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EFFECT OF ECONOMIC LIBERALIZATION ON THE PERFORMANCE OF THE INDUSTRIAL SECTOR IN NIGERIA

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Abstract

This study seeks to identify the effect of economic liberalization policy of the government (introduced in 1986 under the structural adjustment programme) on the performance of the industrial sector in Nigeria. Specifically, the study examines the extent to which changes in some key economic indicators like exchange rate, financial depth, trade openness and inflation rate account for the trend in output performance of Nigeria's industrial sector. Annual data on the variables, sourced from the publications of the Central Bank of Nigeria, were analyzed using the technique of the Vector Error Correction Model. The study shows that exchange rate volatility and trade openness exert significant positive impact on industrial output performance. The study however shows that financial depth and inflation exert negative but not significant impact on industrial output growth. To enhance the performance of the sector, government should seek to diversify sources of foreign exchange inflow to support her import-dependent industrial sector as well as develop the infrastructure base of the economy. Properly functioning infrastructure will, among other things, greatly enhance the realization of low price levels and hence low level of inflation required to boost domestic production capacity.

Introduction

The industrial sector of an economy is often regarded as the engine of growth and economic development largely due to its pivotal role in broadening the productive base of the economy, enhancing its revenue earning capacity, reducing the growth of unemployment and poverty as well as checking rural-to-urban migration. Towards enhanced performance of the sector, governments are often faced with the challenge of adopting either protectionist measures or liberalizing its operations. Economic liberalization policies have been widely acknowledged in development finance literature as a critical factor in economic performance. Basically, liberalization policies can impact economic performance through trade and/or finance flows. A major argument for trade liberalization is enhancement of efficiency and scale economies in the production activity. Tybout (1992) argues that entrepreneurial efforts are better rewarded through increased exposure to international competition. He posits that higher output levels associated with liberalization lower unit costs of production, an indication of efficiency in production.

Trade liberalization, for instance, opens up new markets, beyond national frontiers, thus enabling firms to produce and reap the benefits of large-scale production. Firms seek to be more efficient in their production process in order to compete favourably with their foreign counterparts. Economic liberalization promotes the establishment of export-oriented industries to enhance the foreign exchange earning capacity of the economy and the inflow of raw materials and capital goods (including technological innovations) needed in production. Hence economic openness could lead to enhancement in technology acquisition. Grossman & Helpman (1991) argue that openness to trade can influence technological change, thereby making production more efficient and in the process enhancing productivity improvements.

Adenikinju & Chete (2002) aver that opening up an economy offers immense opportunities to overcome limitations imposed by the shallow domestic markets (particularly in developing economies) which could enhance the inflow of foreign exchange required to finance essential production imports. Economic liberalization promotes the flow of factors of production, like capital (human and physical), technology and finance across national boundaries and thus enhances the scope of economic activity in the importing country. Some academics argue however that major benefits from liberalization may not derive from enhanced capital inflow into the domestic economy but from the attendant operational efficiency arising from reduction of domestic distortions and lock-in reforms (Gourinchas & Jeanne, 2002).

Financial sector liberalization, on the other hand, enables interest and exchange rates to reflect relative scarcities, stimulate savings and discriminate more efficiently between alternative investments (Ndebbio, 2004). Advocates of financial liberalization like Mckinnon (1973) and Shaw (1973) argue that it promotes effective deposit mobilization and allocation of credit to efficiently managed firms that offer high returns on capital. Nwankwo (1989) argues that liberalization promotes efficiency in the financial sector by offering a platform for efficient firms to borrow from the banking system.

Economic theory postulates that openness promotes competition, supports international trade and specialization, enhances market efficiency and drives the process of economic growth and development (Fratzscher & Bussiere, 2004). Studies on the liberalization-growth nexus have produced mixed results. For instance, Edwards (1992), Krueger (1997), Rodriguez (2000) and Umoru & Eborieme (2013) show evidence of positive relationship between trade liberalization and economic performance. On the other hand, while Masike et al (2008) find evidence of a significant negative relationship between them, Harrison (1990) and Osabuohien (2006) produce mixed results.

