

Revisiting the Nexus between FDI, financial development and economic growth: Empirical evidence from Nigeria

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The need for economic development has preoccupied policymakers over the years. Especially the global south such as Nigeria, which is plagued with infrastructural deficit and less foreign direct investment and financial development attraction. This has drawn the attention of stakeholders and government officials for exploration of alternative routes for sustainable development, which is in line with the United Nations Sustainable Development Goals-8 (UNSDG's). Thus, the current study focuses on the FDI-led economic growth hypothesis if it holds or not for the case of Nigeria. The present study is distinct from previous studies in terms of scope by incorporation of more covariates, which has seemed to have been overlooked in the FDI argument. To this end, the current study re-investigates the connection between FDI, financial development, total labour force, gross capital formation, and economic growth using Nigeria as a representation for Africa and Sub-Saharan states specifically. Annual time-series data from 1970 to 2018 is adopted for the econometrics analysis. Our study interest variables are foreign direct investment, economic expansion (GDP). The present study inculcates two additional financial development indicators; from the banking, and financial sectors. Using a battery of unit root and stationarity tests the study explores the stationarity properties of the outlined variables. Subsequently, the novel and recent robust Bayer and Hanck (2013) combined cointegration test in conjunction with Pesaran's ARDL bounds test was used to investigate the equilibrium relationship and regression analysis. While the Toda-Yamamoto Granger causality was used to detect the direction of causality analysis among the variables. Empirical investigation traces a long-run equilibrium relationship among the variables over the sampled period. Furthermore, empirical results show that FDI influences GDP, which suggests that FDI influences economic growth which is indicative of policymakers. Similarly, empirical outcomes establish a significant relationship between GDP and Financial Development from banking-sector which is also corroborated in the causality results as an indirect causality is seen running from GCF to the financial sector. These outcomes suggest that FDI and Financial development are good predictors for sustainable economic growth in Nigeria. All aforementioned results have its inherent policy implications which are elucidated in the concluding remark of this study.

1 | INTRODUCTION

The neoclassical Solow growth model highlighted the pivotal role of capital and labour as a growth driver has raised lots of documented debates in the macroeconomic literature. There is existence of the FDI induced growth hypothesis which has witnessed a plethora of documentation with no consensus in the current body of knowledge. Similarly, there are diverse opinions of positive and negative impacts of Foreign Direct Investment (FDI) on the global economy that are acceptable theories among researchers, policymakers, corporate entities, and so on. Previous literature has linked the inflow of FDI to the development of national and international financial systems, international trade liberalization, and economic growth on the one hand. On the other hand, an outflow of FDI from a region or a nation is contrary. In addition to national institutions, non-state actors such as multinational corporations (MNCs) are predominant players in international business. A non-state actor such as a corporate organization is defined as an MNCs if it has 30% of its business operation abroad with a view to secure profits.

Relevant literatures such as Schmitt and Alexiou (2016) have argued that positive effects of capital inflows into the host economies would enhance employment creation; blended knowledge and transformation; and economic growth. It suffices to conclude that FDI serves as a catalyst in the campaign for economic development thus, giving rise to the FDI-led growth hypothesis. As a result, nations and regions across the globe, including Nigeria, have put tenacious efforts on creating a conducive political and business-friendly environment to attract FDI flows. Papageorgiadis, McDonald, Wang, and Konara (2020) found a positive nexus between informal institution and behavioural aspects of its enforcement agents. According to Papageorgiadis et al. (2020) availability of natural resources, cheap labour, standard, and contemporary infrastructure and as well as competent human capital are considered as the most substantial element of FDI. In the case of Nigeria, low corporate tax rates (as a result of weak currency), labour force, and availability of natural resources have been three of the most significant factors used as a leverage to attract FDI inflow.

Nevertheless, several previous literature have established an inconclusive relationship between FDI and economic growth. Therefore, pointing to a negative relationship or casual association between FDI and economic development (Borensztein, De Gregorio, & Lee, 1998; Joshua, Bekun, & Sarkodie, 2020; Musso, Weare, Oztas, & Loges, 2006; Udi, Bekun, & Adedoyin, 2020; Yalta, 2013). Over the last five-six decades, Nigeria, a powerhouse of Sub-Saharan economies, has experienced fluctuations in economic activities albeit with different degrees based on record political instability, a lack of robust and stable economic policy, lack of resilient institutions just to name a few. The World Bank's (2020) records show FDI inflows have been and will continue to be, a vital component of Nigeria's economic development. The Nigeria government considers FDI a dynamic and vibrant means to reinvigorate Nigeria's economy. These include areas like creation of employment opportunities, employment enhancement, industrial output and growth, and for expansion and diversification of Nigeria exports.

