Applied Journal of Economics, Management, and Social Sciences, 2024, 28-38

Doi: 10.53790/ajmss.v5i2.99
ISSN: 2811-1613
Submitted: February, 2024; Revised: March, 2024; Accepted: April, 2024

ARTICLE

Financial development, private investment and inclusive growth in Sub-Saharan African countries: A second generation PARDL approach

Sheriffdeen Tella[1,2†]; Enemona Joseph[2†*]; Rowland Obiakor [2†]; Aliyu A. Rufai[3†]

[1] Department of Economics, Olabisi Onabanjo University, Ogun State.
[2] Economics Department, Babcock University, Ilishan Remo, Nigeria.
[3] Centre for Econometrics & Applied Research, Ibadan, Nigeria.
[†] Authors contributed equally
* Corresponding Author: joseph0116@pg.babcock.edu.ng
Disclaimer: The contents of this paper are authors' sole responsibility. They do not represent the view of the institution

Abstract
The pursuit of inclusive growth necessitates a comprehensive strategy that addresses entrenched structural barriers curbing economic participation and overall well-being. At the heart of this endeavour lies the significance of a stable financial system. Such a system, by fostering financial inclusion, bolstering entrepreneurship, enabling long-term investments, and enhancing economic stability, holds the potential to bridge the disparities impeding inclusive growth. This study delves into the intricate interplay between financial development, investment, and the realization of inclusive growth. Utilizing data spanning 27 African countries from 2005 to 2021, this research employs the Augmented Group Mean (AGM). The findings illuminate the multifaceted impacts of financial development on gross domestic product per person employed, an indicator of inclusive growth. Importantly, the study underscores the pivotal role a stable financial system plays in fostering overall inclusive growth and creating a conducive environment for equitable economic participation and prosperity for all segments of society.
Keywords: Financial development; Private investment; SSA; Inclusive growth
JEL: C58, F43, R42, F63

Cite as: Tella, S., Joseph, E., Obiakor, R., Rufai, A. A. (2024). Financial development, private investment and inclusive growth in Sub-Saharan African countries: A second generation PARDL approach. *Applied Journal of Economics, Management, and Social Sciences, 5(2), 28-38*

1. Introduction

The ongoing discourse surrounding the intricate relationship between financial development and economic growth has persisted since the nineteenth century. At the heart of this debate lies the pivotal question of whether the expansion of the financial sector fuels growth within the real sector during the dynamic process of economic development or if it is the growth of the real sector that acts as the catalyst for the development of the financial sector. **Bencivenga and Smith (1990)**, **Rauber and Ritschel (2024)** and **Schumpeter and Swedberg (2021)** have made significant contributions by offering key insights into the construction of a theory of economic development, centring on critical factors. These factors encompass the degree of financial repression, the prevalence of banks as primary financial intermediaries in developing nations, the time lags between investment expenditures and profit receipts, and the challenge of self-financing a substantial portion of investment due to insufficient financial intermediation. Their findings underscore that in the absence of a functioning intermediary sector, the composition of savings could unfavourably impact capital accumulation. This emphasizes the essential role of banks in fostering growth, often revolving around enhancing liquidity and optimizing the composition of savings. **Morina et al. (2024)** underscores that financial sector development alone cannot drive growth if the intermediation process is hindered.

Supporting the idea that financial development could benefit marginalized populations, various theoretical models suggest that well-developed financial markets may contribute to reduced income inequality (**Banerjee & Newman, 1993**; **Chisadza & Biyase, 2023**; **Manta et al., 2023**). **Greenwood and Jovanovic (1990)** delve into how financial and economic development could lead to an inverted U-shaped correlation between income inequality and financial sector growth. Their model posits that as financial sectors expand, income inequality initially increases before decreasing as more individuals gain access to the financial system. This dimension of financial development's impact on income distribution holds immense significance for policymakers. Notably, policymakers strive to comprehend the dual impact of policies on both inequality and growth. Despite the inconclusive evidence concerning the connection between financial sector development and economic growth (**Hussain et al.,2024**; **Levine, 1997**; **Salifu et al., 2024**), exploring the interplay between financial sector development and inclusive growth has received relatively less attention. Understanding this intricate relationship empowers policymakers to assess the potential of financial development in ameliorating inequality and identifying situations where it could be instrumental.

Building on the insights of **Greenwood and Jovanovic (1990) and Allen and Giovannetti (2011)**, the challenges in many Sub-Saharan African countries stem from the underdeveloped nature of their financial markets. These economies contribute limited changes to growth due to their predominantly underdeveloped financial markets. Additionally, their income levels remain low, with substantial unemployment and meager earnings for those employed, inadequate to support savings. Consequently, insufficient savings hamper available loanable funds for investment, ultimately affecting capital accumulation. High levels of income inequality further impede economic growth in these economies. Asymmetric information prevails, hindering the functioning of financial intermediaries and potentially stunting growth. These circumstances provide the backdrop against which this study aims to explore the relationship between financial sector development and inclusive growth in Sub-Saharan African countries, considering the role of private investment in this dynamic.

Significantly, numerous studies investigating the link between financial development and economic growth across diverse countries, including advanced, emerging, developing, and African nations, have largely overlooked the role of private investment in driving financial sector development for economic growth (**Ajisafe & Okunade, 2020**; **Alexiou et al., 2017**; **Ayinde & Yinusa, 2016**; **Iheonu et al., 2020**; **Muyambiri, 2020**; **Nyamongo, 2011**; **Odhiambo, 2010**; **Pradhan et al., 2018**).

Empirical analyses on how inclusive growth responds to financial sector development and/or inclusion predominantly focus on the dynamic relationship between variables, employing fundamental measures of economic growth without accounting for equity and poverty metrics within the framework of inclusive growth (**Afolabi, 2020**; **Amponsah et al., 2021**; **Ayinde & Yinusa, 2016**; **Ntow-Gyamfi et al., 2020**; **Joseph & Obikaonu, 2021**; **Raihan et al., 2023**). Specifically, this study adopts GDP per capita per person employed as the proxy for inclusive growth. The remainder of the study is as follows. Section 2 delves into an extensive literature review, encompassing both theoretical underpinnings and empirical evidence. Section 3 elaborates on the data and methodology employed in the research. Section 4 is dedicated to presenting and analysing the results, while Section 5 concludes the study, emphasizing its policy implications.

