saharan Africa (SSA), spanning the years 2014 to 2021. The primary dependent variable is EG, which is measured as the yearly percentage fluctuation in per capita GDP. This research uses the Human Development Index (HDI) as a metric for poverty, since it considers

several dimensions of poverty such as education, health, and income (Park & Mercado 2015; Omar & Inaba 2020; Khan et al., 2021). Main explanatory variable used in this study is financial inclusion, other control variables include, population, age dependency, trade openness, inflation, political stability and education.

3.2 Specification of empirical model

The proposed model for evaluating the impact of FI on EG in SSA is as follows:

$$\ln GDP_{it} = \beta_0 + \beta_1 Fii_{it} + \beta_2 \ln Pop_{it} + \beta_3 \ln Age\ Dep_{it} + \beta_4 \ln Trade_{it} + \beta_5 Polstab_{it} + \beta_6 \ln Inflation_{it} + \varepsilon_{it} \dots \dots \dots 2$$

Where

β_0 is the coefficient of the empirical model

$\ln GDP_{it}$ is the log of Gross Domestic Product (GDP) per capita which represent EG for country i at time t

Fii_{it} is the FI index for country i at time t

$\ln Pop_{it}$, $\ln Age\ Dep_{it}$, $\ln Trade_{it}$, $Polstab_{it}$, and $\ln Inflation_{it}$ are log of population growth, log of age dependency ratio, log of trade, political stability and log of inflation for country i at time t respectively

ε_{it} represents the error term that encompasses all unobservable factors that may impact EG.

The research used system GMM estimate, based on the methodologies described by Arellano and Bond (1991). The system GMM estimator successfully resolves the problem of endogeneity by producing estimates that are both consistent and efficient at the same time. Panel studies that have a greater sample size (N) compared to the number of time periods (T) provide a distinct advantage. Arellano and Bond (1991) discovered that the use of System GMM reduces prejudice and enhances the precision of predictions. System GMM utilizes a model that includes lagged dependent variables to analyze the dynamic properties of both the dependent and independent variables, while also considering endogeneity.

$$\ln GDP_{it} = \beta_0 + \beta_1 \ln GDP_{it-1} + \beta_2 Fii_{it} + \beta_3 \ln Pop_{it} + \beta_4 \ln Age\ Dep_{it} + \beta_5 \ln Trade_{it} + \beta_6 Polstab_{it} + \beta_7 \ln Inflation_{it} + \varepsilon_{it} \dots \dots \dots 3$$

3.3 FI and Poverty Reduction

The proposed model for evaluating the impact of FI on poverty reduction in SSA is as follows:

$$HDI_{it} = \beta_0 + \beta_1 Fii_{it} + \beta_2 \ln GDP_{it} + \beta_3 Education_{it} + \beta_4 \ln Pop_{it} + \varepsilon_{it} \dots \dots \dots 4$$

Where

HDI_{it} is Human Development Index for country i at time t.

4. Empirical Findings and Discussion

4.1 Descriptive statistics

Table 1 presents the summary statistics, which indicate that all the data analyzed in this study has a positive mean value. Moreover, it is evident that the data exhibits a significant skewness, since some variables display a noticeable discrepancy between their average and middle values. Thus, the data at these levels were converted into logarithms to generate a more balanced distribution and to guarantee that the average and median values of the variable were closely comparable.

Table 1: Descriptive Analysis

Variable	Mean	Std. Dev.	Minimum	Maximum
HDI	.5574028	.1013949	.389	.817
GDP	2583.19	2772.153	455.64	11643.5
ADP	80.07215	14.48302	40.42	103.09
EDU	104.9657	17.89011	75.6	156.45
SAV	12.48514	9.125435	2.53	35.53
ACC	41.17868	22.63896	6.96	90.53
INF	10.40424	51.19946	-2.43	557.2
TRADE OP	67.02375	20.98715	27.24	119.5
BORR	8.998958	6.024068	2	25.15
POP	2.462631	.7408179	.002291	3.56999
PS	6.611111	1.078143	4	8

4.2 Impact of financial inclusion (FI) on economic growth (EG)

The researcher utilized various statistical approaches, including RE, Driscoll Kraay standard errors, PCSE, and GMM, to examine the impact of FI on EG. Table 9 presents the findings of the GMM model. The GMM analysis reveals that FI has a positive and significant effect on EG. The findings indicate a 1 percent rise in FI leads to a 0.129% improvement in EG. These findings align with other research that has also found a positive and significant impact of FI on EG (e.g., Adedokun and Ağa, 2021; Ain et al., 2020; Babajide et al., 2015; Ifediora et al., 2022; Ugwuanyi et al., 2022; Van et al., 2019). The increase in population has a significant negative effect, while the ratio of dependent individuals based on age also demonstrates a large detrimental impact. On the other hand, trade has a positive effect, although not significant. Inflation, however, exhibits a statistically insignificant nevertheless negative effect.

