An Emprical Analysis Of the Impact of Exchange Rate Dynamics On Manufacturing Output In Nigeria

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ABSTRACT: This study revealed an empirical analysis of the impact of exchange rate dynamics on manufacturing output in Nigeria and how it affects growth in various global locations has been the subject of many studies. These studies have looked into the relationship between macroeconomic performance and exchange rate fluctuations in relation to manufacturing output and other related variables. Using Error Correction Model and exchange rates, inflation rates, interest rates, and investments as independent variables, this study examined the performance of Nigeria's manufacturing sector as was affected by fluctuations in exchange rates policy, Stationarity, short-term and long-term causal relationships-among the variables were tested using the Unit Root, Johansen co-integration, Granger causality tests. According to the study's empirical findings, interest rates, exchange rates, and investment all have statistically significant effects on Nigeria's manufacturing output; however, investment positively and significantly affects Nigerian manufacturing output, while interest rates and exchange rates have negative effects.

Additionally, the estimation's outcome showed a two-way causal relationship between Nigeria's manufacturing output and exchange rates. Therefore, in order to successfully manage the exchange rate, it is suggested that the government develop a good exchange rate policy in to their economy system.

Keywords: *Error Correction Model, Exchange Rate Fluctuations, Manufacturing output, Granger Causality, Johansen co-integration.*

1.1 Introduction

Popoola (2021) revealed that proper exchange rate dynamics has good influence on on any nation economy growth and development. This thought is expected to be the primary driver of economic change. According to the Asia Tigers, the manufacturing sector can raise per capita income. However, compared to other parts of the world, Africa's manufacturing sector performs poorly, which results in a relatively low contribution of the manufacturing sector to overall output and employment. According to Popoola et al. (2019), this industry has the potential to reduce and provide a long-term solution to the high unemployment rate observed in African economies. Popoola, 2021 revealed that high rate of employment has created a lot of hardship and this led to high crime rate among the youth in developing countries. For many years, Nigeria's industrial sector has not made a significant contribution to the country's GDP. The manufacturing sector's share of the nation's GDP grew from a meager 4.8% in 1960 to 7.2% in 1970 and 7.4% in 1975 (Central Bank of Nigeria, 2020). About 10% of Nigeria's GDP came from the manufacturing sector prior to the oil boom of the 1970s. The sector's relative GDP share then decreased as a result of higher crude oil sales income. It fell to 5.4% in 1980 before rising to a record 10.7% in 1985 (CBN 2020). Nigeria's foreign exchange reserve has drastically decreased as a result of the downturn. Steel production became the primary focus of policy attention as a result of the recession brought on by the decline in oil prices in the early 1980s (World Bank, 2020). In order to promote the impot, government put more effort into industrialization.

The Privatization of the industry, couple with Commercialization Act of 1988, in conjunction with this, promoted increased efficiency in Nigeria's industrial sector.

This are in line with World Bank, 2020. It has been revealed by many scholars that strong currency has significant impact in the exchange rate fluctuation on manufacturing output in the world economy. This has been supported by extensive research in the field of economics globally. Nigeria economic is mono economy and this causes a lot of challenges to the growth and development of the country (Popoola, 2019). Poverty is at alarming rate in Nigeria, and this causes by poor exchange rate fluctuation on manufacturing output in Nigeria, this leads to low income generation and poor employment creation among the populace (Popoola, 2021).

1.2 Research questions:

This study seeks to provide answers to the following questions

i.   What is the impact of exchange rate fluctuations on manufacturing output?

ii.   What is the causal relationship between exchange rate, inflation rate, interest rate and manufacturing output in Nigeria?

1.3 Objectives of the study

The main objective of this study is to examine the impact of exchange rate fluctuations on manufacturing output in Nigeria. Therefore, the specific objectives are to empirically:

i.   Examine the impact of exchange rate fluctuations on manufacturing output

ii.   Establish the causal relationships between exchange rate, inflation rate, interest rate and manufacturing output in Nigeria.

