EXPLORING THE MULTIDIMENSIONAL ROLE OF INCLUSION IN ENHANCING FIRM-LEVEL GROWTH IN EMERGING ECONOMIES: EVIDENCE FROM DYNAMIC PANEL MODELS IN SUB-SAHARAN AFRICA

KAYODE DAVID KOLAWOLE
Department of Accounting Science,
Walter Sisulu University, Mthatha, South Africa
kolawolekayodedavid@gmail.com

DOI: https://doi.org/10.64633/wissj.v9i6.28

Keywords

Financial Inclusion, Firm Performance, Sales Growth, Profitability, Sub-Saharan Africa, Financial Development
JEL Codes: G21, O16, L25, D22

Abstract

Using a sample of 335 firms from 15 countries in Sub-Saharan Africa from 2013 to 2022, this study examines the effects of financial inclusion on firm-level performance (profitability and sales growth) controlling for firm-level and country-level factors using a multidimensional Financial Inclusion Index (FII) that captures access, usage, and penetration of financial services. The results show that financial inclusion has a significant positive impact on both profitability and sales growth, and the effects are robust across different measures of financial inclusion and firm performance (ROA and ROE). The findings suggest that financial inclusion can be a catalyst for productive investment, operational efficiency, and sustainable firm growth. The policy implications emphasize the need to deepen the digital financial infrastructure, enhance access to affordable credit, and integrate financial inclusion into broader economic development strategies.

1. Introduction

In low FI economies, many people struggle with finances, with an estimated 2 billion and 1.7 billion adults around the world not included in financial products and services in 2014 and 2018, respectively (Frost, 2020). FI, including bank deposits, credits, and insurance, is an important instrument to fight poverty, improve welfare, support firm performance, and enhance economic growth (Frost, 2020). Financial services can be an important driver of firm performance, as Demirgüç-Kunt et al. (2018) show that FI fosters firm performance by helping the included invest in new ventures. While FI is still low in SSA, the level increased from 23% in 2011 to 43% in 2019, and the rapid increase was mainly driven by digital services, with the adoption of mobile money accounts, especially in countries such as Kenya and South Africa (World Bank, 2024). But the level of FI in SSA has been rising, and while challenges remain, such as geographic limitations, limited access to credit for SMEs, and persistent gender inequality (Drama, 2025), it has been a force for growth.

While a few studies have analyzed the effect of FI on household welfare, savings, and health (Karlan and Zinman, 2010; Tita and Aziakpono, 2017), and economic growth (Sahay et al., 2015; Gourene and Mendy, 2018), the connection between FI and firm performance has not been fully explored (Efobi et al., 2016). First, Karlan and Zinman (2010) reported that

increased access to credit enhanced self-sufficiency, well-being, and food consumption. Second, Tita and Aziakpono (2017) demonstrated that formal account usage has a positive correlation with income inequality and savings. Third, Gourene and Mendy (2018) established the causality between growth and FI. Fourth, Yenwo et al. (2025) found that financial development mediates the relationship between FI and bank performance in SSA. Fifth, Anifowose (2025) showed that firm-level growth in SSA improves with financial goods and services, and finally, Osuma (2025) revealed that FI, including microfinance, was critical to poverty reduction and sustainable development in SSA.

The study will investigate the impact of FI on the performance of firms. We aim to establish how FI has impacted profitability and firm-level growth in SSA countries. The study contributes to knowledge by adopting robust methodology, constructing a wide-coverage inclusion index, and providing evidence on the inclusion-firm-level performance nexus under a unified dynamic panel framework. This study will serve as a reference that is informative to individuals, business firms, researchers, and policymakers.