2 Literature Review

2.1 Theoretical Issues

Since **Schumpeter (1911)** advanced the idea that the financial sector development is crucial for economic growth, there has been a debate about the nexus between finance and growth. According to Schumpeter, the expansion of the financial industry is necessary for economic expansion, as it uses technical advancements to support economic progress. According to his theory, financial development influences economic growth by giving businesses the most productive use of funds. Afterwards, this viewpoint was backed by **Goldsmith (1959), Mckinnon (2010), and Shaw (1973). Gurley and Shaw (1955)** earlier emphasized the significance of finance for growth in response to the Neoclassical theorists' contention that economists overstate the role of the financial sector. Similarly, **Patrick (1966)** put up two significant theories regarding the relationship between finance and growth – the supply-leading and the demand-following hypotheses. According to Patrick, the financial system drives economic growth in the early stages of the nation's economic development. On the other hand, as the nation gets closer to being a developed one, the growth creates demand for the financial sector to be developed. **Levine (1997)** further strengthened the theoretical argument on the relationship between finance and growth by proposing that finance serves as the primary lubricant for economic expansion.

2.2 Empirical Issues

On the empirical side, the literature on finance-growth links could be split into three – cross-sectional, panel, and time series studies. Most of the studies using cross-

sectional and panel data accounted for the positive and significant association between financial development and economic growth. **Agbelenko and Kibet (2015, Batuo et al. (2018), Ehigiamusoe et al. (2020) Ntow-Gyamfi et al. (2020) re-echoed Goldsmith (1959)** submission – who for the first time utilised annual data set of 35 nations – demonstration of a positive association between financial development and GDP per capita as well as **De Gregorio and Guidotti (1995)** that discovered that financial development, proxied by bank loans to the private sector to GDP, is positively connected to growth. Additionally, King and Levine (1993) found that financial development is strongly associated with real per capita GDP growth, with the rate of physical capital accumulation, and with the improvements in efficiency with which economies employ physical capital. A similar result is also reflected by **Agbloyor et al. (2014), Aluko et al. (2020), Misati and Nyamongo (2011) and Rajan and Zingales (1996)** who concluded that financial markets provide key services for growth. Similarly, **Aluko and Ibrahim (2020), Iheonu et al. (2020), and Khan and Senhadji (2006)** offered empirical evidence on the association between financial development and economic growth.

Furthermore, there is overwhelming evidence in the finance literature that points to financial development (FD) exerting a positive influence on growth. This evidence is solid across time periods, estimation techniques, empirical settings and the nature of data (see **Abeka et al., 2021; Amponsah et al., 2021; Anetor,2020; Beck & Levine, 2004; Beck et al., 2005; Levine, 2003; Law & Singh, 2014**). Admittedly, many of the studies have confirmed the 'more finance-more growth' argument. However, some interesting emerging trends have evolved, such as **Law and Singh (2014)**, investigated the extent to which we could stretch the more finance-more growth' argument and found that there exists a certain threshold effect in the finance-growth nexus. They documented that financial development is beneficial to growth only up to a certain threshold. Further increase in FD beyond that threshold tends to adversely affect growth. Thus, 'more finance-more growth; too much finance, less growth.

The finance-growth relationship has also been found to be affected by the nature of economies around the world. **Rioja and Valev (2004)** document that the relationship between finance and growth is positive and significant but only for middle-income countries. They found the relationship to be weakly significant in high-income countries while no relationship at all is found between the variables in low-income countries. **Huang and Lin (2009), Mitra and Das (2018), and Rousseau and Wachtel (2011)** contradict this finding and record that the positive effect of financial development on economic growth is even more significant in low-income and middle-income countries than in high-income countries. The relationship between FD and growth as discussed in the literature continues also in a bidirectional manner. **Adu et al. (2013), Becket al. (2005)** and **Prah and Quartey (2008)** are some of such studies that investigate bivariate causal linkage between financial development and economic growth. Tangential to the relationship between finance and growth is the argument of an appropriate single measure for FD. While **Prah and Quartey (2008)** use broad money-to-GDP ratio, domestic credit-to-GDP ratio, private credit-to-GDP and private credit-to-domestic credit ratio as alternative measures to ensure robustness of results, **Amoo et al. (2017), Esso (2010) and Olowofeso et al. (2015)** solely rely on the ratio of credit to private sector to GDP. This study does not plunge into this debate since the contribution we seek to make to the literature is different.

3.0 Methodology

The examination of the relationship between financial development, private investment and GDP per capita income in selected SSA countries is carried out in four phases. First, the data set is examined for cross-sectional dependence existence, as it is a common issue in cross-country analysis. Also, the stationarity tests are employed since there may be unit root problems when a large time dimension exists. Aftermath, the panel cointegration test was used to control the long-run relationship between variables. Finally, Panel Autoregressive Distributed Lag Approach (PARDL) with second-generation estimator (i.e., AMG) is applied.

In order to estimate the short-run and the long-run relationship of variables, PARDL developed by **Pesaran and Smith (1995) and Pesaran et al. (1997)** is utilized in this study. Before proceeding to the panel ARDL method, panel unit root and cointegration tests are implemented. Panel ARDL approach requires a large time dimension, moreover, the unit root is a common problem in large time dimension panels. Therefore, when the panel has a larger T dimension, there might be a stationarity problem, and hence, the unit root test should be utilized to control stationarity (**Salisu et al. 2024**). To implement the unit root, cointegration, and panel ARDL tests, initially, a balanced panel data set was constructed for the 27 selected countries from 2005 to 2021, i.e., 17 years' time periods.