Similarly, the exact role of finance in real sector growth has remained a subject of considerable debate. While the Monetarist and Keynesian schools see a role for finance in real sector performance, the Classical school argues otherwise. Empirical studies in the area have further sustained the diversity of opinions in the finance-growth nexus. For instance, studies by Quinn (1997) and Edwards (2001) show evidence of significant positive relationship between financial liberalization and output growth. Studies by Edison et al (2002), Kraay (1998) and Frazscher & Bussiere (2004), however, could not confirm evidence of a significant long-run association between financial liberalization and growth.

In view of the conflicting evidence on the capacity of economic liberalization policies to promote economic growth, particularly in developing economies, this study seeks to examine the effect of the IMF supported economic liberalization policy introduced in 1986 (under the platform of the structural adjustment programme) on output performance in the Nigerian industrial sector. Studies in this area have largely approached this issue either from the point of view of trade or finance. This study adopts a holistic approach. Data over the period 1986-2013 on the research variables, sourced from the publications of the Central Bank of Nigeria, were analyzed using the technique of the vector error correction model.

Overview of the Nigerian Industrial Sector

The industrial sector, according to the Central Bank of Nigeria (2012), consists of crude petroleum and natural gas; solid minerals (including coal mining, metal ores, quarrying and other mining activities) and manufacturing (including oil refining, cement production, food beverages and tobacco; textiles, apparel and footwear; wood and wood products; pulp, paper and publishing; non-metallic products; domestic/industrial plastic and rubber; electrical and electronics; basic metal, iron and steel; motor vehicle and miscellaneous assembly.

The manufacturing sub-sector consists of large, medium, small and micro enterprises. Inability of large-scale industrialization policy to propel the growth of the industrial sector in Nigeria informed the policy shift to small-scale industrialization policy. Small scale enterprises presently maintain a very strong presence in the economy, playing a leading role in the industrial development of the country (Okafor, 2000).

The sub-sector is performing at sub-optimal levels, contributing less than an annual average of 4.0 per cent of the sector's contribution to GDP over the period 1981-2013 (Central Bank of Nigeria, 2013). For instance, between 1981 and 2012, manufacturing posted its highest contribution of 38.44 per cent to sectoral share of GDP (49.70 per cent) in 1983. By 2012, contribution from manufacturing to industrial sector output (39.03 per cent) stood at a paltry 1.88 per cent (Central Bank of Nigeria, 2012).

On the other hand, crude petroleum and natural gas sub-sector which trailed behind manufacturing prior to the reform period seems to perform better in the reform period, consistently out-performing the manufacturing sub-sector since 1989, emerging both as the major source of government revenue and export item for the industrial sector.

The performance of the solid minerals sub-sector suggests grossly under-exploitation or rather outright neglect. The sub-sector was barely able to contribute just over 1.0 per cent to sectoral output between 1981 and 1984. Between 1985 and 2012, solid minerals contributed less than annual average of 1.0 per cent to industrial share of national output. The sub-optimal performance of the sub-sector has been a source of concern because of its immense potentials as a major foreign exchange earner for the economy. According to Sanusi (2011), prior to the discovery of oil, sold minerals like coal and tin were major items of export for the country.

Overall, between 1981 and 1986, industrial output stood at an annual average of about 48.58 per cent of the total output of the economy. Over the 28-year period (1986-2013), the performance of the sub-sector rather than be enhanced, dropped to about 45.15 per cent of GDP (Central Bank of Nigeria, 2012). The declining contribution of the industrial sector, especially the sub-optimal performance of manufacturing and solid minerals, to national output is an issue of serious concern to the authorities in Nigeria and has continued to engage the attention of academics and other stakeholders.

Review of Related Literature

With the attainment of political independence in 1960, successive governments in Nigeria initiated various development plans (between 1962 and 1985) aimed at transforming her hitherto agrarian economy to an industrialized one. The economic vision of government in this regard received an initial boost with the discovery of oil and subsequent boom of the international oil market in the early 1970's. The oil boom provided enormous amount of foreign exchange required to fast-track the process of industrialization through the adoption of the import-substitution or large-scale industrialization policy. This policy encouraged investments in gigantic and ambitious projects, oftentimes, without regard to issues of long-term financing and efficiency, leading to low productivity and hence low value addition to the economy (Okafor, 2000). Following the sudden decline in oil revenue in 1978 due to sharp drop in oil prices, some of the industrial projects were abandoned, further promoting inefficiency and waste.

