External Financing and Industrial Growth in Nigeria

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ABSTRACT

This study examined the potential of external financing in spurring industrial growth in Nigeria within the period of 1985-2018. The study used Industrial Output (INDO), External Loans (EXL), Foreign Direct Investment (FDI), Remittances (RIMT), Gross Fixed Capital Formation (GFCF), Industrial Energy Consumption (IEC) and Contract Intensive Money (CIM) as variables in estimating the relationship. The study hinged on Great Big Push Theory and Kaldor's First Law and adopted the Autoregressive Distributive Lagged (ARDL) bound approach as the estimation technique. The findings revealed that, a positive relationship exists between EXL and INDO while FDI and RIMT exerts a negative effect on industrial growth. The control variables further showed that GFCF, IEC, CIM exerts positive influence on industrial growth. Since only EXL exerts positive influence on INDO, the study concludes that external financing (that is, FDI and RIMT) has not yielded the desired effect on industrial growth in Nigeria. The study recommended amongst others that; public-private partnership, is necessary to spur the industrial sector activities with strong institutional setup.

Keywords: *External financing, Industrial output, Foreign direct investment, External loans, Remittances, Contract intensive money, Gross fixed capital formation, Industrial energy consumption.*
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Highlights of this paper

- This study examined the potential of external financing in spurring industrial growth in Nigeria within the period of 1985-2018.
- The findings showed that: external financing has long term relationship with industrial growth in Nigeria; foreign direct investment, remittance, have significant negative effects on industrial growth in Nigeria in the long-term, while external loan, gross fixed capital formation, industrial energy consumption has a significant positive effect on industrial growth in Nigeria.

1. INTRODUCTION

Different economists have acknowledged the importance of external financing in propelling various economic activities towards sustainable economic growth in economic literature. This is evident in growth models of Classical Growth theory, Keynesian theory, and Great Push Theory (Turnovsky, 2000). Therefore, in economies where domestic finance is inadequate, tendency exist for low level of investment in industrial sector and subsequently economic growth will be slow. In situations where it is not possible to raise investment levels due to deficient savings, foreign inflow is a valid alternative according to Baye and Jansen (2006). In corroboration to the above, Fosu and Magnus (2006) posit that foreign capital inflow is an important vehicle for augmenting the supply of funds for domestic investment.

The flow of external financing in form of foreign direct investment, external loans and other concessional financial facilities, to developing countries, have quadrupled in Africa since 2001 (Africa Development Bank, 2013). Over the years, external financing specifically foreign direct investment has become the largest source of foreign funds flowing to developing countries, of which Nigeria is one of the highest recipients in sub-Saharan Africa countries (UNCTAD, 2015). On remittances, Nigeria receives the highest amount in Africa accounting for 65% of officially recorded remittance inflow to the region (Orozco, 2003; World Bank, 2004). Total remittance in 2011 was $10.68 billion rising to $20.8 billion in 2015 and rose to $22 billiion in 2017 (Network of Research on Africa (NORMA), 2017).

Importantly, findings from newly industrializing and emerging economies has shown that sustainable development is not feasible on a weak industrial base (Lall, 1999). Alfaro (2003) and Barrios *et al.* (2004) further asserted that there is a strong link between the level of industrialization, economic growth and development. Industrialization helps countries to achieve increase in investment, diversify their economies to achieve a high growth rate, and reduces the risk from external shocks; this is evident in countries like Japan, China, Malaysia, Singapore etc. Furthermore, supporting institutions such as research institutes like Federal Institute of Industrial Research (FIIR), Raw Materials Research Development Centre (RMRDC) with offices situated in each state of the federation (Adaowo, 2002) have been set up in addition to polytechnics and universities of technology. However this has not yielded meaningful impact to Nigeria's industrial base. Wickramarachi and Savard (2018) aimed at providing a baseline assessment for countries seeking to improve their business environments and attract foreign investors. This assessment ranked Nigeria at 104 out of 136 countries on the six continents, which implies that, the needed foreign presence to drive industrial growth is still limited and largely skewed towards crude oil exploration.