Literature Review

Financial inclusion (FI), or the use of formal financial services by individuals and businesses, has been considered an important driver of economic development and firm-level growth in SSA, where the majority of the population is unbanked. FI has been associated with firm performance through several theoretical constructs, including the financial intermediation theory (i.e., the role of financial institutions in channelling savings to investments for business expansion), the information asymmetry theory (i.e., the reduction in information asymmetry between lenders and borrowers from access to financial services improves the allocation of credit and business outcomes), and the institutional theory (i.e., formal financial systems contribute to a stable environment for business operations). Mixed evidence has been presented from empirical studies on the relationship between FI and firm performance in SSA, with some research suggesting a positive relationship between FI and firm performance (e.g., enhanced access to financial services improved firm profitability and growth prospects in East African countries (Jima and Makoni 2023), increased use of financial products positively influenced inclusive growth in SSA (Anifowose 2025)).

On the other hand, some other studies have found that the FI effect on firm performance might depend on contextual factors such as firm size, sector, and the quality of financial services (Efobi et al. 2016) or that FI may be more effective in certain contexts (Drama 2025). However, the introduction of digital financial services has revolutionized the way FI is delivered in SSA, with mobile money platforms like M-Pesa in Kenya expanding financial access, especially for women and rural populations (Sulemana 2025), and digital finance improving financial resilience, which makes firms better able to absorb economic shocks (Sulemana 2025). Even with these advances, challenges persist in using FI to drive firm-level growth (Eshun 2025), including low financial literacy, regulatory restrictions, and infrastructural deficits (Eshun 2025), which highlights the importance of further efforts to leverage FI to enhance firm performance.

In addition to firm growth, FI has been shown to influence innovation and entrepreneurial activities. Access to credit and formal financial services allows entrepreneurs to invest in research and development, adopt new technologies, and expand market reach. Empirical evidence from SSA indicates that firms with higher levels of financial inclusion are more likely to innovate, diversify product

lines, and improve operational efficiency (Okeke & Ojo, 2022). Furthermore, FI contributes to employment generation and social development in the region. By enabling small and medium-sized enterprises (SMEs) to access finance, FI indirectly fosters job creation, reduces poverty, and strengthens community welfare. Studies have demonstrated that inclusive financial systems enhance the sustainability of SMEs, which are the backbone of SSA economies (Ademola & Olatunji, 2021).

3. Methodology

The study employs firm-level covering 335 firms for 16 Sub-Saharan African (SSA) countries, spanning the period 2013–2022. The data, including sales, number of employees, profitability, and leverage, are obtained from the World Bank Enterprise Surveys (WBES, 2024), which provide standardized measures of business performance across countries. Also, country-level macroeconomic indicators, such as gross fixed capital formation, percentage of population with secondary education, and GDP growth are adopted and sourced from the World Bank World Development Indicators (WDI, 2024).

Financial inclusion measures are drawn from the World Bank Financial Access Survey (FAS, 2024), which provides detailed information on banking infrastructure (e.g., number of ATMs, bank branches), usage indicators (e.g., number of depositors, loan accounts), and financial penetration at the country level. Using these sources, we construct a multidimensional Financial Inclusion Index (FII) capturing access, usage, and penetration dimensions of financial services.

The panel structure of the dataset allows for the control of firm-specific and industry-time effects while examining the dynamic impact of financial inclusion on firm profitability and sales growth. The combination of firm-level and country-level data ensures a comprehensive analysis of the inclusion-performance nexus in SSA.

To examine the impact of financial inclusion (FI) on firm-level performance, we estimate two baseline models capturing profitability and sales growth:

$$\text{PROFIT}_{i,k,j,t} = \alpha X_{i,k,j,t} + \beta Y_{i,k,j,t} + \delta Z_{j,(t,t-2)} + \lambda FII_{j,(t,t-2)} + \mu_i + \tau_{k,t} + \varepsilon_{i,k,j,t}$$
$$\text{GROWTH}_{i,k,j,(t,t-2)} = \alpha X_{i,k,j,t} + \beta Y_{i,k,j,t} + \delta Z_{j,(t,t-2)} + \lambda FII_{j,(t,t-2)} + \mu_i + \tau_{k,t} + \varepsilon_{i,k,j,t}$$

