IMPACT OF FOREIGN DIRECT INVESTMENT AND SOME KEY MONETARY VARIABLES ON INDUSTRIAL PERFORMANCE IN NIGERIA

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Abstract: This paper examines the influence of foreign direct investment and some key monetary variables on industrial performance in Nigeria using an annual time series dataset from 1980 to 2021. Autoregressive Distributed Lag (ARDL) model was used in analyzing the dataset and the findings revealed that foreign direct investment and exchange rate have a significant negative influence on industrial performance. Furthermore, the results indicated that inflation rate and economic openness have significant positive effect on industrial performance while interest rate has no significant influence on industrial performance. The policy implication of significant negative effect of foreign direct investment on industrial performance is that, more inflow of foreign direct investment into Nigeria will reduce the performance of domestic industries. In line with above findings this paper therefore, recommends that government should device other ways of improving the local industries such as manufacturing, textile and others rather than depending on foreign direct investment to drive the improvement of industrial sector. The study however, proposes that the government should enhance measures to maintain target inflation and foster economic openness.

Keywords: foreign direct investment, industrial performance, exchange rate, inflation rate, ARDL.

JEL codes: F02, C55, F31, L16, E31

1. INTRODUCTION

A workable and functional industrial sector is essential to the restructuring and diversification of the economy. It is one of the means through which the productivity of exports is increased, foreign exchange profits are generated, jobs are generated, investment growth is improved, and the many economic sectors are effectively

interconnected. In addition, workable industrial sectors have been shown to have a number of benefits, including long-term improvements in public welfare, the transfer of technology, and the decrease of unemployment (Opuluwa, Umeh & Abu, 2010).

The industrial sector in Nigeria saw one of the fastest growth rates between the 1960s and the 1980s. Policies such as import substitution, export promotion, bank of industry, and equity investment plan, among others, were established to enhance and sustain the sector's performance (Aza & Dodo, 2014). Despite the implementation of these policies, the sector was unable to demonstrate successes. For instance, statistical data reveals that whereas the sector contributed 43.68% of GDP in 1980, it only contributed 35.41% and 33.88% of GDP in 1990 and 2000, respectively. Additionally, the industry contributed a negligible 25.32% and 23.88%, respectively, to national production in 2010 and 2018. (WDI, 2019). The sector's poor performance is linked to the fact that industrial policies in Nigeria were frequently modified, disregarded, or even abandoned entirely. Furthermore, industrial policies were applied haphazardly and unconditionally; as a result, the policies failed to produced favorable results (Okoli & Agu, 2015).

Furthermore, the proper application of the economic policy framework is critical to the growth of all sectors. It is faith in the policy framework that will create a favorable atmosphere and make conducting business easier. As a result, more foreign capital inflows will be attracted, as will stability in monetary variables such as the exchange rate, inflation rate, and interest rate in the economy. Sinha, Modak and Sengupta (2018) asserts that foreign direct investment has the ability to increase the productivity of inputs used in the production of goods due to introduction of new technology and know-how that can spill over to the rest of the economy. It is further acknowledged that foreign direct investment can have adverse effect on the growth of productive sector if it crowds out domestic investment (Chen & Demurger, 2002). Nigeria as one of the largest economies in Africa has recorded sustained inflows of foreign direct investment over the years. For instance, the share of foreign direct investment to Nigeria's were 35.5%, 13.6%, 16.3% and 14.1% in 1990, 2000, 2005 and 2010 respectively (CBN, 2010). The downward trends in the foreign direct investment inflows to Nigeria were connected to challenges such as exchange rate depreciation, insecurity and decline in crude oil prices among others in the economy.

However, there are disparities in the findings on the relationship between foreign direct investment and industrial performance. Robert, John, Philip and Victor (2014), in China, Ezeonyeji and Ifebi (2016) in Nigeria, Prasanna (2010) in India, Folasade, Joshua and Ifeoluwa (2016) in Africa and Sokunle, Chase and Herper (2017) in Sub-Saharan Africa, find a significant positive relationship between foreign direct investment and industrial performance. Azerouval (2016) in Morocco, Okoli and Agu (2015) in Nigeria, find a significant negative relationship between foreign direct investment and

industrial performance. Moreover, Anowor, Ukweni, Ibiam and Ezekwem (2013) in Nigeria, find no significant relationship between foreign direct investment and industrial performance. The findings therefore suggest that, the study of the relationship between foreign direct investment and industrial performance is inconclusive.