To achieve economic development at the global stage, the World economic order has been characterised in many ways. Among the prominent characterizations is economic integration; wherein regional participation is favourable among nations through trade unions such as Africa Continental's Free Trade Areas (AfCFTA) and Economic of Community of West Africa States' (ECOWAS) economic accord, as a measure to increase FDI inflow and balance of power. Ideally, member-nations of trade unions share common features such as level of development, and so on. Furthermore, member-countries often coordinate trade policies, integration of economic and fiscal policies such as the European Community (EU) union. These integrations subsequently tend to generate internal efficiency, economic stability and upward FDI inflows within the bloc. Previous studies such as Akinlo (2004) have proven direct and positive impacts of regional economic integration on increase in global FDI over the last decades. For the sake of brevity, regional economic integration serves as stimuli to FDI within the region concerned. Axiomatically, Nigeria's economic stability has greater positive development in African continent (United Nations, 2018; World Economic Forum, 2018). Nigeria as the most populous and wealthy among African countries particularly Sub-Saharan African nations can be used as a proxy for the region's FDI-led growth study.

The contributions of previous studies on FDI-led economic growth hypothesis across the Sub-Saharan nations and at the international level cannot be underestimated. Nevertheless, most of the recent studies on Nigeria's economic growth did not capture the current transformation. Therefore, the current study contributes to the FDI-led growth literature debate by incorporation of some dimensions of financial development and used labour force and gross capital formation as control variables in this study. We adopt population as a proxy for labour. Theoretically, labour is a subset of population from demographic viewpoint. Previous study such as Joshua et al. (Joshua, Bekun, & Sarkodie, 2020; Joshua, Salami, & Alola, 2020) adopted GDP population to investigate FDI-led growth theory in the case of Nigeria. Similarly, Joshua, Adedoyin, and Sarkodie (2020) cited Joshua et al. (Joshua, Bekun, & Sarkodie, 2020, Joshua, Salami, & Alola, 2020) as a justification of relevancy of population as a reliable variable in finding connection between FDI and economic growth in South Africa. Furthermore, according to the United Nations (UN) as reported in Bijak, Kupiszewska, Kupiszewski, Saczuk, and Kicinger (2007) there is a direct connection between population and taxes as a revenue. The decrease or increase in percentage of population in working age will cause an equivalent shrinkage or boom in taxes paid, other contributions, and well as family support. Thus, population pattern defines labour force structures. Bijak et al. (2007) opined that diminishing populations in some European countries is an overwhelming phenomenon. Finally, Williamson (2016) explore small-area income in the UK using data from the UK's Census. The results show that residential, that is, population of residents is the dominant driver of income not labour market. Thus, population is a vital variable in examining the connection between FDI and economic development. This is to circumvent deliberate and non-deliberate omissions in the previous studies' statistical or econometric models. For example, previous studies failed to address the pivotal role of financial systems to sustainability and FDI-led economic development. In addition, we

adopt recent estimation techniques to aid arriving at robust coefficients for plausible policy construction. Studies of this sort are arguably worthwhile and timely given global consciousness for economic expansion pathways after the global financial crises specifically in Nigeria.

The rest of the paper is organised as follows: Section 2 is review of literature on FDI-led growth; this is followed by methods in Section 3; while Section 4 focuses on analysis of empirical results and discussion of results. Finally, conclusion and policy direction are rendered in Section 5.

2 | REVIEW OF LITERATURE

Several theoretical and empirical studies have articulately shown numerous ways in which inwardly FDI contribute to the growth of host economies. Theoretically, Alguacil, Cuadros, and Orts (2011) identified channels of improving sustainable FDI inward inflow locally such as improvement of the political and economic framework. Thus, the extent to which FDI is sustainable depends on the quality of environment of the recipient country. Moreover, Akinlo (2004) extended the nexus' variables to the rate of saving in the host country, degree of openness and level of technological development to the quality environment. Gusarova (2019) study on China-BRICS' countries relationship concluded that FDI among the BRICS nations serves as a cushion for their financial market against rise in uncertainty and trade war imposed by the USA against China. Furthermore, FDI may have negative or neutral impacts on the growth of the host economies, if it leads to external remittances of profits and if the multilateral corporation leverages political or economic power to obtain substantial concessions from the host country. Negative effect of a lack of durable economic policy was ascertained by Canh, Binh, Thanh, and Schinckus (2020) in their study on 21 economies across the globe. The findings indicate unstable domestic economic policy has an adverse effect on FDI inflows; nonetheless, a rise in global (143 countries) unpredictable economic policy could increase FDI inflows to the country. Bildiricia and Gokmenoglu (2020) in their study on the impact of terrorism and FDI on environment with sample from Afghanistan, Iraq, Nigeria, and so on the findings indicate positive relationship between terrorism, FDI, and environmental pollution.