To investigate the possible existence of cross-sectional dependence, we employed the CD test as initiated by **Pesaran (2004)**, the biased-adjusted LM test by **Pesaran et al. (2008)**, and the $\%_{c}$ cum $\%_{adj}$ by **Pesaran and Yamagata (2008)** for slope heterogeneity. It should be established that the CD test is robust to the non-normality of errors and structural breaks as it focuses more on the cross-sectional unit of the panel than the times' dimension. At the same time, the bias-adjusted LM was used as a supplement to the

CD test's result. The CD –equation (1) – and bias-adjusted CD tests – equation (2) – are presented thus:

$$CD = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}\right): \quad N(0,1) i, j = 1,2,3,.....,N \tag{1}$$

$$LM^{*} = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}\right)\frac{(T-k)\hat{\rho}_{ij}^{2} - E(T-k)\hat{\rho}_{ij}^{2}}{Var(T-k)\hat{\rho}_{ij}^{2}} \tag{2}$$

Where $\hat{\rho}_{ij}^{2}$ is a sample estimate of the pairwise correlation between the OLS residuals. The result of the cross-sectional dependence (see Table 2) gives room to using methods that are robust to cross-sectional dependence. Furthermore, the slope heterogeneity was tested using the **Pesaran and Yamagata (2008)** test, which uses the below test statistics:

$$\tilde{S} = \sum_{i=1}^{N}\left(\hat{\beta}_i - \tilde{\beta}_{WFE}\right)' \frac{\bar{X}'\bar{X}}{\tilde{\sigma}_i^{2}}\left(\hat{\beta}_i - \tilde{\beta}_{WFE}\right) \tag{3}$$

$$\hat{\Delta} = \sqrt{N}(2k)^{\frac{-1}{2}}(N^{-1}\hat{S} - k) \tag{4}$$

$$\tilde{\Delta} = \sqrt{N}(2k)^{\frac{-1}{2}}(N^{-1}\tilde{S} - k) \tag{5}$$

$\tilde{S}$, $\hat{\Delta}$ and $\tilde{\Delta}$ are the test statistics, $\bar{X}$ is the independent variable vectors in deviation from the mean, $\tilde{\beta}_{WFE}$ captures the weighted fixed effects estimators (the weights are constructed using $\tilde{\sigma}_i^{2}$), and k denoted the number of regressors. The mean and variance bias-adjusted versions of $\hat{\Delta}$ and $\tilde{\Delta}$ are denoted below:

$$\hat{\Delta}_{adj} = \sqrt{N}\left(\frac{2k(T-k-1)^{2}(T-s)}{(T-k-3)^{2}(T-k-5)}\right)^{\frac{-1}{2}}\left(N^{-1}\hat{S} - \frac{k(T-k-1}{T-k-3}\right) \tag{6}$$

$$\tilde{\Delta}_{adj} = \sqrt{N}\left(\frac{2k(T-k-1)}{T+1}\right)^{\frac{-1}{2}}(N^{-1}\tilde{S} - 2k) \tag{7}$$

Since the results suggest the existence of cross-sectional dependence and slope heterogeneity (see Tables 2 & 4), we employed the Augmented Mean Group (AMG) estimator proposed by **Eberhardt and Bond (2009)**, as the estimator provides the unobserved common factors integral to the cointegrating relations, which is unit-specific, making the regression model cover the cointegration that is allowed to be different across units. For estimating **Eberhardt and Bond (2009)**, the following models are employed:

$$y_{it} = \beta_i' x_{it} + u_{it} \quad u_{it} = a_i \_ \lambda_i' f_t + \varepsilon_{it} \tag{8}$$

$$x_{mit} = \pi_{mi} + \delta_{mi}' g_{mt} + \rho_{1mi} f_{1mt} + ... + \rho_{nmi} f_{nmt} + \upsilon_{mit} \tag{9}$$

Where m=1,….k and $f_{.mt} \subset f_t$

$$f_t = \vartheta' f_{t-1} + \in_t \ and \ g_t = \omega' g_{t-1} + \in_t$$

x_{it} is the vector of covariates f_t and g_t are the unobserved common factors while λ_i representing unit-specific factor loadings. **Eberhardt and Bond (2009)** developed the AMG estimator providing that the unobserved common factors are integral to the cointegrating relations, which is unit-specific, making the regression model cover the cointegration that is allowed to be different across units:

AMG-Stage I

$$\Delta y_{it} = b'\Delta x_{it} + \sum_{t=2}^{T} c_t D_t + e_{it} \quad (10)$$

$$\Rightarrow c_t \equiv \mu_t^{\rho}$$

AMG-Stage II

$$y_{it} = a_i + b_i' x_{it} + c_i t + d_i \mu_t^{\rho} + e_{it} \quad (11)$$

$$\hat{b}_{AMG} = N^{-1} \sum_{i=1}^{N} \hat{b}_i$$

The AMG-stage I suggests a pooled first difference estimator regression with T-1 year dummies in the first difference. At the same time, the variable is contained in every N standard unit regression at the AMG-Stage II, resulting in an asymptotically unbiased and efficient coefficient estimated for each country in the panel.

Meanwhile, before proceeding, we examined the existence of cointegration among the empirical model' variables via the **Westerlund and Edgerton (2007)** bootstrap panel cointegration test, thus:

$$y_{it} = \alpha_i + x_{it}'\beta_i + z_{it} \quad (12)$$

Where t = 1,2,3…..T and I =1,2…….N represent the times series and cross-sectional units, respectively. x_{it}' is the regressors' vector and z_{it} is the disturbance term, which is described as:

$$z_{it} = u_{it} + v_{it} \quad (13)$$

4 Empirical Estimations

4.1 Summary Statistics

Table 1 present the summary statistics of the time series properties of the financial development and inclusive growth variables in the model between 2005 to 2022. Specifically, a mean value of 17356.3USD across the 27 countries sampled with a standard deviation of 20623.82, suggesting that on average, during the entire 17 years of the study, the gross domestic product per person employed across these countries was 17356.3USD. In contrast, it was 11.70 and 15.2 for atm, 68.8 and 22,52 for bcbd, 21.04 and 19.25 for DCPS, 32.01 and 21.83 for LLG, respectively. The probability Jarqua Bera statistics for nearly all the variables suggests evidence of the non-normally distributed of the series.

