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Private Investment and Industrial Growth in West Africa

[1]Adeyemi Paul Adeniyi, [2]Akinbiola Folorunso Victor & [3]Jolaiya Damilola Olakunle
[1,2&3]Ekiti State University,
Ado-Ekiti, Nigeria

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Abstract

Private investment is highly vital industrial growth and it serves as a catalyst for sustainable development but the challenges of the private sector investment in West African countries have been an impediment to drive industrialization to its fullest potential in West Africa. On this basis, this study broadly examined the relationship between private investment and industrial growth in West Africa. Specifically, the study set out to investigate the impact of private investment on industrial growth and also explore the direction of causality between the two variables in West Africa respectively. The study utilized recent econometric tools of Panel ARDL model and Panel Pairwise Granger Causality test in estimating the modeling of the study. The ARDL result revealed that there is a significant positive relationship between private investment and industrial output in West Africa. The finding of this study also exhibited that that is insignificant positive relationship between gross fixed capital formation and industrial output while the result confirmed insignificant negative impact of the share of agriculture to the GDP and interest rate on industrial output. The result of Pairwise Granger Causality revealed that there is uni-direction causality between trade openness, foreign direct investment, and exchange rate and industrial output in West Africa. In line with these findings, the study recommends that governments should encourage FDI inflow into the countries of West Africa so that it can serve as a conduit for the transfer of technology, machines, knowledge and skills from industrialized economies to developing countries' manufacturing sector which will lead to the growth and diversification of such economies. Besides, governments of West African countries should effectively channel her resources on productive sectors and while spending on capital projects such as power generation, road, water supply, etc, it should be properly monitored.

Keywords: *Private investment, Industrial output, Panel ARDL model and Panel Pairwise Granger Causality test*.

Corresponding Author: **Adeyemi Paul Adeniyi -** ORCID: https://orcid.org/0000-0003-0747-8747

Background to the Study

Industrialisation is a sine qua non for sustainable economic growth and it is what the present regime of West Africa countries needs to achieve for its transformation agenda. Industrialisation provides an ecosystem for entrepreneurship, promotes business investment, fosters technological upgrading and dynamism, improves human skills and creates skilled jobs, and through inter-sectoral linkages establishes the foundation for both agriculture and services to expand (UNIDO, 2015). It also creates decent jobs and expanding the fiscal revenues needed for social investments which can boost capacity for inclusive development, creating decent work for all, improving health and education systems and living standards, thus alleviating poverty, socio-political tensions and tackling the root causes of migration (UNCTAD, 2020). Rarely has a country progressed and become developed without sustained structural transformation from an agrarian or resource-based economy towards more productive agri-business and a sophisticated industrial or service-based economy (Yong, 2016). Private sector-led industrial development plays a significant role in bringing about the much-needed structural changes that can set the economies of poor countries on a path of sustained economic growth. The private sector has a major role to play in the development and uptake of new innovative technologies and industrial growth.

In any economy, one of the main drivers of growth and sustainable development is the efficient and effective utilization of private resources (private investment) in the economy. This notion is driven by opinions from empirical studies in the past which suggest that private sector led growth has a greater effect on the economy than public sector led growth (Karagöl, 2004). Private sector investment has been the engine of employment and income creation, provision of infrastructure as well as social services. The international organisations have equally acknowledged the role of the private sector in enhancing economic growth of developing countries. Notably, European Commission (EU) (2014) said that the private sector has the potential for generating inclusive and sustainable growth in developing countries. International Finance Corporations (IFC) (2011) equally asserted that the private sector is a critical component in addressing the development challenges of the developing countries through its contributions in many areas, including growth, industrial sector, employment, poverty reduction, service delivery, food security, climate change mitigation, environmental sustainability, and contributions to taxes. This means that the presence of the private sector can at least spur economic growth and poverty reduction. The bottom line is that industrialisation has been upheld as a catalyst for sustainable development in an economy. Thus, conscious investment from Private Sector on infrastructural financing and development is what is required to attain industrialisation and economic recovery.