Unfortunately, based on the growth outlook in Nigeria, the available industrial outlet is still operating beyond the installed capacity even with some foreign investors aimed at boosting the sector's activities. Nigeria has also established industrial/trade zones across the country, but the foreign presence and positive impact on industrialization is yet to be seen even with concessions, waivers, and tax holidays granted to both foreign and domestic investors. The share of industrial sector to GDP in 1985 stood at 50.4% decreasing to 43.2% in 1999 when Nigeria ushered in a fourth democratic regime. It declined to 24% in 2015 and further dropped to 23.18% in 2018. This downward trajectory of industrial growth is not surprising given the continuous rise in the statistics of non-oil

imports to the tune of ₦7.0bn in 1985, rising to ₦650.9bn in 1999, ₦9,350.8bn in 2015 and ₦9,758.9bn in 2018 while non-oil export witnessed slow growth amidst the enormous potentials of Nigeria's industrial sector. In the corresponding period, it stood at N0.5bn, rose to ₦19.5bn, ₦660.7bn and ₦1,434.2bn respectively. This is a clear indication that Nigeria is still a traditional economy with high dependence on imported products. The research on external financing on industrial growth in Nigeria is with the sole aim of outlining how scholars have contributed to this important research agenda. The reviewed studies of Adekunle and Sulaimon (2018); Oburota and Ifere (2017); Ugwuegbe *et al.* (2016); Chigbu *et al.* (2015); Ferdaous and Acma (2014); Orji *et al.* (2014); Bashir (2013); Akinpelu *et al.* (2013); Ekpo and Afangideh (2012) centres on economic growth with positive outcomse. The only similar work is that of Okonkwo (2016) who focused on industrial growth and failed to incorporate important proxies of external financing options such as foreign direct investment and remittance in his/her model. The point of departure from the reviewed empirical literature is that, this study is specifically on industrial growth with the inclusion of variables such as foreign direct investment, remittance and contract intensive money to proxy for quality institution in this study. It is in this light that this study seeks to examine the potential of external financing in boosting industrial growth in Nigeria.

This article proceeds as follows. Section 2 present the literature review, section 3 describes the methodology. Section 4 discusses the results and checks for the robustness of our analysis, while section 5 concludes with recommendations.

2. REVIEW OF RELATED LITERATURE

2.1. External Financing

The study conceptualises external financing as the flow of funds and other capital goods in form of managerial know-how and modern technology from developed to developing countries to boost their productive capacity. Similar, it is a flow of technical expertise into developing economies from foreign counterparts to finance developmental projects for the overall growth of the economy. This external financing could be in form of foreign direct investment, external loans and remittances and sometimes, this external financing could be in concessionary terms. This definition is in corroboration with International Monetary Fund (IMF) (2016) assertion with emphasis on external finance to augment for domestic investment within the developing economies. Most developing economies have their investment root traced to advanced economies, international institutions and other multinational corporations due to limited resource capacity to embark on large-scale infrastructural development for production of goods and services. United Nations and its sub-bodies have continued to emphasize on the need for high and stable capital flows from developed to developing countries, with a recent shift from multilateral and bilateral official flows to private flows.

2.2. Industrial Output

This study views industrial output to be the total value addition from the combination of natural resources, human capacity and technological method to produce semi-finished and finished goods. The level of industrialization is both exogenous and endogenously driven because of the various factors of production required for its production processes. Nigeria being a developing economy is still entrenched with deficiency in both the managerial and modern technology to innovate new products, thus the need for external financing through external loans, foreign direct investment and remittances which enhances production capacity hence boosting industrial activities. There are three (3) segments of the industrial sector in Nigeria namely – crude petroleum and natural gas, solid minerals and manufacturing. The above definition corroborates with that of Todaro and Smith (2011)

who alluded that for a nation to be industrialised, it requires structural transformation and structural transformation is the process of transforming an economy in such a way that the contribution to national income by the manufacturing sector eventually surpasses the contribution by the agricultural sector. To Adejugbe (2004) industrialization is the process of harnessing human and material resources, with increasing application of science and technology to the production of goods and services. The extent of industrialization of a country can be assessed by the manufacturing sector's capacity utilization, the percentage share of the manufacturing sector to the country's gross domestic product, contribution of solid minerals to GDP and as well as the output of finished goods from manufacturing sector.

