Finance and economic development in sub-Saharan Africa: Does foreign direct investment matter?

O.J. Ojeka
Economics Department, Federal University of Technology Akure, Nigeria
Email: ojekajohnobaike@gmail.com

F.C Odey
Department of Economics, Obafemi Awolowo University, Ile-Ife, Nigeria

D.Y Adebayo
Department of Economics, Federal University Oye-Ekiti, Nigeria

G. Amodu
Department of Economics, Ahmadu Bello University, Zaria, Nigeria

Keywords:
- Financial development
- Foreign direct investment
- Economic growth
- Two-step GMM
- sub-Saharan Africa

Abstract

This paper assesses the role of foreign direct investment (FDI) in the link between financial development and economic development in 39 sub-Saharan African (SSA) countries during the period 1995-2020. The study applied a two-step system GMM and Driscoll-Kraay estimator and found that economic development responds positively to a change in the level of financial sector development, and the channels are financial risk diversification, efficient resource allocation, technological development, and financial intermediation. The findings are that the development of the financial sector beyond 29.29% is detrimental to the economic development of the SSA region through high inflation. Also, economic development decreases as FDI increases. The interaction variable (financial development and FDI) indicates that FDI favourably affects the positive link between financial development and economic development in SSA. Also, based on the estimated coefficient for the financial development variable and the interaction term (FDI), it was found that 21.75% was the threshold value of FDI that could strengthen the positive effect of financial development on economic development. Therefore, the study recommended that governments in SSA should formulate policies that ensure inflows of capital beyond the threshold to enjoy the benefits of foreign capital inflows and financial development.

Open Rubric

1. Introduction

The 2008 financial crisis judiciously highlighted the importance of the financial sector to the development of an economy. Over the years and after the crisis, the financial sector has been recognized for its large contribution to developing a country's economy. The financial sector plays a huge role in economic development by helping to determine savings rates, mobilise and pool savings, produce investment information, facilitate and encourage the inflows of foreign capital, and optimise the allocation of capital (World Bank, 2016). Financial development matters both during periods of growth and decline. The finance sector works to maintain a country's GDP growth, and it also lowers poverty and inequality through increasing access to credit, lowering the shock susceptibility of the underprivileged, and boosting productivity and investment, all of which result in greater earnings (World Bank, 2016).

Financial development is an improvement in the standard of five fundamental financial functions. These are (a) collecting and analysing data on potential investments and allocating capital accordingly; (b) monitoring individuals and businesses and exercising corporate governance after allocating capital; (c) management of risk, facilitation of trading, and diversification; (d) pooling of funds and mobilisation of savings; and (e) facilitation of the transfer of financial instruments like stocks and bonds (The World Bank, 2016). The development of the financial sector, from the perspective of Shaw (1973), is an increase in the amount of financial assets over any increase in non-financial assets. Levine (2005) also explained how financial instruments accelerate financial development and help financial markets, financial intermediaries, and financiers work together to lower costs associated with getting information, executing contracts, and conducting transactions. As a result, financial instruments can perform financial functions more effectively. Sahay *et al.* (2015) cited financial institutions and financial markets as two categories of financial development. These categories were further divided into depth (market size and liquidity), access (a person's ease of access to banking services), and efficiency (offering affordable and sustainable financial services), which includes data like lending-deposit spread, liquidity, and transaction costs (Sahay et al., 2015).

Furthermore, the financial crisis of 2008 had a strong impact on the financial structure of many nations, affecting both developed nations with thriving economies and developing nations with dwindling economies. The effect of the crisis was widely felt in African countries with weak economies, and to date, these nations are still trying to recover. African governments have worked towards eliminating these effects by formulating policies that foster financial development in a bid to stimulate economic development. However, a weak financial sector is a barrier to the success of these policies. Low-income sub-Saharan Africa (SSA) has a modest financial sector. The predominant institutions are banks, which cover more than 80% of the financial system's assets (Pattillo, Gulde, Carey, Wagh, & Christensen, 2008). Other financial mechanisms in SSA countries are undeveloped or nonexistent (Kablan, 2010). In fact, when expressed in terms of M2, the financial systems of nearly half of the SSA countries are worth less than $1 billion, which is similar to a small bank in an industrial nation (Pattillo et al., 2008). The limited representation of other financial sector mechanisms is why the data in this study is restricted to broad money (% of GDP) and domestic credit to the private sector (% of GDP), both of which are proxies for financial development in SSA countries.

According to Shaw (1973), financial sector development is defined as an increase in the amount of financial assets over any increase in non-financial assets. Levine (2005) also explained how financial instruments accelerate financial development and help financial markets, financial intermediaries, and financiers work together to lower costs associated with getting information, executing contracts, and conducting transactions. As a result, they can perform their financial functions more effectively. Similarly, foreign direct investment (FDI) is an integral part of developing nations. FDI affects economic growth and productivity in the short run. FDI is theoretically expressed as an addition to physical capital by the neoclassical (Solow, 1956; Swan, 1956) and can be likened to the transfer of foreign savings to a host country (Swan, 1956).

The right amount of FDI, which can come in the form of technology transfers, capital inflows, and multinational enterprises, helps complement a better-functioning financial sector. However, the inflows of FDI to African countries have been low when compared to other nations. In 2015, out of the $1,762 billion in total global FDI inflows, African nations received only about $54 billion (UNCTAD, 2016). This disparity, which has been consistent since 1990, has led African nations to investigate how to attract more FDI. Noorbakhsh et al., 2001; Miyamoto, 2003; and Yimer, 2022, argue that human capital and institutional quality in the face of financial development determine a nation's ability to absorb new ideas, which are needed to maximise the efficiency of technology and mergers and acquisitions. A well-developed human capital makes a nation ready and able to swing to action when capital inflows are available. Therefore, human capital development serves as a transmission channel through which the combination of FDI and a well-developed financial sector can spur economic development.

This research is focused on how financial development and the provision of FDI affect economic development. Aybar and Joyce, 2019; Robeena and Sumaira, 2022; Rahman, Siddique, and Parvez, 2022, have studied and determined how FDI and a well-developed financial sector affect economic growth. However, these studies are limited by their consideration of just economic growth, which only measures the quantitative increase in Gross Domestic Product (GDP), Gross National Product (GNP), or National Income (NI) and not an increase in the standard of living (Haller, 2012) or

economic development in totality. The average income level and growth rate are only a small part of what defines the prosperity of an economy. Economic development takes into account the varied and inclusive goals of what can be called "a decent life" in all of its economic, social, and political dimensions (Cypher, 2014). To show how financial development complements FDI to improve the standard of living of citizens, this research focuses on economic development.

Although financial structure's importance in promoting economic growth is widely acknowledged, the exact mechanism by which financial structure affects growth in economies has long been a source of heated discussion. While some researchers, like Bagehot (1873) and Schumpeter (1934), stressed the importance of banking institutions in the growth of economies, others favoured the financial market and based their research on how the financial market impacts economic growth. On the other side, numerous works of literature have been published against financial development's causal effect on economic growth; these scholars believe that growth in economies necessitates the need for financial services and financial development—the demand-following theory.

Therefore, the main contribution of this study is fivefold. First, to the best of our knowledge, there is no literature written to determine the finance-development nexus in sub-Saharan African countries, and from the bulk of the literature reviewed for this study, only two authors addressed the finance-development link but not in the SSA region (Hunjra, et al., 2022; Herwartz & Walle, 2014). This study contributes to the finance-development nexus. Moreover, much of the available literature focuses on the finance-growth hypothesis (Bandura & Dzingirai, 2019; Demetriades & Hussein, 1996; Ibrahim & Alagidede, 2018). Second, we focused our data collection on twelve years before the 2008 financial crisis and twelve years post-2008 financial crisis for our comparative analysis. This helps us compare the post-2008 global financial crisis development with the pre-2008 financial crisis economic development, which has not been addressed in previous studies.

Third, in line with the theoretical argument in the existing literature that capital inflows are a necessary but not sufficient condition for development and that their positive effect will be maximised when augmented by a well-structured and developed financial sector coupled with the quality of human capital formation (Borensztein et al., 1998). This study adopts FDI as a moderating variable in the link between financial development and economic development. Fourth, the study estimates the threshold of FDI to determine the minimum level of foreign capital inflows needed to augment financial development before it can be beneficial or a mitigating predictor in the development model, which has not been addressed in the existing literature. Most sub-Saharan African nations believed that economic development could be accelerated by selecting viable industries and promoting them with subsidised credit and selective credit regulations (Bhatt, 1960). This study estimated the financial development threshold, which indicates the point at which financial development will start influencing economic development negatively. Lastly, this study applied an advanced econometric model using a two-step GMM that addresses the problem of endogeneity and derives efficiency and robustness from heteroscedasticity and autocorrelation (Roodman, 2009b).