Empirically, a chunk of excellent literature indicates a positive relationship between FDI and economic development on the one hand. Akinlo (2004) study casualty link between FDI-economic growth on Nigeria using panel data from 1970 to 2001 conducted several statistical techniques such as Augmented Dickey-Fuller test (ADF) for unit root (nonstationarity), Johansen-Jesulius technique to determine whether there is at least one linear combination of variables, and so on. The results show a negative relationship between Nigeria extractive industries' (e.g., Oil) FDI and growth. However, the study establishes a statistically significant and positive relationship between manufacturing industries' FDI and growth. Likewise, Shah, Hasnat, Cottrell, and Ahmad (2019) investigated the relationship between sectoral FDI inflow and investment in Pakistan using ARDL integration technique, the results revealed that aggregate FDI is crowded in domestic investment. In the case of Pakistan, aggregate FDI cannot

be generalised. Thus, aggregate FDI in manufacturing and service sectors have positive effects while the primary sector has an insignificant impact on domestic investment in Pakistan.

Notwithstanding, positive FDI-led growth results were obtained by Agbloyor, Abor, Adjasi, and Yawson (2013) in their study across Africa. Specifically, using banking samples across 42 African countries and 16 stock markets across the continent, they established a strong and reciprocal amplifying relationship between FDI and domestic banking systems. Similarly, Xu et al. (2019) and Xie and Sun (2020) studies found positive effects of FDI on the economy and reduction of environmental pollution. The positive contribution of a well-structured financial market also gain significantly from FDI as reported by Alfaro, Chanda, Kalemli-Ozcan, and Sayek (2004). On the other hand, Yalta's (2013) on China's FDI-led growth study, the results found no statistically significant relationship between FDI and Gross Domestic Product (GDP). In the researcher's conclusion, FDI does not lead to higher economic growth at aggregate. Xie and Sun (2020) however, presaged hyper increase inflow of FDI into the emerging economies would erode its positive effects with an increase in its own accumulation.

3 | DATA SOURCES, MODEL SPECIFICATION AND METHODS

3.1 | Data and sources

Our study explores the long-run and causality connections between FDI, economic growth, and financial development for the case of Nigeria. To achieve this objective, we leverage on annual time series data from the World Bank development indicators (www.data.worldbank.org) from 1970 to 2018. The interest variables are economic growth measured by real gross domestic product (constant 2010\$), Foreign direct investment (% GDP). We include covariates for financial development namely financial development from financial development from banking sector (%GDP), total labour force, gross capital formation (GCF), and Financial development from financial sector (%GDP). The GDP has been used as a proxy for measuring economic development (see Papageorgiadis et al., 2020; Qamruzzaman & Jianguo, 2018) because it reflects the average income level of the country.

3.2 | Empirical test sequence

The present study follows four (4) pathways namely; first, investigation of basic summary statistics and correlation analysis known as a pre-test. Second, the test for stationarity traits of all outlined indicators with a battery of test techniques such as conventional Augmented Dickey-Fuller (ADF), Philips Perron (PP), Dickey-Fuller Generalised Least Square (DF-GLS), Elliot, Rothenberg and Stock (ERS) and Kwiatkowski, Phillips, Schmidt, and Shin (KPSS) for robustness that accounts for a simple structural break. Finally, causality analysis by Modified Wald test of Tada-Yamamoto to explore causality direction among the series under consideration.

3.3 | Model specification

The functional expression for the hypothesised relationship among the study variables is drawn from the FDI-led growth theoretical backing. Furthermore, the current study builds on previous studies of (see Agbloyor et al., 2013; Sunde, 2017) by the incorporation of more dimensions of financial development to capture a broader perspective on the literature. The functional is given as:

$$RGDP = f(FDI, FD_{FS}, FD_{BS}, FD_{BS}, LABOUR_{FORCE}, GCF)$$

$$\begin{aligned} \ln RGDP_t = & \alpha + \beta_1 \ln FDI_t + \beta_2 \ln FD_{FS}_t + \beta_3 \ln FD_{BS}_t \\ & + \beta_4 \ln LABOUR_{FORCE}_t + \beta_5 \ln GCF_t + \varepsilon_t \end{aligned}$$

Here, α and β 's are intercept and partial slope parameters to be estimated respectively.

Based on economic intuition and logical reasoning we expect a priori signs for β_1 and β_2 to be >0 . That is, we expect a positive contribution for both proxies to economic growth. However, the expectation for β_3 , β_4 , and β_5 could be ambiguous as a positive sign for all forms of financial development indicates that they also enhance growth. However, this could also be negative as documented in previous empirical studies given the volatile nature of Nigeria economy and her degree of business receptivity environment. The need for further investigation is necessary to either validate/refute the hypothesised claim highlighted in Section 3.2.

4 | EMPIRICAL RESULTS

Statistical findings from preliminary test that consist of descriptive statistics, unit root test, and correlation matrix of the variables understudy followed by the ARDL findings are reported accordingly.