Table 1. Descriptive Statistics

	lgi	atm	bcbd	bcir	dcps	llg	pinv	zscore
Mean	17356.30	11.70	68.88	59.71	21.04	32.01	24.55	**15.58**
Std. Dev.	20623.82	15.20	22.52	13.95	19.25	21.83	9.29	**5.76**
Maximum	130963.9	68.96	154.8	202.04	106.26	163.84	81.02	**37.35**
Minimum	1711.042	0.00	17.51	24.75	2.01	6.03	3.46	**3.29**
Skewness	2.720329	1.86	0.35	3.94	2.27	2.51	1.53	**0.46**
Kurtosis	11.98558	5.66	3.68	39.10	7.99	10.42	8.64	**3.46**
Jarq-Bera	2110.278	402.9	18.68	261.1	874.8	1537.9	787.9	**20.72**
P-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Obs.	459	459	459	459	459	459	459	459

Source: Authors' work

4.2 Preliminary Tests

Table 2 includes the CD and bias-adjusted LM tests, where the null hypothesis of no cross-sectional dependence is rejected at 10%, 5%, and 1% significance levels. The result of the cross-sectional dependence thereby gives room to using methods that are robust to cross-sectional dependence

Table 2: Cross-sectional Dependence

	Value
CD test	21.65***
Bias Adjusted LM test	439.3***

*, **, *** indicate that statistics are significant at the 10%, 5%, and 1% level of significance, respectively.

The null hypothesis is no cross-sectional dependence
Source: Authors' work

Moving ahead, we investigated the stationarity of the time series in the panel set; since cross-sectional

dependency has been established, the CIPS panel unit root test accommodates cross-sectional dependence and **Im et al. (2003)** IPS first generation unit root test. The unit root result is presented in Table 3.

Table 3: Panel Unit Root Tests

	IPS	CIPS
	Null: Unit Root with Individual process	***Null Hypothesis: homogenous non-stationary***
$lg\,dpppe$	-6*448***[b]	-3.124***[b]
atm	-1.436*[a]	-2.325**[a]
$bcir$	-3.010***[a]	-2.148*[a]
$l\,lg$	-2.577***[a]	-3.627***[b]
$dcps$	-2.426***[a]	-2.695***[a]
$bcbd$	-8.510***[b]	-3.772***[b]
$pinv$	-8.226***[b]	-3.460***[b]

Note: [a] and [b] denote stationarity at level and first difference, respectively, while ***, **, and * indicate statistical significance at 1%, 5%, and 10%, respectively.
Source: Authors' work

Under the IPS panel unit root test, four (4) variables were stationary at level [I(0)] – atm, $bcir$, $l\,lg$ and $dcps$ –, while three (3) after first differencing [I(1)] – $lg\,dpppe$, $bcbd$ and $pinv$. Meanwhile, the CIPS test disclosed that some of the variables were stationary at I(0)– atm, $bcir$ and $dcps$ – with others I(1) – $lg\,dpppe$, $l\,lg$, $bcbd$ and $pinv$. Since the study was initially exposed to cross-sectional dependency in the panel data, we align with the CIPS.

Table 4: Slope Homogeneity Test Result

Statistics	Value
$\hat{\Delta}$	10.128***
$\hat{\Delta}_{adj}$	13.920***

Note: *, **, *** indicate that statistics are significant at the 10%, 5%, and 1% level of significance, respectively.
Source: Authors' work

The slope of homogeneity tests revealed that the slope is heterogeneous, as evident from the test statistics employed, whose Pesaran and Yamagata critical values, were statistically significant.

Table 5: Westerlund and Edgerton (2007) panel bootstrap cointegration test

LM statistics	Bootstrap *p*-value
10.241	0.145

Source: Authors' work

The **Westerlund and Edgerton (2007)** bootstrap cointegration test as shown in Table 5 supported the non-rejection of the null hypothesis of cointegration, leading to the conclusion that there is a long-run association in the empirical model, and the cointegrating parameters are estimated via the AMG.

4.3. Augmented Mean Group (AMG) Results

The empirical result of the AMG as proposed by **Eberhardt and Bond (2009)** for the examined 27 SSA countries is presented in Table 5 depicting the effects of financial development – ATM per 100,000 adults (atm), bank cost to income ratio ($bcir$), liquid liability to GDP ($l\,lg$), domestic credit to private sector ($dcps$), bank credit to bank deposit ($bcbd$) – and private investment on gross domestic product per person employed exhibiting both coefficients and standard error. A cursory view of Table 6 revealed that none of the financial development indicators and private investment in three (3) of the SSA countries – Congo Rep, Cote d'Ivoire and Uganda – examined had a significant statistical impact on GDPPPE. This contradicts the submissions of **Ehigiamusoe and Lean (2015), Esso (2010), Gyamfi et al. (2022)** and **Ofori et al. (2022)** where they found that financial development exerts a significant impact on inclusive growth. Although the methodology employed and time coverage in these studies differ from what we used here, for instance, **Esso (2010) and Gyamfi et al. (2022)** used the cointegration and Granger causality, panel corrected standard errors (PCSE) and fixed effect OLS estimation technique, respectively, with study time terminating at 2009 and 2018, respectively. Furthermore, as revealed in Table 5, as ATM increases per 100,000 adults in Botswana, Cabo Verde, Ethiopia, Ghana, Guinea, Lesotho, Mozambique, Nigeria, Sudan and Tanzania, it brings about 0.5%, 2.7%, 47.6%, 1.4%, 24.2%,0.9%,2.8%, 12.7%, 20.2% and 3.4% increase in inclusive growth, respectively, *ceteris paribus*. Meanwhile, as ATM increases per 100,000 adults in Angola, Chad and Kenya, it led to a 2.7%, 15.9% and 2.0 % decrease in inclusive growth in these countries, respectively. These submissions ascertain the mixed effect of this financial development indictor on inclusive growth in these countries, whereas, in general, as ATM increase per 100,000, it brings about 2.9% increase SSA inclusive growth.

