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Determinants of Industrial Development in Developing Countries: The Case of Nigeria

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Abstract: While examining various variables that could drive industrial development in Nigeria, this study verified the contributions of market size, agricultural output, GDP growth rate, exchange rate, foreign direct investment inflows and trade openness to industrial development via empirical investigation using annual data from 1990 to 2019. The study employed Fully Modified Ordinary Least Squares (FMOLS) alongside Granger causality test to analyse the collected data. It is important to report the following as the pertinent findings that came out of this study; market size, agricultural output, trade openness, GDP growth rate and exchange rate are not strong variables that have the capacity to drive industrial development in Nigeria. This implies that these factors are not drivers of industrial development in Nigeria. However, FDI inflows is a weak driver of industrial development in Nigeria. In another page, the Granger causality results submitted that among all the determining variables paired with industrial development, it is only availability of huge market that is a vital condition for industrial development in the country. In view of the above, the study makes these recommendations for the Nigerian policymakers that industrial development in Nigeria requires the expansion of the country`s market size, production of sufficient agricultural product with value addition, expansion of the country`s GDP, controlling exchange rate, export promotion and attraction of more inflows of FDI in

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the country. Therefore, policy measures should be put in place by the Nigerian policymakers to facilitate the implementation of these recommendations in the country.

Keywords: Industrial Development; GDP; Population; FDI; Trade Openness; Nigeria

JEL Classification: F43; F62

1. Introduction

The influence of industrial development in driving the Nigerian economy cannot be undermined in the recent time (Okuneye, 2019; Usman, 2017). This is because industrialization has the capacity to contribute immensely to the achievement of sustainable development in the country. In a developing economy like Nigeria, industrial development could serve as a framework for job creation, technological advancement and reduction of poverty as experienced by some countries in Western Europe during the industrial revolution of the 19th and early 20th centuries. In view of the above, the government of Nigeria has embarked on various industrial reforms to facilitate development of industrial sector in the country.

However, in the past few decades, the contribution of manufacturing sector to the advancement of the Nigerian economy has not been impressive. The above statement is reinforced by the available statistical data which show a fall in the industrial performance from 11.8% in 1982 to 7.4% in 1997, which further pegged to 6% between 1998 and 2010. In 2011, there was a marginal rise in the industrial performance which later fell in 2015 to 9.5%. Furthermore, it has been observed that average industrial performance in the country between 2016 and 2019 is 8.7% (CBN, 2020). This is an indication of non-efficient industrial performance in the country.

The question that requires an urgent empirical answer is why the industrial development in Nigeria has been weak over the years? This is because from both the theoretical and empirical point of views, there are critical variables that drive industrial development in any economy. For instance, Barro (200I) identified economic institutions and domestic human capital as the strategic driver of industrial development. Meanwhile, further efforts by scholars in the recent times to unravel the critical factors that drive in industrial development in both country specific and cross countries studies have generated divided opinions in the literature. Consequently, it is worth of note that various studies regarding this subject matter in the recent times have not provided a conclusive evidence in Nigeria. See (Onodje and Farayib, 2020; Kenny, 2019, Sokunle and Harper, 2018; Otalu and Keji, 2015; Aiyedogbon and Anyanwu, 2015). This necessities more research work to provide better and clearer empirical evidence about critical factors driving industrial development in Nigeria. In addition, to the best of our knowledge, no study in Nigeria has examined the influence of the critical factors such as market size,

agricultural output and trade openness on industrial development in Nigeria. Against this backdrop, this study contributes to knowledge.

However, the structure of this paper is outlined as follows; section one focuses on introduction. Section two accommodates review of the related literature. While methodology, results and discussion alongside policy implication of the paper are presented in section three of the paper.

2. Literature Review

Otalu and Anderu (2015) assessed the determinants of the growth in the industrial sector in Nigeria. The study was analyzed using error correction model. It was discovered that the determinants have more of a fixed impact on industrial output than a temporary impact. Also, capital and labor have a significant effect on industrial sector and exchange rate has a positive and significant effect on industrial sector.