Previous studies in Nigeria on the relationship between foreign direct investment and industrial performance include Anowor, Ukweni, Ibiam and Ezekwem (2013), Okoli and Agu (2015) and Ezeonyeji and Ifebi (2016), applied Ordinary Least Square (OLS) in their estimation which is an inappropriate method when dealing with time series dataset. This study takes the weakness into cognizance. Therefore, this study addresses the methodological gap in the previous time series studies on Nigeria by re-examining the relationship between foreign direct investment and industrial performance using ARDL technique.

To achieve the objective, this study is divided into six sections including this introduction. Section two deals with literature review, section three presents the methodology of this study. Section four consists of analysis of data, section five is discussion of findings, while section six contains conclusions and recommendations.

2.   THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. Theoretical Framework

The theory that underpins this study is the production spill-over theory. The theory was developed by Dunning in the year 1993 in his attempt to explain foreign direct investment by merging three different theories of international production and make them single theory. These theories are the monopolistic advantage, the location advantage and internalization. The theory is also known as eclectic theory or the OLI paradigm. Dunning (1993) stated that foreign direct investment and its return depends on the Ownership advantage of the firm's 'O', that is the monopolistic advantage; Location advantage 'L' which focus on where to produce and the Internalization factor 'I', which ask the question why firms engage in foreign direct investment. The internalization factors focus on stability of macroeconomic variables like inflation rate, exchange rate and interest rate among others.

Folasade, Joshua & Ifeoluwa (2016) added that, the theory focuses on demonstration effect in which well trained and skilled manpower of foreign firms (industry) move to invest in the domestic firms. This motivates the domestic industries to use modern techniques of production so as to become competitive and productive. As a result, the domestic industries will improve on their production processes and become more vibrant and competitive. Thus, enhancing their performance in the market and even improve their market share.

2.2. Review of Empirical Literature

Empirically, there are mixed findings on the relationship between foreign direct investment and industrial performance. For instance, Ezeonyeji and Ifebi (2016) using an annual time series dataset for the period 1986 to 2014 for Nigeria and by applying Ordinary Least Squares regression find a significant positive relationship between FDI and the performance of telecommunications industry. However, their result was spurious owing to the use of wrong method of analysis (i.e., OLS). Umer and Alam (2013) using an annual time series dataset for the period 1960 to 2001 for Pakistan and applying Johansen and Juselius cointegration and VECM find a significant positive relationship between foreign direct investment and industrial sector growth.

Using annual time series data for the Indian economy, Prasanna (2010) examined the impact of FDI on manufacturing exports performance for the period 1991 to 2007. The technique of analysis applied was Ordinary Least Square regression. The results indicate that FDI has a significant positive influence on manufacturing export performance. In a study on Africa, Folasade, Joshua and Ifeoluwa (2016) applied an annual panel dataset from 1996 to 2015 and used Pooled Ordinary Least Squares and fixed effect regression to analyze the influence of foreign direct investment (FDI) on industrial performance for a sample of 43 African countries. The findings suggest that FDI has a significant positive effect on industrial performance.

Robert, John, Philip and Victor (2014) applied descriptive statistics to analyze the effect of FDI by Chinese manufacturing export in Kenya on survey dataset for a sample of 30 respondents. The findings suggest that FDI has a significant positive influence on manufacturing export. In another study by Chen and Demurger (2002), annual panel dataset was employed to investigate the relationship between FDI and manufacturing total productivity performance for a sample of 23 manufacturing companies in China from 1988 to 1994, by applying both fixed effect and random effect regressions. They considered consumer goods; intermediate goods and equipment goods manufacturing firms and the results suggest that FDI has a significant positive effect on consumer goods manufacturing firms and no significant effect on intermediate goods and manufacturing goods manufacturing firms.