Furthermore, it was only in Burundi, Ethiopia and Zambia that bank cost-to-income ratio $(bcir)$ impacted inclusive growth positively and significantly, as it has a significant negative influence on inclusive growth in Cameroon, Cote d'Ivoire, Madagascar, Nigeria, Rwanda and Senegal with different magnitude. Meanwhile, as liquid liability to GDP ($l\,lg$) increases by one per cent, it brings about a 0.01 %, 0.005 %, 0.130 %0.028%, 0.007%, 0.003 %, 0.012% and 0.018% decrease in inclusive growth in Angola, Botswana, Equatorial Guinea, Eswatini, The Gambia, Mauritius, South Africa and Tanzania, respectively. One major observation in this is that the majority of

these countries are Southern African countries, establishing that liquid liability to GDP effectively impacts inclusive growth in that part of the African continent. This assertion was also upheld in some previous studies on SSA countries (see **Acaravci et al., 2009; Hakeem, 2010; Xu et al., 2022; Yusheng et al., 2021**).

Table 6: The nexus among financial development, private investment and gross domestic product per capita (GDPPC), in SSA countries

Country	*atm*	*bcir*	*llg*	*dcps*	*bcbd*	*lpinv*
SSA	0.029*	0.002	-0.011	0.016**	-0.003	0.023*
	(0.001)	(0.002)	(0.007)	(0,008)	(0.003)	(0.013)
Angola	-0.027*	0.002	-0.010**	0.016**	0.004	0.005**
	(0.015)	(0.003)	(0.004)	(0,007)	(0.004)	(0.002)
Botswana	0.005**	-0.002	-0.005**	-0.008	0.002	-0.004
	(0.002)	(0.002)	(0.003)	(0.006)	(0.002)	(0.004)
Burundi	0.026	0.005***	-0.005	0.004	-0.001	-0.002
	(0.038)	(0.002)	(0.004)	(0.007)	(0.005)	(0.005)
Cabo Verde	0.027***	0.002	-0.003	-0.002	-0.002	0.006***
	(0.004)	(0.002)	(0.005)	(0.003)	(0.002)	(0.002)
Cameroon	0.012	-0.002**	-0.002	0.022*	-0.002	0.069**
	(0.014)	(0.001)	(0.005)	(0.013)	(0.001)	(0.227)
Chad	-0.159*	-0.002	0.002	0.023	0.003	0.008**
	(0.086)	(0.003)	(0.003)	(0.033)	(0.002)	(0.004)
Congo, Rep.	-0.022	0.007	0.013	0.035	-0.007	-0.002
	(0.042)	(0.021)	(0.029)	(0.045)	(0.007)	(0.002)
Cote d'Ivoire	0.009	-0.003	0.003	0.026	0.003	0.008
	(0.020)	(0.004)	(0.013)	(0.025)	(0.004)	(0.006)
Equatorial	-0.002	0.039	-0.130***	0.241***	-0.018***	0.015***
Guinea	(0.024)	(0.035)	(0.036)	(0.041)	(0.005)	(0.003)
Eswatini	0.001	0.002	0.017*	-0.002	0.005	0.007
	(0.004)	(0.007)	(0.010)	(0.0111)	(0.004)	(0.016)
Ethiopia	0.476***	0.006***	-0.125	0.147	-0.065	-0.011***
	(0.184)	(0.001)	(0.197)	(0.218)	(0.114)	(0.004)
The Gambia	0.009	0.002	-0.028***	0.040***	-0.011**	0.002
	(0.013)	(0.004)	(0.006)	(0.013)	(0.004)	(0.004)
Ghana	0.014**	-0.002	-0.008	0.007	-0.007***	-0.001
	(0.007)	(0.002)	(0.007)	(0.005)	(0.002)	(0.003)
Guinea	0.242***	-0.002	-0.003	-0.022	-0.001	-0.002
	(0.056)	(0.002)	(0.009)	(0.017)	(0.004)	(0.002)
Kenya	-0.020*	-0.003	-0.004	-0.001	-0.001	0.001
	(0.012)	(0.004)	(0.010)	(0.008)	(0.003)	(0.001)
Lesotho	0.009**	-0.002	-0.007*	-0.005	-0.002	0.007***
	(0.005)	(0.002)	(0.004)	(0.006)	(0.003)	(0.002)
Madagascar	-0.005	-0.003**	-0.002	-0.014	0.0000	0.005***
	(0.040)	(0.001)	(0.003)	(0.015)	(0.003	(0.001)
Mauritius	-0.006	-0.001	-0.003**	-0.001	-0.003*	-0.011***
	(0.008)	(0.001)	(0.001)	(0.002)	(0.002)	(0.004)
Mozambique	0.028***	-0.001	-0.001	0.001	-0.001	-0.000
	(0.005)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Nigeria	0.127*	-0.002**	-0.004	-0.003	0.001*	0.021**
	(0.014)	(0.001)	(0.005)	(0.05)	(0.014)	(0.021)
Rwanda	0.005	-0.002**	0.014	0.003	-0.000	0.012
	(0.022)	(0.002)	(0.002)	(0.021)	(0.003)	(0.008)
Senegal	0.001	-0.003**	-0.003	0.019**	-0.006**	0.011***
	(0.019)	(0.001)	(0.006)	(0.009)	(0.003)	(0.004)
South Africa	0.000	-0.006	-0.012***	0.008**	-0.004**	-0.022***
	(0.0021)	(0.004)	(0.003)	(0.003)	(0.002)	(0.005)
Sudan	0.202***	0.003	0.001	-0.002	0.014***	0.004*
	(0.074)	(0.005)	(0.007)	(0.016)	(0.004)	(0.002)
Tanzanian	0.034***	0.003***	-0.018***	0.011	-0.000	0.002*
	(0.011)	(0.001)	(0.005)	(0.008)	(0.001)	(0.001)
Uganda	-0.096	0.001	0.023	-0.023	0.013	0.011
	(0.082)	(0.003)	(0.018)	(0.018)	(0.009)	(0.010)
Zambia	0.015	0.005***	-0.004	-0.007	-0.001	-0.000
	(0.011)	(0.001)	(0.005)	(0.006)	(0.002)	(0.002)