Against this background, the aim of this study is to answer the question of whether foreign capital inflows foster or dampen the effect of financial development on economic development in sub-Saharan Africa. The rest of the paper is structured as follows: Section 2 discusses the literature review, while section 3 covers the methodology and data. Section 4 focused on empirical results and discussion of findings, while section 5 concludes the paper with policy implications.

2.   Literature review

The empirical literature on the concepts of foreign direct investment, financial development, and economic development and their interrelationships is scant. According to our understanding, only two studies have addressed this issue, but not in sub-Saharan African countries (Herwartz & Walle, 2014; Hunjra et al., 2022). However, the finance-growth nexus, which has attracted the attention of various researchers, has reported inconsistencies in their findings (Borensztein et al., 1998; Cheng et al., 2020; Ouyang & Li, 2018). Some research found a positive association, others found a negative association, and others were inconclusive.

On the theoretical background, Schumpeter (1911) was one of the authors who championed the finance-led growth argument, and the author acknowledged that financial development enhances economic growth through financial intermediation and innovation diffusion, which are necessary for capital formation and business development. King and Levine (1993) documented theoretical findings using a panel of 80 countries within the scope of 1960–1989 and affirmed that economic growth responds positively to a change in financial development through physical capital formation and efficiency in the production factors. McKinnon (1973) supported the idea that financial development increases the efficiency of the money market and stock market capitalization. Anon (1979) supported the supply-led hypotheses from a different angle. This theory posits that an increase in economic growth leads to improvements in the performance of banks' financial markets. Edwards (1999) attributed the negative value of the balance of payments in Malaysia to the financial crisis. Lucas (1988) regarded the financial sector as a key player in the economic model because it contributes to the formation of physical and human capital.

Nguyen et al. (2022) addressed how economic growth in emerging markets changes with respect to a change in

financial development using panel data from 22 countries within the scope of 1980–2020. The finding from their causality test indicated a bi-directional relationship, while the result from the advanced dynamic common correlation estimator (DCCE) suggested that economic growth in the region responds positively to a change in financial development in a linear format. The study claimed that a positive effect is achieved through capital accumulation and financial intermediation. The study supported both the demand-led hypothesis and the supply-led hypothesis by justifying that an increase in economic growth is accompanied by higher demand for financial products and services.

Asteriou and Spanos (2018) used the fixed effect to contribute to the debate on the finance and growth nexus by utilising panel data from 26 European countries between 1990 and 2016. The derived conclusion from a comparative analysis is that economic growth responds positively to a change in financial development before the financial crisis, while the post-financial crisis suggests a negative response of economic growth to a change in financial development. In support of Asteriou and Spanos (2018), Shahbaz et al. (2015) discovered, using time series data on the finance-growth link in Bangladesh, that growth is positively and statistically significant for changes in financial development. The study emphasised that the impact of the financial sector on growth is huge and must not be neglected if Bangladesh or any other economy is growth-driven. Also, Ouyang and Li (2018) utilised panel VAR and GMM on the finance-growth links in China and found that economic growth and financial development are positively related, taking financial development as the predictor. The major drawback of this study is that three indicators of financial development were employed in the same model without conducting a correlational analysis to check for the possibility of multicollinearity issues.

Herwartz and Walle (2014) conducted a study to show whether financial development fosters or mitigates economic development between 1975 and 2011, using a sample of 73 countries. The evidence from a functional-coefficient model suggests that economic development responds positively to any change in financial development. However, when a comparative analysis was done, the magnitude of the response was stronger in high-income economies compared to low-income countries. The authors further made an argument to strengthen their findings and concluded that high-income economies have complementary policies: strong social capital, strong and well-structured institutions, and high capital accumulation that financial development could thrive upon and enhance the finance-development nexus in comparison to low-income economies, where some of these factors are either low or not present at all. In contrast, Cheng *et al.* (2020) conducted a comparative analysis of the finance and growth relationship utilising panel data from 72 economies between 2000 and 2015. The dynamic system GMM was used as the method of estimation, and the results from the overall model suggested that financial development is harmful to economic growth. Also, based on the comparative analysis results, the magnitude of the effect is stronger in high-income countries compared to low- and middle-income groups. The study further examined the interlinkage effect of financial development and information and communication technology (ICT) on growth. The findings show that ICT significantly mitigates the negative effect of the finance-development link, with the exception of high-income countries, where it was not statistically significant.

Olayungbo and Quadri (2019) used the PMG-ARDL method of data analysis between 2000 and 2015, utilising a panel of 20 sub-Saharan African countries to explore remittance, finance, and growth relationships. The study revealed that both the long-run and short-run effects of financial development are positive and statistically significant. The study further interacted with financial development and remittance to see the interlinkage effect on growth and concluded that financial development plays a substitutionary role in the remittance-growth nexus hypothesis. Also, Osei and Kimb (2020) applied a dynamic panel regression to determine the moderating role of financial development in the FDI-growth nexus within the period of 1987–2016 in 62 countries selected from middle- and high-income groups. The study found that financial development fosters economic growth, but it was not statistically significant. It was further stated that economic growth is positively affected by FDI; however, the effect becomes insignificant when financial development exceeds the 95.6% threshold. The study concluded that the development of the financial market strengthens the positive FDI-growth nexus. This study suggested that for any economy to realise the maximum benefits of FDI in terms of forward and backward linkage effects with domestic firms in the host economies, accumulation of human and physical capital, an efficient and well-developed financial market, and openness to trade are necessary.

Trinugroho et al. (2021) argued that financial development is critical to the development of developing economies. The positive effect of financial development is an increase in research and innovation that enhances the productive capacities of the economy. Desbordes and Wei (2017) postulated that a sophisticated and efficient financial system facilitates inflows of foreign capital with positive externalities on the productive capacities in both the host and source economies. Nguyen and Lee (2021) show evidence from 116 countries across the globe using a two-step GMM affirmed that financial inflows are proportionally biased toward well-structured and developed financial markets. Hunjra et al. (2022) showed evidence from 50 low- and middle-income countries with the application of fixed effects, bootstrap panel quantile regression, and fully generalised least squares and found a positive and significant relationship between financial development and economic development. The study concluded that financial development, along with other social and economic variables, is needed in the development process of low- and middle-income countries.

On the link between FDI, growth, and development, Adegboye *et al.* (2020) found that political stability and institutional quality through foreign investment inflows and domestic investment drive economic development. Similarly, Glawe and Hagner (2019) emphasised that institutional quality played an important role in the economic success of a

province in China through human development. FDI acts as a catalyst and engine of economic development as it ensures technological diffusion, knowledge transfer, increased capital formation, enhanced managerial skill spillover, and human capital augmentation, facilitates trade and generates employment in the host economy (Adegboye et al., 2020; Cheng et al., 2020; Ojewumi & Akinlo, 2017). It is expected to have a positive effect on economic development. However, Adegboye et al. (2020) argue that FDI is like a two-edged sword whose effect is determined by its utilisation, concentration, and reinvestment of revenue. The negative effect is realised through capital flight, the acquisition of local firms, and a reduction in the employment of unskilled and semi-skilled labour.

Alvarado et al. (2017), who conducted a study in Latin America using panel data from 19 Latin American countries, pointed out that FDI is beneficial to the host economies through technological diffusion, employment generation, and human capital formation while being beneficial to the investors via cost reduction and market expansion. The authors argue that in developing countries where a wide gap exists between saving and investment, inflows of capital are necessary. Anwar and Nguyen (2010) postulated that technological diffusion through FDI inflows bridges the host countries' technological gap and ensures the efficiency of their production factors. Tan and Tang (2016) show evidence from a panel of five countries from the Asian region, pointing out that inflows of capital are complementary to domestic investment, which can increase the efficiency of production factors with a multiplier effect on productivity and growth. The effect of FDI is more pronounced in economies with high absorptive capacity than in economies at an early stage of development (Alvarado et al., 2017). FDI enhances economic growth via increased consumption and investment opportunities, employment generation, and societal welfare maximisation (Asongu & Odhiambo, 2019).

3. Materials and Methods

This study utilised longitudinal panel data from 39 sub-Saharan African countries between 1995 and 2020 to investigate how FDI fosters the development-finance nexus in SSA. The data was sourced from the World Development Indicators 2020 edition. The countries were chosen based on data availability, and the scope of 26 years was based on a balanced panel of 12-year pre- and 12-year post-2008 global financial crises. The list of countries included in this study can be found in the appendix section (Appendix A).