A characteristic feature of Nigeria's post-independence economic/industrial policy was the categorization of economic activities for foreign exchange allocation and credit ceiling control purposes as well as the implementation of government policies on interest and exchange rates. The industrial sector was accorded priority status in the allocation of credit and foreign exchange. The sector contributed about 11.3 per cent to the nation's GDP during the period 1960-1970 and 29.1 per cent in the corresponding period of 1971-1980 (Sanusi, 2011). The rapid growth in industrial sector's output in the second decade of independence coincides with the era of massive inflow of foreign exchange earnings from crude oil exports.

In terms of aggregate output growth, the economy grew at an annual average of 5.9 per cent during the period 1960-1970 and 5.6 per cent in the corresponding period of 1971-1980 (Sanusi, 2011). The decline in aggregate output in an era of economic windfall raised very fundamental economic issues. However, in what could be regarded as an executive appraisal of the economic policy of the era, the then Military President, General Ibrahim B. Babangida acknowledged that pegging of interest rate, contrary to expectation, did not achieve its

desired goal of stimulating new investments, nor did it result in increased capacity utilization (Federal Government Budget Speech, 1987).

Following the inability of the regulated policy regime to promote rapid economic growth, Nigeria, July, 1986 adopted the IMF supported structural adjustment programme (SAP) which was targeted at restructuring and redirecting the economy, eliminating price distortions and diversifying the export base of the economy (CBN, 1995). With respect to industrial sector development, SAP was designed to encourage: (a) the accelerated development and use of local raw materials and intermediate inputs in place of imported ones (backward integration policy) (b) the development and utilization of local technology (c) promotion of export-oriented industries, and (d) liberalizing controls to facilitate greater indigenous and foreign investments (Ogbonna, 1994). Similarly, with respect to the financial sector, particularly the banking sub-sector, SAP was designed to deregulate banking, liberalize banking operations, promote competition and make banking operations more market driven (Okafor, 2011). In this regard, SAP liberalized the mechanism for interest rate management and set the stage for a transition from fixed to market determined exchange rate regime. However, SAP had unintended consequences on domestic production capacity. Three years into the implementation of SAP, President Ibrahim B. Babangida explained that adjustments in the foreign exchange rates led to generalized increase in prices because of the high import content of domestic manufacturing and thereby impacted adversely on domestic manufacturing operations (Federal Government Budget Speech, 1989).

SAP created serious liquidity squeeze which led to severe shortage of vital production inputs like machinery and equipment, industrial raw materials and spare parts (Okoh, 1994). Also, the domestic currency depreciation attending the introduction of SAP led to sharp increase in the cost of imports, thereby raising the cost of domestic production. The high cost of production imports rendered domestic production unaffordable (Ukwu, 1994). High production costs of local industries render domestic output uncompetitive relative to their imported counterparts leading to low patronage of local products, hence low levels of capacity utilization and contribution to national output (Manufacturers Association of Nigeria, 2006).

A number of factors have been identified as impediments to the growth of the industrial sector in Nigeria. For instance, Okafor (2000) and Sanusi (2011) argue that lack of access to credit constitutes one major constraining factor to rapid small-scale industrialization. Okafor explains that small-scale enterprises in Nigeria lack the proper level and right mix of financing. Fesse (1995) argues that many small-scale enterprises with enormous potentials for growth often wither and die for lack of access to credit. Okafor (2000) further argues that public policy environment often inhibits the growth of small-scale industries because, according to him, the sector lacks effective policy cover against smuggling and dumping, often, of substandard and lowly priced goods into the country. He argues that available incentives are not only inadequate but are poorly managed.

Soludo (2006), Uche (2000) and Sanni (2009) attribute the high cost of domestic production to poor industrial infrastructure base as many industrial establishments are compelled to provide independent sources of water, electricity and in some cases access roads.