where $\text{PROFIT}_{i,k,j,t}$ and $\text{GROWTH}_{i,k,j,(t,t-2)}$ are the dependent variables representing profitability and sales growth of firm i in industry k and country j. Growth rates are computed over two-year intervals, while profits are measured yearly. X denotes scalar controls, and $Y_{i,k,j,t}$ captures firm-level characteristics such as firm size (SIZE) and leverage (LEVR). $Z_{j,(t,t-2)}$ represents country-level variables including investment (INV), human capital accumulation (HCA), and GDP growth rate (GRT). Firm fixed effects are denoted by μ_i, while $\tau_{k,t}$ accounts for industry-time heterogeneity.

To overcome limitations in previous studies regarding the measurement of FI, we construct a multidimensional Financial Inclusion Index (FII), extending Makina and Walle (2019). The FII incorporates five indicators: number of ATMs per 1,000 km² (I_a), number of bank branches per 100,000 adults (I_b), outstanding credit as a percentage of GDP (I_c), number of depositors per 1,000 adults (I_d), and

number of loans per 1,000 adults (I_n). The composite index is computed as:

$$FII = \frac{1}{2}\left[\frac{\sqrt{I_a^2 + I_b^2 + I_c^2 + I_d^2 + I_n^2}}{\sqrt{m}} + 1 - \frac{\sqrt{(1-I_a)^2 + (1-I_b)^2 + (1-I_c)^2 + (1-I_d)^2 + (1-I_n)^2}}{\sqrt{m}}\right] \quad (1)$$

where $m = 5$ represents the number of variables included, each equally weighted. The index ranges from 0 (complete financial exclusion) to 1 (full inclusion).

We first examine the stochastic properties of the data using panel unit root tests including LLC, IPS, and PP. Panel cointegration is verified with the Kao ADF test to avoid spurious regression:

$$w_{i,t} = \beta y_{i,t} + \gamma z_{i,t} + e_{i,t} \quad (2)$$

where $e_{i,t}$ is white noise and $w_{i,t}, y_{i,t}, z_{i,t}$ are integrated of order one. Residuals from the pooled OLS are estimated via a Fisher-ADF regression:

$$\hat{e}_{i,t} = \rho \hat{e}_{i,t-1} + \sum_{j=1}^{p} \vartheta_j \, \Delta \hat{e}_{i,t-j} + v_{i,t,p} \quad (3)$$

where ρ is the first-order autoregressive coefficient, $\hat{e}_{i,t}$ are residuals from detrended series, and $v_{i,t,p}$ is the error term. The null hypothesis of no cointegration is $H_0: \rho = 0$.

Given the dynamic structure and potential endogeneity of FI and firm characteristics, we employ the Arellano-Bond Generalized Method of Moments (GMM) estimator, which addresses unobserved heterogeneity, simultaneity, and serial correlation (Arellano & Bond, 1991). Lagged dependent variables and appropriate instruments are included to improve efficiency. Robustness checks are performed using alternative FII specifications, system GMM, and alternative firm-level performance measures such as ROA and ROE. Sensitivity analyses include excluding outliers and accounting for industry-time interactions to confirm stability of results.

Table 1: Data description

Variable	Description	Measurement	Source
PROFIT	Firm profitability	Net profit margin (%)	World Bank Enterprise Surveys
GROWTH	Firm sales growth	% change in annual sales over 2 years	World Bank Enterprise Surveys
SIZE	Firm size	Log of total employees	World Bank Enterprise Surveys
LEVR	Leverage	Total debt / total assets	World Bank Enterprise Surveys
INV	Investment	Gross fixed capital formation as % of GDP	World Bank Development Indicators
HCA	Human capital accumulation	% of population with secondary education	World Bank Development Indicators
GRT	GDP growth	Annual GDP growth rate (%)	World Bank Development Indicators
FII	Financial Inclusion Index	Composite index (0–1)	Financial Access Survey, World Bank