Aiyedogbon and Anyawu (2015) focused on the impact of macroeconomic determinants on industrial productivity in Nigeria from 1981-2013 using the ordinary least square technique to analyze the data. It was shown that exchange rate has a positively significant impact on industrial productivity in Nigeria. Also, interest rate, foreign direct investment and real GDP exerts positive effect on Industrial productivity while consumer price index, broad money supply and credit to manufacturing sector are negative.

OU (2015) evaluated the effect of industrial development on economic development in Nigeria from 1973-2013 with the use of PC Give to analyze the data. It was discovered that foreign direct investment and saving which were used to proxy industrial development have a positively significant effect on economic development while inflation had a negative impact on economic development.

Samouel and Aram (2016) ran a dynamic panel model for 35 countries from 1970-2012 to evaluate the determinant of industrialization in Africa. It found that Human capital, Labor Market conditions, Real Effective Exchange Rate and GDP per capita are major determinants of industrialization in Africa. The result also showed that the determinants of industrialization are different in various regions in Africa and grow over time.

Amoah and Jehu- Appiah (2022) examined the factors that influence industrialization in Africa from 1990-2018 using two-stage least square to analyze the data. It was discovered that foreign direct investment, total natural resources, and financial development had a positively significant effect on industrialization. Also, trade openness had a negatively significant effect on industrialization while human capital and inflation were insignificant.

Using a dynamic panel model, Kothakapa et al. (2021) investigated the association between financial development and industrialization in low- and middle-income countries from 1970 to 2014. The findings show that the two variables have a non-linear connection. More specifically, the data show that financial development impedes industrial development until a point at which the effect reverses.

Ndiaya and Lv (2018) made use of ordinary least square to analyze data from 1960-2016 to determine the role of Industrialization on economic growth in Senegal. The result showed that an increase in industrial output will bring about an increase in economic growth. This means that industrialization has a significant impact on economic growth in Senegal.

Singh and Kumar (2021) measured the performance of industrial sector in India using linear, log-linear and non-linear regression model from 2003-2018. The linear regression result showed that gross value added with total persons engaged, gross capital formation, total inputs, labor productivity, per person emoluments, capital intensity, credit to industry by scheduled commercial banks, and literacy rate were observed to be positive and statistically significant. The log linear regression result also showed that labor productivity, annual population growth, literacy rate, credit to industries by scheduled commercial banks, total persons engaged, per person emoluments, and gross capital formation have a positive impact on the gross value added of industries. The nonlinear result showed that labor productivity, annual population growth, credit to industries by scheduled commercial banks, total persons engaged, and gross capital formation display a linear association with the gross value added of industries. Meanwhile, literacy rate, per person emoluments, capital intensity, and total inputs display a hill-shaped association with industrial development in India.

Maroof *et al.* (2018) used panel auto regressive distributed lag and granger causality test to analyze the determinants of industrial development in South-Asian countries from 1996-2015. It was found that foreign direct investment, Equity Openness and Inflation are significant factors that add to the industrial development of south Asian countries.

Kumar *et al.* (2017) made use of cross sectional approach at three points to determine the factors affecting industrial development in Punjab in 1991, 2001 and 2014. It was revealed that infrastructural amenities has always been an essential factor affecting industrialization in Punjab.

3. Methodology

The study involves the connection between dependent variable and set of explanatory variables, and how the variation is the former is explained by the latter. As such, an expo facto research design is considered as the appropriate research

design for this study. Consequently, data from secondary sources such as CBN statistical bulletin and World Development Indicators are utilized between 1990 and 2020.