Furthermore, Sinha, Modak and Sengupta (2018) uses an annual panel dataset to examine the relationship between FDI and productivity growth of industrial sector for a sample of 4 classifications of industries (mining, quarrying, manufacturing and electricity) in India from 2009 to 2015 using GMM model. The results suggest a significant positive relationship between FDI and productivity growth of the industrial sector. In a similar study, Bahzad, Pouria and Jennefer (2015) examine the impact of FDI on industrial value added to GDP using an annual panel dataset for a sample of 4 classifications of industry from China and Thailand over the period 2000 to 2013. The

authors categorize the industry into low, medium and high value added. Their findings reveal that FDI has a significant positive influence on value added of medium and high value-added industries in China compare to Thailand.

Gu, Awokuse and Yuan (2008) employed an annual panel dataset to investigate the relationship between FDI and performance of exports manufacturing sector in china for a sample of 14 manufacturing firms over the period 1995 to 2005 by applying Ordinary Least Squares (OLS) regression. The findings indicate a significant positive relationship between FDI and performance of exports manufacturing firms. However, their result was spurious because OLS regression is not the appropriate technique for panel analysis. Therefore, the results cannot be robust and reliable. Similarly, Popovici (2018) uses an annual panel dataset to examine the impact of FDI on exports performance in manufacturing and services sectors for a sample of 15 European countries over the period 1999 to 2012. Generalized Method of Moments (GMM) model was employed as a technique of analysis. The findings indicate a significant positive relationship between FDI and exports performance in manufacturing and services sectors.

In another study on India, Samal and Raju (2016) uses an annual panel dataset to investigate the relationship between FDI manufacturing industry for a sample of 8 classifications of industry for the period 2000 to 2015 by applying Spearman's correlation analysis. The results indicate that foreign direct investment has a significant positive correlation with manufacturing sector growth. Furthermore, Antony and Paul (2018) applied descriptive statistics and correlation analysis to examine the relationship between foreign direct investment and banking industry performance in Kenya using an annual time series dataset from 2005 to 2015. The findings suggest that foreign direct investment has a significant positive correlation on banking industry's performance.

On the other hand, Azerouval (2016) examined the effect of foreign direct investment on the productivity growth of manufacturing sector in Morocco from 1985 to 2012. The author applied Generalized Method of Moment (GMM) in modeling 22 sub-sectors of the manufacturing sector. The study divided foreign direct investment (FDI) sources into two namely; FDI from France and FDI from Spain. The results show that FDI from France has a significant negative effect on productivity growth in manufacturing sector, while FDI from Spain has a significant positive impact on the manufacturing sector productivity. Okoli and Agu (2015) examine the influence of foreign direct investment (FDI) on manufacturing performance in Nigeria using an annual time series dataset from 1970 to 2013. The authors applied Ordinary Least Square (OLS) regression. Their findings suggest that foreign direct investment has a negative significant influence on manufacturing performance. Thus, the study has methodological weakness because OLS was applied and it is not suitable for the time series dataset.

Similarly, Akintoye (2013) examines the relationship between foreign direct investment and manufacturing performance in Nigeria using an annual dataset from 1970 to 2009 and by applying Autoregressive Distributed Lag (ARDL) model. The findings suggest that there is a significant negative relationship between foreign direct investment and manufacturing sector performance.

On the contrary however, Anowor, Ukweni, Ibiam and Ezekwem (2013) apply Ordinary Least Squares regression and an annual dataset from 1970 to 2011 to investigate the relationship between of foreign direct investment and manufacturing sector growth in Nigeria. The results suggest that foreign direct investment has no significant influence on manufacturing sector growth. Thus, the results might be spurious due to the application of OLS which is an inappropriate technique in time series analysis. Sokunle, Chase and Herper (2017) using an annual panel dataset from 2008 to 2010 of twenty-six (26) African countries. The authors applied multiple regression and find on significant relationship between FDI and manufacturing sector growth.

In the concluding part of this sub-section, review of some key monetary variables is presented. The studies reviewed are Egbulonu (2016), Babatunde (2018), Mensah, Ofori-Abebrese and Pickson (2016), Okoye, Nwakoby and Modebe (2015) among others. Egbulonu, (2016) Used Autoregressive Distributed Lag (ARDL) model to analyze an annual time series dataset in Nigeria for the period 1980 to 2013. The findings suggest that interest rate has a significant negative influence on industrial sector growth. Additionally, Babatunde (2018) applied Johansen cointegration and vector error correction model (VECM) to examine an annual time series dataset from 1981 to 2015 in Nigeria. The findings suggest a significant negative relationship between interest rate and manufacturing sector output.