2.3. Theoretical Literature

2.3.1. Great Big Push Theory

Great Big Push theory is associated with Rosenstein-Rodan (1961) who asserted that "coordinated investment" is the basis of the concept of the big push. That is a large comprehensive programme is needed in the form of a high minimum amount of investment to overcome the obstacles to development in an underdeveloped economy and to launch it on the path of progress. Developing countries generally lack the capital required to provide this big push in investments. Hence, the big push hypothesis became the justification for foreign aid and other external financing channels. For meaningful development to set in, specific amount of resources must be available for all-inclusive programmes. Therefore, Rosenstein-Rodan's arguments became a major part of the way development economists thought about development problems in the 1950s and 1960s, and this has being taught in development course (Todaro and Smith, 2011). Importantly, Big Push idea has returned to the center of development policy in recent times. Especially the coming up of Commission for Africa and the Millennium Development Goals in line with the United Nations MDGs, and most recently the Sustainable Development Goals which kick started in January 1st 2016. Transforming development possibilities of Africans has been associated with renewed emphasis on the positive case for a Big Push. This has been linked to the case for a major expansion in collaboration with other foreign countries and investors.

2.3.2. Kaldor First Law

On the other hand, Kaldor (1966) posited that the growth trajectory of developed economies in the post war period displayed the relationship between industrial growth and the performance of the economy as a whole. This observation is the origin of Kaldor's first law, which states that there is a close relationship between the growth of manufacturing output and the growth of the gross domestic product (GDP). The vibrancy of manufacturing and other subsectors of industry in developing countries requires external financing because of their backwardness in capital goods and managerial expertise, as such this study looks at how this external financing can spur the growth of industrial sector as postulated by big push theory amongst others.

In addition, theories making case for flows of external financing to developing countries, have not tinkered on the possibility of incorporating quality institutions in growth and development theory thus rendering the applicability of those theories to developing countries a challenge. In the quest to address these issues, supporting arguments from notable scholars led by Stiglitz (2001) in revised Washington Consensus became prominent. In order to reap the full benefits of globalization effectively, the economy requires quality institutions that can enforce contract and property rights. According to Clague *et al.* (1999) enforcement of contract and property rights through the ratio of contract intensive money can bring about a larger share of industrial output to GDP and gains from

economies of scale and specialization leading to higher capital stock, productivity and per capita income. In addition, the greater the ability of investors to source funds the higher rate of investment and faster rate of economic growth.

2.4. Empirical Literature

Adekunle and Sulaimon (2018) examined the relationship between foreign capital flows and economic growth in Nigeria. The study used Autoregressive Distributed Lag (ARDL) on annual data for the period of 1986 to 2015. Findings showed that foreign capital flows (foreign direct and portfolio investment, external loans and foreign aids) exerts both linear and non-linear effects on economic growth in Nigeria.

Oburota and Ifere (2017) examined the effect of manufacturing subsector on economic growth in Nigeria. The study used Johansen Cointegration and Error Correction Model on annual data from 1981 to 2013. Results showed that manufacturing output, capital and technology influences economic growth positively while institutional quality and labour force exerts negative effect on economic growth.

Ugwuegbe *et al.* (2016) investigated the effect of external borrowing and foreign aid on economic growth in Nigeria. The study used Ordinary Least Square technique (OLS), Johansen Co-integration and Error Correction Method (ECM) on annual data of 1980 to 2013. Empirical result showed that external debt has a positive and significant effect on economic growth.

Okonkwo (2016) investigated the relationship between foreign portfolio investment and industrial growth in Nigeria. The study used Ordinary Least Square (OLS) on time series data for the period of 1986 to 2013. Findings revealed that there is a positive relationship between foreign portfolio investment, gross fixed capital formation, market capitalization and industrial growth.

Chigbu *et al.* (2015) examined the impact of capital inflows on economic growth of developing countries (Nigeria, Ghana, and India). The study used Johansen Co-integration, Granger Causality, and Ordinary Least Square on the data covering the period of 1986-2012. Findings showed that capital inflows of foreign direct and portfolio investment, foreign borrowing and remittance have significant impact on economic growth of the three countries.

Ferdaous and Acma (2014) inspected the impact of international trade, remittances and industrialization on the economic growth of Bangladesh. The study used co-integration and Granger causality test for the period of 1976 to 2010. The study revealed that there is a relationship between export, import, remittances, and industrialization on economic growth in Bangladesh.