3.1. Model Specification

Employing model to estimate the objective of this study requires drawing of insight from studies such as Aderemi *et al.* (2020), Omoyele *et al.* (2021) and Obiakor *et al.* (2021). The insight drawn from the above studies was integrated in this adapted model to capture the objective of this present study in the following way:

$$IDP=f\ (MKTZ, AGP, GDPR, EXCH, FDI, TRO) \quad (1)$$

Transforming equation (1) to econometric model results in equation two (2) as follows;

$$LogIDP_t = \alpha + \beta_0 MKTZ_t + \beta_1 LogAGP_t + \beta_2 GDPR_t + \beta_3 EXCH_t + \beta_4 LogFDI_t + \beta_5 TRO_t + \mu_t \quad (2)$$

Furthermore, examining the direction of causality requires the specification of Granger causality equations, following Lawal *et al.* (2022) as follows;

$$IDP_t=\beta_0+\sum_{i=1}^{m}\beta_1 IDP_{t-i}+\sum_{j=1}^{n}\beta_2 AGP_{t-j}+\sum_{k=1}^{O}\beta_3 GDPR_{t-k}+\sum_{l=1}^{P}\beta_4 EXCH_{t-l} +\sum_{k=1}^{O}\beta_5 FDI_{t-m}+\sum_{l=1}^{P}\beta_6 TRO_{t-n}+\sum_{l=1}^{P}\beta_7 MKTZ_{t-o}+\mu_t \quad (3)$$

$$AGP_t=\beta_0+\sum_{i=1}^{m}\beta_1 AGP_{t-i}+\sum_{j=1}^{n}\beta_2 IDP_{t-j}+\sum_{k=1}^{O}\beta_3 GDPR_{t-k}+\sum_{l=1}^{P}\beta_4 EXCH_{t-l} +\sum_{k=1}^{O}\beta_5 FDI_{t-m}+\sum_{l=1}^{P}\beta_6 TRO_{t-n}+\sum_{l=1}^{P}\beta_7 MKTZ_{t-o}+\mu_t \quad (4)$$

$$GDPR_t=\beta_0+\sum_{i=1}^{m}\beta_1 GDPR_{t-i}+\sum_{j=1}^{n}\beta_2 AGP_{t-j}+\sum_{k=1}^{O}\beta_3 IDP_{t-k}+\sum_{l=1}^{P}\beta_4 EXCH_{t-l} +\sum_{k=1}^{O}\beta_5 FDI_{t-m}+\sum_{l=1}^{P}\beta_6 TRO_{t-n}+\sum_{l=1}^{P}\beta_7 MKTZ_{t-o}+\mu_t \quad (5)$$

$$EXCH_t=\beta_0+\sum_{i=1}^{m}\beta_1 EXCH_{t-i}+\sum_{j=1}^{n}\beta_2 AGP_{t-j}+\sum_{k=1}^{O}\beta_3 GDPR_{t-k}+\sum_{l=1}^{P}\beta_4 IDP_{t-l} +\sum_{k=1}^{O}\beta_5 FDI_{t-m}+\sum_{l=1}^{P}\beta_6 TRO_{t-n}+\sum_{l=1}^{P}\beta_7 MKTZ_{t-o}+\mu_t \quad (6)$$

$$FDI_t=\beta_0+\sum_{i=1}^{m}\beta_1 FDI_{t-i}+\sum_{j=1}^{n}\beta_2 AGP_{t-j}+\sum_{k=1}^{O}\beta_3 GDPR_{t-k}+\sum_{l=1}^{P}\beta_4 EXCH_{t-l} +\sum_{k=1}^{O}\beta_5 IDP_{t-m}+\sum_{l=1}^{P}\beta_6 TRO_{t-n}+\sum_{l=1}^{P}\beta_7 MKTZ_{t-o}+\mu_t \quad (7)$$

$$TRO_t=\beta_0+\sum_{i=1}^{m}\beta_1 TRO_{t-i}+\sum_{j=1}^{n}\beta_2 AGP_{t-j}+\sum_{k=1}^{O}\beta_3 GDPR_{t-k}+\sum_{l=1}^{P}\beta_4 EXCH_{t-l} +\sum_{k=1}^{O}\beta_5 FDI_{t-m}+\sum_{l=1}^{P}\beta_6 IDP_{t-n}+\sum_{l=1}^{P}\beta_7 MKTZ_{t-o}+\mu_t \quad (8)$$

$$MKTZ_t=\beta_0+\sum_{i=1}^{m}\beta_1 MKTZ_{t-i}+\sum_{j=1}^{n}\beta_2 AGP_{t-j}+\sum_{k=1}^{O}\beta_3 GDPR_{t-k}+\sum_{l=1}^{P}\beta_4 EXCH_{t-l} +\sum_{k=1}^{O}\beta_5 FDI_{t-m}+\sum_{l=1}^{P}\beta_6 IDP_{t-n}+\sum_{l=1}^{P}\beta_7 TRO_{t-o}+\mu_t \quad (9)$$