Another source of performance inhibition for the industrial sector in the post-reform period is the absence of local capacity (Ude, 1996). Ude argues that developing economies can only benefit from currency depreciation (an outcome of economic liberalization) if the productive sector has sufficient inventories of goods ready for export or have the potentiality to expand production of such goods, should their demand occur abroad as a result of the or devalued cheap currency. It is indeed doubtful if Nigeria has such capacity and, worse still, Nigerians have an insatiable appetite for foreign goods even at their higher prices. The net impact therefore is ceaseless outflow of foreign exchange that should have sustained an enhanced and vibrant domestic real sector.

Appraising the performance of the real sector in the post-SAP era, Osisioma (1998) avers that after 12 years of restructuring, the fundamental defects of the Nigerian economy still persist as the economic base remains import-oriented with weak industrial and technological base.

Empirical studies on the economic liberalization-output nexus, particularly in developing economies, have produced mixed results. While some studies produce evidence of significant positive impact of liberalization policy on output growth, others show evidence that economic liberalization has either contracted output growth

or has no relationship with output performance. For instance Umoru & Eborieme (2013) examined the effect of trade liberalization on industrial growth in Nigeria using annual data on industrial output growth, capital stock, exchange rate, trade liberalization. They adopted the co-integration and error correction analytical techniques and find a significant positive impact of trade liberalization on industrial output growth in Nigeria.

Kim (2000) investigated the impact of trade liberalization on productivity, competition and scale efficiency in Korea. He finds evidence of positive but not significant impact of liberalization on productivity. He attributes the low level of impact to shallowness of the liberalization policy in Korea.

Oyovwi & Eshenake (2013) studied the effect of financial liberalization on economic growth in Nigeria, adopting the methodology of the vector error correction technique. Annual data on GDP, financial depth (proxied by the ratio of M2 to GDP), government policy (represented as the ratio of total trade to GDP) and investment to GDP were employed for the study. They find that financial depth exerts a significant positive impact on economic growth while government policy or trade openness and investment-GDP ratio impact growth significantly but in the opposite (negative) direction.

Afaha & Njogo (2012) examined the impact of trade openness on the Nigerian economy using data over the period 1970-2010. Employing the technique of the ordinary least squares (OLS), they find a strong positive impact of trade openness on growth.

Udegbunam (2002) studied the effect of trade openness on industrial output growth in Nigeria using data for the period 1970-1997. He finds that trade openness is a major determinant of industrial output growth in Nigeria. Also, Bakare & Fawehinmi (2011) investigated the impact of trade openness on industrial output. They find that public domestic investment, savings rate, capacity utilization and infrastructure have negative impact on industrial output performance in Nigeria.

Masike et al (2008) studied the effect of trade liberalization on rubber production in Nigeria using data for the period 1960-2004. They find evidence that trade liberalization reduced the growth of rubber production during the period.

Saibu (2011) employed the VAR analytical technique in estimating the effectiveness of trade policy shocks on sectoral and aggregate output growth. He finds that trade openness has negative impact on both sectoral and aggregate output. The result further shows that monetary policy shocks have significant positive effects on manufacturing, service and industrial sectors. On the other hand, fiscal policy exerts a significant positive impact on the agricultural output.

Harrison (1990) examined the effect of trade liberalization in Cote d'Ivorie using a sample of 287 firms. The study produced mixed results. It shows evidence of positive impact for some firms and negative impact for some others. Mixed results were also documented in Osabuohien (2006) for Nigeria and Ghana. The study employed annual data for both countries covering the period 1975-2004. Data were processed using the co-integration and error correction models.

Edwards (1992) investigated the relationship between trade orientation, distortions and growth in developing economies. He finds evidence of positive relationship between trade openness and economic growth. Krueger (1997) examined the relationship between trade policy and economic development. The study documents evidence of positive relationship between economic growth and trade openness. Also, Rodriguez (2000) studied the effect of trade openness on the output performance of an open economy using 1996 data from 106 countries. Employing the methodology of the ordinary least squares estimation technique, he finds strong empirical support for a positive relation between per capita GDP and trade openness.

Methodology

Quantitative research technique based on ex-post facto research design was adopted for the study. It involves the use of available data on research variables to explain the extent to which they relate to the event. Data on exchange rate, trade openness, inflation rate, and financial deepening (sourced from the publications of the Central Bank of Nigeria) were used to explain the capacity of the industrial sector in Nigeria to contribute to the growth of the economy over the period 1986-2013.