3.1 Econometric Estimation

To capture the moderating role of FDI on financial development and economic development nexus, this paper uses a panel econometric forecasting model in line with Herwartz and Walle (2014), Egolum and Ugonabo (2020), Hunjra et al. (2022), and Osei and Kimb (2020), although with a slight modification to suit the objective of this study. The model followed the assumptions of neoclassical development theories, which assumed that development is both exogenously and endogenously determined. Among the endogenous and exogenous factors are capital inflows and financial development. To address the issue of endogeneity, the study used a two-step GMM. The baseline equation for this paper is specified as:

$$GDPPC_{it} = \beta_0 + \beta_{FD}FD_{it} + \beta_{FDI}FDI_{it} + \beta_{INV}INV_{it} + \beta_{MD}MD_{it} + \beta_{FC}FC_{it} + \theta_i + \varepsilon_{it} \qquad (1)$$

Where GDPPC represents the real GDP per capita, serving as a proxy for economic development, FD is a 2-by-2 vector matrix comprising two financial indicators previously identified in existing studies. INV represents domestic investment, proxied by domestic fixed capital formation as a percentage of GDP, while MD represents manufacturing value added as a percentage of GDP, acting as a proxy for the development of the manufacturing sector. Additionally, FC is a binary dummy variable that signifies the post-2008 global financial crisis and allows for a comparison of economic development before and after the crisis. The variable takes one (1) for the post-2008 global financial crisis and zero (0) for the pre-financial crisis. ε_{it} is the stochastic error term with the assumption that it is normally distributed with a mean value of zero and constant variance of 1, that is, $\varepsilon_{it} \sim N(0, 1)$. θ_i is the individual fixed effect, and t is the time trend ranges from 1995 to 2020.
The dynamic form of equation (1) becomes:

$$GDPPC_{it} = \beta_0 + \beta_1 GDPPC_{it-1} + \beta_{FD}FD_{it} + \beta_{FDI}FDI_{it} + \beta_{INV}INV_{it} + \beta_{MD}MD_{it} + \beta_{FC}FC_{it} + \theta_i + \varepsilon_{it} \qquad (2)$$

The current body of research provides evidence supporting the notion that the extent of natural and mineral resources plays a crucial role in determining the level of development, particularly through industrialization. This factor (industrialization) heavily relies on the accessibility of resources that can be utilised as raw materials (Siyum, 2018). As a result, this study incorporates this variable into the model and specified as:

$$GDPPC_{it} = \beta_0 + \beta_1 GDPPC_{it-1} + \beta_{FD}FD_{it} + \beta_{FDI}FDI_{it} + \beta_{INV}INV_{it} + \beta_{MD}MD_{it} + \beta_{FC}FC_{it} + \beta_{FC}RE_{it} + \varepsilon_{it} \tag{3}$$

Where; RE is the total natural resources rents (% of GDP).

Also, economic development cannot be attained without economic growth, this variable was introduced into equation (3) and it becomes:

$$GDPPC_{it} = \beta_0 + \beta_1 GDPPC_{it-1} + \beta_{FD}FD_{it} + \beta_{FDI}FDI_{it} + \beta_{INV}INV_{it} + \beta_{MD}MD_{it} + \beta_{FC}FC_{it} + \beta_{RE}RE_{it} + \beta_{LGDP}LGDP_{it} + \varepsilon_{it} \tag{4}$$

With the assumption that FDI will translate into economic development when there is a well-structured and developed financial sector. The interaction of these two variables was incorporated into the equation (3.5) to become:

$$GDPPC_{it} = \beta_0 + \beta_1 GDPPC_{it-1} + \beta_{FD}FD_{it} + \beta_{FDI}FDI_{it} + \beta_{INV}INV_{it} + \beta_{MD}MD_{it} + \beta_{FC}FC_{it} + \beta_{RE}RE_{it} + + \beta_{LGDP}LGDP_{it} + \beta_{FD*FDI}FD*FDI_{it} + \varepsilon_{it} \tag{5}$$

In line with Arellano and Bover (1995), Blundell and Bond (1998) argued that taking the first difference of the equation (5) removes the individual fixed effects. Thus, the equation (5) becomes:

$$GDPPC_{it} - GDPPC_{it-1} = \beta_0 + \beta_1(GDPPC_{it-1} + GDPPC_{it-2}) + \beta_{FD}(FD_{it} - FD_{it-1}) + \beta_{FDI}(FDI_{it} - FDI_{it}) + \beta_{INV}(INV_{it} - INV_{it-1}) + \beta_{MD}(MD_{it} - MD_{it-1}) + \beta_{FC}(FC_{it} - FC_{it-1}) + \beta_{RE}(RE_{it} - RE_{it-1}) + \beta_{LGDP}(LGDP_{it} - LGDP_{it-1}) + \beta_{FD*FDI}(FD*FDI_{it} - FD*FDI_{it-1}) + (\varepsilon_{it} - \varepsilon_{it}) \tag{6}$$

The threshold in the model can be derived with the application of derivative calculus by taking the partial first differentiation of equation (6) with respect to financial development which is the full model with the interaction effect of the role of FDI on the effect of financial development on economic development in Africa. The coefficient of the first difference of equation (6) suggested the marginal effect of financial development on economic development.

$$\frac{\partial GDPPC}{\partial FD} = \beta_{FD} + \beta_{FD*FDI}FDI \tag{7}$$

The mediating role of FDI on the effect of financial development on economic development from equation 3.7 has four main interpretations in line with Olaniyi (2022).

a) If $\beta_{FD} > 0$ and $\beta_{FD*FDI} > 0$, it denotes that financial development is a positive determinant of economic development, and FDI acts as a complementary input that makes the positive effect of financial development stronger.

b) If $\beta_{FD} > 0$ and $\beta_{FD*FDI} < 0$, it denotes that financial development is a positive driver of economic development, and FDI acts as a negative driver that weakens the positive effect financial development has on economic development in SSA.

c) If $\beta_{FD} < 0$ and $\beta_{FD*FDI} > 0$, it implies that financial development acts as the negative drivers of economic development, and FDI mitigates the severity of adverse effects.

d) If $\beta_{FD} < 0$ and $\beta_{FD*FDI} < 0$, it signifies that financial development acts as a negative determinant of economic development, and FDI worsen and compounds the unfavourable effect of financial development on development.

Similarly, strong evidence of a threshold of FDI exist at which financial development tends to spur economic development in SSA if the parameters β_{FD} and β_{FD*FDI} indicated different signs (Olaniyi, 2022). The threshold of FDI can be obtained by setting the equation 3.7 equal to zero meaning $\frac{\partial GDPPC}{\partial FD} = \beta_{FD} + \beta_{FD*FDI}FDI = 0$

The threshold depicted from equation (7) is faulted and regarded as a static analysis with a lot of shortcomings and criticisms from the existing literature (Olaniyi, 2022). Therefore, this study followed the dynamic threshold regression proposed by Seo and Shin (2016) as the robustness check for the threshold estimate of FDI. The equation for the regression in line with Seo and Shin (2016) is specified thus;

$$GDPPC_{it} = (1, x'_{it})\alpha_1 1\{FDI_{it} \le \delta\} + (1, x'_{it})\alpha_1 1\{FDI_{it} > \delta\} + \varepsilon_{it}$$

Where $\varepsilon_{it} = \gamma_i + v_{it}$, 1,..............n, t = 1, ..., T
GDPPC is the dependent variable measured as economic development, x_{it} is the K * 1 vector of independent variables with a lagged of the dependent variable. δ is the threshold estimate, and FDI is the threshold variable or transition variable; $\alpha1$ and $\alpha2$ are the slope coefficients associated with regimes (1 and 2), respectively; ε_{it} is the stochastic error term with the assumption of constant variance and zero mean.

3.2 Variable measurement and Justification
3.2.1 Economic development
An increase in economic productive capacities plus structural and institutional change is termed economic development. It is a broad concept and a continuous variable. The utility function of a developed country is maximised when the level of inequality is very close to zero, there is a significant increase in health and social indicators, and per capita income is high and rising over time. Most previous studies have deviated from addressing the developmental concept because of the difficulty in measuring it. Some have debated that development is in stages and is a process, so there is no way it can be measured. In contrast to those who believe it can be measured quantitatively, they utilise the human capital development index, or per capita income. (Adegboye et al., 2020; Egolum & Ugonabo, 2020; Herwartz & Walle, 2014). This study used real per capita income instead of human capital development based on data availability, which is in line with previous studies (Egolum & Ugonabo, 2020; Herwartz & Walle, 2014). The study agreed with the fact that HDI is a better proxy for economic development, but it is characterised by a huge loss of observations beyond what we can use. Real per capita was used instead of nominal to account for inflation.