Moreover, it is important to stress that IDP represents industrial development, and manufacturing value added is used to proxy it in this study. MKTZ denotes market

size in which it is proxied by population growth rate. AGP stands for agricultural output, and agricultural value added is used for its proxy. GDPR means GDP growth rate. Whereas, EXCH, FDI, TRO represent exchange rate, foreign direct investment inflows and trade openness respectively. Also, μ is error term. α is intercept and β_0, β_1, β_2, β_3, β_4, β_5 represents coefficient of parameters with the positive aprori expectation. IDP=f (MKTZ, AGP, GDPR, EXCH, FDI, TRO)

4. Results and Discussion

Table 1. Descriptive Statistics

	logIDP	MKTZ	AGP	GDPR	EXCH	FDI	TRO
Mean	12.67270	2.574954	24.33226	4.341822	1.454475	1.662131	36.89020
Median	11.52236	2.564872	24.10000	4.631193	1.580443	1.552115	37.02160
Maximum	20.92708	2.680930	37.00000	15.32916	1.772032	5.790847	53.27796
Minimum	6.552817	2.488792	20.00000	-2.035119	0.734393	0.195183	20.72252
Std. Dev.	4.582622	0.068877	3.824516	4.081692	0.286351	1.205851	8.675701
Skewness	0.447107	0.203599	1.534063	0.413103	-1.042414	1.824741	0.005043
Kurtosis	1.694782	1.562088	5.774899	3.180687	2.870957	6.716303	2.398221
Jarque-Bera	3.233318	2.884809	22.10489	0.923882	5.635748	35.04243	0.467892
Probability	0.198561	0.236359	0.000016	0.630059	0.059733	0.000000	0.791404
Sum	392.8536	79.82358	754.3000	134.5965	45.08873	51.52605	1143.596
Sum Sq.Dev.	630.0128	0.142321	438.8077	499.8063	2.459910	43.62227	2258.034
Observations	31	31	31	31	31	31	31

Source: Authors' Computation (2022)

The descriptive statistics for the estimated data set are shown in Table 1 with a view to determining if the data set conforms to the normal distribution assumption. According to the table above, population growth rate, agriculture value added, gross domestic product growth rate, exchange rate, foreign direct investment have mean value and median value that are very close. However, manufacturing value added and trade openness have the mean value and the median value with a slight difference. All the variables means are bigger than their standard deviations. Because the standard deviation is less than the mean, this implies that the data is moderately dispersed from its mean. In addition, the data's set skewness is positive, that is, the skewness of the standard deviation is towards positive. The kurtosis for IDP, MKTZ, EXCH and TRO are all less than 3 indicating that the distributions are flat relative to normal distribution or are plato-kurtic while the kurtosis for AGP, GDPR and FDI are all greater than 3 indicating that the distributions are peaked relative to normal distribution or are lepto-kurtic.

Table 2. Correlation Matrix

	IDP	MKTZ	AGP	GDPR	EXCH	FDI	TRO
IDP	1.00						
MKTZ	-0.86	1.00					
AGP	0.12	-0.39	1.00				
GDPR	-0.35	0.28	0.42	1.00			
EXCH	-0.84	0.53	-0.01	0.08	1.00		
FDI	0.18	-0.11	0.20	-0.06	-0.21	1.00	
TRO	0.02	-0.12	0.33	0.36	-0.09	0.001	1.00

Source: Author's Computation (2022)

