On the Nexus of Foreign Capital Inflow, Volatility, Financial Development and Economic Growth in Sub-Saharan Africa: A Sectoral Approach[2]

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Abstract

There is increasing concern among policymakers over the effect of capital inflows and volatility on economic growth. The empirical literature on the foreign capital - growth nexus in sub-Saharan Africa has, however, focused on aggregate growth overlooking sector-specific dynamics that might lead to varying responses. This study, therefore, examines whether the impacts of capital inflows and volatility in the region vary across different sectors, namely service, industry, and agriculture over the period 1990 to 2017. It also assesses the role of financial development. The study employed the dynamic panel ordinary least square technique due to its ability to correct for serial correlation and endogeneity. The results reveal that capital flows and volatility have varying effects on the three sectors. In the service sector, only aid exerted a significant negative effect while FDI and cross-border bank lending volatilities showed a depressing effect. Regarding the agricultural sector, only FDI had a negative impact, with the rest showing significant positive relationships. Concerning industrial growth, FDI and remittances had the potential to drive growth, while aid exhibited negative impacts. The findings thus have some policy implications. Policymakers in sub-Saharan Africa could target FDI and remittances to develop the industrial sector while aid and remittances could be channeled into the agricultural sector.

Keywords *Foreign capital inflows, Volatility, Financial development, Panel dynamic ordinary least square, Sectoral growth.*

Introduction

The world's financial architecture has changed dramatically since the 2008–2009 global financial crisis (Tyson & Beck, 2018). This has led to the reassessment both from policy and academic perspectives of the impact of foreign capital inflows, particularly in developing countries. Foreign capital inflows have become an important source of additional resources to help spur development (Phimmavong, 2017). Foreign capital inflows such as aid could be used to fund social and economic projects (Martins, 2011), while remittances could directly increase the rate of capital stock available to a household for investment purposes, thereby relaxing credit constraints of the household (Gapen, Chami, Montiel, Barajas and Fullenkamp, 2009). Cross-border lending (CBL) also offers an additional source of funding for developing economies to support investment and growth (Schoenmaker & Wagner,

[2] The paper is an extract from my thesis:
https://scholar.sun.ac.za/browse?type=author&value=Ustarz%2C+Yazidu

2013).While providing these benefits, policymakers are concerned about the volatility effect of foreign capital on growth. Foreign capital volatility could worsen the economic conditions of receiving economies which undermines the fight against poverty and inequality (Tyson & Beck, 2018). While different inflows could be volatile, the degree of volatility however differs from one capital inflow to another. For instance, Foreign Direct Investment (FDI) is considered less volatile and with higher growth prospects relative to portfolio investment (UNDP, 2011), while portfolio investment tends to be procyclical and thus subject to fluctuations based on the business cycle (Combes, Kinda, Ouedraogo, & Plane, 2017). For sub-Saharan Africa (SSA), Table 1 shows that for the full sample (1981–2017), FDI is the most volatile while aid displays the lowest level of volatility. There is also an indication that except for remittances, the other inflows fairly display a falling trend in volatility with CBL having the most impact, falling from about 130% (1991–2000) to just about 6% (2011–2017). The decreasing trend could be a result of improvement in institutional operations such as the development of financial institutions and improvement in the quality of governance.

Table 1: Variations in the volatility of foreign capital inflows

INFLOWS Volatility	**Coefficient of Variation (%)**				
	1981–1990	**1991–2000**	**2001–2010**	**2011–2017**	**1981–2017**
Remittances	18.93672	19.32332	35.78994	6.50261	53.76114
FDI	37.11581	45.82653	23.95975	16.73511	64.71175
Aid	33.32905	22.00805	14.04208	6.711266	27.55789
CBL	NA	129.7679	18.0111	5.989847	45.17363

Source: Author's computation based on data from WDI, UNCTAD and Bank of International Settlement.

Another strand of the literature suggests that the extent to which foreign capital volatility affects growth depends on the level of financial development of receiving economies (example, Kumi, Ibrahim, & Yeboah, 2017). A developed financial sector can enhance the impact of foreign capital inflows and limit their volatility by making available the needed credit for domestic entrepreneurs to explore innovative ways to enhance production and productivity (Alfaro, Kalemli-Ozcan, & Sayek, 2009). Secondly, it can also assist foreign investors in the domestic market to expand their operations (Hermes & Lensink, 2003). Future expansion in investors' operations may require reliance on the domestic market, the absence of which could lead to sudden reversals and stops in inflows. Thirdly, a well-developed financial system could aid in ensuring that the backward linkages that foreign capital inflow produces result in the efficiency of production of local producers (Alfaro et al., 2009).

While the link between foreign capital and growth has been extensively examined in SSA, much of the focus has been on the level rather than the volatility of foreign capital inflows (example, Adeniyi, Oyinlola, Omisakin, & Egwaikhide, 2015; Agbloyor, Abor, Adjasi, & Yawson, 2014; Combes et al., 2017; Olayungbo & Quadri, 2019). The studies that address the role of volatility tend to focus either on a single inflow (Forinstance, Efobi, Asongu, Okafor, & Tchamyou, 2019; Kumi et al., 2017) or aggregate growth (example, Nyang`oro, 2017). This has been already noted by Igan, Kutan, and Mirzaei (2020) who reported that studies on foreign capital inflows have concentrated either on foreign direct investment or aggregate inflows, ignoring the heterogeneity that exists among different capital inflows. The other issue which was also earlier raised by Alfaro (2003) is that studies on foreign

capital inflows have primarily concentrated on aggregate output and have overlooked the fact that different sectors of the economy respond differently to different types of capital inflows.

This study seeks to expand the literature along the lines of Igan et al. (2020), Kumi et al. (2017), Nyang`oro (2017) and Lensink and Morrissey (2006) by examining how capital inflow and volatilities affect sectoral growth rather than aggregate growth in SSA. Examining sectoral output helps in revealing these nuanced relationships between foreign capital inflows volatility and growth. Tyson and Beck (2018) noted that different capital inflows have varying effects on economic growth. Alfaro (2003) argued that the benefit of foreign capital inflow on growth depends on the sector's absorptive capacity and that inflows into manufacturing could enhance growth relative to the mining sector. Secondly, the current study seeks to cover both private and official inflows instead of a single inflow. This is useful because SSA countries rely both on official and private inflows. Thirdly, in examining the role of financial development on limiting or magnifying the impact of foreign capital inflow and volatility on sectoral growth, the study adopts a broader measure of financial development as suggested by Tyson and Beck (2018) that incorporates not just the banking sector, but also other institutions such as pension funds, insurance, mutual funds among others.