Table 9. The impact of FI on EG: GMM results

VARIABLES	LnGDP
$LnGDP_{t-1}$	0.0961** (0.0467)
Financial Inclusion	0.129*** (0.0174)
LnPopulation Growth	-0.0437* (0.0225)
LnAge Dep Ratio	-2.181*** (0.458)
LnTrade	0.0540 (0.0372)

Political Stability	0.0505*** (0.00774)
LnInflation	-0.00508 (0.00415)
Constant	15.64*** (2.106)
Observations	89
Number of countries	17

Note: *** p<0.01, ** p<0.05, * p<0.1

Source: Author analysis by Stata

4.3 Financial inclusion (FI) and Poverty reduction

To examine the effect of FI on poverty reduction, the researcher utilized GMM. The presence of endogeneity in the model implies that the researcher cannot just rely on the findings derived from FE and RE analyses. To address this challenge, the researcher employed system GMM to mitigate endogeneity and other potential concerns in the model. The GMM results indicate that FI has a positive and significant effect on HDI. There is a positive but insignificant influence on GDP, but there is a positive and statistically significant effect on HDI from both education and population increase. Table 11 findings indicate that a greater proportion of FI is associated with a rise in the HDI. The GMM analysis reveals that FI has a positive and significant effect on EG. The findings indicate a 1 percent rise in FI leads to a 0.682% improvement in HDI. An increase in HDI is correlated with a reduction in poverty, while a decline in HDI is associated with an increase in poverty. The impact of FI on HDI is more pronounced in countries that have a higher HDI.

Table 11. Financial inclusion (FI) and poverty reduction

VARIABLES	HDI
HDI_{t-1}	0.682*** (0.0876)
Financial Inclusion	0.00301* (0.00166)
LnGDP	0.00322** (0.00500)
Education	0.000148* (0.000793)
LnPopulation	0.00388*** (0.00142)
Constant	0.135** (0.0525)
Observations	72
Number of countries	16

Note: *** p<0.01, ** p<0.05, * p<0.1

Source: Author Self Computation

5. Conclusion and Recommendations

Impact of FI on EG and poverty reduction in SSA is examined in this research. To assess the impact, the researcher constructed an FI index. The researcher utilized GMM models to analyze the impact of FI on EG. According to the findings, FI consistently exhibits a significant and positive

impact on EG across all models. The researcher also utilized GMM to examine the impacts of FI on poverty reduction. Across all the models, FI consistently emerged as an effective instrument for reducing poverty. Specifically, the findings from the quantile regression analysis revealed that FI has a larger significant impact on poverty reduction, particularly in countries with higher HDI.

This study proposes several policy recommendations for SSA countries based on the findings. To foster EG and eliminate poverty, it is essential for SSA countries to strengthen their financial sector by expanding financial markets and derivatives markets. This expansion should explicitly address the requirements of the low-income population, guaranteeing the availability, accessibility, and usability of financial products and services. Mobile money and other FinTech components should be a part of effective policies that governments and lawmakers implement to increase access to financial services, particularly in rural regions. Also, the financial regulator can help the banks contact the unbanked people and bring them into the formal economy. Regulations should be enacted to facilitate access to deposit accounts for individuals and households with low incomes, as well as small enterprises. This would allow them to take advantage of the expanded availability, improved savings opportunities, and borrowing alternatives offered by formal financial services. Government and policymakers should also implement policies that effectively address obstacles to financial inclusion. Efforts to improve FI should be matched by the promotion of broad-based EG that benefits all segments of society. Providing credit to those with lower incomes improves their access to financial services, enabling their participation in productive activities and promoting more stable spending behaviour. Finally, governments and policymakers should establish a policy aimed at removing obstacles associated with accessing private sector credit. This can be achieved by constantly expanding the options for retail and business loans, mortgages, overdrafts, credit cards, and letters of credit to the eligible adult population.

Further research should be conducted on this topic, based upon the availability of data. Researchers should broaden their focus beyond bank-based financial services to encompass mobile money services and digital payment platforms, as well as examine the effects on household savings, investment, EG, and poverty reduction in SSA.

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