3.2.2 Financial development
The neoclassical and institutional schools of thought regarded the quality of institutions and capital as the precondition for economic development, and the financial sector is no exception. The existing literature that supports the existence of a significant positive finance-led-development hypothesis argues that the effect of financial development is through an increased allocation of scarce financial resources. This bridges the gap between the deficit sectors (investors with potential and viable ideas but lack funds for operationalization) and the surplus sectors (those with financial resources who lack business ideas but are interested in earning interest through saving), increased technological development, facilitation of business transactions, and diversification of financial risks. Financial development can be proxied by two indicators: domestic credit as a share of GDP and broad money supply as % GDP (Osei & Kimb, 2020; Herwartz & Walle, 2014; Levine et al., 2000; Demetriades & Hussein, 1996).

Table 1: Variable measurement, data sources and theoretical expectation.

Symbol	Definition	Measurement	Sources	Expected sign
GDP	Economic Development	Real GDP per capita using 2015 as the base year and measured in US$	WDI	DV
DC	Financial Development	(Domestic credit to private sector/Nominal GDP) *100	WDI	Positive
M2	Financial Development	(Broad money/ Nominal GDP)*100	WDI	Positive
INV	Domestic investment	(Gross fixed capital formation/ Nominal GDP) *100	WDI	Positive
MD	Manufacturing sector development	(Manufacturing, value added/ Nominal GDP) *100	WDI	Positive
RE	Natural resources	(Total natural resources rents/Nominal GDP) *100	WDI	Positive
FDI	Foreign capital inflows	Foreign direct investment, net inflows (% of GDP)	WDI	Positive
LRGDP	Economic growth	Natural logarithm of GDP (constant 2015 US$)	WDI	Positive
DC*FDI	Interaction variable		Author's estimation	Positive
M2*FDI	Interaction variable		Author's estimation	Positive
FC	Dummy Variable	Post-financial crisis takes 1 and zero for pre-2008 global financial crisis.	Author's estimation	Positive

Note : DV denotes the dependent variable.

4. Empirical analysis and discussion

The estimation of econometric specifications on the extent to which FDI mitigates or fosters the finance-development nexus in the SSA region for the period of 1995–2020 is summarised and presented in this section. The section is further subdivided into the preliminary analysis (that is, summary of descriptive statistics and correlation matrix results), the two-step system GMM to present the nature and significance of the effect, and the discussion of findings. Table 2 presents the summary statistics.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Standard. Deviation	Minimum	Maximum
Economic Development (GDPPC)	1,014	2099.619	2909.309	215.756	16990
Financial Development (DC)	917	19.22943	22.89928	0	142.422
Financial Development (M2)	968	30.04452	21.66884	2.85741	163.65
Capital Inflows (FDI)	1,014	3.94072	8.496142	-11.199	161.824
Investment (INV)	914	21.24581	9.616077	-2.42436	93.5475
Manufacturing Development (MD)	946	10.35464	4.709817	0.232608	25.7506
Infrastructure (RE)	1,011	12.35377	11.7117	0.001172	62.0011
Economic Growth (LGDP)	1,014	22.94441	1.38604	19.68095	26.94374

Note: Obs denotes the number of observations

The summary statistics in Table 2 reveal that there is a high level of consistency in the model, as the mean value of the series falls within the minimum and maximum. There is strong evidence to conclude that there is a high possibility of no outliers in the series. The average value of economic development between 1995 and 2020 is $2,099.619, while the minimum and maximum values within the period of estimation are $215.756 and $16,990, respectively. The standard deviation values for all the series in the model are relatively low, suggesting that the series in the model do not have any significant variations from their mean within the cross-section. The low value of economic development reveals that the state of the economy in the region examined is bleak, as most drivers are either monotonically downward trending or nonexistent. Although, SSA countries are rich in natural resources such as gold, silver, diamonds, oil, and other precious natural but, their economies are characterised by underdevelopment, infrastructural decay, weak and unorganised institutions, low per capita income, and large proportions are multidimensionally poor (Siyum, 2018).

Table 3: Correlation Analysis

	GDPPC	DC	M2	FDI	INV	MD	RE	LRGDP
gdppc	1							
Dc	0.400	1						
m2	0.490	0.739	1					
Fdi	0.123	-0.038	0.096	1				
Inv	0.293	0.019	0.130	0.455	1			
Md	0.209	0.248	0.157	-0.126	-0.069	1		
Re	0.065	-0.277	-0.331	0.109	0.220	-0.176	1	
Lrgdp	0.091	0.362	0.001	-0.120	0.091	0.205	-0.089	1

Source: Authors Computation

Table 3 presents the results of the correlation matrix, showing the strength and nature of the relationship between variables in the model. This was done to avoid including independent variables that are highly correlated with each other in the same model to avoid multicollinearity problems. The results display that all the independent variables are positively and significantly correlated with economic development in sub-Saharan African countries. Broad money supply and domestic credit to the private sector are highly correlated, pointing toward a high possibility of multicollinearity if included

in the same model, although the variance inflation factor is less than five when tested but excluded to be on the safer side (Gujarati & Porter, 2008). In the study, therefore, financial development, proxied by credit to the private sector, was used in the main estimation, while M2 was used for the robustness check. Both indicators have been documented in the existing literature as proxies for financial development (Herwartz & Walle, 2014; Levine, et al., 2000; Osei & Kimb, 2020). Credit to the private sector measures the quality of financial intermediaries as they help to bridge the gap between the surplus and deficit economic units by channelling savings to potential investors, while broad money supply measurement tends toward quantity of financial development (Herwartz & Walle, 2014). The *dejure* approach to the measurement from the literature was adopted.

Table 4: Two-step system GMM Results

Variable	Model 1	Model 2	Model 3	Model 4
L1. GDPPC	0.922***(0.010)	0.914***(0.122)	0.910***(0.012)	0.901***(0.013)
DC	18.504***(1.280)	19.785***(1.689)	21.158***(1.236)	18.047***(1.757)
FDI	-14.651***(1.077)	-7.481***(1.383)	-4.189**(1.581)	-24.307***(8.058)
INV	14.115***(0.414)	14.929***(0.553)	13.426***(0.889)	11.304***(1.212)
MD	-120.654***(4.495)	-127.254***(5.006)	-117.883***(5.293)	-110.266***(5.993)
FC	-123.844***(12.260)	-142.537***(12.220)	-136.718***(12.870)	-140.309***(13.039)
RE		8.662***(1.127)	7.434***(1.110)	4.232**(1.635)
LRGDP			-206.118***(72.982)	-193.556**(73.622)
DCFDI				0.831**(0.326)
_cons	883.350***(73.500)	811.576***(80.088)	5512.970***(1693.836)	5319.812***(1705.162)
Number of Groups	37	37	37	37
Number of Instruments	27	27	27	27
AR(1)	-2.08 **(0.037)	-1.95*(0.051)	-1.94*(0.052)	-1.85*(0.065)
AR(2)	-1.04(0.297)	-1.03(0.303)	-1.08(0.280)	-1.07(0.285)
Hansen Test	23.04 (0.287)	22.85(0.244)	23.58(0.169)	16.11(0.516)

*Note : *,** and *** denotes rejection of null hypothesis at 10%, 5% and 1% respectively. The robust standard error of the regression coefficient in parenthesis (). The p-value for Hansen Test, First Order Serial correlation(AR(1)) and Second Order Serial correlation (AR(2)) test in parenthesis (). The instrument count reported is based on the number of ``collapsed''instruments, using the xtabond2 specification from Roodman (2009a).*

The results of the two-step system GMM presented in Table 4 followed the normal practices and assumptions underlying the relevance of estimates identified in the literature. This paper subjected the result of empirical analysis to misspecification and other diagnostic tests as required. The hypothesis of the presence of first- and second- order serial correlation following the Arrellano-Bond statistics, AR (1) and AR (2), is presented. The findings are consistent, as the hypotheses for second-order serial correlation were all rejected at 10%. The Hansen test fails to reject the hypothesis of jointly valid instruments for all the models estimated. The insignificant level of the Hansen test statistic in all the estimated models denotes that the set of instruments used satisfies the exogeneity condition required to obtain a consistent and efficient estimate, meaning the instruments are valid. The value of the Hansen test statistic in all the estimated models is within the required range specified in the literature (see Roodman, 2009a).