The rest of the paper is structured as follows: Section 2 looks at the relevant literature. Section 3 describes the methodology used to analyze the data, and Section 4 presents the findings of the study. The paper concludes by offering policy recommendations in Section 5.

Literature review

Theoretical Review

There are two major strands of literature concerning the impact of foreign capital on economic growth (Adams, Kwame, & Klobodu, 2017): the neoclassical growth theory and the neo structuralists position. The neoclassical growth theory posits that capital flows from developed to developing countries where it is most needed (Combes et al., 2017). These countries are expected to have wide investible projects but to face liquidity constraints. Hence, an injection of foreign capital into an investible project is expected to positively impact growth with an equally higher return for holders of capital. The injection of capital into the economy frees the economy from liquidity constraints and hence could result in growth (Bosworth & Collins, 1999). These inflows could affect growth via their spillover effects through technological innovation in the mode of production and operation (Bosworth & Collins, 1999; Almfraji & Almsafir, 2014). The neo structuralists, on the other hand, argued that foreign capital could hurt economic growth and hence developing countries should be cautious in seeking financial integration (Agosin, 2006). Phimmavong (2017) asserted that foreign capital may serve as a substitute to domestic savings and investment and hence it increases the levels of vulnerability of a country to external shocks.

Empirical Review

In the empirical literature, different aspects of foreign capital-growth nexus have been examined. Most studies have centred around the impact of the level and volatility of foreign capital inflows on economic growth. Some have also examined the interactive effect of financial development whilst few studies have provided answers to the question of sectoral

effect. The study reviews the literature in line with these strands and concludes with a focus on studies related to SSA.

Previous studies on foreign capital inflow largely concentrated on FDI with significant variations across studies. In a survey of the empirical literature for the period 1994 to 2012, Almfraji and Almsafir (2014) reported that although the majority of the findings pointed to a positive relationship between FDI and growth, some studies found the relationship to be negative whilst others could not establish any relationship at all. Sohail et al. (2023) established a non-linear relationship between growth and FDI, with the positive effect being more pronounced. Kentor (1998), however, noticed that countries that depend on foreign capital inflows may experience positive growth only in the short run. In the long run, these inflows could hurt growth as they tend to increase unemployment and inequality. With regard to remittances, the empirical evidence remains mixed and ambiguous (Hosny, 2020). In a comprehensive analysis of 84 countries over the period 1970–2004, Gapen et al. (2009) did not find any support for a positive impact of remittances on growth. Even after accounting for both squared and interactive effects, the evidence pointed to either insignificant or negative effects. Other studies established a negative relationship between remittances and growth (see Acosta, Lartey & Mandelman, 2009; Chami, Fullenkamp & Jahjah, 2005; Mundaca, 2009). These scholars argued that remittance-receiving households might use the remittances to smoothen consumption or reduce their level of participation in economic activities, hence growth is affected negatively. Giuliano and Ruiz-Arranz (2009), however, argued that remittances could positively affect growth by relaxing investment constraints. In a recent study, Kapri and Ghimire (2020) showed that remittance inflow positively affected agricultural productivity in Nepal.

The impact of aid on growth has also been controversial and the results are inconclusive. Combes and Kinda (2019) argued that the impact of aid on growth could be long-term as aid is extended to human capital and infrastructure development. Sethi, Bhujabal, Sahoo and Sucharita (2019) found that aid affects growth in India in both the long and short runs, whilst in Sri Lanka the impact is positive only in the long run. Geng and Hernandez (2020) concluded that for aid to have an enhancing growth effect, it should exceed 7% of GDP. Lensink and Morrissey (2000), however, argued that the positive effect of aid on growth is eroded by aid uncertainty.

Evidence on the impact of foreign capital volatility on growth is, however, scanty. Lensink and Morrissey (2006) examined the impact of FDI and its volatility on growth in both developed and developing countries for the period 1975–1997. They found FDI volatility to affect growth negatively with the impact being greater among developing countries. Combes et al. (2017) covered both private and official inflows in their study of 77 low- and middle-income countries for the period 1980 to 2012. Using the GMM, they did not find any significant relationship between the volatility of various inflows and growth. In a study of some South Asian countries, Jawaid and Raza (2016) found that remittance volatility, however, exerted a negative effect, although not significant in some countries.

Only a few studies have addressed the issue of sectoral effect concerning both the levels and volatilities of foreign capitals (see, for example, Hong 1997; Alfaro 2003; Aykut and Sayek 2007; Abouelfarag and Abed, 2019). It is instructive to note that most of the studies focused on FDI with results pointing to a positive impact on the manufacturing sector. Hong (1997) was one of the earliest studies to examine the sectoral impact of FDI and bank

lending on growth. The author found FDI to have a significant positive impact on manufacturing relative to agricultural and service sectors. He disaggregated bank lending into commercial and public loans and found commercial loans to positively impact manufacturing and agriculture whilst exerting a negative impact on the service sector. The public loan had a negative impact on both manufacturing and agricultural sectors but a positive impact for the service sector. The study by Alfaro (2003) provided some evidence on the sectoral impact of FDI among 47 countries over the period 1981 to 1999, and reported that FDI had no significant impact on growth. After disaggregating FDI into the various sectors, however, the results showed that FDI in manufacturing positively impacted growth whilst the relationship was negative for the primary sector. In the case of the service sector, although positive it was not significant across different estimation methods. In a comprehensive study, Igan et al. (2020) examined the sectoral impact of different inflows among 22 emerging countries. Disaggregating inflows into equity and debt, they noticed the positive impact was driven by debt rather than equity. They further observed that the impact of foreign capital on sectoral growth is enhanced in countries with well-developed financial systems.

The empirical literature relative to SSA showed that the impact of foreign capital inflow and its volatility on growth vary among different inflows and across studies. Some studies considered only a single inflow (forinstance, Olayungbo and Quadri, 2019; Jena and Sethi, 2020). The study by Olorogun et al. (2022) established a positive relationship between FDI and growth in Nigeria. Asamoah and Alagidede (2021) however found FDI to have a positive effect on growth only above a certain threshold.

Jena and Sethi (2020) showed that aid affects growth in both the short and long run. Kumi et al. (2017) demonstrated that the impact of aid volatility is dampened by a strong financial sector, with the effect being stronger in the tradeable sectors of the economy. Ssozi, Asongu, and Amavilah (2019) focused on agricultural productivity and found aid to have a positive impact on agricultural productivity. When they disaggregated aid, they observed the effect to be negative in relation to food crops. Appiah-Otoo et al. (2022) however found the impact of aid on growth to be conditioned on the country's level of financial development. Studies that examined the impact of remittances on growth also concluded that the impact of remittances on growth is enhanced by a developed financial system (see, for instance, Efobi et al., 2019; Kadozi, 2019; Peprah, Ofori & Asomani, 2019) while Olayungbo and Quadri (2019) found financial development to be a substitute to remittances.