Statement of Problem

There is a great deal of empirical evidence to suggest that it is not an easy task for a government to make the production of all goods and services for all the needs and what it entails to provide a robust well-being of its citizens. It has been acknowledged in the literature that the activity of the private investment is a fulcrum to enhance industrial sector as well as to give immense support to the government (public sector). However, despite that fact that private investment is a pillar and a stronghold to boost industrial development, private

investment in Nigeria keeps collapsing basically due to salient factors such as policy somersaults, bad governance, decay infrastructures, etc. These foregoing factors have made a lot of investments moribund and chased away many potential investors both local and foreign in west Africa. In literature, there are various studies on the relationship between private investment and industrial growth both in country-specific and cross-country's analysis but only few studies have been carried out on the nature and the direction of causality between these two variables in ECOWAS countries. On this backdrop, this study intends to examine basically the causal relationship between private investment and industrial output in Nigeria.

The broad objective of this study is to investigate the relationship between private investment and Industrial growth in West Africa while the specific objectives are to: examine the impact of private investment on industrial growth as well as to explore the direction of causality between private investment and industrial output in West Africa. The rest of the paper is organized as follows: The Section two presents the relevant empirical literature. Section three describes the theoretical framework and methodology. The section 4 discusses the results while the final section concludes.

Empirical Literature

Fimpong and Marbuah (2010) also looked into factors that have either stimulated or damped private investment in Ghana. With the use of unit root tests, cointegration and error correction techniques within an Autoregressive Distributed Lag (ARDL) framework the results of the study indicate that private investment in the short-run is positively related to public investment, inflation, real interest rate, openness, real exchange rate and a regime of constitutional rule. Private investment in the long run is positively related to real output, inflation, real interest rate, openness and real exchange rate; while negatively affected by external debt.

Gerald, Bonga and Thabani (2019) examined the Macroeconomic determinants of private investment in sub-Saharan Africa using data spanning from 2000 to 2017 for 35 SSA countries. The study employed the pooled regression, fixed effect and random effect model as well as the Panel Corrected Standard Error technique in an attempt to analyse the macroeconomic determinants of private investment. The main finding of the study indicates that, in SSA region, private investment was determined by GDP, real interest rate, public investment and inflation.

Salvador, Holger and Eric (2007) used panel data analysis to analyse the impact of foreign direct investment on industrial development of the host country. The finding from this study showed that the competition effect may have initially deterred local firm entry, this initial effect outpaced positive externalities making the overall impact of FDI largely positive for the domestic industry.

Ekpo (2016) examined issues on the determinants of private investment in Nigeria. The study has identified determinants of private investment in Nigeria to include domestic inflation rate, size and growth rate of market, availability and access to bank credit, interest rate, fiscal deficits, public investment rate, poor provision of infrastructure, political and economic

stability, investment climate and institutional factors. The findings show that, among other things, from the colonial government era up to the Nigeria's First Development Plan of 1964, there was commitment to the promotion of private investment. The relative non-performance of the private sector in general and the disappointing inflow of expected foreign capital during the First National Development Plan in particular, spurred the need for greater public sector involvement in the economic activities. This work establishes that the expected sustained improvement in the level of private investment has been greatly constrained by the adverse impacts exerted by most of the determinants of private investment.

Adeyemi and Oloruntuyi (2019) used ARDL Cointegration and Error Correction model to explore the relationship between private investment and manufacturing output in Nigeria. The results of the study revealed that public investment has negative and significant impact on manufacturing output in Nigeria while credit to private sector has significant positive relationship with manufacturing output in Nigeria. Other variables in the study in the long run have no significant impact on manufacturing output in Nigeria.

Olatunji and Etukomeni (2019) examined infrastructural investment and industrial growth via private investment approach. The study employed ARDL bound testing approach to estimate the relevant relationships. The result of the study revealed that there is long run cointegration among the variables of the study. Similarly, Ayeni (2020) used ARDL Cointegration analysis to investigate the determinants of private investment in Gambia. The results revealed that there is cointegration among the variables. The result also showed that high exchange rate increased the real cost of import especially the capital goods making investments very costly. Moreover, the finding of the study equally exhibited that huge debt hampers private investment in Gambia.

Nguohouo and Ewane (2020) used Pooled Mean Group estimation technique to examine the direct and the indirect effect of foreign direct investment on industrialization by comparing the franc and the non-franc zone countries in Africa. The results showed that FDI has a significant positive effect on industrialization within the franc zone countries while it has a negative but significant effect on industrialization within the non-zone franc countries. In other words, the results reveal that within the franc zone, industrialization is at better advantage when compared to the non-franc zone countries.