Orji *et al.* (2014) conducted an empirical analysis of foreign capital inflows and growth on West African Monetary Zones (WAMZ). The study used Seemingly Unrelated Regression Estimation (SURE) technique for the period of 1981-2010. Findings showed that FDI contributed positively to output growth in Nigeria and Gambia. On the other hand, ODA positively contributes more to output growth in Sierra Leone and Ghana. Remittances contributes to Liberia output while none of the capital inflows contribute to Guinea's output.

Bashir (2013) investigated the impact of foreign assistance in the form of official development assistance (ODA) and foreign direct investment (FDI) on real growth in Nigeria. The study used Granger causality test, Johansen co-integration test and Error Correction Method (ECM) covering the period of 1980 to 2011. Findings revealed that a negative relationship exist between FDI and real growth and as well, ODA exacts no impact on real growth in the country.

Akinpelu *et al.* (2013) examined the effects of remittance inflows on economic growth in Nigeria. The study used co-integration and causality tests. Empirical results showed that there is long run relationship among the variables (gross capital formation, foreign direct investment, openness and foreign exchange rate).

Ekpo and Afangideh (2012) evaluated the effect of official development assistance on the economic performance of Nigeria. The study used descriptive and three stage least squares (3SLS) on the data covering the period of 1970-2010. The study revealed that there is a positive but insignificant relationship between ODA and economic development.

Syed *et al.* (2012) in a study "does capital inflows really stimulate domestic investment: a case study of Pakistan" used System of Equations and Ordinary Least Square techniques on data covering the period of 1992-2010. Findings showed that FDI is positive and statistically significant to domestic investment in different model specifications.

Houssem and Hichem (2011) investigated the impact of foreign direct investment and portfolio investment on economic growth in developing and developed economies. The study use Generalized Method of Moments (GMM), Within-Group (WG) and Generalized Least Square (GLS) on the data covering the period of 1990-2009. Findings revealed that there is a positive and significant relationship between FDI and output growth in developed economies. The coefficient of portfolio investment (PI) is negative and not statistically significant in developing economies

From the reviewed empirical studies, this study is specifically on the effect of foreign direct investment, external loans, remittance in addition to other control variables like gross fixed capital formation, industrial energy consumption and contract intensive money on industrial output.

3. METHODOLOGY

3.1.Sources of Data

The study used an ex-post facto research method, employing secondary data from Central Bank of Nigeria and World Bank Publications. The data covered the period of 34 years from 1985-2018, a period Nigeria witnessed major economic and financial reforms through the adoption of World Bank's Structural Adjustment Programme (SAP).

This study applied time series data in achieving the objective of the study which are as follows: industrial output serving as dependent variable while the explanatory variables are external loans (EXL), foreign direct investment (FDI), remittance (RIMT), (GFCF) gross fixed capital formation, (IEC) industrial energy consumption and (CIM) contract intensive money. Unlike previous studies, the justification for using these variables in this study is stated as follows. Industrial output is utilised in this model to capture the combined volume of production in crude petroleum and natural gas, solid mineral and manufacturing and expects that external financing would boost the growth of this sector given foreign participation with their modern production techniques. External loans is included because it is generally perceived that developing countries experience inadequate capital hence the need for external debt to supplement domestic savings and investment. Foreign direct investment raises productivity through technology transfers. Remittance inflow from Diaspora can boost productivity of sub-sectors as against the household consumption motive. Gross fixed capital formation is the aggregation of physical investments that facilitate the production of goods and services within economic cycle of a country, hence it is necessary to ascertain the level of physical infrastructure that can give rise to industrial growth. Industrial energy consumption is the proportion of energy/electricity that is consumed in the industrial sector measured in kwh per capita while contract intensive money is broad money supply minus currency in circulation divided by broad money supply and positively related to income, growth and investment. CIM is used as an indicator of institutional quality (Clague *et al.*, 1999; Ubi and Udah, 2014; Oburota and Ifere, 2017). The data were chosen based on their availability and sourced from

Central Bank of Nigeria (CBN) exception of industrial energy consumption sourced from World Development Indicator.