Table 4, column 2, shows the baseline equation for the finance-development nexus in SSA. A financial crisis dummy was created to determine whether sub-Saharan African countries' economic development is higher after the 2008 global financial crisis compared to pre-financial crisis development. The 2008 financial crisis variable is given by a simple binary variable assigning one (1) to the post-2008 global financial crisis and zero (0) to the pre-2008 global financial crisis. The findings suggested that financial development is positively, economically, and statistically related to economic development, in such a way that economic development responds on average at a speed of \$18.50 when financial development increases by one unit. All the control variables included in the model are statistically significant at the 1% level. The first lag of economic development suggested that current development is positively influenced by past levels of development. The speed of response is nearly unitary in such a way that a one-unit increase in the previous year's

development corresponds with a $0.92 increase in the current year's development. This further confirmed that the application of a dynamic two-step GMM in estimating how economic development responds to a change in financial development is consistent and appropriate.

The findings also suggest that economic development responds negatively to a change in foreign direct investment. The coefficient implies that, on average, economic development decreased by $14.65 when FDI increased by one unit. Although it was not correctly signed, it was economically and empirically verified (Adegboye et al., 2020). Investment constitutes a major driver of economic growth as it is positively correlated, statistically significant, and economically significant. Its magnitude implies that economic development increased by $14.11 in response to a one-unit increase in domestic capital stock (investment). Manufacturing sector development has a negative and significant effect on economic development. It is incorrectly signed; however, its magnitude reveals that a 1% increase in financial sector development would decrease economic development by $126.65 on average. According to the dummy variable for the 2008 global financial crisis, there is 99.9% certainty that sub-Saharan Africa development is monotonically decreasing following the 2008 global financial crisis. This supports the findings of Siyum (2018), who identified where African countries are poor and argued that most African countries performed better before independence based on per capita growth. This might connote that most sub-Saharan African countries have not come out of the economic shock resulting from the 2008 global financial crisis.

Column 3 in Table 4, identified as Model 2, is an extension of the baseline model but includes the availability of natural resources to capture whether the availability of natural deposits is necessary for development in sub-Saharan African countries. The sign and the level of significance for all the variables in Model 1 were retained when natural resources were introduced into the development model. The sign indicated that economic development responds positively to a change in natural resources. Its coefficient, which is positively, economically, and statistically significant, suggested that economic development on average increases by $8.66 in response to a unit change in natural resources.

Column 4 in Table 4, named "Model 3," is an extension of equation 2 when the log of real GDP is incorporated into the model as a control variable. Literature that defined economic development as economic growth plus structural and technological changes argues the likelihood of an economy experiencing economic growth without economic development, and the reverse cannot be the case. Consistent with the previous empirical studies, the natural logarithm of real GDP was adopted as a proxy for economic growth in the sub-Saharan economic development model. It is negatively and statistically significant, revealing that economic development decreases in response to a unit change in economic growth. Although it is not in line with theoretical expectations, previous studies in the development literature have argued that such a negative effect is possible when growth is not inclusive, and inflation is persistent.

Column 5 in Table 4 summarises the sub-Saharan African countries' development model when the interaction effect of FDI and financial development is included. This was done to determine whether inflows of capital strengthen or mitigate the finance-development nexus in the region. Model 3 retained the sign and level of significance for both independent and control variables, and there was no significant difference in magnitude. The findings from the analysis suggested that financial development beyond the threshold of 29.29% is detrimental to the economic development of the SSA region. The interaction variable indicated that FDI favourably affects the positive response of economic development to a unit change in financial development.

The estimated coefficient of the interaction variable is important for the minimum requirement of FDI to strengthen the finance-development nexus, suggesting 21.75% as the threshold value that FDI would attain before it could strengthen the positive responsiveness of development to a change in financial development in SSA. The coefficient of lagged economic development is statistically, economically, and positively signed, indicating that the previous year's economic development corresponds with the current level of development. Its coefficient and sign, showing the magnitude and nature of the effect, suggested that economic development on average increases by $0.90 in response to a unit change in last year's economic development. This justifies the panel dynamic model and the use of a two-step GMM in modelling development dynamics in SSA. The development of the financial sector by one unit stimulates economic development on average by $18.05, which is statistically significant at 1%. Economic development decreases on average by $24.31 in response to a unit change in FDI inflows. Investment is positively, statistically, and economically related to economic development. Its coefficient suggests that economic development increases by $11.30 in response to a unit change in domestic fixed capital stock (investment).

Manufacturing sector development is negatively and statistically associated with economic development. Its coefficient indicates that economic development decreases on average by $110.27 when manufacturing sector development rises by one unit. The availability of natural resources influences economic development and has a positive, statistically significant, and economically significant effect on economic development. Its coefficient suggests that an increase in natural resources by one unit is associated with a $4.23 rise in economic development. The finding, in contrast to theoretical expectation, pointed to economic development as a negative driver of development in the SSA region, and its significance at 1% is significant. The magnitude of the effect suggests that economic development on average decreases by $193.56 when economic growth rises by one unit. The dummy for the 2008 global financial shocks, which was incorporated for post- and pre-development levels, strongly suggests that there was higher development in the pre-2008 financial period

compared to the post-financial crisis period.

4.2 Robustness check

The summarised results showing the robustness of the econometric estimates are provided in this section. The broad money supply was used as a measure of financial development. Three main panel econometric methods were used for the robustness check. The three methods include Driscoll-Kraay non-parametric covariance estimator, dynamic threshold estimator and two-step system GMM. However, only the results from the two-step System GMM are summarised and presented for interpretation because no significant difference was recorded. This section is to determine whether the significant positive effect of financial development on economic development is based on the method of analysis or variable measurement. The summary of the findings can be found in Table 5.

Table 5: Two-step system GMM Robustness check results

Variable	Model 1	Model 2	Model 3	Model 4
L1. GDPPC	0.989***(0.012)	0.939***(0.013)	0.940***(0.016)	0.919***(0.015)
M2	7.046***(0.867)	11.747***(0.992)	9.692***(1.402)	8.092***(1.765)
FDI	-15.025***(1.060)	-3.633**(1.459)	-8.935***(2.206)	-36.091**(14.931)
INV	14.295***(0.400)	19.198***(0.592)	22.650***(1.277)	20.692***(1.940)
MD	-121.750***(7.403)	119.015***(7.852)	131.811***(8.095)	-106.388***(13.132)
FC	-60.366***(12.786)	-101.035***(12.784)	-127.804***(14.331)	-89.718***(21.870)
RE		13.516***(1.316)	16.448***(1.921)	16.099***(1.813)
LRGDP			306.310**(121.178)	330.863**(121.002)
M2FDI				0.435*(0.243)
Constant	829.811***(102.459)	524.066***(112.617)	-6415.644**(284.474)	-7051.919**(2844.79)
Number of Groups	37	37	37	37
Number of Instruments	27	27	27	27
AR(1)	-2.22**(0.026)	-2.09**(0.037)	-2.13**(0.033)	-2.56**(0.010)
AR(2)	-1.03(0.301)	-1.09(0.274)	-1.01(0.313)	-1.01(0.313)
Hansen Test	21.33 (0.378)	22.80(0.246)	21.66(0.247)	16.23 (0.508)

*Note: *,** and *** denotes rejection of null hypothesis at 10%, 5% and 1% respectively. The robust standard error of the regression coefficient in parenthesis (). The p-value for Hansen Test, First Order Serial correlation (AR(1)) and Second Order Serial correlation (AR(2)) test in parenthesis (). The instrument count reported is based on the number of ''collapsed''instruments, using the xtabond2 specification from Roodman (2009a).*

Table 5 shows that there is no significant difference between the results obtained in the main model and when the broad money supply is used as a proxy for financial development. The only exception recorded is that economic development responsiveness to a change in economic growth is positive and statistically significant. This has a theoretical explanation and is more consistent with the conclusion from the previous studies. The result suggests that using the broad money supply in the SSA development model is more accurate. However, we could not nullify the findings in the main model, since there is an economic explanation for the findings, which explain the situation of most African countries without inclusive growth and wide income inequality. Also, some countries are in the early process of growth characterised by low capital formation, and high inflation. For example, Nigeria recorded 3.40% growth in 2021 yet characterised by 133 million people that are multi-dimensionally poor in the same year (NBS, 2021). This accounts for about 63% of their population. The magnitude of the effect suggests that economic development on average increases by \$330.86 when economic growth rises by one unit. The coefficient of interaction variable (broad money and foreign direct investment) is positive and statistically significant at 1%. This suggests that FDI has a positive finance-development nexus. It was discovered that 18.39% was the threshold value that FDI would attain before it could favourably affect the positive effect of the financial-development nexus in SSA.