Obianuju and Anthony (2022) examined the dynamic relationship between foreign direct investments in Nigeria. The study employed cointegration and error correction techniques to capture the stated objective of this paper. The result from this study showed that FDI does not have a significant impact on industrialisation. Findings from the study also revealed that trade has not significantly influenced industrialisation in Nigeria.

Theoretical Framework and Methodology

Theoretical Framework

The Accelerator Theory

The theory states that an increase in the rate of output of a firm will require a proportionate increase in its capital stock. That is, an increase in output puts pressure on existing production

capacity which calls for an expansion of the capital stock and in turn necessitates a high rate of investment expenditure. Accelerator is the ratio of capital to output, that is

$$B = \frac{K}{Y} \text{ ----------1}$$

K_t as stated below is optimal capital stock in period t, β (accelerator) is a positive constant and Y_t is output in period t.

$$K_t = \beta Y_t \text{ ----------2}$$

Any change in output will lead to a change in the capital stock as in equation (3)

$$\Delta K_t = \beta \Delta Y_t \text{ ----------3}$$

In equation (4), a change in capital stock leads to change in output

$$K_t - K_{t-1} = \beta(Y_t - Y_{t-1}) \text{ ----------4}$$

In equation (5), the level of net investment is proportional to change in output

$$I_t = \beta(Y_t - Y_{t-1}) \text{ ----------5}$$

More so, the flexible accelerator which suggests that the net investment is the fraction of the difference between planned capital stock and actual capital stock in the previous period is also a function of change in demand for output overtime. This indicates that increase in output will stimulate productive capacity which brings optimal capital stock. Optimal capital stock will promote growth of investment.

Model Specification

The model used in this study follows the model of Obianuju, Lotanna and Anthony (2022) with modifications which derived its root from theory of Accelerator Principle. This study modifies the model with a control variable of exchange rate, interest rate and inflation.

The model is thus specified below:

IND = F (FDI, GFCF, OPENNESS, AGRIC, EXR, INT, INF)----------.------1

By linearizing the function, we have the following equations:

$$IND_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 GFCF_{it} + \beta_3 OPENNESS_{it} + \beta_4 AGRIC_{it} + \alpha_5 EXR_{it} + \alpha_6 INT_{it} + \alpha_7 INF_{it} + \varepsilon_t \text{ ---------- (2).}$$

It is pertinent to point-out that both the linear and the log-linear specifications were tried; however, the log-linear appeared better in terms of goodness of fit, precision of estimates and a tolerable level of multi-collinearity. Thus, transforming equations 2 into aggregate production function

Yi =AXi + U ----------(3)

Where;
IND = Index of industrial output
FDI = Foreign Direct Investment
GFCF= Gross Fixed Capital Formation
OPENNESS = Trade Openness
AGRIC= The share of agriculture to the GDP
EXR = Exchange rate
INT = Interest rate
INF= Inflation β_0
β_0= intercept, β_0- β_0 = parameters/coefficients.

Estimation Techniques
This study employed ARDL panel cointegration and Error Correction model as well as Panel Granger Causality test to examine the impact of private investment on industrial growth in West Africa and to explore the direction of causality between private investments on industrial growth in West Africa respectively.

A Prior Expectation
This refers to the expected relationship between the dependent variables and independent variables of the model. In connotation to the economic theory, foreign direct investment, gross fixed capital formation and share of agriculture to GDP is expected to impact industrial output positively while exchange rate, interest rate and inflation is expected to impact industrial output negatively. The theoretical expectation is symbolically expressed as follows:

$\propto_1 \propto_2 \propto_3 \propto_4 > 0$ while $\propto_4$ and $\propto_5 \propto_6 \propto_7 < 0$

Sources of Data
This study relies on secondary data. Data like external debt, domestic debt, budget deficit, broad money supply and exchange rate were sourced from World Bank Development Indicator, World Bank Data Base, World Bank Global Development Network Growth Data Base, National bureau of statistics and Central Bank of various sub-Saharan African countries statistical bulletins (2021). Data such as inflation, interest rate and debt were sourced from IMF's International Financial Statistics (IFS) and United Nation statistical bulletin (2021).