Table 2 above shows the result of the correlation matrix analysis. The correlation coefficient between MKTZ and AGP, GDPR and FDI, MKTZ and TRO, AGP and EXCH, GDPR and FDI, EXCH and FDI, EXCH and TRO are -0.39, -0.11, -0.12, -0.01, -0.06, -0.21, and -0.09 respectively, indicating that there is weak negative relationship between them. Also, the correlation coefficient between MKTZ and GDPR, MKTZ and EXCH, AGP and GDPR, AGP and FDI, AGP and TRO, MKTZ and EXCH, MKTZ and TRO are 0.28, 0.53, 0.42, 0.20, 0.33, 0.08, and 0.36 respectively, indicating that there is weak positive relationship between them. Finally, the correlation coefficient between FDI and TRO is 0.00 indicating that there is no correlation between FDI and TRO.

Using the correlation matrix as shown in Table 2, there is no problem of multicollinearity since the correlation coefficients of all the variables are lower than the recommended threshold of more than 0.8. As a rule of thumb, Gujarati (2009) suggested that if the correlation is greater than 0.8, then severe multicollinearity may be present.

Table 3. Unit Root Test

	Augmented Dickey- Fuller Test				Remarks
	Level	Probability	1st Difference	Probability	
IDP	-2.998064	0.0009			I (0)
MKTZ	-2.976263	0.0558	-2.981038	0.7377	I (2)
AGP	-2.971853	0.3535	-2.971853	0.0000	I(1)
GDPR	-2.963972	0.0263			I(0)
EXCH	-2.963972	0.0702	-2.967767	0,0007	I(1)
FDI	-2.963972	0.0460			I(0)
TRO	-2.963972	0.0506	-2.971853	0.0002	I(1)
	Phillip Peron Test				
	Level	Probability	1st Difference	Probability	
IDP	-2.963972	0.6528	-2.967767	0.0009	I(1)
MKTZ	-2.963972	0.6450	-2.967767	0.3764	I(2)
AGP	-2.963972	0.1611	-2.967767	0.0000	I(1)
GDPR	-2.963972	0.0179			I(0)
EXCH	-2.963972	0.0245			I(0)
FDI	-2.963972	0.0460			I(0)
TRO	-2.963972	0.0506	-2.967767	0.0000	I(1)

Source: Authors' Computation (2022)

One of the important pretests that cannot be undermined when dealing with time series data is stationary test because time series analysis usually generates spurious regression if appropriate precaution is not taken. In view of the above, this study estimated the unit root test within the techniques of Augmented Dickey-Fuller (ADF) and the Phillips Perron (PP) Tests, in which their results are presented in Table 3. Moreover, the above results indicate that IDP, GDPR and FDI data set was stationary at level, AGP, EXCH and TRO dataset is stationary at first differencing and MKTZ dataset is stationary after second differencing. This is an evidence that all the dataset used in this study comprises of a mixture of I (0), I (1) and I (2)

Table 4. Johansen Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.984422	120.6941	46.23142	0.0000
At most 1 *	0.927520	76.10883	40.07757	0.0000
At most 2 *	0.791320	45.44163	33.87687	0.0014
At most 3	0.542952	22.70606	27.58434	0.1864
At most 4	0.459221	17.82759	21.13162	0.1364
At most 5	0.253260	8.469092	14.26460	0.3330
At most 6 *	0.133297	4.148721	3.841466	0.0417

Source: Authors' Computation (2022)

The majority of variables of interest in this study are not stationary in their natural form. This might account for a short run divergence among these variables. However, a long run convergence is still possible among the variables. Against this backdrop, this study employs Johansen Cointegration Test in investigating the long run equilibrium among these variables with the results presented in Table 4. It is evident that the presence of at most five (5) cointegration equations is confirmed in the model. This affirms the presence of long run equilibrium relationship among the variables.