3.2. Model Specification

The Great Big Push Theory and the Kaldor (1966) anchors the model specification of this study. Kaldor's First Law states that there is a close relationship between the growth of manufacturing output and the growth of the gross domestic product (GDP). Kaldor's First Law concludes that the "manufacturing industry is the engine of economic growth". The Linear specification of Kaldor's first law is as follow:

$$gGDP = a_o + a_1\, gMANU \quad \text{Eqn. (1)}$$

where: gGDP is the growth of total output; and gMANU is the manufacturing output's growth. The growth of manufacturing sector is expected to spur economic growth. This means that high growth is usually found in cases where the share of manufacturing industry in GDP is increasing (Libanio, 2006). In addition, this study will use industrial sector output as the dependent variable against manufacturing sector.

According to endogenous growth model pioneered by Romer (1990) technical progress has being argued to depend on the strength of institutions, which are the formal and informal constraints on political, economic and social interactions (Ubi and Udah, 2014). Arising from this, this study incorporates a proxy for institutional quality using contract intensive money (CIM) as used in the works of Clague *et al.* (1999); Ubi and Udah (2014) and Oburota and Ifere (2017).

To examine the potential of external financing on industrial output, the model for Kaldor adopted and used in Oburota and Ifere (2017) was transformed, by substituting Equation 2 into Equation 1, which becomes the model of this study. In addition, most investment inflows through external financing comes with the incorporation of capital goods as a means of production, thus this study will only focus on the external financing inflows and other control variables that could give rise to industrial output.

To achieve the objective of this study, the above model is modified and expressed as follows:

$$INDO = f(EXL, FDI, RIMT, GFCF, IEC, CIM) \quad \text{Eqn. (2)}$$

Where: INDO = industrial output (₦ billion), EXL = external loan (₦' billion), FDI = foreign direct investment (₦' billion), RIMT = remittance (₦' billion), GFCF = goss fixed capital formation (₦' billion), IEC = industrial energy consumption (kwh per capita), CIM = currency intensive money (Ratio) and U_i = error term.

3.3. Method of Analysis

The test for stationarity using Philip Perron test and the estimates obtained gave rise to the application of ARDL methodology. According to Shrestha and Bhatta (2017) the choice of appropriate methodological is based on the unit root test, which determines the stationarity of the variables as stationary time series cannot be used to analyze non-stationary series.

Therefore, an ARDL representation of Equation 1 can be specified in equations as follows

$$\Delta INDO_t = \theta_o + \sum_{i=1}^{k} \theta_{1i}\, \Delta EXL_{t-i} + \sum_{i=1}^{k} \theta_{2i}\, \Delta FDI_{t-i} + \sum_{i=1}^{k} \theta_{3i}\, \Delta RIMT_{t-i} + \sum_{i=1}^{k} \theta_{4i}\, \Delta GFCF_{t-i} + \sum_{i=1}^{k} \theta_{5i}\, \Delta IEC_{t-i} + \sum_{i=1}^{k} \theta_{6i}\, \Delta CIM_{t-i} + \pi_1 EXL_{t-i} + \pi_2 FDI_{t-i} + \pi_3 RIMT_{t-i} + \pi_4 GFCF_{t-i} + \pi_5 IEC_{t-i} + \pi_6 CIM_{t-i} + \varepsilon_t \quad \text{Eqn. 3}$$

Where Δ is difference operator, k is the lag length and is assumed to be serially uncorrelated. The co-integration test is based on the F-statistics. Once co-integrating relationship is ascertained, the long run and error correction estimates of the ARDL model are obtained.

The error correction representation is specified as follows:

$$\Delta INDO = \sigma_o + \sum_{i=1}^{k} \sigma_{1i} \Delta EXL_{t-i} + \sum_{i=1}^{k} \sigma_{2i} \Delta FDI_{t-i} + \sum_{i=1}^{k} \sigma_{3i} \Delta RIMT_{t-i} + \sum_{i=1}^{k} \sigma_{4i} \Delta GFCF_{t-i} + \sum_{i=1}^{k} \sigma_{5i} \Delta IEC_{t-i} + \sum_{i=1}^{k} \sigma_{6i} \Delta CIM_{t-i} + \varphi ECM + \varepsilon$$

Eqn. 4

The speed of adjustment parameter is represented by $\varphi$and ECM is the residuals obtained from Equation 4. The coefficient of the lagged error correction term (φ) is expected to be negative and significant to further confirm the existence of a co-integrating relationship.