Other studies considered the impact of multiple foreign capital inflows on growth. Agbloyor et al. (2014) found FDI, portfolio and debt to have a negative impact on growth while their interaction with financial development resulted in a positive effect on growth. They asserted that a developed financial sector ensures that capital is allocated to the most productive sectors of the economy and helps to cope with the effect of exchange rate appreciation. Anetor (2020), however, found the impact of FDI to be negative even after accounting for the impact of financial development. This is in contrast with the findings of Adeniyi et al. (2015) who reported that financial development enhanced the positive impact of FDI on growth. Taylor (2020) studied the short and long-run sectoral growth effect of FDI in Tanzania and concluded that FDI only exerts a significant impact in the primary sector while the effect is insignificant in relation to the secondary and tertiary sectors.

The reviewed literature on sub-Saharan Africa showed that only a few studies, such as Kumi et al. (2017) and Taylor (2020) addressed the role of financial development in dampening the sectoral growth effect of foreign capital volatility. However, they considered only aid without addressing how other forms of inflows and their volatilities affect sectoral growth.

Methodology

Empirical model estimation strategy

To examine the long-run relationship between foreign capital inflow, volatility and sectoral growth, the study must first test the time-series properties of the variables by conducting a unit-root test. For a long-run relationship to be established, variables must be integrated of order $I(1)$ at level. Available unit-root tests could be classified into first and second generations. Pesaran (2007) noted that the assumption of cross-section independent by first-generation panel such as ADF-Fisher Chi-Square and the PP-Fisher Chi-Square is very restrictive in the context of cross-country studies where the error terms are not independent. Second generation unit-root test such as Im, Pesaran and Shin (2003) tried to address the problem by suggesting de-meaning the series before the test, which according to Pesaran (2007) could not fully address the problem. Pesaran (2007) therefore suggested augmenting the standard Dicker-Fuller regression with cross section averages of lagged levels and first difference. Hence, the need to first perform unit-root test to determine the level of integration. Following Herzer and Grimm (2012), the study used the Pesaran (2007)[3] unit root test which filters out the effect of cross-section dependency that might be present in the series by adding the cross-section averages of lagged levels and first differences of the individual series. The technique is specified as:

$$\Delta y_{it} = \alpha_i + \beta_i y_{i,t-1} + \gamma_{if_t} + \varepsilon_{it} \quad (1)$$

Where y_{it} is the observation on the ith cross-section unit at time t, f_t captures the unobserved common effect while ε_{it} represent the individual-specific error. $\alpha_i = (1 - \emptyset_i)\mu_i$,

$\beta_i = -(1 - \emptyset_i)$ and $\Delta y_{it} = y_{it} - y_{i,t-1}$. The unit root hypothesis of interest is $\emptyset_i = 1$ and expressed as:

$$H_0: \beta_i = 0 \quad (2)$$

Against the alternative:

$$H_1: \beta_i < 0, i = 1, 2, \cdots, N_1, \beta_i = 0, i = N_1 + 1, N_1 + 2, \cdots, N \quad (3)$$

Having established that variables are integrated into order $I(1)$, the next requirement to satisfy in estimating a long-run relationship is to test whether the variables are cointegrated. The study tested for cointegration using the Pedroni (2004) panel cointegration test which tests for cointegration among variables by using seven test statistics. The *xtpedroni* cointegration command by Neal (2014) was used. The test has to be run for each of the models to be estimated.

Finally, the long-run relationship is estimated after the results of Pedroni (2004) suggested that variables are cointegrated. The study employed the dynamic panel ordinary least

[3] The test is estimated using the pescadf command by Piotr Lewandowski

square (DPOLS)[4] technique by Kao and Chiang (2000) to estimate the long-run relationship. The technique is preferred in estimating long-run relationships among variables because of its ability to correct for serial correlation and endogeneity of regressors by adding leads and lags of the changes in the explanatory variables (Kao & Chiang, 2000). The technique is also robust to omitted variables not included in the cointegration test (Herzer & Grimm, 2012). Following Herzer and Grimm (2012), the DPOLS is specified as:

$$y_{it} = a_i + \delta_i t + x_{it}^{'}\beta + \sum_{j=-q}^{q} \phi_{ij}\Delta \mathrm{x}_{it-j} + \varepsilon_{it} \quad (4)$$

Where y_{it} is the dependent variable for the ith country at time t, $x^{'}$ is a vector of the explanatory variables to be estimated, β is the associated coefficients, a_i is the country-specific effect and $\delta_i t$ captures the country-specific time trend. ϕ_{ij} is included to account for possible serial correlation and endogeneity and it represents the coefficients, leads and lag differences of the variables while ε_{it} shows the error term (Herzer & Grimm, 2012). The approach has also recently been used by Opperman and Adjasi (2017), Bist (2018) and Jena and Sethi (2020).

Substituting the variables of interest, equation (4) becomes:

$$SG_{it}^{j} = a_i + \delta_i t + \beta_1 \mathrm{TRDO_{it}} + \beta_2 \mathrm{CONS_{it}} + \beta_3 \mathrm{LAB_{it}} + \beta_4 \mathrm{FIND_{it}} + \beta_5 \mathrm{FCI_{it}} + \beta_6 \mathrm{FCIV_{it}} + \beta_7 (FCI_{it} * FIND_{it}) + \beta_8 (FCIV_{it} * FIND_{it}) + \varepsilon_{\mathrm{it}} \quad (5)$$

Where SG_{it}^{j} is the sectoral growth and the superscript "j" corresponds to service, agriculture and industrial sectors. Sectoral growth is measured as a percentage of GDP. $FIND$ is financial development measured as an index ranging between 0 to 1 with 1 being a higher level of financial development. The measure is seen as a broader measure of financial development as it incorporates different indicators of financial institutions and financial markets. Hence, it better reflects the level of financial development in an economy (Svirydzenka, 2016). FCI is an umbrella of the various foreign capital inflow considered in the study while $FCIV$ refers to foreign capital inflow volatility. The inflows considered are FDI, CBL, Aid and $remittances$ and measured as a percent of GDP, except for aid which is expressed as a percentage of gross national income (GNI). On the otherhand, volatility of inflows is computed as a normalised standard deviation in a rolling window using three years as the length of the window. The approach is able to account for sudden and inflated capital inflows (Lee, Park & Byun, 2013). The technique is specified as:

$$\sigma_{it} = \left({}^{1}\!/_{n} \sum_{k=t-(n-1)}^{t} (flow_{ik} - \mu)^2 \right)^{\frac{1}{2}} \quad (6)$$

Where $\mu = \frac{1}{n}\sum_{k=t-(n-1)}^{t} flow_{ik}$, with $flow_{ik}$ representing capital inflows as a percentage of GDP of country i, in period k.