2. Literature review

Exchange rate is the value of one currency in relation to another. It is the price of the currency of one country in terms of another currency that a country uses in determining its level of economic performance (Onabote et al., 2021). Exchange rates are significant because it bridges the gap between domestic and foreign prices. There is a high demand for foreign exchange in Nigeria, with a high import rate of

raw materials and capital goods from the manufacturing sector. Thus, shocks to Nigerian exchange rates will have a wide range of effects on manufacturing sector (Areghan et al., 2018).

Exchange rate fluctuations impact the production level of manufacturing firms through trade channel effects and variations in the prices of input and outputs. According to Akeem (2019), increasing manufacturing sector performances have real- positive impact on economy. That is not the case in Nigeria because the inability to import due to currency-depreciation has negative impacts on manufacturing-production (Tams-Alasia et al., 2018).

An emprical analysis of the impact of exchange rate dynamics on manufacturing output has been carried out by many scholars as revealed below.

Oladipo et al., (2023) empirically investigated the impact of exchange rate fluctuations on manufacturing output in Nigeria. Using the Generalized Auto-regressive Conditional Heteroscedasticity (GARCH) technique and the business cycle stylized facts, the study established that exchange rate is highly volatile and has a negative effect on manufacturing output in Nigeria. Okoye et al. (2021) examined the link between exchange rate oscillation and government spending in Nigeria. The study adopted- the Mundell-Fleming model and descriptives- statistics. The findings shows that both capital and recurrent expenditures has no significants effect on exchange-rate policy in Nigeria. Mlambo (2020) in his study examined how exchange rate badly affected manufacturing performance in Southern African countries. He used the FMOLS (fully modified ordinary least- squares) and PMG (pooled means -group) panel group methods to analyse data. The findings revealed that manufacturing performance was positively correlated with exports and inflation. Ali (2020) examined the impact of exchange rate fluctuations on manufacturing performance in Nigeria using the ARDL- approach. The study shows that exchange rate fluctuation has a sound -negative impact on the performance of the manufacturing output.

Lawal (2016) studied the effect of exchange rate fluctuations on manufacturing sector output from 1986 to 2014, a period of 28 years. Using Autoregressive

Distribution Lag (ARDL) model, it was discovered that exchange rate fluctuations have long run and short run relationship with manufacturing sector output. The results showed that exchange rate has a positive relationship with the manufacturing sector's output but is not significant. Opaluwa et al (2012) examined the impact of exchange rate fluctuations on the Nigerian manufacturing sector during a twenty (20) year period (1986 – 2005). Using regression analysis, they found out that exchange rate fluctuations have negative impact on manufacturing sector's performance. Ehinomen and Oladipo (2012) studied exchange rate management and the manufacturing sector performance in the Nigerian economy. Employing the Ordinary Least Square (OLS) multiple regression analysis, it was found that in Nigeria, exchange rate appreciation has a significant relationship with domestic output. And that exchange rate appreciation will promote growth in the manufacturing sector.

With a lot of extensive research carried out on exchange rate fluctuations and their numerous effects on various macroeconomic variables, not much attention is given to its effect on manufacturing aspect. The Error Correction Model (ECM) with the data spanned 44 years. Thus, this study seeks to investigate the impact of exchange rate fluctuations on manufacturing output in Nigeria for a period that covered 1980 to 2023.

3. Methodology

This study looks into how changes in exchange rates affect industrial production using annual time series data from 1980 to 2023. To avoid spurious regression, the data is stationary and subjected to a unit root test. Estimates are derived using the Error Correction Model and multiple regression analysis. For statistical significance, the Durbin Watson statistics, R^2 coefficient, F test, and T-statistics are employed...