4. RESULTS AND DISCUSSIONS

The Phillips-Perron (PP) was applied in order to check the integrating properties of the investigated variables. The $H_0 : \rho = 0$ for PP, and the alternative is $H_1 : \sigma_\nu^2 > 0$. The Z-A test is conducted using the null hypothesis in PP.

4.1. Result of Stationarity of Data Series

Table-1. Unit Root Test.

Phillips and Perron (1988) **Test**					
Variables	**At level**	**Prob.**	**First Difference**	**Prob.**	**Order of Integration**
Ln INDO					
Intercept	-1.314220	0.6112	-5.242418***	0.0002	I(1)
Intercept & Trend	-2.309675	0.4174	-5.372201***	0.0006	
LnEXL					
Intercept	-2.496198	0.1255	-3.878199***	0.0057	I(1)
Intercept & Trend	-2567553	0.2964	-3.784670***	0.0307	
Ln FDI					
Intercept	-3.689743***	0.0090	-7.642619***	0.0000	I(0)
Intercept & Trend	-1.866812	0.6488	-10.10665***	0.0000	
Ln RIMT					
Intercept	-0.758566	0.8176	-5.460582***	0.0001	I(1)
Intercept & Trend	-1.775121	0.6938	-5.426673***	0.0006	
Ln GFCF					
Intercept	-2.295537	0.1793	-3.354175**	0.0205	I(1)
Intercept & Trend	0.470333	0.9987	-4.198575***	0.0119	
LnIEC					
Intercept	-1.812955	0.3679	-4.592731***	0.0009	I(1)
Intercept & Trend	-2.026274	0.5660	-4.522760***	0.0055	
Ln CIM					
Intercept	-0.351220	0.9062	-6.091839***	0.0000	I(1)
Intercept & Trend	-2.124756	0.5137	-6.520324***	0.0000	

Notes: ***, ** and * denote 1%, 5% and 10% significance levels at which the null hypothesis of non-stationarity is rejected for all tests. The intercept and trend and intercept are included in the levels and the first difference equations. The optimal lag order are selected based on Schwarz information Criterion (SIC).

In other to embark on the estimation of the ARDL, this study conducted unit root tests to check the integrating properties of the series and the results presented in Table 1. The results of these tests show that under PP, the series such as lnINDO, lnEXL, lnRIMT, lnGFCF, lnIEC and lnCIM indicate uniform order of integration at first difference I(1). However, the variables lnFDI are integrated of order zero, which is stationary at level I(0). Summarily, the results indicate that the variables under investigation have mixed order of integration, hence, the application of Autoregressive Distributive Lag (ARDL) technique.

4.2. Results of the Estimated Model

Table-2. ARDL Bounds Test for Cointegration.

Variables	F– Statistic	
F(INDO/ EXL, FDI, RIMT, GFCF, IEC, CIM	4.149508*	
Critical value	**Lower Bound**	**Upper Bound**
1%	2.88	3.99
5%	2.27	3.28
10%	1.99	2.94

Table 2 reveal the estimate of the F statistic in the ARDL model and it shows that the F* value is greater than the upper critical bound value. The findings revealed that external financing variables significantly influenced industrial growth in Nigeria given the acceptance of alternative hypothesis (H_1).

Table-3. Estimated Coefficients using the ARDL Approach

Variables	Co-efficient	Std. Error	t-Statistic	P-value
C	6.710388	0.923439	7.266735	0.0000
LOG(EXL)	0.093119	0.041159	2.262420	0.0326
LOG(FDI)	-0.027114	0.064322	-0.421527	0.6770
LOG(RIMT)	-0.081635	0.045315	-1.801485	0.0837
LOG(GFCF)	0.209037	0.083690	2.497739	0.0194
LOG(IEC)	0.027722	0.082725	0.335110	0.7403
CIM	1.346398	0.505876	2.661518	0.0134
ECM(-1)	-0.350138	0.053714	-6.518509	0.0000
R-squared	0.519853	Adj R-squared	0.519853	
Log likelihood	58.35853	D-W stat	2.260867	