The study also controlled for some key variables established in the literature to have an impact on growth. These include trade openness, government consumption and labour. $TRADO$ is trade-openness measured as the sum of trade to GDP multiplied by 100 and is

[4] The xtdolshm command by Diallo Ibrahima Amadou was used in estimating the DPOLS models

meant to show the effect of trade and economic activities on sectoral growth. LAB represents labour force measured as a proportion of the active labour force to total population, aged between 15–64 multiplied by 100, to capture the effect of human effort employed in the production process, while $CONS$ captures government consumption measured as a percentage ratio of GDP to reflect how government policy and spending affect different sectors of the economy. These variables have been used in recent studies to control for the foreign capital–growth nexus (see Nyang`oro, 2017; Efobi et al., 2019; Kadozi, 2019; Olayungbo & Quadri, 2019).

The parameters to be estimated are: $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ and β_8. Data was taken from different sources: trade openness, government consumption and FDI were sourced from the UNCTAD database and it defined FDI as an investment made by a resident enterprise in one economy to establish a long-term interest in an enterprise resident in another economy with an ownership of at least 10% voting power. CBL and financial development were taken from the Bank of International Settlement (BIS) and Svirsky (2016) respectively. CBL is defined as flow from individual lender banking system for individual borrower resident in another economy. The financial development index ranges between 0–1 but rescaled for fitness to 0–100. Further, data on labour, aid and remittances were sourced from the World Development Indicators (WDI) of the World Bank. Remittances is defined as personal transfers received by a household from a non-resident household.

The number of countries varies depending on the model based on data availability (see the Appendix for the sampled countries). The estimation of panel dynamic ordinary least square requires no gaps at the beginning of an observation, otherwise a country is dropped. It can however estimate if the gap or missing observations are not at the beginning. Hence, countries with gaps or missing observations were not included in the estimation. For FDI, aid and remittances, the period for the analysis is 1990–2017 while cross-border lending covered 1997–2017 due to limited observations.

In determining whether financial development has a dampening or magnifying effect on the relationship between foreign capital inflows and sectoral growth, the main variables of interest are FCI and the interaction term of foreign capital inflow and financial development; $FCI * FIND$. Also, in examining the role of financial development in magnifying or dampening the impact of foreign capital inflow volatility on sectoral growth, the variables of interest become $FCIV$ and the interaction term of foreign capital volatility and financial development; $FCIV * FIND$. β_5 and β_6 respectively measure the direct impact of FCI and $FICIV$ on sectoral growth while β_7 and β_8 measure the impact of the interactive effect on the dependent variables.

Results and Discussion

Descriptive statistics and correlation matrix

The descriptive statistics in Table 2. shows that the service sector is the largest contributor to GDP in SSA, with agriculture being the least with an average value of 25% over the sample period. The measures of volatility show that CBL exhibits the highest level of volatility and remittances the lowest. The financial development index has a mean of about 0.13 or 13%, reflecting the underdeveloped nature of the financial sector in SSA. Trade-openness has the widest dispersion with a minimum value of 7.8% and a maximum of 290%, pointing to a different degree of integration with the rest of the world. The summary statistics further

point to higher variation in the employment of labour in the production process as indicated by the value of standard deviation while CBL shows a higher variation. The mean value for aid suggests that it is still an important source of financing for SSA economies. Remittances on the other hand have a higher mean value compared to FDI, pointing to the increasing importance of remittances to households and also at the macrolevel.

Table 2: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Service	1230	48.737	11.927	14.307	85.943
Agriculture	1230	25.042	15.413	0.887	80.511
Industry	1230	26.225	13.294	0.265	83.799
Trade-openness	1230	68.908	37.269	7.828	290.5
Consumption	1230	15.771	7.845	0.911	63.632
Labour	1198	6444607.3	9176116.5	34858	57000000
FIND	1221	0.132	0.089	0.002	0.627
Remittances	1007	4.193	12.555	0.00	167.432
Remittance volatility	989	18.309	13.664	0.068	82.05
FDI	1196	3.966	7.454	-53.534	72.793
FDI volatility	1204	34.857	19.863	1.226	110.845
CBL	915	32.146	186.09	-24.462	2037.34
CBL volatility	913	24.008	17.36	1.003	108.817
Aid volatility	1176	18.378	11.554	0.025	86.251
Aid	1195	10.739	10.871	-0.251	94.946

Note: FDI is foreign direct investment, CBL is cross-border lending, FIND is financial development.

The study further performed a correlation matrix to assess the level and direction of correlation among the variables. First, the results in Table 3 show a low level of correlation among the independent variables, reducing the problem of collinearity. Second, the matrix reveals that the direction of correlation between the inflows, volatilities and growth of the various sectors is mixed. This further strengthens the justification of the study that different inflow volatilities could have a varied impact across different sectors of the economy.

Table 3: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Service	1.000														
(2) Agriculture	-0.595	1.000													
(3) Industry	-0.088	-0.748	1.000												
(4) Trade-openness	0.067	-0.443	0.493	1.000											
(5) Consumption	0.279	-0.327	0.175	0.552	1.000										
(6) Labour	-0.084	0.143	-0.107	-0.278	-0.263	1.000									
(7) FIND	0.478	-0.424	0.132	0.182	0.315	0.095	1.000								
(8) Remittances	0.144	-0.080	-0.020	0.304	0.428	-0.125	-0.006	1.000							
(9) Remittance volatility	-0.260	0.115	0.072	-0.070	-0.117	0.069	-0.222	-0.180	1.000						
(10) FDI	-0.115	0.123	-0.058	0.304	0.184	-0.082	-0.010	0.076	0.035	1.000					
(11) FDI volatility	-0.062	-0.062	0.128	0.010	0.066	-0.095	-0.037	-0.178	0.122	-0.142	1.000				
(12) CBL	-0.387	0.389	-0.163	0.232	0.106	-0.056	0.048	0.134	0.093	0.434	-0.067	1.000			
(13) CBL volatility	-0.052	0.057	-0.027	-0.019	-0.035	-0.086	-0.190	-0.110	0.070	-0.028	0.080	-0.131	1.000		
(14) Aid	-0.303	0.578	-0.467	-0.152	0.016	-0.102	-0.317	0.009	0.170	0.237	-0.010	0.438	0.126	1.000	
(15) Aid volatility	-0.153	-0.116	0.270	0.245	0.059	-0.081	-0.031	0.004	0.141	0.055	0.062	0.127	0.111	0.002	1.000

Note: FDI is foreign direct investment, CBL is cross-border lending, FIND is financial development.