Results and Discussions

Panel Unit Root Test

Table 1: Panel Unit Root Test Result

Variable		IND	FDI	GFCF	TOP	AGR	INF	EXR	INT
Level	ADF Fisher Unit Root Test	15.6555	19.6561	96.0503	147.209***	57.5726	56.9005	4.31932	31.1563
	Phillips-Perron Fisher Unit Root Test	29.3724***	24.5091	438.519	242.183***	127.334	87.9367	3.12027	21.5757
1st Difference	ADF Fisher Unit Root Test	129.379***	128.327***	214.512***	9.66188	163.315***	113.678***	58.4952***	94.0581***
	Phillips-Perron Fisher Unit Root Test	461.234	764.201***	1109.26***	8.50327	1108.00***	1338.53***	82.4141***	138.791***

Note: *** *signifies 1% level of significance*

In furtherance of the analysis, it is vital to test for unit root or stationarity using ADF Fisher Unit root and Phillips-Perron Fisher Unit root test for individually variables in this study. Results of Table 4.3 reveal that only Trade Openness (TOP) is stationary at levels while other variables are stationary at first difference using ADF Fisher Unit Root test. On the other hand, Index of Industrial Output (IND) and Trade Openness (TOP) were stationary at levels while all other variables were stationary at first difference when Phillips-Perron fisher Unit roots test was used. Furthermore, the table below shows the probability of variables used implying a 1 percent level of significance. Based on the condition that the variables are integration of order zero and one, the study can go for ARDL panel data analysis.

ARDL Panel Data

Table 2: Panel ARDL Estimation of 6 West African Countries

	Pooled Mean Group		**Mean Group**	
Variables	**Long Run**	**Short Run**	**Long Run**	**Short Run**
FDI	0.355676*		0.3066845	
	(1.70)		(0.81)	
GFCF	0.0308426		0.1029663	
	(1.15)		(1.50)	
TOP	0.0851222**		-1.24543	
	(2.00)		(-0.88)	
AGR	-0.106888		-	
	(-0.42)		0.7818674	
			(-1.37)	
INF	-0.0444478		-	
	(-1.57)		0.3936697	
			(-0.93)	
EXR	0.0239213		-1.034424	
	(0.60)		(-1.08)	
INT	-0.0529316		-	
	(-1.51)		0.4467048	
			(-1.01)	
Hausman Test			12.43	
			(0.0872)	
ECT(-1)		0.8017066***		0.9137313***
		(5.53)		(5.53)
D(FDI)		-0.1321289		-0.0188499
		(-1.13)		(-0.13)
D(GFCF)		0.1238515		0.1314548
		(1.64)		(1.54)
D(TOP)		0.1703164*		.0366379
		(1.93)		(0.31)
D(AGR)		-0.1605134		-0.2857206
		(-0.92)		(-1.39)
D(INF)		0.0344024		-0.030616
		(0.75)		(-0.28)
D(EXR)		-0.1686864		-0.2690318
		(-1.28)		(-1.43)
D(INT)		-0.0167997		-0.0833162
		(-0.78)		(-0.79)
Constant		-86.36423***		-195.4836***
		(-2.92)		(-3.01)
Observations	210	210	210	210

Note: ***, ** and * *signifies 1%, 5% and 10% level of significance*

The table 2 reveals the pooled mean group (PMG) and mean group (MG) results. The Hausman test reveals Pooled Mean Group Test is most appropriate given the probability test is greater than 5 percent. From the result of the Pooled Mean Group, Foreign Direct Investment (FDI) has a significant positive relationship which implies that a unit increase in FDI lead to an average 35.56 percent increase in Industrial Output (IND) in the long run having a significant level of 10 percent. Also, Trade Openness (TOP) positively impacts

Industrial Output (IND) with a significant level of 5 percent. Furthermore, Gross Fixed Capita Formation (GFCF) and Exchange Rate (EXR) have positive but insignificant association with Industrial Output (IND) while Share of Agriculture to GDP (AGR), Inflation Rate (INF) and Interest Rate (INT) has negative insignificant impact on Industrial Output (IND).

However, the error correction term (ECT) shows 80.17 percent speed of adjustment in any incidence of disequilibrium or shock in the short back to equilibrium. This implies that there is significant 80.17 percent ability for self-adjustment to happen in the long run. Nevertheless, in the short run, it was revealed that within the years under review, Foreign Direct Investment (FDI) was negatively related to Industrial Output (IND) but highly insignificant, this is also applies to Share of Agriculture to GDP (AGR) and Exchange Rate (EXR). On the other hand, Gross Fixed Capita Formation (GFCF), Trade Openness (TOP) and Inflation Rate (INF) have positively insignificant coefficients as regards to the dependent variable Industrial Output (IND). Constant at zero level of all the dependent variables Pooled Mean Group and Mean group were -86.36423 and -195.4836 respectively which is significant at 1 percent.