Number of observation	459	Wald Chi square	20.79
Number of groups	27	Prob (chi square)	0.002

Note: *, **, *** indicate that statistics are significant at the 10%, 5%, and 1% level of significance, respectively.
Source: Authors' work

In addition, private investment exhibited mixed impact on inclusive growth as it established a significant positive impact on some countries – Angola, Cabo Verde, Cameroon, Chad, Equatorial Guinea, Lesotho, Madagascar, Nigeria, Senegal, Sudan, Tanzania – and significant negative impact on others (see Table 6). With the current increased in-flow of foreign capital, the SSA countries are still characterized by GDP per person employed stimulating a lot of arguments in the literature. This assertion is supported in this study as private investment depicted a significant negative impact on GDPPPE (inclusive growth) in SSA as shown in Table 6 that a one per cent increase in private investment in SSA countries led to a 0.023 per cent decrease in the region, *ceteris paribus*. It should be of note that private investment negative signs are contrary to a-prior expectations indicating the dearth or absence of private investments in the SSA countries. This result further highlights the importance of private investment, private in explaining inclusive growth (GDPPPE) during the sampled period. The submission of negative impact is in line with the argument of **Alfaro (2003), George et al. (2012)** and **Makuyana and Odhiambo (2017),** as it contradicts that of **Assefa and Mollick (2017), Ayinde and Yinusa (2016), Ibrahim and Alagidede (2018), Oyinlola and Adedeji (2019),** and **Zulkhibri (2018).**

Finally, it could be established from Table 6 that financial development and private investment have a statistically significant impact on inclusive growth in SSA countries as depicted through the probability value of the Wald Test. Hence, we conclude that financial development and private investment have a significant impact on inclusive growth in SSA countries.

5. Conclusion and Policy Implication

This study demonstrates the nexus between financial development, private investment, and inclusive growth in SSA countries using a second-generation heterogeneous Augmented mean group (AMG) panel modelling framework for accounting for long-run dynamics. For emphasis, we employ the ATM per 100,000 adults, bank cost-to-income ratio, liquid liability to GDP, domestic credit to private sector, bank credit to bank deposit and private investment as the main predictors for gross domestic product per person employed (GDPPPE) – proxy for inclusive growth. The study conveys that, the gross domestic product person employed responds more significantly in some of these SSA countries than others, to the dynamics influence of private investment, positively in about 11 SSA countries and negatively to only three SSA countries significantly. However, financial development variables of LLG and BCBD show a negative and non-significant association with GDPPPE in the SSA region, while ATM and DCPS exhibited a positive and significant nexus with GDPPE in SSA using the full sample data.

We equally documented the dynamics of financial development on inclusive growth (GDPPPE) in different SSA countries. First, partially with ATM, was established to have significant negative impact on inclusive growth in Angola, Chad and Kenya, as it exhibited a significant positive effect in Botswana, Cabo Verde, Ethiopia, Ghana, Guinea, Lesotho, Mozambique, Nigeria, Sudan and Tanzania. However, liquidity to GDP despite having a negative and non-significant impact on the entire SSA region, is evident that LLG continued to exude its significant negative nexus on inclusive growth in Angola, Botswana, Equatorial Guinea, The Gambia, Mauritius, and South Africa. Relatedly, bank credit to bank deposit exhibits a negative and significant nexus with the gross domestic product per person employed in Equatorial Guinea, Ghana, Mauritius, Senegal and South Africa, despite the non-significant negative nexus in the full sample. Regards to bank cost-to-income ratio, conveys a positive but non-significant nexus towards inclusive growth in the full sample (SSA), however, in the individual countries, the case was divergent, as it was a significant positive nexus in Burundi, Ethiopia, Tanzania and Zambia, while there is evident of significant negative association in Cabo Verde, Cameroon, Madagascar, Nigeria and Rwanda.

It is clear as shown that, financial development and private investment are a relevant predictor of inclusive growth dynamics in SSA-selected countries with a moderate predictive power on gross domestic product per person employed. From the policy perspective, the study offers reasonable insight into understanding monetary and financial development policy measures that guarantee to foster the accessibility of financial services to mitigate inequality among marginalized segments, encompassing low-income individuals and small enterprises. It equally avails the understanding of financial development, private investment and inclusive growth as policymakers and practitioners may equally use the study to evolve new investment

and financial policy measures that enhance inclusive growth in the SSA economies.

References

Abeka, M. J., Andoh, E., Gatsi, J. G., & Kawor, S. (2021). Financial development and economic growth nexus in SSA economies: The moderating role of telecommunication development. *Cogent Economics & Finance*, *9*(1), 1862395.

Acaravci, S. K., Ozturk, I., & Acaravci, A. (2009). Financial development and economic growth: Literature survey and empirical evidence from Sub-Saharan African countries. *South African Journal of Economic and Management Sciences*, *12*(1), 11-27.

Adu, G., Marbuah, G., & Mensah, J. T. (2013). Financial development and economic growth in Ghana: Does the measure of financial development matter? Review of Development Finance, 3(4), 192-203

Afolabi, J. O. (2020). Impact of financial inclusion on inclusive growth: An empirical study of Nigeria. *Asian Journal of Economics and Empirical Research*, *7*(1), 8-14

Agbélénko, F. A., & Kibet, K. S. (2015). Financial development and economic growth in West African Economic and Monetary Union (WAEMU). *African Journal of Business Management*, *9*(17), 624-632.