Mensah, Ofori-Abebrese and Pickson (2016) using an annual time series dataset for Ghana for the period 1980 to 2013 and applied autoregressive distributed lag (ARDL) model. The results reveal a significant positive relationship between inflation and industrial performance. Furthermore, Okoye, Nwakoby and Modebe (2015) used an annual time series dataset in Nigeria from 1986 to 2015 and by applying Johansen cointegration and vector error correction model (VECM). The findings suggest that inflation has significant negative influence on industrial performance. Babatunde, (2018) used an annual time series dataset in Nigeria from 1981 to 2015 and applied Johansen cointegration and vector error correction model (VECM) as techniques for analysis. The findings suggest no significant relationship between inflation and manufacturing performance.

Ilechukwu and Nwakoye (2015) examined the effect of exchange rate on industrial performance in Nigeria using an annual time series dataset for the period 1980 to 2013 and applied Ordinary Least Squares regression. The findings indicated a significant

positive relationship between exchange rate and industrial performance. Babatunde (2018) employed Johansen cointegration and vector error correction model (VECM) to analyze time series dataset in Nigeria from 1981 to 2015. The results show a significant negative relationship between exchange and manufacturing performance.

Akintoye (2013) used an annual time series dataset from 1970 to 2009 in Nigeria and autoregressive distributed lag (ARDL) model for estimation. The results show that economic openness has a significant negative influence on manufacturing performance. Similarly, Okoye, Nwakoby & Okorie, (2016) used an annual time series dataset in Nigeria from 1986 to 2014 and applied Johansen cointegration and vector error correction model (VECM). Their results indicate a significant negative relationship between economic openness and industrial sector performance. Umer and Alam (2013) applied an annual time series dataset in Pakistan for the period 1960 to 2011 and applied Johansen cointegration and vector error correction model (VECM). Their results indicate a significant negative relationship between economic openness and industrial sector growth.

3. DATA AND METHODOLOGY

This section dwells on the methodology of conducting this paper. It comprises of type and source of data, variables measurement, method /technique of data analysis and model specification.

3.1. Type and Source of Data

This paper uses an annual time series dataset from 1980 to 2021 for its empirical estimation. The data of the appropriate variables were sourced from World Development Indicators (WDI) a publication of World Bank.

3.2. Variables Measurement

In this paper industrial performance is measured as the ratio of industrial value added to Gross Domestic Products (GDP). This measure of industrial performance was employed by Ileckukwu and Nwakoye (2015), Behzad, Pouria and Jennifer (2015) and Folasade, Joshua and Ifeoluwa (2016). With regard to foreign direct investment, it is measured in this paper as the aggregate inflows of foreign direct investment during the period under review. This measure of FDI was adopted by Akintoye (2013), Folasade, Joshua and Ifeoluwa (2016) and Okoli and Agu (2015).

Interest rate is the rate at which deposit money banks lend out money to the public, firms or industry. It is measured as the rate of bank charges on customers' loans. This is in conformity with the works of Mensah, Ofori-Abebrese and Pickson (2016), and Okoye, Nwakoby and Modebe (2015). Consumer Price Index (CPI) is used

as proxy for inflation. CPI reflects the annual percentage changes in the cost to the average consumer of acquiring a basket of goods and services. This measure of inflation was adopted by Babatunde (2018) and Okoye, Nwakoby and Modebe (2015).

Exchange rate is measured as the price at which Naira is exchange for US dollar (following the works of Shuaibu, 2018). Finally, following the work of Okoye, Nwakoby and Okorie (2016), Umer and Alam (2013) and Adenutsi (2007) economic openness is measured as sum of exports and imports of goods and services as a share of gross domestic products (GDP).

3.3. Method of Data Analysis

This paper used both descriptive and inferential techniques in its analysis. The rationale behind the use of descriptive statistics is to summarize and understand the nature of the dataset. For the inferential method, this paper applied Autoregressive Distributed Lag (ARDL) model. The reasons behind the use of ARDL approach are: first, ARDL can be applied irrespective of whether the variables are stationary at level value I(0) or at first difference I(1) or combination of both. Second, it can generate robust and reliable results even if the number of observations is small or large. Finally, it provides consistent coefficients despite the presence of endogeneity because it contains lags of the dependent and independents variables in a single model (Pesaran *et al,* 2001).