4.2 Test for the presence of unit-root

The results for the panel unit-root test is presented in Table 4. The unit root test was conducted by including both the intercept and trend. Except for aid volatility, all variables were non-stationary at level I(0), but become stationary after first difference I(1). Given that Aid volatility is stationary at level, the variable is dropped in the estimation of the aid model.

Table 4: Panel unit root testing using Pesaran 2007 - CIPS

Variable	Level	First difference	Decision
Service	0.651	-5.716***	I(1)
Agriculture	1.691	-7.082***	I(1)
Industry	1.207	-2.796***	I(1)
FDI volatility	-1.275	-7.483***	I(1)
Remittance volatility	-0.793	-6.924***	I(1)
CBL volatility	0.732	-3.320***	I(1)
Aid volatility	-3.523***	-8.811***	I(0)
FIND	0.532	-4.779***	I(1)
Trade-openness	1.691	-2.088**	I(1)
Consumption	1.571	-5.105***	I(1)
Labour	3.284	-1.547*	I(1)
FDI	-0.173	-3.802***	I(1)
Remittance	-0.346	-3.616***	I(1)
CBL	0.012	-2.617***	I(1)
Aid	-0.450	-4.937***	I(1)

Note: *** p<0.01, ** p<0.05, * p<0.1 FDI is foreign direct investment, CBL is cross-border lending FIND is financial development

4.3 Panel co-integration test

The results for cointegration test presented in Table 5 reject the null hypothesis of no cointegration and hence conclude that the variables are cointegrated. In each of the models, most of the seven statistics are significant, indicating that the presence of cointegration between the dependent variable and the explanatory variables.

Table 5: Test for cointegration

FDI model			
Statistics	Service	Agriculture	Industry
Panel v-statistic	-2.335 (0.0195)	-3.542 (0.000)	-3.213 (0.000)
Panel rho-statistic	4.515 (0.000)	3.752 (0.000)	5.369 (0.000)
Panel PP-statistic	-3.54 (0.000)	-7.426 (0.000)	-2.154 (0.0312)
Panel ADF-statistic	-3.448 (0.000)	-6.521 (0.000)	-1.16 (0.246)
Group rho-statistic	6.644 (0.000)	5.44 (0.000)	7.189 (0.000)
Group PP-statistic	-3.674 (0.021)	-9.715 (0.000)	-2.897 (0.004)
Group ADF-statistic	-3.495 (0.082)	-8.523 (0.000)	-1.299 (0.1939)
CBL model			
Panel v-statistic	- -3.63 (0.000)	-3.72 (0.000)	-3.815 (0.000)
Panel rho-statistic	6.086 (0.000)	5.629 (0.000)	6.015 (0.000)
Panel PP-statistic	-4.327 (0.000)	-6.86 (0.000)	-4.661 (0.000)
Panel ADF-statistic	-4.57 (0.000)	-4.832 (0.000)	-2.987 (0.002)
Group rho-statistic	8.207 (0.000)	7.519 (0.000)	8.358 (0.000)
Group PP-statistic	-5.725 (0.000)	-8.159 (0.000)	-4.555 (0.000)
Group ADF-statistic	-4.879 (0.000)	-5.575 (0.000)	-2.576 (0.010)
Aid			
Panel v-statistic	-1.541 (0.123)	-2.951 (0.003)	-2.916 (0.004)
Panel rho-statistic	3.562 (0.000)	2.942 (0.003)	4.407 (0.000)
Panel PP-statistic	-3.309 (0.001)	-7.021 (0.000)	- -1.524 (0.128)
Panel ADF-statistic	-4.011 (0.000)	-6.307 (0.000)	-1.468 (0.142)
Group rho-statistic	5.749 (0.000)	4.658 (0.000)	6.633 (0.000)
Group PP-statistic	-3.423 (0.001)	-9.361 (0.000)	-1.857 (0.063)
Group ADF-statistic	-3.898 (0.000)	-7.416 (0.000)	-2.101 (0.036)
Remittance			
Panel v-statistic	-1.559 (0.119)	-2.156 (0.031)	-2.246 (0.025)
Panel rho-statistic	3.282 (0.001)	2.251 (0.024)	3.813 (0.000)
Panel PP-statistic	-3.578 (0.003)	-7.007 (0.000)	-2.132 (0.033)
Panel ADF-statistic	-3.96 (0.000)	-6.075 (0.000)	-1.785 (0.074)
Group rho-statistic	4.842 (0.000)	3.767 (0.000)	5.213 (0.000)
Group PP-statistic	-3.612 (0.000)	-8.139 (0.000)	-2.218 (0.027)
Group ADF-statistic	-3.974 (0.000)	-6.34 (0.000)	-1.575 (0.115)

Note: P-values are in parentheses. FDI is foreign direct investment, CBL is cross-border lending

4.4 Estimating long-run relationships

After noting the existence of co-integration among the variables, the next step is to estimate the long-run parameters of all the models. As specified under the methodology, the PDOLS is used in estimating the long-run relationship. The estimation for the service sector is presented in Table 6. On the levels of inflow, only remittances and aid posed significant negative effects on service growth. A percentage point increase in remittance and aid respectively leads to decrease in service growth by 0.22% and 0.20% points. The interaction of the level of inflows with financial development however resulted in significantly positive coefficients for remittances, implying that a developed financial system dampens the negative effect. While FDI interaction with financial development had a negative effect on growth, implying the possibility of a substitution effect. Thus, a strong financial sector could support service growth by maximizing the gains associated with remittances. The finding on remittance is supported by Efobi *et al*. (2019) and Peprah *et al*. (2019) who established that a developed financial sector has an enhancing effect on the growth-remittance nexus.

On volatility, only FDI and CBL were found to have a significant negative effect on service growth. The effect is however greater in relation to CBL as indicated by the magnitude of the coefficients. Thus, a percentage point increase in CBL volatility results in a 0.28% point decrease in service growth while an increase in FDI volatility by 1% point leads to a fall in service growth by 0.13%. The service sector in SSA attracts a lot of FDI and hence volatility in the form of a sudden stop or reversal could worsen the sector's growth. A negative effect of FDI volatility on the service sector will affect the growth of the sector and other sectors because of the forward linkages that exist between the service and other sectors of the economy. The finding is consistent with Lensink and Morrissey (2006), though they looked at aggregate growth. When inflows volatilities were interacted with financial development, it is revealed that a strong financial development helps to dampen the negative effect of FDI and CBL and volatilities on service growth. This further strengthens the earlier conclusion that a strong financial system not only attracts foreign capital inflows but also limits their volatility effect on service growth.