Table 5. Determinants of Industrial Development in Nigeria

Dependent Variable: IDP				
Method: Fully Modified Least Squares (FMOLS)				
Sample (adjusted): 2 31				
Included observations: 30 after adjustments				
Cointegrating equation deterministics: C				
Long-run covariance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MKTZ	-35.02551*	3.315189	10.56516	0.0000
AGP	-0.021139	0.057274	0.369088	0.7154
GDPR	-0.145794**	0.057302	2.544300	0.0181
EXCH	-9.301228*	0.755605	12.30964	0.0000
FDI	0.015015	0.124300	0.120795	0.9049
TRO	-0.020968	0.018919	1.108295	0.2792
C	118.2527	8.899661	13.28733	0.0000
R-squared	0.968561	Mean dependent var		12.50237
Adjusted R-squared	0.960360	S.D. dependent var		4.560064
S.E. of regression	0.907902	Sum squared residua		18.95859
Long-run variance	0.555050			

*Source: Authors' Computation (2022) *1% **5% ***10%*

Table 5 shows the estimated results of the determinants of industrial development in Nigeria as follows; firstly, the relationship between industrial development and market size show a negative and significant relationship. A unit change in market size reduces industrial development in Nigeria by 0.35%. This finding contradicts the submission of Singh and Kumar (2021) in a similar work in India. Likewise, agricultural output and industrial development possess an insignificant relationship in Nigeria. Ditto for trade openness because it has a similar relationship with industrial development. This result is contrary with the argument of Amoah and Jehu- Appiah (2022) in a related paper focusing on Africa. Consequently, GDP growth rate has an inverse relationship with industrial development. The relationship is significant at 5% level of significance. A unit change in GDP growth rate brings about 0.001% reduction in industrial development in the country. This contradicts the finding of Ndiaya and Lv (2018) in a related study in Senegal. Meanwhile, exchange rate and industrial development have a significant inverse relationship between each other in Nigeria. A unit change in exchange rate leads to a reduction in industrial development by 0.09%. This finding is not in tandem with the conclusions of Aiyedogbon and Anyawu (2015), Otalu and Anderu (2015) and Samouel and Aram (2016) in a similar researches in Nigeria and Africa respectively. However, FDI inflows and industrial development have an insignificant relationship in Nigeria. This finding is in agreement with the submission of Maroof *et al.* (2018), Aiyedogbon and Anyawu (2015) in related studies focusing on the South Asian countries and Nigeria simultaneously.

In summary, market size, agricultural output, trade openness, GDP growth rate and exchange rate do not contribute positive drive to industrial development in Nigeria. This implies that these factors are not drivers of industrial development in Nigeria.

Table 6. Granger Causality Test for Determinants of Industrial Development in Nigeria

Sample: 31					
Lags: 2					
Null Hypothesis:	Obs	F-Statistic	Prob.	Decision	Causality
MKTZ does not Granger Cause IDP	29	3.57645	0.0437	Reject	Unidirectional causality
IDP does not Granger Cause MKTZ		0.10214	0.9033	Accept	
AGP does not Granger Cause IDP	29	2.57155	0.0973	Accept	No causality
IDP does not Granger Cause AGP		0.99231	0.3854	Accept	
GDPR does not Granger Cause IDP	29	2.95245	0.0714	Accept	No causality
IDP does not Granger Cause GDPR		0.00234	0.9977	Accept	
EXCH does not Granger Cause IDP	29	0.11740	0.8897	Accept	No causality
IDP does not Granger Cause EXCH		0.74530	0.4853	Accept	
FDI does not Granger Cause IDP	29	0.13816	0.8716	Accept	Unidirectional causality
IDP does not Granger Cause FDI		4.12335	0.0289	Reject	
TRO does not Granger Cause IDP	29	0.19208	0.8265	Accept	No causality
IDP does not Granger Cause TRO		2.43090	0.1093	Accept	
AGP does not Granger Cause MKTZ	29	5.11250	0.0141	Reject	Bidirectional causality
MKTZ does not Granger Cause AGP		9.89661	0.0007	Reject	
GDPR does not Granger Cause MKTZ	29	11.3263	0.0003	Reject	Bidirectional causality
MKTZ does not Granger Cause GDPR		3.71051	0.0394	Reject	
EXCH does not Granger Cause MKTZ	29	0.73548	0.4898	Accept	No causality
MKTZ does not Granger Cause EXCH		0.33103	0.7214	Accept	
FDI does not Granger Cause MKTZ	29	2.67328	0.0895	Accept	No causality
MKTZ does not Granger Cause FDI		0.28422	0.7551	Accept	
TRO does not Granger Cause MKTZ	29	0.10280	0.9027	Accept	No causality
MKTZ does not Granger Cause TRO		3.26470	0.0557	Accept	
GDPR does not Granger Cause AGP	29	0.82948	0.4484	Accept	No causality
AGP does not Granger Cause GDPR		0.38967	0.6815	Accept	