Table 3 reveal that the long-run effect of EXL on industrial output is inelastic, positive and statistically significant at 5%, that is ($\pi = 0.09$, $P < 0.0326$) suggesting that a 1% increase in external loan would lead to about 0.09% increase in industrial output, which agrees with a priori expectation and further concurs with the findings of Chigbu *et al.* (2015) and Ugwuegbe *et al.* (2016). Importantly, the Nigeria government has continued to source for external loans to finance development projects notably infrastructural projects capable of spurring industrial sector growth. As at December 2018, external loans stock is to the tune of $25,274.36 billion according to Debt Management Office (2019). One percent increase in foreign direct investment is associated with 0.03% decrease in the industrial output, that is ($\pi = 0.03$, $P > 0.6770$). This result is inelastic and statistically insignificant. Given the insignificance, it shows that foreign direct investment is not in the direction of boosting industrial output. This finding is in line with the findings of Bashir (2013); Okonkwo (2016) but contrary to Kolawole (2013); Akinpelu *et al.* (2013) and Akpan and Eweke (2017). The results also show that the long-run effect of remittance on industrial output is negative that is ($\pi = -0.08$, $P < 0.0837$). The negative effect is inelastic and statistically significant at 5%. This portends that, a good proportion of remittances do not find its way into industrial subsectors as most often, it is directed towards household consumption. This finding is contrary with the findings of Ferdaous and Acma (2014); Odionye and Emerole (2015) and Chigbu *et al.* (2015). Gross fixed capital formation exerts positive effect with industrial output and statistically significant. The results show that a one per cent increase in gross fixed capital formation is associated with a ($\pi = 0.21$, $P < 0.0194$) increase in the growth of industrial output. This is in line with findings of Akinpelu *et al.* (2013) but contrary to Tamuno and Edoumiekumo (2012) who asserted that Nigeria's domestic investment is weak and unreliable, and in addition is characterized by decay infrastructure like poor road network, inconsistency in electricity generation and distribution.

The result of IEC obtained is positively signed and statistically insignificant and in line with expectations but the insignificance implies that the inclusion could not account for changes in the dependent variable. The results show that a one percent increase in IEC will lead to a (π = 0.03, P > 0.7403) increase in INDO. Surprisingly, the result is contrary to reality as most industries rely on independent power source to carry out their production activities hence given rise to high cost of goods and service. To support this, information from IEA (2012) reveals that out of 118,325 kilotonne supply, only 10,148 kilotonne goes to industrial sector representing 8.56% making it inconsequential. This is one of the reasons for most manufacturing sectors operating at 48.8% installed capacity, which affects their operating cost while others result to complete shutdown (Ogunjobi, 2015). The coefficient of contract intensive money proxy for institutional quality is elastic, positive and statistically significant at 5% level, that is (π = 1.35, P < 0.0134), suggesting that 1% increase in contract intensive money will bring about 1.35% increase in industrial output. This result is contrary to the findings of Oburota and Ifere (2017). The elasticity is an indication that any little change in government policy, can spur significant growth in industrial output in Nigeria. Notable scholars such as Clague *et al.* (1999); Parks *et al.* (2017) have emphasized on the need for strong institutional quality to guarantee sustainable growth and development.

The error correction term (ECM) value of -0.350138 with standard error of 0.053714 and F-statistic of -6.518509 indicates that the speed of adjustment to long-run horizon is significant. The adjusted R-squared of the result reveals that the model for this study explained about 52% of total variation in the industrial output. In all, the results suggest that the variables captured in the model have the tendency to adjust to the long-run equilibrium values after experiencing short-run deviation at a speed of adjustment of 35%.

4.3. Post Diagnostic Test

Table-4. Diagnostic Test.

	LM Test	Heteroskedasticity Test ARCH	Ramsey Test
F-Statistics	1.76376	0.586346	0.902767
Probaility	0.1938	0.7606	0.3515

The diagnostic tests of LM and ARCH presented in Table 4 fail to find serial correlation and fail to reject homeskadisitcy in the data using the Bruesch-pagan LM test and ARCH test at lag 1. The Ramsey reset test further confirmed the adequacy of the model in the study.