Source: Author (2025)

4. Results

4.1. Discussion of Results

The results presented in Tables 2 and 3 provide robust evidence on the positive influence of financial inclusion (FII) on firm-level profitability and sales growth across Sub-Saharan Africa. Consistently across all specifications, FII emerges as a significant determinant of firm performance, highlighting

the critical role of financial accessibility, usage, and penetration in supporting business operations. In Table 2, the baseline GMM estimates indicate that a one-unit increase in FII is associated with a 0.215 increase in profitability and a 0.187 increase in sales growth in specifications that include only firm-level controls. When country-level variables and industry-time fixed effects are incorporated (PROFIT 2 and GROWTH 2), the coefficients remain positive and significant (0.198 for profitability and 0.174 for growth), confirming the robustness of the inclusion-performance nexus. These findings are consistent with the theoretical expectation that improved access to financial services enables firms to undertake productive investments, smooth operational cash flows, and expand market opportunities (Beck et al., 2020; Allen et al., 2021).

Firm-level characteristics also influence performance in predictable ways. Firm size (SIZE) exerts a positive effect on both profitability and sales growth, indicating that larger firms benefit from economies of scale and greater capacity to leverage financial resources. Conversely, leverage (LEVR) demonstrates a negative impact, suggesting that excessive debt constrains firm flexibility and may exacerbate financial vulnerability, particularly in environments with underdeveloped financial markets (Adeola & Evans, 2020). Country-level controls including investment (INV), human capital accumulation (HCA), and GDP growth (GRT) also show significant positive relationships with firm outcomes, reinforcing the view that broader macroeconomic and institutional contexts amplify the benefits of financial inclusion (Sarma & Pais, 2011; Demirgüç-Kunt et al., 2020). The Arellano-Bond tests for AR(1) and AR(2) shows no autocorrelation, while Hansen J statistics validate the chosen instruments, lending confidence to the dynamic GMM estimates.

Robustness checks using different measures of FII and other performance measures, such as ROA and ROE, as presented in Table 3, also show a consistent significant positive association between FII and firm performance (Alt FII 1 and Alt FII 2 exclude ATM density and loan penetration respectively, confirming that the positive effect of financial inclusion is not driven by a single dimension of financial access but rather a broader multidimensional phenomenon covering access, usage, and penetration of financial services; ROA and ROE as alternative dependent variables corroborate the main results and are consistent with the empirical literature that inclusive financial systems support firm efficiency, profitability, and growth (Efobi et al., 2016; Makina and Walle, 2019)). The economic significance of the results highlights how financial infrastructure can contribute to firm-level resilience and growth (firms in countries with higher FII are more able to absorb shocks and reinvest profits to expand operations), and how financial inclusion can serve as a catalyst for firm competitiveness by reducing credit constraints and increasing investment capacity (Demirgüç-Kunt et al., 2018; Frost, 2020). The results also show that the inclusion effect is stronger when combined with higher human capital and macroeconomic growth, suggesting that financial access, human resource development, and favorable economic conditions can reinforce each other in boosting firm performance (Adegbite and Adekunle, 2020).

The evidence shows that efforts to increase access to financial services can provide significant gains at the firm level, and regulatory and infrastructural changes that allow more people to take part in the financial system can be translated into higher profitability and growth for firms, which can lead to broader economic development in SSA (Sarma and Pais 2011, Allen et al. 2021). The findings also suggest that a combination of

strategies that target both the supply and demand sides of financial inclusion, such as financial literacy and capacity building for firms, can maximize the benefits of inclusive financial systems.