As shown in Table 1, LNRGDP has the highest means coefficient followed by FDI while FD on banking sector has the lowest mean

coefficient. The ratio of FDI/GDP is 0.8250% which considerable small but still fall between the range of average FDI inflow (−0.83 to 1.45%) to the Africa over the period 1970–2007 (see Agbloyor et al., 2013 for more) as reported in the second half of the table. Despite the mean FDI is about 21.62%, the proportion of the mean to several sectors are very small for financial development on financial sector (FD_FS = 2.6334%), and financial development on banking sector (FD_BS = 2.2655%). Similarly, standard deviation of all variables understudy are less than 1. This implies that all variables understudy are relatively stable as standard deviation is static method of measuring volatility. Skewness distribution shows that distribution for FD_FS and the control variables, that is, total labour force and gross capital formation are negatively skewed while other variables are positively skewed. This indicates that FD_FS future value would be lower than the mean while others variables future value would be greater than their current mean values.

Furthermore, the Kurtosis coefficient indicates that FD_FS distribution is far from normal distribution for the $K > 3$ while normality distribution of other series at 5% significance level is not rejected. In general, according to Kotkatvuori-Örnberg (2016) the presence of skewness and kurtosis in series distribution signifies non-normal distribution of the series. Our Jarque-Bera statistics' coefficients indicate that FD_FS distribution is not normally distributed, which is consistent with kurtosis distribution conclusion. Based on our results we concur with Dutta, Essaddam, Kumar, and Saadi (2014) and El Hedi Aroui, Lahiani, and Nguyen (2015) assertion that significance of the coefficient of Jarque-Bera statistics clearly rejects series normality distribution. Skewness of the series distribution marginally contributed to a relatively small coefficient of the sectorial FDI. According to Chang, Ren, and Shi (2009) if the skewness of the distribution is not zero, it exerts marginal contribution on the final finding. The finding of this study also shown that GDP and FDI moves in the same direction, which implies growth in Nigeria economy depends on the amount of FDI inflows. Our finding is similar to Sunde (2017) conclusion on unidirectional inflow of FDI to developing countries for economy growth.

	LNRGDP	LNFDI	LNFD_FS	LNFD_BS	LNLABOR_FORCE	LNGCF
Mean	26.2070	21.6202	2.6334	2.2655	17.6241	24.3321
Maximum	26.8747	22.9027	3.2792	3.1031	17.9078	25.2213
Minimum	25.5835	20.1920	1.1066	1.5990	17.2831	23.2367
SD	0.4601	0.8090	0.5164	0.4047	0.1908	0.6055
Skewness	0.1994	0.0811	−0.9837	0.2437	−0.2819	−0.0985
Kurtosis	1.4529	1.7521	3.7418	2.2961	1.7730	1.5466
Jarque-Bera	3.1905	1.9794	5.5265*	0.9162	2.2791	2.6888
Probability	0.2029	0.3717	0.0631	0.6325	0.3200	0.2607
Observations	49	49	49	49	49	49

Note: Value presented in the bracket is the p-value of Jarque-Bera(JB). The asterisk * indicates 10% significance level. Here, Foreign direct investment (FDI). We include covariates for financial development namely financial development from financial development from banking sector (FDI_BS) and Financial development from financial sector (FD_FS), Economic growth (GDP), while labour force, and gross capital formation (GCF) are used as control variables.

TABLE 1 Descriptive statistics

In addition, FD on banking sectors exhibits similar pattern. However, the FD on financial sector has a distinct pattern may request special attention as negative shock may severely affect the sector. Figure 1 shows the graphical presentation of the outlined variables under consideration.

Table 2 presents the correlation coefficient among the variables understudy. We observed high correlation between FD on private sector and FD on banking sector, therefore, FD on private was dropped from this study to prevent multi-collinearity issue. Majority of the variables are strongly correlated at 5% significance level. This finding is consistent with Canh et al. (2020) conclusion that FDI has

positive correlation with economic growth and trade openness. Surprisingly, correlation between FD_FS and Labour force is positive but statistically insignificant. The highest correlation is found between labour force and RGDP, followed by GCF and RGDP. Nothing that both labour force and GCF are control variables in this study. In general, positive correlation among the variables understudy is observed which implies that variables are moving towards same direction implying that FDI inflow enhances economic growth.