Table 6: Impact of foreign capital inflows, volatility, and financial development on the service sector

Variables	FDI	CBL	Aid	Remittances
Trade-openness	-0.0532*** (0.0161)	-0.134*** (0.0207)	-0.0627*** (0.0218)	-0.0269 (0.0243)
Consumption	0.316*** (0.0946)	0.461*** (0.0874)	0.322*** (0.0990)	0.256*** (0.0983)
Labour	-1.343 (2.566)	-1.768 (2.533)	-1.185 (2.643)	-0.471 (2.405)
FIND	0.667*** (0.143)	0.115 (0.177)	0.634*** (0.150)	0.487*** (0.120)
FDI	-0.00317 (0.132)			
FDI volatility	-0.126*** (0.0281)			
FDI* FIND	-0.0307*** (0.0102)			
FDI volatility* FIND	-0.00122 (0.00177)			
CBL		0.974 (0.761)		
CBL volatility		-0.279*** (0.0480)		
CBL* FIND		0.0609 (0.0549)		
CBL volatility* FIND		0.0152*** (0.00323)		
Aid			-0.200** (0.0834)	
Aid* FIND			0.0133 (0.00849)	
Remittances				0.224***(0.0566)
Remittance volatility				-0.0634 (0.0438)
Remittance* FIND				0.029***(0.0051)
Remittance volatility* FIND				0.000112(0.003)
Diagnostics				
Wald chi2(8)	191.48	160.06	63.9	98.95
Prob > chi2	(0.000)	(0.000)	(0.000)	(0.000)
Observations	850	486	900	600
Number of Countries	34	27	36	24

Note: Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

In the agricultural model, the findings from Table 7 showed that while CBL, aid and remittances had a direct significant positive effect on agricultural growth, the effect is negative in relation to FDI. The negative effect of FDI on the agricultural sector could be due to increasing FDI investment into the non-agricultural sector which are deemed to be attractive for investment. It could also result from the Dutch-disease effect where policymakers shift focus from the sector to other sectors due to discoveries particularly in

the extractive sector. For instance, in the case of Ghana, while the share of industrial value addition increased due to oil discovery in commercial quantity in 2007/2008, Agricultural contribution to output fell from about 30.8% in 2009 to 23.9% by 2011. Alfaro (2003) also found FDI to have a negative effect on the primary sector. Aid however posed a significant positive effect on agricultural growth. An increase in aid by 1% results in a 0.52% increase in agricultural growth. The agricultural sector in SSA contributes significantly both in output and employment and SSA relies on aid to finance economic activities. Hence, an increase in aid could support growth of the agricultural sector. The findings are supported by Kumi et al. (2017) and Ssozi et al. (2019).

Remittances was also found to exert a positive effect on agricultural growth. Remittances provide additional resources for agricultural households to employ modern technology such as the use of tractors and fertilizer application which enhances productivity. Hence an increase in remittances to households, particularly for those involved in agricultural activities could supplement their capital and investment levels which drives growth. The finding is consistent with Kapri and Ghimire (2020). The results further show that financial development dampens the negative effect of FDI on agricultural growth while suggesting a substitution effect in relation to remittances. Thus, firms and households in the agricultural sector could use inflows from remittances in place of formal credit. The case for remittances is particularly true for receiving remittance households who have limited capacity to access credit from the formal financial system as established by Olayungbo and Quadri (2019) and Sobiech (2019).

It was however observed that financial development had a dampening FDI volatility effect while it suggests a substitution effect in relation to CBL and remittances. The findings suggest that a developed financial system could diminish the volatility effect of foreign capital on agricultural growth. The negative relationship for remittance could point to substitutability between remittance utilization and formal financial credit for agricultural activities.

Table 7: Impact of foreign capital inflows, volatility, and financial development on the agricultural sector

Note: Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Variables	FDI	CBL	Aid	Remittances
Trade-openness	-0.154*** (0.0104)	-0.221*** (0.0156)	-0.205*** (0.0134)	-0.171*** (0.0185)
Consumption	-0.175*** (0.0610)	0.221*** (0.0661)	0.0388 (0.0607)	0.0359 (0.0748)
Labour	0.885 (1.655)	1.864 (1.915)	1.248 (1.619)	1.943 (1.830)
FIND	-1.037*** (0.0924)	-0.384*** (0.134)	-0.249*** (0.0920)	-0.620*** (0.0911)
FDI	-1.211*** (0.0854)			
FDI volatility	0.0211 (0.0181)			
FDI* FIND	0.138***(0.00657)			
FDI volatility* FIND	0.00403*** (0.00114)			
CBL		1.213** (0.576)		
CBL volatility		0.332*** (0.0363)		
CBL* FIND		-0.0431 (0.0415)		
CBL volatility* FIND		-0.00870*** (0.002)		
Aid			0.515*** (0.0511)	
Aid* FIND			-0.0114** (0.00520)	
Remittances				0.127*** (0.0431)
Remittance volatility				0.186*** (0.0333)
Remittance* FIND				-0.00618 (0.00391)
Remittance volatility* FIND				-0.0165*** (0.00243)
Diagnostics				
Wald chi2(8)	1215.25	437.33	594.6	282.18
Prob > chi2	(0.000)	(0.000)	(0.000)	(0.000)
Observations	850	486	900	600
Number of Countries	34	27	36	24

The results for the industrial sector as reported in Table 8 showed that the FDI and remittances exhibited a positive relationship with industrial growth while CBL and aid had a negative relationship. A percentage increase in FDI results in a 1.2% increase in industrial growth. The industrial sector in SSA attracts a lot of FDI due to activities in the extractive sub-sector. Hence, an increase in FDI has the potential to drive growth in this sector. For instance, according to statistics from the UNCTAD database[5], FDI in Ghana increased from about 4.3% of GDP in 2008 to 11.15% in 2009 following the country's discovery of oil in commercial quantity. Consequently, industrial value addition to output increased from about 27.9 in 2009 to 36.3% of GDP by 2011. Aykut and Sayek (2007) found FDI to have a positive effect on the manufacturing sector.

Interacting the level of inflows with financial development however, the coefficients for FDI, and remittances had negative effects. The negative effect may suggest that activities in the sector could be using FDI and remittances as a substitute to domestic financial development. This could be particularly true for FDIs that are market or resource seeking, hence might rely externally for financing.

[5] Available at https://unctad.org/statistics

Turning to volatility, FDI volatility exerted a positive effect on industrial growth, with the effect been negative in relation to remittance volatility. The positive effect on the industrial sector might be related to surges in foreign capital in response to increasing activities in the extractive industry. For instance, new discoveries in the extractive sector could result in sudden increase in FDI inflows. The findings for the negative effect of remittance volatility is partly supported by Jawaid and Raza (2016) who studied the South Asian economies. The results for the interactive terms between inflows volatilities and financial development were however mixed; while the coefficients are negative for FDI and CBL, the sign is positive in relation to remittance. Thus, the result demonstrates that the role of financial development in reducing foreign capital volatility varied across sectors.