Lastly, the combination of dynamic panel estimation and robustness checks to multiple FII measures and performance metrics supports the conclusions, as the positive and significant effects across the different specifications show that financial inclusion is a key driver of firm-level success in Sub-Saharan Africa and has implications for policymakers, financial institutions, and business practitioners. These findings are in line with the growing empirical evidence that highlights the importance of financial inclusion as not just a social goal but as a driver of firm productivity, efficiency, and sustainable growth (Efobi et al. 2016, Makina and Walle 2019, Beck et al. 2020).

Table 2: Impact of Financial Inclusion on Firm Profitability and Sales Growth (GMM Estimates)

Variable	PROFIT (1)	PROFIT (2)	GROWTH (1)	GROWTH (2)
FII	0.215*** (0.045)	0.198*** (0.042)	0.187*** (0.038)	0.174*** (0.036)
SIZE	0.102** (0.048)	0.089* (0.045)	0.074* (0.036)	0.066* (0.034)
LEVR	-0.123** (0.056)	-0.117** (0.054)	-0.092* (0.048)	-0.085* (0.045)
INV	0.165*** (0.052)	0.158*** (0.050)	0.138*** (0.044)	0.129*** (0.041)
HCA	0.198*** (0.061)	0.182*** (0.058)	0.173*** (0.049)	0.160*** (0.046)
GRT	0.087* (0.046)	0.081* (0.044)	0.075* (0.039)	0.069* (0.037)
Constant	1.042*** (0.254)	1.015*** (0.248)	0.894*** (0.212)	0.862*** (0.208)
Observations	315,000	315,000	315,000	315,000
Number of Firms	35,000	35,000	35,000	35,000
AR(1) p-value	0.012	0.015	0.018	0.021
AR(2) p-value	0.512	0.528	0.493	0.507
Hansen J p-value	0.421	0.438	0.457	0.472

Notes: Standard errors are reported in parentheses. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively. PROFIT (1) and GROWTH (1) include only firm-level controls; PROFIT (2) and GROWTH (2) additionally include country-level variables and industry-time fixed effects. AR(1) and AR(2) are Arellano-Bond tests for first and second-order autocorrelation in the residuals. Hansen J tests the validity of instruments.
Source: Author (2025)

Table 3: Robustness Checks [Alternative FII Measures and Firm Performance Indicators (GMM)]

Variable	ROA (Alt FII 1)	ROA (Alt FII 2)	ROE (Alt FII 1)	ROE (Alt FII 2)
FII	0.187*** (0.041)	0.192*** (0.043)	0.203*** (0.046)	0.197*** (0.045)
SIZE	0.086* (0.036)	0.089* (0.038)	0.095* (0.041)	0.092* (0.039)
LEVR	-0.089* (0.043)	-0.091* (0.045)	-0.102** (0.048)	-0.099** (0.046)
INV	0.142*** (0.038)	0.147*** (0.040)	0.155*** (0.042)	0.150*** (0.041)
HCA	0.165*** (0.047)	0.170*** (0.049)	0.182*** (0.051)	0.178*** (0.050)
GRT	0.072* (0.034)	0.074* (0.035)	0.081* (0.036)	0.078* (0.035)
Constant	0.892*** (0.198)	0.907*** (0.202)	0.965*** (0.214)	0.951*** (0.210)
Observations	315,000	315,000	315,000	315,000
Number of Firms	35,000	35,000	35,000	35,000
AR(1) p-value	0.019	0.017	0.016	0.018
AR(2) p-value	0.502	0.488	0.493	0.479
Hansen J p-value	0.438	0.426	0.421	0.435

Notes: ROA = Return on Assets; ROE = Return on Equity. Alt FII 1 = Index excluding ATM density; Alt FII 2 = Index excluding loan penetration. Standard errors in parentheses. ***, **, * denote significance at 1%, 5%, and 10% levels, respectively. AR(1) and AR(2) are Arellano-Bond tests for first and second-order autocorrelation in the residuals. Hansen J tests the validity of instruments.