Table 3 presents the stationarity test of the variables understudy using several unit-root tests approach. This provides more robust findings on the stationarity of the series understudy. Based on the

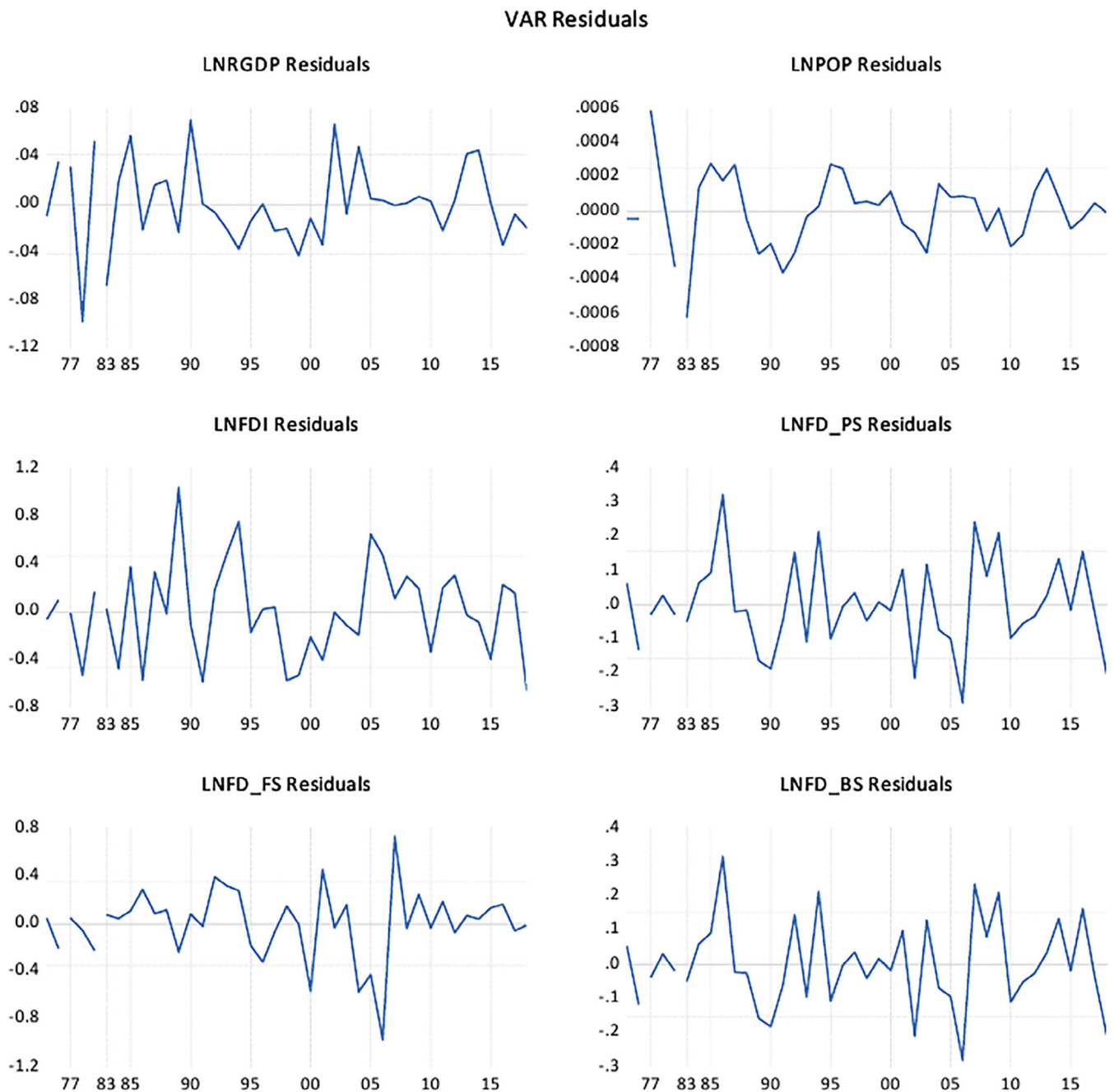


FIGURE 1 Visual plot of variables under consideration

TABLE 2 Correlation coefficient matrix analysis

	LNRGDP	LNFDI	LNFD_FS	LNFD_BS	LNLABOR_FORCE	LNGCF
LNRGDP	1					
LNFDI	0.7869***	1				
LNFD_FS	0.4141**	0.2280**	1			
LNFD_BS	0.8262***	0.8089**	0.4727**	1		
LNLABOR_FORCE	0.9592**	0.7860	0.2812	0.8561**	1	
LNGCF	0.9377**	0.7975	0.2226**	0.7657*	0.8872*	1

Note: Asterisk ***, **, and * denote 1%, 5%, and 10% significance level.

Variables	Level				
	ADF	PP	ERS	DF-GLS	KPSS
LNRGDP	-1.8054	-1.8823	1.1546	-1.6683	0.1929***
LNFDI	-2.1601	-2.2409	1.8799	-2.7377	0.1311
LNFD_FS	0.5006	-0.1717	1.4464	-2.0021	0.1183
LNFD_BS	-1.5165	-2.8434	1.2503	-1.6683	0.1171
LNLABOUR_FORCE	-1.1507	-1.6737	4.9632	0.1661	0.7071
LNGCF	-1.8801	-2.0124	34.1723***	-1.0658	0.2747***
<i>First difference</i>					
ΔLNRGDP	-4.6825*	-4.6825*	7.4436*	-5.5332*	0.1314
ΔLNFDI	-4.3641*	-4.3066*	5.5422*	-4.5239	0.1767**
ΔLNFD_FS	-3.2646***	-3.3649***	7.6446*	-3.4221**	0.1531**
ΔLNFD_BS	-6.1804*	-4.8257*	4.5831*	-5.5332*	0.3838*
ΔLNLABOUR_FORCE	-2.8032*	-2.9238*	2.3654***	-2.8331***	0.2470***
ΔLNGCF	-3.4203**	-3.2342**	2.6172***	-3.3472***	0.5077