Table 8: Impact of foreign capital inflows, volatility, and financial development on the industrial sector

Variables	FDI	CBL	Aid	Remittances
Trade-openness	0.207***(0.0153)	0.354*** (0.0211)	0.268*** (0.0207)	0.197*** (0.0223)
Consumption	-0.141 (0.0896)	-0.681*** (0.0893)	-0.360*** (0.0939)	-0.288*** (0.0904)
Labour	0.458 (2.431)	-0.0921 (2.588)	-0.0590 (2.507)	-1.466 (2.212)
FIND	0.370*** (0.136)	0.269 (0.181)	-0.385*** (0.142)	0.132 (0.110)
FDI	1.214*** (0.125)			
FDI volatility	0.105*** (0.0267)			
FDI* FIND	-0.107*** (0.00965)			
FDI volatility* FIND	-0.00280* (0.00168)			
CBL		-2.193*** (0.778)		
CBL volatility		-0.0524 (0.0491)		
CBL* FIND		-0.0177 (0.0560)		
CBL volatility* FIND		-0.00642* (0.00330)		
Aid			-0.316*** (0.0791)	
Aid* FIND			-0.00197 (0.00805)	
Remittances				0.0959*(0.0520)
Remittance volatility				-0.122*** (0.0403)
Remittance* FIND				-0.0231*** (0.00473)
Remittance volatility* FIND				0.0164*** (0.00293)
Diagnostics				
Wald chi2(8)	396.3	405.61	295.07	167.01
Prob > chi2	(0.000)	(0.000)	(0.000)	(0.000)
Observations	850	486	900	600
Number of Countries	34	27	36	24

Note: Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Based on the results in Tables 6, 7, and 8, financial development has a direct positive impact on service growth. Also, we observed a direct negative impact of financial development on agricultural growth. However, the direct effect of financial sector development on industrial growth is sensitive to the capital inflow indicator used. For instance, the effect is positive when FDI is employed but negative in the aid model. This maybe due to the measure of industrial growth which combines the manufacturing , mining and other related activities. . On the control variables, the evidence shows that trade-openness positively affects only the industrial sector while negatively affecting the service and the agricultural sectors. Findings

on trade-openness are confirmed by Efobi et al. (2019), who established that trade liberalisation has positively impacted the industrial sector in SSA. Government consumption only benefited the service sector. Finally, labour is positively and significantly related to the agricultural sector only in the remittance models. Agricultural activities in SSA economies are largely labour-intensive and hence the positive relationship between labour and agricultural growth should not be surprising. The finding is in line with Kumi et al. (2017).

5. Conclusion and Policy Recommendations

The extant literature on the link between foreign capital inflow and growth in SSA is largely limited to the level of inflows and aggregate growth. This study complements and extends the literature in three significant ways: first, the study covers all the major inflows into SSA, both private and official, relative to existing literature where analysis has covered either a single or a small group. In this regard, the study covers FDI, CBL, aid and remittances.

FDI is found to have a significant negative effect on agricultural growth while exerting a positive effect on industrial growth with apparently no significant effect on service growth, though its sign is negative. However, financial development is shown to dampen the negative effect of FDI on the service and agricultural growth while suggesting a substitution effect between financial development and FDI on industrial growth. On the other hand, FDI volatility negatively affected service growth while posing a positive effect on industrial growth. The second foreign capital considered is CBL, which positively impacted agricultural growth while showing a negative relationship with industrial growth. CBL volatility negatively affects growth of the service sector while the impact is positive in the agricultural sector. A developed financial system is revealed to dampen the negative effect of CBL volatility on the service sector, with a substitution effect been established with industrial and agricultural growth.

On aid, the results showed that aid drives agricultural growth while having a negative impact on service and industrial growth. Its interaction with financial development only yielded a significant negative effect for the industrial sector. Finally, remittance inflow positively affects industrial and agricultural growth while posing a negative effect on service growth. The negative impact on service growth vanishes after interacting it with financial development while suggesting a substitution effect in the agricultural and service sectors. The study further observed remittance volatility to affect agricultural growth significantly and positively while negatively affecting industrial growth. Financial development has been revealed to have a moderating effect in the industrial sector while negatively affecting agricultural growth.

A major conclusion from the findings is that the impact of foreign capital inflows and volatility significantly vary across sectors. Hence, the study recommends that policymakers to consider the different compositions of inflows and volatility when examining their growth effect. As has been shown, different inflows and volatility exert different degrees of effect across the various sectors of the economy. Based on the results, FDI could be directed to the most productive activities in the industrial sector while aid and remittances could be channeled into the agricultural sector. Policymakers should also note that the role of the financial sector in dampening or magnifying the growth effect of inflows and volatility varies across different sectors and inflows. However, the study is limited by the lack of data over a

more extended period on sectoral inflows basis in SSA. Future research could explore this relationship when data becomes available over a longer period.

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References

Adams, S., Kwame, E. and Klobodu, M. (2017), "Capital flows and economic growth revisited: Evidence from five sub-Saharan African countries", *International Review of Applied Economics*, Vol.32 No.5, pp. 620–40.

Adeniyi, O., Oyinlola, A., Omisakin, O. and Egwaikhide, F.O. (2015), "Financial development and economic growth in Nigeria: Evidence from threshold modelling", *Economic Analysis and Policy*, Vol.47, pp. 11–21.

Agbloyor, E. K., Abor, J.Y., Adjasi, C.K.D. and 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*, Vol.30 No.1, pp. 137–152.

Agosin, M. R. (2006), "Capital flows and macroeconomic policy in emerging economies", *Inter- American Development Bank*, Washington DC.

Alfaro, L. (2003) "Foreign direct investment and growth : Does the sector matter?" Working Paper, Harvard Business School, Boston.

Alfaro, L., Kalemli-Ozcan, S. and Sayek, S. (2009), "FDI, productivity and financial development", *World Economy*, Vol.32 No.1, pp. 206-213.

Anetor, F. O. (2020), "Financial development threshold, private capital inflows and economic growth: Evidence from sub-Saharan African countries", *International Journal of Development Issues*, Vol.19 No.1, pp. 77–92.

Appiah-Otoo, I., Acheampong, A. O., Song, N., Obeng, C. K., & Appiah, I. K. (2022). Foreign aid—Economic Growth Nexus in Africa: Does Financial Development Matter?. *International Economic Journal*, *36*(3), 418-444.

Asamoah, M. E., & Alagidede, I. P. (2023). Foreign direct investment, real sector growth and financial development. *International Journal of Finance & Economics*, *28*(1), 626-643.