The study utilized econometric model to determine the effect of economic liberalization on industrial output performance in Nigeria. The time series properties of the data as well as their short and long-run dynamics were examined. The Augmented Dickey-Fuller (ADF) and Phillip Perron (PP) unit root tests were used to test for stationarity of data. Johansen & Jusellius (1990) method was adopted in testing for co-integration while the vector error correction mechanism (VECM) was used to capture the short and long-run relationship between endogenous and exogenous variables.

Model Specification

The model adopted for this study was derived from a similar work by Oyovwi & Eshenake (2013) with slight modifications to suit our purpose. Oyovwi & Eshenake (2013) used financial depth (proxied by M_2/GDP), trade openness and investment to GDP ratio to explain growth rate of GDP in Nigeria using the methodology of the vector auto regression (VAR) technique. Our model however, expressed output performance as a function of exchange rate, financial depth, trade openness and inflation. The implicit representation of the model is expressed as:

OUTP= f (EXR, FINDEP, OPNS, INFL) …… equation (1)
Where;
OUTP = industrial output to GDP
EXR = exchange rate changes
FINDEP = financial depth
OPNS = trade openness
INFL = inflation rate
The explicit form of the model in equation (1) is expressed as:

$$OUTP_t = \beta_0 + \beta_1 EXR_t + \beta_2 FINDEP_t + \beta_3 OPNS_t + \beta_4 INFL_t + \varepsilon_t \ldots\ldots\ldots \text{equation (2)}$$

Where;
β_0 = constant term
$\beta_{1\ldots}\beta_4$ = coefficients of the exogenous variables
ε_t = error term

Variables/Proxies

Industrial Output: This is the aggregate output from crude petroleum and natural gas, solid minerals and manufacturing sub-sectors in a given year expressed as a ratio of the nation's GDP.
Exchange Rate: This is the price at which a given unit of the domestic currency exchanges for one unit of a foreign currency. For our purpose in this study, exchange rate volatility expressed as rate of change over successive periods was adopted as proxy.
Financial Depth: This is a measure of accessibility to financial services, expressed in this study as ratio of credit to private sector (CPS) to GDP.
Trade Openness: This measures the extent to which restrictions to trade are relaxed. It is proxied by the ratio of total foreign trade to GDP
Inflation Rate: This is a measure of the price level in the domestic economy.

A priori Expectations

It is expected that positive relationships exist between industrial output, financial depth and trade openness while a negative relationship is expected between industrial output, inflation rate and change in exchange rate. Hence this can be mathematically represented as $\beta_1<0$, $\beta_2>0$, $\beta_3>0$ while $\beta_4<0$.

Data Analysis and Interpretation

Unit Root Test Result

Table 1: Augmented Dickey Fuller at Levels and first difference

Variable	ADF Test @Levels	Test @ First Difference	ADF Critical value @ 1%	Remark
OUTP	-0.607091	-4.687125***	-3.788030	Integrated of order 1
EXR	-2.809629	-7.611245***	-3.724070	Integrated of order 1
FINDEP	-1.366013	-4.178491**	-3.711457	Integrated of order 1
OPNS	-2.509945	-8.351977***	-3.711457	Integrated of order 1
INFL	-2.438370	-3.283745**	-3.004861	Integrated of order 1

Table 2: Phillip Perron (PP) Unit Root Test at Levels and first difference

Variable	PP Test @Levels	Test @ First Difference	PP Critical values @ 1%	Remark
OUTP	-2.534504	-11.03825***	-3.711457	Integrated of order 1
EXR	-6.433227***	-18.79008***	-3.711457	Integrated of order 0
FINDEP	-1.378268	-4.033444***	-3.711457	Integrated of order 1
OPNS	-2.464961	-14.90284***	-3.711457	Integrated of order 1
INFL	-2.438370	-5.106970***	-3.711457	Integrated of order 1

Source: Author's Compilation from E-views 7.0. *** . ** stationarity at 1% and 5%

To enhance the reliability of the results, the Augmented Dickey Fuller (ADF) and Phillips Perron (PP) tests were employed to establish stationarity of the variables. Both the ADF and PP test the null hypothesis of the existence a unit root especially in time series observations. The null hypothesis of a unit root is rejected and the alternative accepted to confirm a stationary series when the test statistic is greater than the critical values at 5 per cent level of significance. This implies the absence of a unit root in the time series observations.