Note: Asterisk ***, **, and * denote 1%, 5%, and 10% significance level. Δ denotes first difference Here ADF-Augmented Dickey-fuller (ADF), Philips Perron (PP) Dickey-Fuller Generalised least squares (DF-GLS), Kwiatkowski-Phillips-Schmidt-Shin (KPSS) and Elliott, Rothenberg and Stock (ERS). Here, Foreign direct investment (FDI). We include covariates for financial development namely financial development from banking sector (FDI_BS) and Financial development from financial sector (FD_FS), Economic growth (GDP), while labour force and gross capital formation (GCF) are used as control variables.

results of the series' stationarity tests we reject the null hypothesis of stationarity of the series at level. The lack of stationarity in the series meet the theoretical requirement for proceeding to the cointegration test (see Elyas & Masih, 2019). Chkili (2016) reported three stationarity tests using ADF, PP, and KPSS to affirm stationarity of series for the study. Specifically, our results of stationarity tests show that some variables are stationary at level $I(0)$ while majority of the variables understudy were stationary at the first difference $I(1)$. Having series of $I(0)$ and $I(1)$ mixture fulfilled necessary condition for using ARDL model. Therefore, this study applied ARDL model in this study. Using the first difference series is an accepted approach in opting for ARDL studies (see Liu, 2009; Malik et al., 2020; Qamruzzaman & Jianguo, 2018).

Table 4 presents the results of long-run and short-run relationship among the variables understudy. The finding establishes statistically significant short-run and long-run relationship between GDP and FDIs. As evident in the Table 4, the long-run shocks among the

TABLE 3 Stationarity of the variables

variables under evaluation are adjusting back to the equilibrium at the speed of 68.32%. Therefore, this finding supports the argument for mean reversion that the shock in the short-run is temporarily. Likewise, our result indicates that in the long-run, 1% shock to FDI decreases GDP by -0.7667 and -0.1879% in both short and long run, respectively, in Nigeria. This result supports Agras and Chapman (1999) conclusion that low-income countries could either unable to attract FDI or only service sectors attract FDI. However, findings on FDI to sectors contrary to the finding by Agras and Chapman (1999). Nigeria's financial sector and banking sector attract FDI in different proportion over the period of study. For example, 1% shock to the FD on financial sector significantly increase GDP by 0.3584% while FD on banking sector increases GDP by 0.0458% but not significant.

This suggests that FD on several sectors collectively determine the growth of GDP and economic development as a whole in Nigeria. According to Elyas and Masih (2019), the growth in GDP may attract

TABLE 4 ARDL findings and diagnostic reports

Model Variables	RGDP _t = ∫ (LNFDI _t + LNFD_FS _t + LNFD_BS _t + LNLABOUR_FORCE _t + LNGCF _t)			
	Short-run Analysis			
	Coefficient	SE	t-stat	P > t
ECT(-1)	-0.6832	0.0357	-19.1465	0.0000
ΔRGDP	-0.7667	0.0771	-9.9433	0.0000
ΔLNFDI	0.0731	0.0054	13.5451	0.0000
ΔLNFD_FS _t	0.1495	0.0085	17.5211	0.0000
ΔLNFD_BS _t	-0.1196	0.0137	-8.6820	0.0000
ΔLNLABOUR_FORCE _t	-0.2151	0.1922	-1.1187	0.3141
ΔLNGCF _t	0.2648	0.0137	19.3546	0.0000
<i>Loong-run analysis</i>				
LNFDI _t	-0.1879	0.0732	-2.5681	0.0501
LNFD_FS _t	0.3584	0.0307	11.6743	0.0001
LNFD_BS _t	0.0458	0.1708	0.2684	0.7991
LNLABOUR_FORCE _t	1.2451	0.2485	5.0097	0.0041
LNGCF _t	0.4970	0.0561	8.8627	0.0003
Constant	-4.7027	4.1740	-1.1267	0.3110
<i>Residual diagnostic results</i>				
Test	Coefficient			
ARCH	0.4334			0.4130
Normality	1.4046			0.4955
Serial Correlation	0.2644			0.7384
CUSUM	Stable			
CUSUM Sq.	Stable			
Adj.R ²	0.9877			
Durbin-Watson Stat	3.1819			
AIC	-7.0243			

Note: ***, **, * Represent 1%, 5%, and 10% statistical significance level respectively. The values in the brackets represent the p-value of diagnostic test. Here, Foreign direct investment (FDI). We include covariates for financial development namely financial development from banking sector (FDI_BS) and Financial development from financial sector(FD_FS), Economic growth (GDP), while labour force, and gross capital formation (GCF) are used as control variables.