Source: Author (2025)

4.2. Policy Implications

The implications for policy, particularly for SSA, are profound and multi-dimensional, illustrating the role of financial inclusion in facilitating firm-level growth and economic development. The evidence suggests that greater access to financial services improves profitability and sales growth, and governments and regulators should make policies that increase both the supply and the demand for financial services across the business sector. Policies that expand bank branch networks, ATM coverage, and mobile financial platforms directly ease credit constraints and liquidity bottlenecks that firms, especially SMEs, face, as SMEs are the backbone of many SSA economies (Beck et al., 2020; Allen et al., 2021). The strong positive relationship between financial inclusion and firm performance also shows that investments in digital financial infrastructure, such as mobile banking, digital payments, and fintech solutions, can overcome geographic and institutional barriers that have historically prevented access to conventional banking and reduce transaction costs, improving access to timely credit, working capital, and investment in productive assets (Frost, 2020). This means that regulatory frameworks should be supportive of fintech innovation and at the same time should provide consumer protection and maintain financial stability (Adeola and Evans, 2020).

The results also indicate that the advantages of financial inclusion are greater when paired with macroeconomic stability and human capital development, and thus governments would be well advised to coordinate financial inclusion policies with other economic policies, including education, workforce skill development, and investment-friendly regulations. The positive impact of HCA on firm outcomes (human capital accumulation) is consistent with human capital accumulation allowing firms to use financial resources more effectively, and thus to be more productive and innovative (Adegbite & Adekunle, 2020). The results also underscore the importance of targeted credit policies for firm growth, even though leverage itself was found to have a negative impact on firm performance, which may be a result of inefficient allocation of credit or high borrowing costs in SSA. Policymakers should therefore consider designing mechanisms that make risk-adjusted credit available at affordable rates, especially for SMEs, to avoid over-indebtedness and to enable productive investment, including credit guarantee schemes, subsidized interest rates, and enhanced access to microfinance, which brings financial inclusion into harmony with sustainable enterprise development (Efobi et al., 2016; Makina & Walle, 2019).

Furthermore, the multidimensional findings of the FII index show that financial inclusion is not only about the number of financial institutions but also about the usage and penetration of financial products, for which policy measures beyond opening new banks are needed, such as financial literacy programs, outreach campaigns, and incentives for formal account adoption, to improve the effective use of financial services (Demirgüç-Kunt et al., 2018). This way, policymakers can guarantee that inclusion leads to economic productivity and not just to numerical coverage. Lastly, the strong and statistically significant positive link between financial inclusion and firm-level outcomes suggests that inclusive financial systems may also contribute to overall economic growth by improving firm profitability, sales growth, and employment, which can contribute to higher domestic investment, higher formalization of informal enterprises, and higher tax revenues, leading to virtuous cycles of growth (Beck et al., 2020;

Frost, 2020; Allen et al., 2021). SSA governments should thus make financial inclusion part of long-term economic development planning, understanding that financial access is not only a social goal but also an economic tool.

5. Conclusion

The results of the study present strong evidence that financial inclusion positively contributes to firm-level profitability and sales growth across Sub-Saharan Africa, supporting the argument that financial inclusion in SSA is not just a social or financial objective but also a strong economic tool that can spur job creation and growth. The results indicate that access to and use of financial services has a positive effect on firm performance, which is statistically significant for both alternative performance measures, ROA and ROE, and persists even when controlling for firm size, leverage, investment, human capital, and GDP growth (Efobi et al., 2016; Makina & Walle, 2019; Allen et al., 2021).

These results highlight the necessity for holistic approaches that increase both access and utilization of financial services and underscore the positive complementarity between financial inclusion, human capital, and macroeconomic conditions, which implies that policymakers should integrate inclusion strategies into broader economic development programs, such as education, investment promotion, and regulatory support. Measures such as expanding banking infrastructure, developing digital financial platforms, increasing financial literacy, and offering low-cost credit to SMEs can build firm resilience and productivity (Beck et al., 2020; Frost, 2020; Adeola and Evans, 2020).

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