EXCH does not Granger Cause AGP	29	0.87127	0.4312	Accept	No causality
AGP does not Granger Cause EXCH		0.03737	0.9634	Accept	
FDI does not Granger Cause AGP	29	0.15405	0.8581	Accept	No causality
AGP does not Granger Cause FDI		0.08620	0.9177	Accept	
TRO does not Granger Cause AGP	29	2.73102	0.0854	Accept	No causality
AGP does not Granger Cause TRO		1.39564	0.2671	Accept	
EXCH does not Granger Cause GDPR	29	0.09812	0.9069	Accept	No causality
GDPR does not Granger Cause EXCH		0.41536	0.6648	Accept	
FDI does not Granger Cause GDPR	29	1.31264	0.2877	Accept	No causality
GDPR does not Granger Cause FDI		0.44265	0.6475	Accept	
TRO does not Granger Cause GDPR	29	2.04749	0.1510	Accept	No causality
GDPR does not Granger Cause TRO		2.50471	0.1028	Accept	
FDI does not Granger Cause EXCH	29	3.84853	0.0355	Reject	Unidirectional causality
EXCH does not Granger Cause FDI		1.72060	0.2003	Accept	
TRO does not Granger Cause EXCH	29	0.78121	0.4691	Accept	No causality
EXCH does not Granger Cause TRO		0.53709	0.5913	Accept	
TRO does not Granger Cause FDI	29	0.90496	0.4179	Accept	No causality
FDI does not Granger Cause TRO		0.71896	0.4975	Accept	

Source: Authors' Computation (2022)

Table 6 above shows the estimated results for the pairwise Granger causality test of industrial development and various factors that drive in Nigeria. The empirical evidence in the above table confirms that among all the determining variables paired with industrial development, it is only market size that shows a unidirectional feedback flowing to industrial development in Nigeria. This is an indication that availability of huge market is a vital condition for industrial development in the country. Further evidence proves that a bidirectional causality exists between agricultural output and market size in one hand as well as market size and GDP growth rate on the other hand in the country. However, a unidirectional causality flows from FDI inflows to exchange rate in Nigeria.

By and large, it could be submitted that among others, market size is a very strategic factor that could stimulate industrial development in Nigeria.

5. Conclusion and Policy Recommendation

While examining various variables that could drive industrial development in Nigeria, this study verified the contributions of market size, agricultural output, GDP growth rate, exchange rate, foreign direct investment inflows and trade openness to industrial development via empirical investigation using annual data from 1990 to 2019. The study employed Fully Modified Ordinary Least Squares (FMOLS) alongside Granger causality test to analyse the collected data. It is important to report the following as the pertinent summary of the findings that came out of this study. Firstly, market size, agricultural output, trade openness, GDP growth rate and exchange rate are not strong variables that have the capacity to drive to industrial development in Nigeria. This implies that these factors are not drivers of industrial development in Nigeria. However, FDI inflows is a weak driver of industrial development in Nigeria. In another page, the Granger causality results submitted that among all the determining variables paired with industrial development, it is only availability of huge market that is a vital condition for industrial development in the country. In view of the above, the study makes these recommendations for the Nigerian policymakers that industrial development in Nigeria requires the expansion of the country`s market Sze, production of sufficient agricultural product with value addition, expansion of the country`s GDP, controlling exchange rate, export promotion and attraction of more inflows of FDI in the country. Therefore, policy measures should be put in place by the Nigerian policymakers to facilitate the implementation of these recommendations in the country.

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