TABLE 5 ARDL bounds testing

F-bounds test		Null hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	23.8044***	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15
Estimated models		EG-JOH-BO-BDM	Critical Values	Cointegration
RGDP _t = f(LNFDI _t , LNFD_BS _t , LNLABOUR_FORCE _t , LNGCF _t)		19.322***	19.604***	Cointegrated

Note: Bayer and Hanck cointegration test results. ***Denotes statistical significance rejection at 0.10 level.

more investors to invest their capital in such an attractive economy. These findings assert that FDI inflow to Nigeria has positive economic growth. Moreover, post-modelling diagnostic test such as ARCH,

normality, autocorrelation and Ramsey RESET tests are statistically insignificant which indicate that the finding are not spurious. Furthermore, the model is statistically significance at 1% as reported in

Table 5. The F-statistic of $K = 5$ is greater than ARDL upper bound test report at 1% significance level. Since the F -value is greater than the upper critical value, null hypothesis is rejected, there is sufficient evidence that the variables are significantly cointegrated (see Elyas & Masih, 2019). The results of the ARDL bounds to establish long-run bonds between the outlined variables. See below the CUSUM and CUSUMsq that depicts model stability as reported in Figures 2 and 3 as well as long-run equation provided.

Long-run equation is presented as follows:

$$\begin{aligned} \text{LNREGDP} = & 4.7027 (-1.1267) + 0.1879 * \text{LNFDI} (2.5681) \\ & - 0.3584 * \text{LNFD_FS} (11.673) \\ & - 0.0458 * \text{LNFD_BS} (0.2684) \\ & - 1.2451 * \text{LNLABOUR_FORCE} (5.0097) \\ & - 0.4970 * \text{NGCF} (8.8627) \end{aligned}$$

*Note that values in the parenthesis represent t-statistics of the equation variables.

Having established long-run relationship among the FDIs and GDP on Nigeria's economic growth, we proceeded to examine existence of causality among the series using Granger causality and the findings are reported in Table 6.

Table 6 presents the granger causality between variables under-study. The reports as evident from the table indicates unidirectional Granger causality. Interestingly, RGDP unidirectional granger cause FD_BS and GCF. Hansen and Rand (2006) finding supports that FDI granger cause GDP after examining 31 countries. Sunde (2017) reveals unidirectional granger causality from FDI to GDP on the study conducted on South Africa. Similarly, FDI and FD on financial sector unidirectional granger cause GCF. While FD on banking sector unidirectional granger cause labour force and GCF significantly. Furthermore, labour force granger cause GDP, FD banking sector and GCF significantly. The GCF unidirectional granger cause FD on banking sector. This implies that any shock to FD on financial sector in the long-run needs special attention by the authority as such shock may directly granger causes GDP, FD on banking sector and indirectly granger cause FD on financial sector through shock in GCF. This implies that shock to FD on financial sector make cause unidirectional

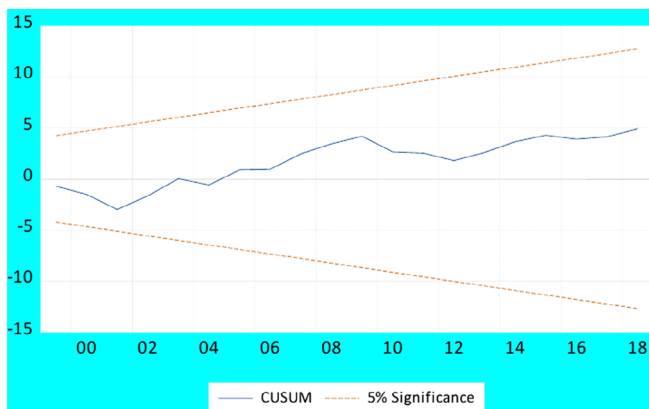


FIGURE 2 CUSUM

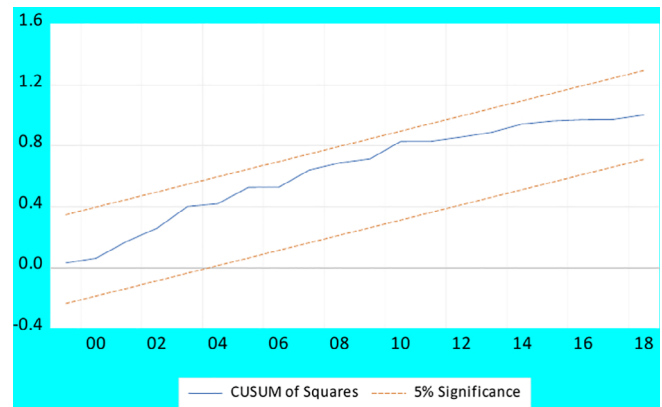


FIGURE 3 CUSUMsq

TABLE 6 Granger causality between LNGDP, LNFDI, LNFD_FS, LNFD_BS, LNLABOUR_FORCE, and LNGCF