4.2.3 Cross-sectional dependence

Table 6: Results tests for cross-sectional dependence from regression equation

CD-Test	CD-test statistic	P-Value
Pesaran's test	11.552***	0.000
Friedman's test	11.600	1.000
Frees' test	10.360	0.317

Note: *** implies rejection of null hypothesis at 1% significance level

Table 6 presents the results for cross-sectional dependence tests using three main methods for robustness check. The results of Pesaran's test indicated that there is cross-sectional dependence and it is statistically significant at 1% level of significance. However, the results of Friedman's and Frees' tests indicate that there is no cross-sectional dependence in the series. The study went further to examine the cross-sectional dependence on each series against one equation depicted in Table 6.

4.2.2 Tests for Cross-Sectional Dependence in the series

This section captures the test for cross-sectional dependence on each series in the model.

Table 7: Tests for Cross-Sectional Dependence in the series

Variable	CD Test	P-Value	CORR
GDPPC	57.950***	0.000	0.418
M2	65.750***	0.000	0.492
FDI	14.510***	0.000	0.125
MD	3.600***	0.000	0.023
RE	24.680***	0.000	0.178
LRGDP	120.350***	0.000	0.867

Note: *** implies rejection of null hypothesis at 1% significance level

The results of cross-sectional dependence on each series in the model are summarised and presented in Table 7. The results indicate that there is existence of cross-sectional dependence on all the series in the model. This further confirmed that the financial development of one country in Africa depends on the level of development of another country because they belong to either the same block or region.

4.2.4 Driscoll-Kraay Regression

Driscoll-Kraay regression is explained in this section of the paper in order to account for the cross-sectional dependence in the model. Also, there is debate in favour of Driscoll-Kraay Regression in producing a more robust standard error to heteroskedasticity and serial correlation when cross sectional dependence is confirmed in the series in the model or equation (Olaniyi, 2022). Thus, this study tested for the cross-sectional dependence and applied Driscoll-Kraay regression for the robustness check on the two-step system GMM. The results are summarised and presented in Table 8 respectively.

Table 8: Driscoll-Kraay Regression

Variable	Model 1	Model 2
DC	48.240***(10.96)	
M2		55.901***(7.90)
FDI	-18.681(-0.46)	-121.072***(-4.59)
INV	84.674***(3.92)	62.266***(4.04)
MD	104.323***(3.14)	108.507***(2.68)
RE	39.721***(3.76)	56.440***(6.83)
LRGDP	-201.375**(-2.33)	176.335***(3.58)
DCFDI	1.645(0.96)	
M2FDI		3.810***(3.66)
FC	-310.445***(106.21)	-478.769***(-7.06)
CONS	2594.259(1.24)	-6446.959***(-4.61)

*Note: *,** and *** denotes rejection of null hypothesis at 10%, 5% and 1% respectively. The values in ( ) connotes the probability value of each coefficient. The study execute the Driscoll-Kraay regression postulated by Driscoll and Kraay (1998) using xtscc stata code in the spirit of Hoechle (2006).*

The Kraay regression results presented in Table 8 indicated that both the indicators of financial development (credit to private sector as a share of GDP and broad money supply as a share of GDP) have a positive and significant effect on economic development. Column 1 in Table 8 shows that a unit increased in financial development by 1% would influence economic development by US$48.240 on average, holding other exogenous factor fixed. Column 2 indicates that for every 1% increase in money supply (i.e financial development), on average, the level of economic development tends to increase by US$55.901 holding all other variables fixed respectively. This result further confirmed and strengthened the validity and robustness of the two-step GMM main results presented. Furthermore, FDI inflows were found to be a negative determinant of economic development in sub-Saharan African countries in both models. In addition, the 2008 financial crisis acted as a negative influence on economic development, and there is strong evidence to conclude that the level of economic development in the pre-financial crisis was better than the post financial crisis. This also corroborated with the results obtained with the two-step system GMM summarised and presented in Table 4.

4.6 Dynamic Threshold Regression

In order to explore the minimum of FDI at which financial development starts to exact a positive effect on economic development in sub-Saharan Africa, Olaniyi (2022) is followed, and the results are presented in Table 9 respectively.

Table 9: Dynamic Threshold Regression

Threshold Estimate	4.101***(0.00)
Linearity test (Bootstrap *P Valu*e)	0.00***
Constant	-782.055***(0.00)
Lower regime ($q_{it} \leq \delta$)	
L1.GDPPC	0.891***(0.00)
FDI	-39.307***(0.00)
DC	6.755***(0.00)
LnGDP	-19.624*(0.05)
Upper regime ($q_{it} > \delta$)	
L1.GDPPC	0.047***(0.00)

FDI	37.993***(0.00)
DC	-6.560***(0.00)
LnGDP	40.586***(0.00)

*Note: * and *** denotes rejection of null hypothesis at 10 and 1% significance level respectively. The numbers presented in ( ) are the probability value corresponding to each indicator. The results present utilised the STATA code of xthenreg syntax provided by Seo et al. (2019) in line with Seo and Shin (2016).*

The results of the dynamic threshold regression presented in Table 9 indicate that FDI inflows as a share of GDP have to exceed 4.101 before FDI can spur the positive effect of financial development on economic development in the sub-Saharan region. The test from the dynamic panel threshold estimated in line with Olaniyi (2022) indicated that the threshold value is lower compared to the static model estimated in the main results. However, both the static and dynamic threshold models validated and supported the existence of the threshold in the FDI-FD-Development trilogy. On average, it was noted from Table 1 that the mean value estimated for FDI (3.94072) was lower than the estimated threshold value (4.101). This denotes that the sub-Saharan region operates below the point at which FDI could moderate the finance-development nexus within the scope of this research. The low inflows of capital in the region have been attributed to weak institutional quality, high level of corruption and low level of technical know-how in the region (Siyum, 2018; Adegboye *et al*, 2020).

4.3 Discussion of the results
The results reveal that financial development contributes positively and in significant measure to the economic development of SSA. Similar findings were also reported in the literature (Olayungbo & Quadri, 2019; Hunjra et al., 2022). However, the results contradict the findings and conclusions of Cheng, Chien, and Lee (2020) and Arcand, Berkes, and Panizza (2015), who pointed out that excessive financial development can result in a financial crisis or bubble with a negative effect on growth. The results suggest that regardless of how financial development is measured and whether an econometric method is applied, economic development responds positively to a change in the level of financial development and is statistically significant. There is sufficient evidence from the findings and previous studies to regard financial development as one of the positive drivers of economic development in sub-Saharan African countries. The channel of the positive effect is normally through efficient distribution of scarce financial resources to enhance productive investment, increased diversification of financial risk, mobilising savings from surplus economic units and channelling them to productive investments, facilitation of inter-industrial trading, and reduced information and transaction costs. All of these factors are expected to raise the efficiency level of resource distribution and enhance technological transfer via capital inflows and human capital accumulation, with a multiplier effect on the standard of living (Levine et al., 2000; Cheng et al., 2020; Herwartz & Walle, 2014). The 2008 global financial crisis has further affirmed that financial development is the lifeline of any economy, and when it sneezes, the whole indicator of development shrinks. The crisis was characterised by high unemployment, hyperinflation, low saving, low consumption, low investment, and financial fragility.

All the main estimations and auxiliary models for the robustness check confirmed FDI as a negative determinant of economic development in SSA. The finding contradicts some existing literature. For example, Alvarado et al. (2017), showing evidence from 19 Latin American countries by the application of the panel estimation method, pointed out that FDI is beneficial to the host economies through technological diffusion, employment generation, and human capital formation. However, the result obtained in this study is consistent with the findings and conclusions of other previous studies. Ojewumi and Akinlo (2017) reported the negative effect that FDI might have on the host economy when the remittance of resources is through dividends and price transfers. The implication of our finding is that perhaps FDI in SSA countries has not attained the required threshold where it will start exerting a positive effect. This is indicated as one of the negative drivers of development in the SSA region, or the foreign capital inflows are concentrated more where they can exploit agricultural and natural resources for the source country's benefit. Also, the result implies that most inflows of capital lead to capital flight, acquisition of local firms, and unemployment via the substitution effect. The interaction term suggested that FDI strengthens the positive effect of financial sector development on economic development in SSA. The result is valid and economically sensible. The finding implies that the inflows of capital will only be a blessing to the development of the SSA region if a certain threshold is attained, while below the threshold, their effect remains negative and highly significant. The threshold for the finding is 21.75%. There is strong evidence to assert that although inflows of capital from source economies have a negative effect on development when interacting with financial development, FDI strengthens the positive effect of financial development on economic development in SSA at a certain threshold. The interaction of FDI and financial development helps in risk diversification, enhanced technological diffusion, and efficient resource allocation in the host economy. Literature supported this argument by pointing out that FDI needed a well-structured financial system, efficient institutions, and quality human capital formation in the host economies before its

potential positive effect could be realised (Borensztein et al., 1998).