3.4. Model Specification

Following Okoli and Agu (2015) and Folasade, Joshua and Ifeoluwa (2016), the ARDL model for the analysis of the nexus between foreign direct investment and industrial performance is specified as follows:

$$\Delta LINP_t = \beta_o + \sum_{i=1}^{m} \beta_1 \Delta LINP_{t-i} + \sum_{i=1}^{m} \beta_2 \Delta LFDI_{t-i} + \sum_{i=1}^{m} \beta_3 \Delta LINT_{t-i} + \sum_{i=1}^{m} \beta_4 \Delta LINF_{t-i}$$

$$+ \sum_{i=1}^{m} \beta_5 \Delta LEXR_{t-1} + \sum_{i=1}^{m} \beta_6 \Delta LOPN_{t-1} + \alpha_1 LINP_{t-1} + \alpha_2 LFDI_{t-1} + \alpha_3 LINT_{t-1}$$

$$+ \alpha_4 LINF_{t-1} + \alpha_5 LEXR_{t-1} + \alpha_6 LOPN_{t-1} + \mu_t \qquad (3.1)$$

Where LINP denotes industrial value added which is the proxy for industrial performance. FDI is the foreign direct investment, INT is the interest rate, INF represents consumer price index which is the proxy for inflation, EXR is the exchange rate and OPN denotes economic openness. Additionally, β_0 and α_0 are the intercepts,

β_1 to β_6 and α_1 to α_6 are the estimated parameters of the model while μ_t is the error term. The ARDL model is divided into two parts. The first part of the model with β_0 to β_6 is the short-run part, while the parameters α_1 to α_6 represents the long-run portion of the model. The null hypothesis of the model is defined as H_0:

$\alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = \alpha_5 = \alpha_6 = 0$ implying that there is no cointegration among the variables. Furthermore, the study began the analysis by conducting cointegration test of the ARDL in order to identify the presence of cointegration. The calculated F-statistics is compared with the critical value as tabulated by Pesaran *et al* (2001). If F-statistics is greater than the upper critical value bounds, then the decision rule is to reject the null hypothesis of no cointegration. whereas if it falls below the critical value bounds, then the null hypothesis will be accepted and if it falls within these two critical value bounds, then the result is indecisive (Pesaran *et al.,* 2001).

However, the error correction part of the ARDL model is formulated as:

$$\Delta LINP_t = \beta_0 + \sum_{i=1}^{m} \beta_1 \Delta LINP_{t-i} + \sum_{i=1}^{m} \beta_2 \Delta LFDI_{t-i} + \sum_{i=1}^{m} \beta_3 \Delta LINT_{t-i} + \sum_{i=1}^{m} \beta_4 \Delta LINF_{t-i}$$

$$+ \sum_{i=1}^{m} \beta_5 \Delta LEXR_{t-i} + \sum_{i=1}^{m} \beta_6 \Delta LOPN_{t-i} + \beta_7 ECM_{t-i} \qquad (3.2)$$

Where ECM is the error correction term generated from the ARDL model and $\hat{a}_7$ is the coefficient of the error correction term which implies the speed of adjustment back to equilibrium in case of disequilibrium in the economy.

4. RESULTS AND DISCUSSIONS

This section deals with the descriptive statistics, inferential results and discussion of findings.

4.1. Descriptive Statistics

This subsection presents the results of the descriptive statistics generated from the analysis. The results aid in understanding the nature of the dataset. The results of the descriptive statistics reported in Table 4.1shows that, there are forty-two (42) observations per variable. The mean of industrial performance and foreign direct investment are 3.38 and 0.31 respectively. This indicates that the average contribution of industrial sector to the GDP is 3.38, while the average inflows of the foreign direct investment into Nigeria is 0.31 throughout the study period. Interest rate and inflation rate have excess kurtosis of more than 3.00. The Jarque-Bera estimates show that all variables are normally distributed except inflation rate.