Analysis of the results indicates no stationary trend for the ADF test at levels. However all the variables (OUTP, EXR, FINDEP, OPNS and INFL) achieved a stationary trend at first their difference. The PP test indicates that all the variables except EXR are not stationary at their levels but become stationary at first difference.

Co-integration Analysis

Table 3a: Co-integration Analysis (Trace statistic)
Trend assumption: Linear deterministic trend
Series: OUTP EXR FINDEP OPNS INFL
Lags interval (in first differences): 1 to 1

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.805383	90.79966	69.81889	0.0005
At most 1 *	0.646690	48.24493	47.85613	0.0459
At most 2	0.418260	21.19432	29.79707	0.3457
At most 3	0.216962	7.109297	15.49471	0.5650
At most 4	0.028449	0.750387	3.841466	0.3864

Trace test indicates 2 co-integrating eqn(s) at the 0.05 level
* rejection of the hypothesis at 5% level **MacKinnon-Haug-Michelis (1999) p-values

Table 3b: Co-integration Analysis (Maximum Eigen Value)
Unrestricted Co-integration Rank Test (Maximum Eigen value)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.805383	42.55473	33.87687	0.0036
At most 1	0.646690	27.05061	27.58434	0.0584
At most 2	0.418260	14.08503	21.13162	0.3581
At most 3	0.216962	6.358910	14.26460	0.5676
At most 4	0.028449	0.750387	3.841466	0.3864

Source: Author's Compilation from E-views 7.0.

The Johansen & Jusellius (1990) was used to ascertain co-integrating properties of the model. Co-integration was determined by comparing the trace and maximum eigen value statistics against the critical value at 5 per cent. The co-integration result using the trace statistic rejects the null hypothesis of no co-integrating vectors and 1 co-integrating vector at 5 per cent significance level given that the computed test statistics of 90.79966 and 48.24493 are greater than their corresponding critical values (69.81889 and 47.85613 respectively). Also, the maximum Eigen value statistic rejects the null hypothesis of no co-integrating vectors at 5 per cent, with the Max-Eigen statistic of 42.55473 being greater than 33.87687. Hence both methods reject the null hypothesis of no co- integration.

Vector Error Correction Analysis (Long-run estimate)

Table 4: Vector Error Correction Model

Variable	Co-efficient	Std. Error	T-statistics
C	-80.37339		
EXR(-1)	0.382854	0.16148	2.37095
FINDEVP (-2)	-0.018974	-0.14848	-0.12782
OPNS(-1)	0.723096	0.10418	6.94002
INFL(-2)	-0.139198	0.08728	-1.59488

Source: Author's Compilation from E-views 7.0.

From the result presented in table 4, the model can be explicitly re-expressed as:

$OUTP_t = -80.373+0.3828EXR_t -0.019FINDEP_t+ 0.723OPNS_t -0.139INFL_t + \varepsilon_t$ ……equation (3)

The long-run estimate from the vector error correction model is presented in table 4. Equation 3 shows that output will reduce by 80.37339 units when other variables are held constant. Exchange rate (0.382854) indicates a positive and significant impact on output performance. The estimated co-efficient for exchange rate shows that a unit increase in the rate at which exchange rate fluctuates brings about a corresponding increase in output by 0.382854 units in the long-run. Though this result does not conform to a priori expectation of negative association between exchange volatility and output performance, it is an indication of the extent to which the sector is dependent on imports for its operations.

Financial depth (-0.018974) shows negative but not significant effect on output performance. This suggests that finance did not play any significant role in output determination within the scope of the study. This result does not conform to a priori expectation of significant positive relationship but can be explained partly by diversion of credit away from real sector operations to areas that could return quick profits to compensate for the prevailing high rates of interest.

Evidence from the estimated result for economic openness shows a significant positive effect on output performance. This result shows that a unit increase in openness will increase output by 0.723096 units. The inflation rate co-efficient (-0.139198) shows an inverse but not significant impact of inflation on output. The empirical result indicates that a unit increase in inflation reduces output by 0.139198 units, holding other variables constant. This however conforms to a priori expectation since it is expected that increases in inflation rate would retard investment and productivity in the real sector.