    The findings with regard to economic growth and manufacturing sector development contradict some economic theories. Kumar and Singh (2021) argue that manufacturing development is critical and constitutes one of the determinants of development. This was realised when the manufacturing development nexus was examined using time series data. The positive effects are employment generation, enhanced capital formation, and high revenue generation for the government, with huge social and welfare effects on the citizens. Also, the linear five-stage development model developed by Rostow regarded manufacturing development as one of the conditions for economic development to take off. Our finding implies that maybe the level of manufacturing sector development and economic growth has not been sufficient to start affecting the level of development in SSA countries positively. The availability of natural resources constitutes one of the positive determinants of economic development in SSA. The availability of natural and mineral resources to serve as raw materials for industries can attract foreign investors into economies with multiplier effects on development through employment generation, infrastructural development, capital formation, employment effects, and revenue generation for the government (Siyum, 2018). Domestic investment is critical to economic development in SSA, and the finding is consistent with Adegboye et al. (2020), which implies that sacrificing current consumption for future benefit in terms of addition to existing capital stocks raised productivity and bridged the infrastructural gap with multiplier effects on economic development. When a comparative analysis was done by incorporating the dummy variable that measures the post-2008 period, we concluded that SSA experienced higher development in the pre-financial crisis than in the post-financial crisis. This might imply that most SSA countries might not have survived the economic shock that was inflicted upon their economies by the 2008 global financial crisis. In support of this finding, Siyum (2018), who used a systematic literature review, asserted that most stimulants of economics in Africa are trending either downward or non-existent. The major indicators are high corruption, low physical and human capital formation, and weak institutional quality. The study found a significant downward trend in the growth of per capita income in Africa.

5. Conclusion and Policy Implications

    We answered the question of whether FDI fosters or mitigates the effect of financial development on economic development. The dynamic panel data estimation using two-step GMM was applied to a panel data from 39 sub-Saharan African countries within the period 1995–2020. Also, dynamic threshold regression was estimated as the robustness check for the static threshold approach, which has received much criticism because of its limitations. Further, the test for cross-sectional dependence was conducted and found to be present. The study applied Driscoll-Kraay regression, which is not only robust to heteroscedasticity and serial correlation but also has the potential to address the panel econometric issue of cross-sectional dependence, which has not been addressed in the extant literature on the FDI-finance-development trilogy. This study concluded that economic development responds positively to a change in financial sector development in significant measure. This implies that financial sector development increases financial risk diversification, financial intermediation, infrastructural diffusion, and investment stimulation, which tend to induce a level of development. Moreover, the interaction variable indicated that FDI favourably affects the positive effect of financial sector development on economic development in SSA. Based on the estimated coefficient for the financial development variable and the interaction term, it was found that 21.75% was the threshold value that FDI would attain before it could strengthen the positive effect of financial development on economic development in sub-Saharan Africa. Although the results from the dynamic threshold regression found a lower value as the threshold point, one of the implications of this study is that there is a minimum requirement for foreign capital inflows before the positive effect can be realised. Secondly, the interaction of FDI and financial development is beneficial to the development of the region examined. Therefore, the government of this region should formulate policies that ensure inflows of capital beyond the minimum threshold to reap the benefits of financial development.

References

Adegboye, F. B., Osabohien, R., Olokoyo, F. O., & Matthew, O. (2020). Institutional quality, foreign direct investment, and economic development in sub-Saharan Africa. *Humanities and Social Sciences Communications*, 1-10. doi:https://doi.org/10.1057/s41599-020-0529-x.

Adegboye, F. B., Osabohien, R., Olokoyo, F. O., Matthew, O., & Adediran, O. (2020). Institutional quality, foreign direct investment, and economic development in sub-Saharan Africa. *Hummanities & Social Sciences Communications, 7*(38), 1-9. doi:https://doi.org/10.1057/s41599-020-0529-x

Alvarado, R., Iñiguez, M., & Ponce, P. (2017). Foreign direct investment and economic growth in Latin America. *Economic Analysis and Policy, 56*, 176–187. doi:https://doi.org/10.1016/j.eap.2017.09.006

Anwar, S., & Nguyen, L. (2010). Foreign direct investment and economic growth in Vietnam. *Asia Pac. Bus. Rev., 16*, 183–202.

Arcand, J., Berkes, E., & Panizza, U. (2015). Too much finance? *J. Econ. Growth, 20*(2), 105–148. doi: https://doi.org/10.1007/s10887-015-9115-2.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components. *models. J. Econom., 68*(1), 29–51. doi: https://doi.org/10.1016/0304-4076(94)01642-D.

Asongu, S. A., & Odhiambo, N. M. (2019). Foreign direct investment, information technology and economic growth dynamics in Sub-Saharan Africa. *Telecommunications Policy*, 1-14. doi:https://doi.org/10.1016/j.telpol.2019.101838.

Asteriou, D., & Spanos, K. (2018). The Relationship between Financial Development and Economic Growth during the recent Crisis: Evidence from the EU. *Finance Research Letters*. doi:10.1016/j.frl.2018.05.011.

Bandura, W. N., & Dzingirai, C. (2019). Financial development and economic growth in SubSaharan Africa: The role of institutions. *PSL Quarterly Review, 72*(291), 315-334. doi:https://doi.org/10.13133/2037-3643_72.291_5.

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *J. Econom. , 87*(1), 115–143.

Borensztein, E., De Gregorio, J., & Lee, J. (1998). How does foreign direct investment affect economic growth? . *J. Int. Econ., 45*, 115–135.

Cheng, C.-Y., Chien, M.-S., & Lee, C.-C. (2020). ICT diffusion, financial development, and economic growth: An international cross-country analysis. *Economic Modelling*, 1-10. doi:https://doi.org/10.1016/j.econmod.2020.02.008.

Combes, J.-L., Kinda, T., Ouedraogo, R., & Plane, P. (2019). Financial flows and economic growth in developing countries. *Economic Modelling, 83*, 195–209.

Demetriades, P., & Hussein, K. (1996). Does financial development cause economic growth? Time series evidence from 16 countries. *J. Dev. Econ. , 51*(2), 387–411.

Desbordes, R., & Wei, S.-J. (2017). The effects of financial development on foreign direct investment. *J. Dev. Econ., 127*, 153–168.

Driscoll, J. C., & Kraay, A. C. (1998). Consistent Covariance Matrix Estimation with Spatially Dependent Panel Data. *Review of Economics and Statistics, 80*, 549–560.

Edwards, S. (1999). *Crisis prevention: Lessons from Mexico and east Asia.* National Bureau of Economic Research. Retrieved from https://www.nber.org/papers/w7233/.

Egolum, P. U., & Ugonabo, C. U. (2020). The Effect of Value Added Tax on Economic Development in Nigeria (1994-2018). *IOSR Journal of Humanities And Social Science, 26*(5), 21-30. doi:10.9790/0837-2605012130.

Frees, E. W. (1995). Assessing cross-sectional correlation in panel data. *Journal of Econometric, 69*(2), 393–414.

Fry, M. J. (1988). Foreign debt instability: An analysis of national saving and domestic investment responses to foreign debt accumulation in 28 developing countries. *Journal of International Money and Finance, , 8*(3), 315–344.

Glawe, L., & Wagner, H. (2019). The deep determinants of economic development in China—a provincial perspective,. *Journal of the Asia Pacific Economy*. doi:DOI:10.1080/13547860.2019.1636610

Gries, T., Kraft, M., & Meierrieks, D. (2009). Linkages between financial deepening, trade openness, and economic development: causality evidence from Sub-Saharan Africa. *World development, 37*(12), 1849-1860.

Gujarati, D., & Porter, C. (2008). *Basic Econometrics* (5th ed ed.). New York: McGraw-Hill Education.

Hansen, L. (1982). Large sample properties of generalized method of moments estimators. *Econometrica , 50* (3), 1029–1054.