In order to ascertain the stability of the coefficients of all variables in the model, the cumulative sum (CUSUM) and cumulative sum of square (CUSUMSQ) were carried out using (Brown *et al.*, 1975) model stability tests and the graph is presented in Figure 1 and Figure 2. In Figure 1 the CUSUM recursive residuals lie within the ridged line and are negative in 1994 before returning to equilibrium in 1995 to 1996 and fall from 1997 to 2001 before it appreciated in 2002. From 2002 to 2018, it has remained above the equilibrium line although between 2008 and 2010, it was tangential to the equilibrium line. For Figure 2 of CUSUMSQ, the recursive residual lies directly above equilibrium point from 1995 to 2018 within the ridged line. The result of both CUSUM and CUSUMSQ has maintained stability within the study period and can be rely upon.

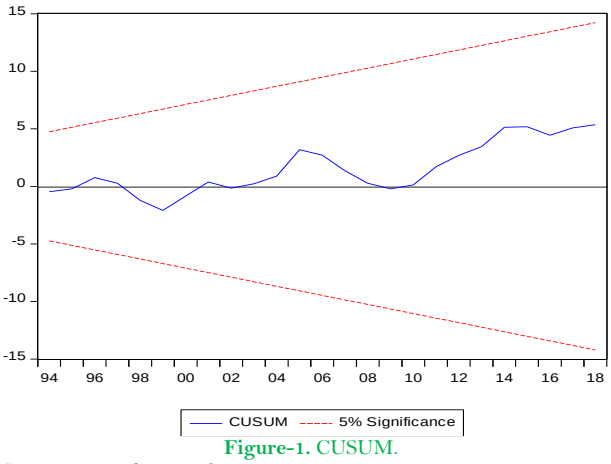

Figure-1. CUSUM.

Source: Extract from Results.

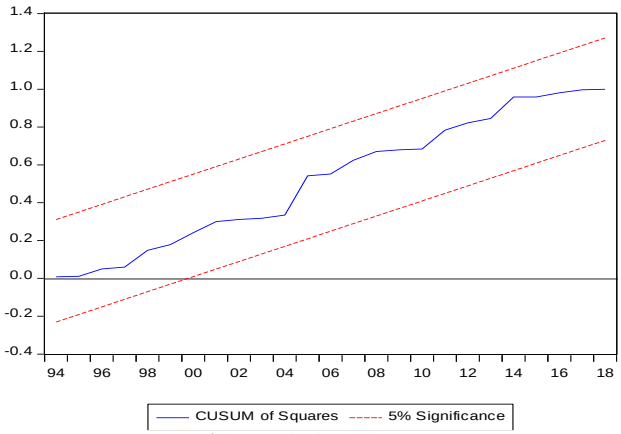

Figure-2.CUSUM Square.

Source: Extract from Results.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The study sought out to examine the potential of external financing in spurring industrial growth in Nigeria from 1985 to 2018, using the ARDL technique. The study tested the integrating properties of the series and their cointegration and found that the variables are integrated of mixed orders, and there was a long-run association from the ARDL bound approach. The empirical results of the model estimation showed that, there is positive relationship between external loans and industrial output which is also significant. Foreign direct investment exerts negative influence on industrial output but not significant while remittance revealed negative effect on industrial output and statistically significant. For the control variables, gross fixed capital formation, industrial energy consumption and contract intensive money exhibit positive relationship with only industry energy consumption not significant.

The empirical results of the various components of external financing showed that, their effect on industrial growth in Nigeria is still negligible. The study concludes that Nigeria's benefits from external financing has not translated into industrial growth given the non-proportionality of the coefficients and the likelihood of the diversion of public funds by government officials. The negative coefficient of remittance is likely due to diversion to household consumption in addition to non-reflection of the true effect of FDI inflows given the over dependence of Nigerians on imported goods.

5.2 Recommendations

Hence, the study therefore recommends that, the channels of full implementation of external loans needs to be pursued vigorously through government institutions to ensure that funds meant for investment in infrastructures are not diverted to other uses. Given the huge capital intensity in industrial setup, government needs to seek for capable investors to collaborate in various industrial activities in line with institutional framework. There is need for government to create awareness and educate Nigerians in the Diaspora on the need to invest in industries in Nigeria instead of consumption needs for households.

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