Agbloyor, E. K., Abor, J. Y., Adjasi, C. K. D., & Yawson, A. (2014). Private capital flows and economic growth in Africa: The role of domestic financial markets. *Journal of International Financial Markets, Institutions and Money*, *30*, 137-152.

Ajisafe, R. A., & Okunade, S. O. (2020). Finance-led-growth hypothesis and domesti investment in Nigeria. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)*, *11*(2), 40-52

Alexiou, C., Vogiazas, S., & Nellis, J. G. (2018). Reassessing the relationship between the financial sector and economic growth: Dynamic panel evidence. *International Journal of Finance & Economics*, *23*(2), 155-173.

Alfaro, L. (2003). Foreign direct investment and growth: Does the sector matter. *Harvard Business School*, *2003*, 1-31.

Allen, F., & Giovannetti, G. (2011). The effects of the financial crisis on Sub-Saharan Africa. *Review of Development Finance*, *1*(1), 1-27.

Aluko, O. A., Adeyeye, O. P., & Oladele, P. O. (2020). Finance-growth nexus in sub-Saharan Africa revisited: Evidence based on a new composite index. *Economic Change and Restructuring*, *53*(2), 333-355.

Amoo, G., Eboreime, M. I., Adamu, Y., & Belonwu, M. C. (2017). The impact of private sector credit on economic growth in Nigeria. *CBN Journal of Applied Statistics (JAS)*, *8*(2), 1.

Amponsah, M., Agbola, F. W., & Mahmood, A. (2021). The impact of informality on inclusive growth in Sub-Saharan Africa: Does financial inclusion matter?. *Journal of Policy Modeling*, *43*(6), 1259-1286.

Anetor, F. O. (2020). Financial development threshold, private capital inflows and economic growth: Evidence from sub-Saharan African countries. *International Journal of Development Issues, 19*(1), 77-92.

Assefa, T. A., & Mollick, A. V. (2017). Financial development and economic growth in Africa. *Journal of African Business*, *18*(3), 320-339.

Ayinde, T. O., & Yinusa, O. G. (2016). Financial development and inclusive growth in Nigeria: A threshold analysis. *Acta Universitatis Danubius. Œconomica*, *12*(5), 166-189.

Banerjee, A. V., & Newman, A. F. (1993). Occupational choice and the process of development. *Journal of Political Economy,* 101, 274-298.

Batuo, M., Mlambo, K., & Asongu, S. (2018). Linkages between financial development, financial instability, financial liberalisation and economic growth in Africa. *Research in International Business and Finance*, *45*, 168-179.

Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. Journal of Banking and Finance, 28(3), 423-442.

Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2005). Financial and legal constraints to firm growth: Does size matter? Journal of Finance, 60(1), 137-177

Bencivenga V. R. & Smith B. D. (1990). Financial intermediation and endogenous growth. *The Review of Economic Studies, 58*(2),195-209.

Chisadza, C., & Biyase, M. (2023). Financial development and income inequality: Evidence from advanced, emerging and developing economies. *Annals of Financial Economics*, *18*(01), 2241002.

De Gregorio, J., & Guidotti, P. E. (1995). Financial development and economic growth. *World development*, *23*(3), 433-448.

Eberhardt, M., & Bond, S. (2009). *Cross-section dependence in nonstationary panel models: a novel estimator* (No. 17692). University Library of Munich, Germany.

Ehigiamusoe, K. U., & Lean, H. H. (2015). Does Financial Development Promote Economic Growth in West Africa? Evidence from Cote D" Ivoire and Nigeria. *Proceedings of Universiti Sains Malaysia*, 133.

Ehigiamusoe, K. U., & Samsurijan, M. S. (2020). What matters for finance-growth nexus? A critical survey of macroeconomic stability, institutions, financial and economic development. *International Journal of Finance & Economics*, 1-19. https://doi.org/10.1002/ijfe.2066

Esso, L. J. (2010). Cointegrating and causal relationship between financial development and economic growth in ECOWAS countries. Journal of Economics and International Finance, 2(4), 036-048.

George, G., McGahan, A. M., & Prabhu, J. (2012). Innovation for inclusive growth: Towards a theoretical framework and a research agenda. *Journal of management studies*, *49*(4), 661-683.

Goldsmith, R. W. (1959). Financial structure and development as a subject for international comparative study. In *The comparative study of economic growth and structure* (pp. 114-123). NBER.

Greenwood, J., & Jovanovic B. (1990) Financial development, growth, and the distribution of income. *The Journal of Political Economy,* 98(5),1076-1107.

Gurley, J. G., & Shaw, E. S. (1955). Financial aspects of economic development. *The American economic review*, *45*(4), 515-538.

Gyamfi, N. M., Bokpin, G. A., Aboagye, A. Q., & Ackah, C. G. (2022). Financial development, institutional quality and inclusive growth in Africa. *Global Business Review*, *23*(3), 584-607.

Hakeem I, M. (2010). Banking development, human capital and economic growth in Sub-Saharan Africa (SSA). *Journal of Economic Studies*, *37*(5), 557-577.

Huang, H. C., & Lin, S. C. (2009). Non-linear finance–growth nexus: A threshold with instrumental variable approach. Economics of Transition, 17(3), 439-466

Hussain, S., Rehman, A. U., Ullah, S., Waheed, A., & Hassan, S. (2024). Financial inclusion and economic growth: Comparative panel evidence from developed and developing Asian countries. *SAGE Open*, *14*(1), 21582440241232585.

Ibrahim, M., & Alagidede, P. (2018). Effect of financial development on economic growth in sub-Saharan Africa. *Journal of Policy Modeling*, *40*(6), 1104-1125.

Iheonu, C., Asongu, S., Odo, K., & Ojiem, P. (2020). Financial sector development and investment in selected ECOWAS countries: Empirical evidence using heterogeneous panel data method. *Financial Innovations, Forthcoming*. https://doi.org/10.1186/s40854-020-00195-0

Joseph, T. E., Obikaonu, C. P. (2021). Economic growth and quality adjusted humancapital equation: moderating role of social capabilities in Africa. *Applied Journal of Economics, Management, and Social Sciences,* 2(2), 1-9

Khan, M. S., Senhadji, A. S., & Smith, B. D. (2006). Inflation and financial depth. *Macroeconomic Dynamics*, *10*(2), 165-182.