Herwartz, H., & Walle, Y. M. (2014). Determinants of the link between financial and economic development:Evidence from a functional coefficient model. *Economic Modelling, 37*, 417–427. doi:http://dx.doi.org/10.1016/j.econmod.2013.11.029.

Hoechle, D. (2006). Robust Standard Errors for Panel Regressions with Cross-Sectional Dependence. *The Stata Journa, vv*(ii), 1-31.

Hunjra, A. I., Azam, M., Bruna, M. G., & Taskind, D. (2022). Role of financial development for sustainable economic development in low middle income countries. *Finance Research Letters*. doi:https://doi.org/10.1016/j.frl.2022.102793.

Ibrahim, M., & Alagidede, P. (2018). Effect of Financial Development on Economic Growth in sub-Saharan Africa. *Journal of Policy Modeling*. doi:https://doi.org/10.1016/j.jpolmod.2018.08.001.

Inoue, T. (2017). Financial Development, Remittances, and Poverty: : Empirical Evidence from a Macroeconomic Viewpoint. *Journal of Economics and Business*.

King, R. G., & Levine, R. (1993a). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics, 108*(3), 717–737.

King, R., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics, 108*(3), 717-737. doi:10.2307/2118406.

Kumar, M., & Singh, R. (2021). Contribution of the Manufacturing Sector in the Context of Economic Development of Uttarakhand: A Special Reference to District Dehradun. *An International Bilingual Peer Reviewed Refereed Research Journal, 8*(29), 192-197.

Kumari, R., & Sharma, A. (2017). Determinants of foreign direct investment in developing countries: a panel data study. . *Int. J. Emerg. Mark., 12*(4), 658–682. doi: https://doi.org/10.1108/IJoEM-10-2014-0169.

Kuznets, S. (1955). Economic growth and income inequality. *American Economic Review, 45*, 1–28.

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: causality and causes. *J. Monet. Econ., 46* (1), 31–77.

Lewis, W. A. (1956). *Theory of Economic Growth.* London: George Allen and Unwin Ltd.

Lucas, R. (1988). On the mechanics of economic development. *Journal of Monetary Economics, 22*(2), 3-42. doi:10.1016/0304-3932(88)90168-7.

M, F. (1937). The use of ranks to avoid the assumption of normality implicit in the analysis of variance . *Journal of the American Association , 32*(200), 675–701.

Manu, E. K., Xuezhou, W., Paintsil, I. O., Gyedu, S., & Ntarmah, A. H. (2020). Financial Development And Economic Growth Nexus In Africa. *Business Strategy & Development. ,* 1-16.

McArthur, J. W., & McCord, G. C. (n.d.). Fertilizing Growth: Agricultural inputs and their effects in economic development. *Journal of Development Economics*. doi: http://dx.doi.org/10.1016/j.jdeveco.2017.02.007

McArthur, J. W., & McCord, G. C. (2017). Fertilizing Growth: Agricultural inputs and their effects in economic development. *Journal of Development Economics, 127*, 133-152. doi:http://dx.doi.org/10.1016/j.jdeveco.2017.02.007.

McKinnon, R. (1973). *Money and Capital in Economic Development.* Washington: Brookings Institution Press.
Menyah, K., Nazlioglu, S., & Wolde-Rufael, Y. (2014). Financial development, trade openness and economic growth in African countries: New insights from a panel causality approach. *Economic Modelling, 37*, 386-394.

Menyah, K., Nazlioglu, S., & Wolde-Rufael, Y. (2014). Financial development, trade openness and economic growth in African countries: New insights from a panel causality approach. *Economic Modelling, 37*, 386–394.

Nguyen, C. P., & Lee, G. S. (2021). Uncertainty, financial development, and FDI inflows: Global evidence. *Economic Modelling, 99*, 1-10. doi:https://doi.org/10.1016/j.econmod.2021.02.014

Nguyen, H. M., Le, Q.-T., Ho, C. M., Nguyen, T. C., & Vo, D. H. (2022). Does financial development matter for economic growth in the emerging markets? *Borsa Istanbul Review, 22*(4), 688-698. doi:https://doi.org/10.1016/j.bir.2021.10.004

Ojewumi, S. J., & Akinlo, A. E. (2017). Foreign Direct Investment, Economic Growth and Environmental Quality in Sub-Saharan Africa: A Dynamic Model Analysis. *African Journal of Economic Review, Volume V*(Issue I), 48-68.

Olaniyi, C. O. (2022). On the transmission mechanisms in the finance–growth nexus in Southern African countries: Does institution matter? *Economic Change and Restructuring, 55*(1), 153-191. doi:https://doi.org/10.1007/s10644-020-09313-5.

Olaniyi, C. O. (2022). On the transmission mechanisms in the finance–growth nexus in Southern African countries: Does institution matter? *Economic Change and Restructuring, 55*(1), 153-191. doi:https://doi.org/10.1007/s10644-020-09313-5.

Olayungbo, D. O., & Quadri, A. (2019). Remittances, financial development and economic growth in sub-Saharan African countries: evidence from a PMG-ARDL approach. *Financial Innovation, 5*(9), 1-25. doi:https://doi.org/10.1186/s40854-019-0122-8.

Osei, M. J., & Kimb, J. (2020). Foreign direct investment and economic growth: Is more financial development better? *Economic Modelling, 93* , 154–161. doi:https://doi.org/10.1016/j.econmod.2020.07.009.

Ouyang, Y., & Li, P. (2018). On the nexus of financial development, economic growth, and energy consumption in China: New perspective from a GMM panel VAR approach. . *Energy Economics, 71*, 238-252.

Pesaran, H. (2004). *General diagnostic tests for cross-sectional dependence in panels.* University of Cambridge.

R., S., Čihák, M., N'Diaye, P., & A., B. (2015). "Rethinking Financial Deepening: Stability and Growth in Emerging Markets. *Revista de Economía Institucional, 17* (33), 73-107.

Roodman, D. (2009a). A Note on the Theme of Too Many Instruments. *Oxford Bulletin of Economics and Statistics, 71*(1), 0305-9049. doi:10.1111/j.1468-0084.2008.00542.x.

Roodman, D. (2009b). How to Doxtabond2: An Introduction to Difference and System GMM in Stata. *The Stata Journal, 9*, 86-136. doi:https://doi.org/10.1177/1536867X0900900106.

Saci, K., Giorgioni, G., & Holden, K. (2009). Does financial development affect growth?" . *Applied Economics, 41*, 1701–1707.

Schumpeter, J. (1911). *The Theory of Economic Development.* Cambridge, MA: Harvard University Press.

Schumpeter, J. (2011). *The Theory of Economic Development.* Cambridge, MA: Harvard University Press.

Schumpeter, J. A. (1934). *The theory of economic development. Translated by Redvers Opie.* Cambridge, MA: Harvard University Press.

Seo, M. H., & Shin, Y. (2016). Dynamic panels with threshold effect and endogeneity. *Journal of Econometrics, 195*(2), 169–186.

Seo, M., Kim, S., & Kim, Y. J. (2019). Estimation of dynamic panel threshold model using Stata. *Stata Journal , 19*(3), 685–697.

Shahbaz, M., Rehman, I. U., & Muzaffar, A. T. (2015). Re-visiting financial development and economic growth nexus: The role of capitalization in Bangladesh. *South African Journal of Economics , 83*(3), 452–471.

Shaw, E. (1973). *Financial deepening in economic development.* Oxford University Press: New York, NY.

Siyum, N. (2018). Why Africa Remains Underdeveloped Despite its Potential? Which Theory can Help Africa to Develop? *Biostatistica & Bioinformatics, 1*(2), 1-5. doi:10.31031/OABB.2018.01.000506.

Tan, B., & Tang, C. (2016). Examining the causal linkages among domestic investment, FDI, trade, interest rate and economic growth in ASEAN-5 countries. *Int. J. Econ. Finance*(Issues 6), 214–220.

Trinugroho, I., Law, S. H., Lee, W. C., & Wiwoho, J. (2021). Effect of financial development on innovation: Roles of market institutions. *Economic Modelling, 103*, 1-16. doi:https://doi.org/10.1016/j.econmod.2021.105598.

Turnbull, C., Sun, S., & Anwar, S. (2016). Trade liberalisation, inward FDI and productivity within Australia's manufacturing sector. *Econ. Anal. Policy, 50*, 41–51.

Wooldridge, J. (2002). *Econometric analysis of cross section and panel data.* Cambridge, MA: MIT Press .