Dependent variables	Independent variables	χ^2	p-Value
LNREGDP	LNFDI	2.0260	.1455
	LNFD_FS	1.0655	.3544
	LNFD_BS	4.0255	.0252**
	LNLABOUR_FORCE	0.2916	.7498
	LNGCF	7.3570	.0024**
LNFDI	LNREGDP	1.6581	.2037
	LNFD_FS	0.2203	.8034
	LNFD_BS	2.2379	.1202
	LNLABOUR_FORCE	0.5471	.5860
	LNGCF	7.4560	.0023**
LNFD_FS	LNREGDP	1.2110	.3088
	LNFDI	1.3031	.2842
	LNFD_BS	5.5949	.0073**
	LNLABOUR_FORCE	0.3277	.7239
	LNGCF	0.2380	.7897
LNFD_BS	LNREGDP	0.2833	.7547
	LNFDI	0.0980	.9069
	LNFD_FS	0.8744	.4251
	LNLABOUR_FORCE	3.7257	.0397**
	LNGCF	7.0229	.0031**
LNLABOUR_FORCE	LNREGDP	8.3043	.0019**
	LNFDI	0.1124	.8942
	LNFD_FS	0.4838	.6226
	LNFD_BS	2.7040	.0882*
	LNGCF	8.6947	.0015**
LNGCF	LNREGDP	0.5776	.5672
	LNFDI	1.3878	.2647
	LNFD_FS	2.9309	.0683*
	LNFD_BS	1.5002	.2388
	LNLABOUR_FORCE	0.0271	.9733

Note: ***, **, * Represent 1%, 5%, and 10% significance level. χ^2 represents Chi-square coefficient. There is unidirectional granger causality.

shock to all other varieties of FDs in Nigeria. This is consistent with Agbloyor et al. (2013) findings that FDI may lead to development of domestic banking sector.

5 | CONCLUDING REMARKS AND POLICY IMPLICATIONS

Our findings established a statistically significance long-run relationship between FDI and GDP in Nigeria. The findings support FDI increase economic growth in Africa (see Sunde, 2017). The study establishes mean reversion for the short-run shock and the speed of adjustment is estimated to be about 68%. Direct and indirect unidirectional Granger causality was established and FD in financial sector. This is highly sensitive and has a tremendous effect on all other FDs examined. Therefore, this study suggests that the authorities should pay vivid attention to FD on sectors. The policy implications of these findings for the Nigerians economy are:

First, our findings show that the development or growth is assured by the presence of FDI inflows in the long-run through the financial sector; this affirms that financial sector is the most important sector of Nigerian economy. This affirms Central Bank of Nigeria (CBN 2017) publication on structure of Nigeria economy. According to the CBN (2017) financial system is broadly divided into formal and informal. While the formal sector which includes banks and non-banks financial institutions are well regulated and monitored by all federal monetary agencies. It justifies Agbloyor et al. (2013) reciprocal relationship between advance and sophisticated banking system and FDI inflow. Similarly, Akinlo (2004) advocacy for economic policies change and transformation.

Second, the informal sector, however, is a loose organized system without any formal records and regulation (CBN 2017). Conclusively, interpretation and evaluation of its performance is not captured in these results or any other similar previous studies. Thus, Nigeria financial sector's influence is underestimated since many financial activities were not properly or not totally documented. Although, its impacts might have been felt through productions and consumption. Notwithstanding, authorities must design programs in which such vital financial activities must be recorded and monitored.

Third, proper regulation and monitoring programs would reduce vices such as corruptions, money laundry, mismanagement, and so on at both micro and macro and as well as public and private levels that are major problems of Nigerian economy as evident in Contractor, Dangol, Nuruzzamana, and Raghunath (2020). At the macroeconomic level, such activities would enhance Nigeria's balance of payment if it leads to international business. Similarly, and most importantly, at micro level, it would enhance the GDP and elevates the masses' standard of living, protection of the have-not against the affluent transgression. Finally, it would prevent fraudulent transactions at both government and private institutions which would ultimately serve as prevention against funding terrorist organizations such as Boko Haram in Nigeria and Sub-Saharan Africa as a whole. This conclusion is in conformity with Bildiricia and Gokmenoglu (2020) assertion. This

would ultimately lead to economic and political stabilities. Similarly, our findings are in line with Alguacil et al. (2011) and Canh et al. (2020) conclusion that microeconomic uncertainty adversely affects FDI inflow. Taking these recommendations into account would serve as resilience against any short-run shock's effects that are recipes for FDI attractions in Nigeria.

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