Pair-wise Granger Causality Test

Table 3: Pair-wise Granger Causality Test Result

Null Hypothesis:	**Obs.**	**F-Statistic**	**Prob.**	**Decision**
INF does not Granger Cause IND	198	0.00329	0.9967	Accept
IND does not Granger Cause INF		3.15687	0.0448	Reject
TOP does not Granger Cause IND	198	2.00297	0.1377	Accept
IND does not Granger Cause TOP		3.00106	0.0521	Reject
GFCF does not Granger Cause FDI	198	2.71512	0.0687	Reject
FDI does not Granger Cause GFCF		2.62404	0.0751	Reject
EXR does not Granger Cause FDI	198	0.99208	0.3727	Accept
FDI does not Granger Cause EXR		3.35175	0.0371	Reject
TOP does not Granger Cause GFCF	198	4.56601	0.0115	Reject
GFCF does not Granger Cause TOP		0.34272	0.7103	Accept
AGR does not Granger Cause GFCF	198	6.12045	0.0026	Reject
GFCF does not Granger Cause AGR		4.63711	0.0108	Reject
EXR does not Granger Cause GFCF	198	3.82711	0.0234	Reject
GFCF does not Granger Cause EXR		0.0382	0.9625	Accept
TOP does not Granger Cause INF	198	8.26445	0.0004	Reject
INF does not Granger Cause TOP		0.01527	0.9848	Accept
AGR does not Granger Cause INF	198	2.84191	0.0608	Reject
INF does not Granger Cause AGR		0.42321	0.6555	Accept
EXR does not Granger Cause TOP	198	2.73555	0.0674	Reject
TOP does not Granger Cause EXR		0.9683	0.3816	Accept

The table 3 reveals the pairwise granger causality test for the model as the result indicates a Uni-direction between Industrial output (IND) and Inflation Rate (INF) which is significant at 5 percent. Uni-directional causality also applies to Industrial Output (IND) and Trade Openness (TOP), Foreign Direct Investment (FDI) and Exchange Rate (EXR), Trade Openness (TOP) and Gross Fixed Capita Formation (GFCF) of which are significant at 10 percent, 5 percent and 5 percent respectively. Furthermore, Exchange Rate (EXR) granger cause Gross Fixed Capita (GFCF), and Trade Openness (TOP) granger Cause Inflation Rate (INF) at 5 percent while Share of Agriculture to GDP (AGR) granger Cause Inflation Rate (INF), and Exchange Rate (EXR) granger cause Trade Openness (TOP) at 10 percent level of significance. However, there exists Bi-directional causality between Gross Fixed Capita Formation (GFCF) and Foreign Direct Investment (FDI) significant at 10 percent. This is also the case with Share of Agriculture to GDP (AGR) and Gross Fixed Capita Formation (GFCF) which is significant at 5 percent

Conclusion and Policy Recommendations

This study investigated the relationship between private investment and industrial growth in West Africa. The specific objectives of this study are to examine the impact of private investment on industrial output and to determine the direction of causality between private investment and industrial growth in West Africa respectively. The result from the specific objective number one exhibited that the long run results of Pooled Mean Group revealed there is a significant positive relationship between foreign direct investment, trade openness and industrial output in West Africa. This result is in line with theoretical connotation. The study also revealed that gross fixed capital formation has positive effect on industrial output but it is insignificant. However, another long run result exhibited a insignificant negative relationship between the share of agriculture to the GDP, interest rate and industrial output. The third objective used Panel Granger Causality test. The result of this objective also showed that there is uni-directional causality between trade openness, foreign direct investment, exchange rate and industrial output while there is bi-directional causal relationship between gross fixed capital formation and foreign direct investment. In line with these findings, the study recommends that governments should encourage FDI inflow into the countries of West Africa so that it can serve as a conduit for the transfer of technology, machines, knowledge and skills from industrialized economies to developing countries' manufacturing sector which will lead to the growth and diversification of such economies. Besides, governments of West African countries should effectively channel her resources on productive sectors and while spending on capital projects such as power generation, road, water supply, etc, it should be properly monitored.

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