Table 4.1: Summary Statistics of the Variables Under Estimation

	LINP	*LFDI*	*LINT*	*LINF*	*LEXR*	*LOPN*
Mean	3.38	0.31	17.51	19.08	86.28	19.54
Median	3.37	0.48	17.55	12.21	92.33	20.97
Maximum	3.77	1.75	31.65	72.83	306.08	36.02
Minimum	2.89	-1.35	8.43	5.38	0.54	5.24
Std. Dev.	0.20	0.77	5.00	17.09	87.13	8.23
Skewness	-0.33	-0.47	0.15	1.78	0.83	-0.18
Kurtosis	2.46	2.66	3.48	4.99	3.00	2.10
Jarque-Bera	1.18	1.57	0.54	27.10	4.51	1.50
Probability	0.55	0.45	0.76	0.00	0.10	0.47
Observations	42	42	42	42	42	42

Source: Computed by the author using EViews version 10.

4.2. Inferential Results

This subsection deals with the results of the inferential tests. It consists of unit root tests, bound test, long run and short run results of the ARDL model, diagnostic tests and stability tests. Based on the results reported in Table 4.2, both Augmented Dickey-Fuller (ADF) and Phillips-Perron tests indicate that, industrial performance, inflation rate and economic openness are all stationary at level value I(0), while foreign direct investment, interest rate and exchange rate are stationary at first difference I(1). Going by the results, there is no I(2) series among the variables, this therefore suggests that ARDL is the most appropriate model for the analysis.

Table 4.2: Unit Root Test (Augmented Dickey-Fuller and Phillips-Perron)

Variables	*Augmented Dickey-Fuller*		*Phillips-Perron*	
	Level	*First Diff.*	*Level*	*First Diff.*
Industrial per.	-4.2744***	-6.6931	-3.3904*	-10.8810
Foreign direct inv.	-2.5000	11.1354***	-2.2974	-21.2217***
Interest rate	-2.2039	-5.6119***	-2.1414	-7.0469***
Inflation rate	-3.6651**	-5.6719	-2.9570	-11.4828***
Exchange rete	-1.8606	-4.6128***	-1.0598	-4.4403***
Economic open.	-3.4530*	-8.3034	-3.7034**	14.5691

Note: ***, ** and * indicate significant at 1%, 5% and 10% respectively.
Source: Computed by the author using EViews version 10.

The results presented in Table 4.3 suggest that, F-statistics (4.25) is greater than critical values at 1%, 5% and 10% levels of significant. This indicates that, there is long run relationship among the variables.

Table 4.3: ARDL Bounds Test

		Null Hypothesis: No levels relationship		
Test Stat.	*Value*	*Significance*	*I(0)*	*I(1)*
F-statistics	4.25	10%	2.08	3
K	5	5%	2.39	3.38
		1%	3.06	4.15

Source: Author's Computation using Eviews Version 10.

From the results in Table 4.4, foreign direct investment has a significant negative influence on industrial performance at 10% level. The findings suggest that foreign direct investment inflow reduces industrial performance in Nigeria. This finding is similar to those of Akintoye (2013), Azeroval (2016) and Okoli and Agu (2015) who find a significant negative relationship between foreign direct investment and industrial performance. However, the finding is contrary to those of Ezeanyeji and Ifebi (2016), Prasanna (2010) and Folsade, Joshua and Ifeoluwa (2016) who find a significant positive relationship between foreign direct investment and industrial performance.

However, interest rate has no significant influence on industrial performance. According to findings, interest rate does not influence the performance of industry in Nigeria. This finding is contrary to those of Egbulonu (2016) and Babatunde (2018) who find a significant negative relationship between interest rate and industrial performance.

From the results in Table 4.4, inflation rate has significant positive influence on industrial performance at 5% level. The results suggest that, an increase in inflation rate will lead to increase in the performance of the industrial sector in Nigeria. The finding is in line with those of Mensah, Ofori-Abebrese and Pickson (2016) who find a significant positive influence between inflation and industrial performance. While it is contrary with those of Okoye, Nwakoby and Modebe (2015) who find a significant negative relationship between inflation rate and industrial performance.

Exchange rate has a significant negative effect on industrial performance at 1% level. The findings suggest that exchange rate exert negative influence on the performance of industry in Nigeria. Additionally, an increase in exchange rate will lead to decrease in the contribution of industrial sector in Nigeria. The result is in agreement with the work of Babatunde (2018) who find that exchange rate has significant negative effect on industrial performance and it is at variant from the finding of Ileckukwe and Nwakoye (2015) which reveals a significant nexus between exchange rate and industrial performance.