Short run Analysis

The short-run estimate shows that exchange rate and openness have significant negative effect on industrial output while inflation shows a significant positive impact. The result also shows that financial deepening has a positive but not significant effect on output. The error correction model also captures the speed of adjustment of the model to short-run disequilibrium conditions. The negatively signed co-efficient depicts the presence of a feedback mechanism in the model in the incidence of external shocks. The result shows a high speed of adjustment to short-run shocks of approximately 79 per cent. Hence the short run deviations from equilibrium position are re-adjusted to maintain balance in the system by the variables in the long-run.

Table 5: Vector Error Correction Estimates

Variable	D(OUTP)	D(EXR)	D(FINDEP(-1))	D(OPNS)	D(INFL(-1))
ECM (-1)	-0.788516	-1.431293	0.112505	-0.912391	1.177267
Standard Error	(0.20582)	(0.83667)	(0.13772)	(0.32894)	(0.54073)
T-Statistic	[-3.83114]	[-1.71070]	[0.81690]	[-2.77376]	[2.17719]

R-squared	0.762924		Adj. R-squared	0.545603	
F-statistic	3.510598		Sum sq. resids	261.6458	

Source: Author's Compilation from E-views 7.0.

The co-efficient of determination (R^2) for the dynamic model (0.762924) shows that the included variables jointly explain over 76 per cent of variations in output. The result of the adjusted R^2 (0.545603) which controls for incremental variables to the model, shows that 54.56 per cent of the total variations in output is traced to the changes in the independent variables.

Diagnostic Tests

Table 6: Diagnostic Tests

Test	Null Hypothesis	T-statistics	Probability
Langrage Multiplier (LM)	No serial correlation	18.96593	0.7988
Jacque-Bera (JB)	Normal distribution	6.990608	0.7157
Heteroskedasticity (Chi-sq)	Absence of Conditional Heteroskedasticity	344.3862	0.2817

Source: Author's Compilation from E-views 7.0.

The diagnostic checks serve to validate the result obtained from the estimated equations developed for the study. The vector error correction model (VECM) was tested for serial autocorrelation using langrage multiplier (LM) test, heteroskedasticity was tested using the White test and normality was ascertained by utilizing the Jarque-Bera. The result of the diagnostic test shows acceptance of the null hypothesis of no serial auto correlation, no heteroskedasticity. The Cholesky (Lutkepohl) orthogonization of the normality test reveals that data are normally distributed and well shaped.

Summary, Conclusion and Recommendations

The finding from this study provides empirical evidence in support of a long-run relationship between selected variables and industrial output growth in Nigeria. The long-run estimate shows that exchange rate and openness have significant positive impact on industrial output in Nigeria. There is also evidence of negative impact of trade openness and financial deepening on industrial output. However, the short-run estimate shows that exchange rate and openness have significant negative effect on industrial output while inflation shows a significant positive impact. The result also shows that financial deepening has a positive but not significant effect on output.

From the above results, the study concludes that economic liberalization significantly impacts on the operations of the real sector in Nigeria. However, the financing deepening impact of liberalization does not show significant impact on industrial output.

In view of the significant role of exchange rate in the promotion of the industrial sector growth in Nigeria, it is recommended that the economy be diversified to boost her foreign exchange earning capacity.

There should be strong credit support for the private sector to enhance its output performance in Nigeria. This could be achieved through strong partnership between the real sector and financial institutions. Such a strong collaboration between investors and lenders in project initiation, implementation and management will reduce issues of moral hazard. Monetary authorities should also review credit policies with the aim of reducing bureaucratic practices that hinder easy access to credit as well as strongly emphasize monitoring and supervision of the credit portfolio of lending institutions.

Policy measures that foster trade integration between Nigeria and the international community should be pursued in order to benefit from enhanced trade flow. However, export promotion strategies should be intensified to enhance trade balance. Local content in production should also be promoted.
Finally, the study recommends that government should give serious attention to infrastructural development as a way of lowering the cost of doing business. Low output cost supports low output price and leads to a reduction in general price levels, a major condition for attainment of low rates of inflation.

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