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The quarterly journal of economics*, *108*(3), 717-737.

Law, S. H., & Singh, N. (2014). Does too much finance harm economic growth? Journal of Banking and Finance, 41, 36-44.

Levin. (2003) More on finance and growth: More finance, more growth? Review Federal Reserve Bank of Saint Louis, 85(4), 31–46.

Levine, R. (1997). Financial development and economic growth: Views and Agenda. *Journal of economic literature*, *35*(2), 688-726.

Makuyana, G., & Odhiambo, N. M. (2017). Public and private investment and economic growth in Zimbabwe: An empirical test. *Business and Economic Horizons*, *13*(1), 60 76.

Manta, A. G., Badareu, G., Florea, I. A., Staicu, A. L., & Lepădat, C. V. M. (2023). How much financial development accentuates income inequality in Central and Eastern European Countries?. *Sustainability*, *15*(18), 13942.

McKinnon, R. I. (2010). *Money and capital in economic development*. Brookings Institution Press.

Misati, R. N., & Nyamongo, E. M. (2011). Financial development and private investment in Sub-Saharan Africa. *Journal of Economics and Business*, *63*(2), 139-151.

Mitra, A., & Das, D. (2018). Inclusive growth: Economics as if people mattered. Global Business Review, 19(3), 756-770.

Morina, F., Kilaj, D., & Alija, S. (2024). Nexus between Macroeconomic factors and financial development: Empirical evidence from transition countries. *Economic Studies journal*, (2), 3-26.

Ntow-Gyamfi, M., Bokpin, G. A., Aboagye, A. Q., & Ackah, C. G. (2020). Environmental sustainability and financial development in Africa; does institutional quality play any role?. *Development Studies Research*, *7*(1), 93-118.

Odhiambo, N. M. (2010). Finance-investment-growth nexus in South Africa: an ARDL-bounds testing procedure. *Economic Change and Restructuring*, *43*(3), 205-219.

Ofori, I. K., Osei, D. B., & Alagidede, I. P. (2022). Inclusive growth in Sub-Saharan Africa: Exploring the interaction between ICT diffusion, and financial development. *Telecommunications Policy*, *46*(7), 102315.

Olowofeso, E. O., Adeleke, A. O., & Udoji, A. O. (2015). Impact of private sector credit on economic growth in Nigeria. *CBN Journal of Applied Statistics*, *6*(2), 81-101.

Oyinlola, M. A., Adedeji, A. A., & Onitekun, O. (2021). Human capital, innovation, and inclusive growth in sub-Saharan African Region. *Economic Analysis and Policy*, *72*, 609-625.

Patrick, H. T. (1966). Financial development and economic growth in underdeveloped countries. *Economic development and Cultural change*, *14*(2), 174-189.

Pesaran, M. H., & Smith, R. (1995). The role of theory in econometrics. *Journal of econometrics*, *67*(1), 61-79.

Pesaran, M. H., Shin, Y., & Smith, R. P. (1997). *Pooled Estimation of Long-run Relationships in Dynamic Heterogeneous Panels* (No. 9721). Faculty of Economics, University of Cambridge.

Pradhan, R., Arvin, M. B., Bahmani, S., & Hall, J. H. (2019). Attaining economic growth through financial development and foreign direct investment. *Journal of Economic Studies*, *46*(6), 1201-1223

Prah, F., & Quartey, P. (2008). Financial development and economic growth in Ghana: Is there a causal link? African Finance Journal, 10(1), 28-54.

Raihan, A., Rashid, M., Voumik, L. C., Akter, S., & Esquivias, M. A. (2023). The dynamic impacts of economic growth, financial globalization, fossil fuel, renewable energy, and urbanization on load capacity factor in Mexico. *Sustainability*, *15*(18), 13462.

Rajan, R. G., & Zingales, L. (1996). *Financial Dependence and Growth* (No. 5758). National Bureau of Economic Research, Inc.

Rauber, T., & Ritschel, P. (2024). Banking competition and capital dependence of the production sector: Growth and welfare implications. *International Review of Economics & Finance*, *89*, 676-698.

Rioja, F., & Valev, N. (2004). Finance and the sources of growth at various stages of economic development. Economic Inquiry, 42(1), 127-140

Rousseau, P. L., & Wachtel, P. (2011). What is happening to the impact of financial deepening on economic growth? Economic Inquiry, 49(1), 276-288.

Salifu, M., Peprah, J. A., Sebu, J., & Cantah, W. G. (2024). Openness policies and financial development in Ghana: An ARDL approach. *Heliyon*, *10*(3).

Salisu, A. A., Rufai, A. A., & Nsonwu, M. C. (2024). Exchange rate and housing affordability in OECD countries. *International Journal of Housing Markets and Analysis*.

Schumpeter, J. A. (1911). *Theorie der wirtschaftlichen entwicklung*. Leipzig: Duncker & Humblot.

Schumpeter, J. A., & Swedberg, R. (2021). *The theory of economic development*. Routledge.

Studies, 60, 35-52.

Shaw, E.S., (1973). *Financial deepening in economics development.* Oxford University Press, London

Xu, S., Asiedu, M., & Effah, N. A. A. (2022). Inclusive finance, gender inequality, and sustainable economic growth in Africa. *Journal of the Knowledge Economy*, 1-37.

Yusheng, K., Bawuah, J., Nkwantabisa, A. O., Atuahene, S. O., & Djan, G. O. (2021). Financial development and economic growth: Empirical evidence from Sub-Saharan Africa. *International Journal of Finance & Economics*, *26*(3), 3396-3416.

Zulkhibri, M. (2018). The impact of monetary policy on Islamic bank financing: bank-level evidence from Malaysia. *Journal of Economics, Finance and Administrative Science*, *23*(46), 306-322.