Economic openness has significant positive influence on industrial performance at 5% level. The results indicate that economic openness has increased the performance of industrial sector. A 1% increase in economic openness will lead to about 0.013% increase in industrial performance in Nigeria. This finding contradicts the findings of Akintoye (2013) and Umer and Alam (2013) that reported economic openness exerting significant negative effect on industrial performance.

Table 4.4: Long run coefficients of ARDL

Dependent Variable: Industrial Performance

Variables	Coefficient	Std. Error	t-Statistic	Prob.
Foreign direct investment	-0.1268	0.0654	-1.9387	0.0623*
Interest rate	-0.0065	0.0096	-0.6771	0.5037
Inflation rate	0.0062	0.0030	2.0798	0.0465**
Exchange rate	-0.0014	0.0004	-3.5436	0.0014***
Economic openness	0.0130	0.0062	2.0888	0.0456**

R^2 = 0.86, Adj. R^2 = 0.82, AIC = -1.9941, SIC = -1.6062, HQC = -1.8561, DW = 1.89, F-stat. = 23.00 (0.0000)

Note: ***, ** and * indicate significant at 1%, 5% and 10% respectively.
Source: Author's Computation using Eviews Version 10.

From Table 4.5, the result shows that foreign direct investment has significant negative influence on industrial performance at 5% level in the short run. It further reported that interest rate and exchange rate have no significant influence on industrial performance in the short run. Moreover, inflation rate and economic openness have significant positive influence on industrial performance at 10% and 1% levels in the short run.

However, the results from Table 4.5 reveals that error correction model (ECM) have the correct sign, it is negative, less than one (-0.4962) and statistically significant at

Table 4.5: Short run coefficients of ARDL

Dependent Variable: Industrial Performance

Variables	Coefficient	Std. Error	t-Statistic	Prob.
Foreign direct investment	-0.0554	0.0241	-2.2994	0.0289**
Interest rate	-0.0061	0.0041	-1.4961	0.1454
Inflation rate	0.0015	0.0008	1.7070	0.0985*
Exchange rate	-0.0006	0.0006	-0.9934	0.3287
Economic openness	0.0120	0.0019	6.1140	0.0000***
Error correction model	-0.4962	0.1472	-3.3698	0.0021***

Note: ***, ** and * indicate significant at 1%, 5% and 10% respectively.
Source: Author's Computation using EViews Version 10.

1% level. The findings suggest the possibility of re-establishment of equilibrium in the case of instability in the economy. The results further explain that, it takes the economy about 49% annually to recover in case of any distortion.

Post estimation tests such as serial correlation test, heteroscedasticity test and normality test were all conducted to avoid reporting spurious results. The results reported in Table 4.6 show no evidence of serial correlation (autocorrelation) and heteroscedasticity. The results further indicated that the dataset is normally distributed.

Table 4. 6: Results of the Diagnostic Tests

Serial Correlation Test			
F-Statistics	0.020106	Prob. F (2, 18)	0.8883
Obs R-Square	0.027268	Prob. Chi-Square (2)	0.8688
Heteroscedasticity Test			
F-Statistics	1.148479	Prob. F (6, 12)	0.3624
Obs R-Square	9.142643	Prob. Chi-Square (6)	0.3304
Normality Test			
Jarque-Bera	1.0717	Prob.	0.5851

Source: Author's Computation Using EViews Version 10.

5. CONCLUSIONS, POLICY IMPLICATIONS AND RECOMMENDATIONS

This paper concludes that foreign direct investment and exchange rate have a significant negative influence on industrial performance. However, inflation rate and economic openness have a significant positive effect on industrial performance, while interest rate has no significant influence on industrial performance.

The implication of negative effect of foreign direct investment and exchange rate is that, more inflow of foreign direct investment into Nigeria and persistent fluctuations of domestic currency against foreign currencies will reduce the performance of industries in Nigeria. This paper therefore, recommends that, government should device other ways such as free trade or trade openness of improving the local industries rather than relying on foreign direct investment and exchange rate for the improvement of industrial performance. It is also reported that inflation rate and economic openness have a significant positive effect on industrial performance. This paper further suggests that government should improve the policies that will sustain desired inflation and stimulate economic openness.

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