Aykut, D. and Sayek, S. (2007), "The role of the sectoral composition of foreign direct investment on growth", in Ghauri, P.N. (Ed.), Do multinationals feed local development and growth, Vol.22, *International Business and Management* Series, Elsevier, pp. 35-62.

Bosworth, B. and Collins, S. M. (1999), "Capital inflows, investment, and growth" Brooking Papers on Economic Activity, Vol.30 No.1, pp. 143–180.

Combes, J., Kinda, T., Ouedraogo, R., Plane, P. (2017), "Does it pour when it rains ? Capital flows and economic growth in developing countries", Working Papers P157, FERDI.

Efobi, U., Asongu, S., Okafor, C. and Tchamyou, V. (2019), "Remittances, finance and industrialisation in Africa", *Journal of Multinational Financial Management*. Vol.49, pp. 54–66.

Gapen, M.T., Chami, R., Montiel, P., Barajas, A. & Fullenkamp, C. 2009. Do Workers' Remittances Promote Economic Growth? *IMF Working Papers*.

Geng, X. and Hernandez, M. A. (2019), "Aid, policies and growth : A nonlinear reassessment",

Applied Economics, Vol.52 No.15, pp. 1617–1633.

Hermes, N. and Lensink, R. (2003), "Foreign direct investment, financial development and economic growth", *Journal of Development Studies*, Vol.40 No.1, pp. 142–163.

Herzer, D., & Grimm, M. (2012). Does foreign aid increase private investment? Evidence from panel cointegration. *Applied Economics*, *44*(20), 2537–2550.

Hong, K. (1997), "Foreign capital and economic growth in Korea : 1970 -1990" *Journal of Economic Development,* Vol.22 No.1, pp. 79–89.

Igan, D., Kutan, A. M. and Mirzaei, A. (2020), "The real effects of capital inflows in emerging markets", *Journal of Banking and Finance*. Vol.119, pp. 105933.

Jawaid, S. T. and Raza, S. A. (2016), "Effects of workers ' remittances and its volatility on economic growth in South Asia", *International Migration*, Vol.54 No.2, 50–68.

Jena, N. R. and Sethi, N. (2020), "Foreign aid and economic growth in sub-Saharan Africa", *African Journal of Economic and Management Studies*, Vol.11 No.1, pp. 147–168.

Kao, C. and Chiang, M. H. (2000), "On the estimation and inference of a cointegrated regression in panel data", *Advances in Econometrics*, Vol.15, pp. 179-222.

Kentor, J. 1998. The long-term effects of foreign investment dependence on economic growth, 1940-1990. *American Journal of Sociology*.

Kumi, E., Ibrahim, M., Yeboah, T. (2017), "Aid, aid volatility and sectoral growth in sub-Saharan Africa : Does finance matter? ", *Journal of African Business*. Vol.18 No.4, pp. 435–456.

Lee, H., Park, C. and Byun, H. (2013), "Do contagion effects exist in capital flow volatility?", *Journal of The Japanese and International Economies*, Vol.30, pp. 76–95.

Lensink, R. and Morrissey, O. (2006), "Foreign direct investment : Flows, volatility, and the impact on growth", *Review of International Economics*. Vol.14 No.3, pp. 478–493.

Nyang`oro, O. (2017), "Capital inflows and economic growth in sub-Saharan Africa", Working Paper Series N° 285*,* African Development Bank, Abidjan, Côte d'Ivoire*.*

Olayungbo, D. O. and Quadri, A. (2019), "Remittances, financial development and economic growth in sub-Saharan African countries : Evidence from a PMG-ARDL approach", *Financial Innovation*, Vol.5 No.1, pp. 1-25.

Olorogun, L. A., Salami, M. A., & Bekun, F. V. (2022). Revisiting the Nexus between FDI, financial development and economic growth: Empirical evidence from Nigeria. *Journal of Public Affairs*, *22*(3), e2561.

Opperman, P. and Adjasi, C. K. D. (2017), "The determinants of private capital flow volatility in sub-Saharan African countries", *Research in International Business and Finance,* Vol.42, pp. 312–320.

Peprah, J. A., Kwesi Ofori, I. and Asomani, A. N. (2019), "Financial development, remittances and economic growth: A threshold analysis", *Cogent Economics and Finance*, Cogent OA, Vol.7(1).

Pedroni, P.(2004), "Panel cointegration: Asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis", *Econometric Theory* Vol.20, 597–625.

Pesaran, M.H. (2007), "A simple panel unit root test in the presence of cross-section dependence", *Journal of Applied Econometrics* Vol.22, pp.265-312.

Phimmavong, K. (2017), "Impacts of foreign capital inflows on domestic savings in 6 ASEAN countries: A panel data analysis", *International Journal of Management, Accounting and Economics*, Vol.4 No.5, pp. 486–518.

Schoenmaker, D., & Wagner, W. (2013). Cross-B order Banking in Europe and Financial

Stability. International Finance, 16(1), 1-22.

Sobiech, I. (2019), "Remittances, finance and growth : Does financial development foster the impact of remittances on economic growth? ", *World Development*. Vol.113, pp. 44–59.

Svirydzenka, K. (2016), "Introducing a new broad-based index of financial development", IMF Working Papers 16/5.

Sohail, H. M., & Li, Z. (2023). Nexus among foreign direct investment, domestic investment, financial development and economic growth: a NARDL approach in Pakistan. *International Journal of Economics and Business Research*, *25*(2), 249-269.

Tyson, J. and Beck, T. (2018) "Capital flows and financial sector development in low-income countries", Available at https://degrp.odi.org/publication/capital-flows-and-financial-sector-development-in-low-income-countries/, (accessed on 8 June 2020).

UNDP (2011) "Private capital flows: foreign direct investment and portfolio investment', in *Towards human resilience: Sustaining MDG progress in an age of economic uncertainty. United Nations Development Programme*, (accessed on 16 July 2020).

Appendix: List of countries

FDI: Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo (Republic of), Côte d'Ivoire, Equatorial Guinea, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Rwanda, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Uganda, Zambia.

CBL: Angola, Benin, Botswana, Burkina Faso, Cape Verde, Comoros, Congo Democratic, Equatorial Guinea, Ethiopia, Gabon, Ghana, Kenya, Lesotho, Mali, Mozambique, Namibia, Niger, Nigeria, Senegal, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia.

Aid: Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo (Republic of), Côte d'Ivoire, Equatorial Guinea, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Namibia, Niger, Nigeria, Rwanda, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Zambia.

Remittances: Benin, Botswana, Burkina Faso, Cameroon, Cape Verde, Côte d'Ivoire, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Mali, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Sudan, Swaziland, Togo.