4. Model specification

The specification of an econometric model was based on economic theory and empirical literature relating to the link between exchange rate and manufacturing sector performance. On that premise, this study modified Yaqub's (2010) model. Yaqub (2010) investigated the effect of exchange rate on the output of the

agricultural and manufacturing sectors in Nigeria. Based on the model employed, the study developed the following regression model:

GDP = F (ER, INF, INT, FDI) --**1**

Where:

GDP = gross domestic product

ER = Exchange rate

INF = Inflation rate

INT = Interest rate

FDI = Foreign direct investment

The above model was modified into a time series, functional model, with manufacturing output as the dependent variable, which was proxied by the contribution of manufacturing to gross domestic product, exchange rate, interest rate, investment and consumer price index as independent variables. The following is a representation of the model:

M-GDP = f (EXR, INTR, CPI, INV) --**2**

Where

M-GDP = Manufacturing output

EXR = Exchange Rate dynamic

INTR = Interest Rate

CPI = Risk from Consumer Price Index

INV = Investment

The econometric form of the model is presented as:

M-GDP = η_0 + η_1EXR + η_2INTR + η_3CPI + η_4INV + ε_t ----------------------------**3**

Where

η_0 = Intercept

$\eta_1 - \eta_4$ = Shift Parameters and ε_t = error term at period t

Using econometric regression estimation, the study examines how Nigerian manufacturing output is affected by fluctuations in exchange rates. The study employs the Error Correction Model to examine the direction and significance of the effect, the co-integration test to identify long-term relationships, and the Phillips-Perron model and Augmented Dickey - Fuller Test to identify stationary variables. To ascertain the relationship between interest rates, industrial output, and exchange rate fluctuations, the results are evaluated using Durbin-Watson, F-test, t-test, and coefficients of determination.

Summary Statistical of Variables

Table 1.1: Descriptive Analysis

	LM-GDP	LINV	EXCH	INT	INF
Mean	8.534403	6.547237	88.66242	17.57684	50.23254
Median	8.707881	6.611111	97.39930	17.54000	28.90091
Maximum	11.75793	10.12981	306.0801	29.80000	158.9435
Minimum	4.975561	2.672078	0.610000	7.750000	0.493799
Std. Dev.	2.336375	2.555846	87.19263	4.628256	52.57900
Skewness	-0.188011	-0.099905	0.799107	0.203869	0.746710
Kurtosis	1.600187	1.587669	2.964197	3.668072	2.110328
Jarque-Bera	3.326374	3.221456	4.046317	0.969903	4.784551
Probability	0.189534	0.199742	0.132237	0.615727	0.091421
Sum	324.3073	248.7950	3369.172	667.9200	1908.837
Sum Sq. Dev.	201.9701	241.6968	281294.5	792.5680	102288.4
Observations	44	44	44	44	44

Source: Authors' Computation 2024

According to the study, every variable is normally distributed, with the exception of investment, which has a leptokurtic distribution. Nevertheless, the Jaque-Bera test

shows that the manufacturing output with real currency rate are not distributed consistently.

Table 1.2: Correlation Matrix Output

	LM-GDP	LINV	EXCH	INT	INF
LM-GSDP	1				
LINV	0.99809	1			
EXCH	0.90024	0.90944	1		
INT	0.18541	0.16881	0.07221	1	
INF	0.91350	0.92592	0.91188	-0.01937	1

Source: Authors' Computation 2024

Unit Root Test

The Phillips-Perron and Augmented Dickey-Fuller (ADF) tests were employed to ascertain whether a time series variable has a unit root or is non-stationary. The findings demonstrated that while all of the variables were stationary at first difference, none of them were stationary at levels.

The presentation of results is shown in Tables 1.3 and 1.4 below

Table 1.3: Unit Root Test Result using Augmented Dickey-Fuller (ADF)

Variable	Level		First Difference		Status
	ADF Critical Value	t*	ADF Critical Value	t*	
LM-GDP	-1.155155	-3.626784	-3.180352	-2.945842**	I(1)
LINV	-0.990371	-3.626784	-3.662953	-3.626784*	I(1)
EXCH	1.728339	-3.621023	-4.216838	-3.626784*	I(1)
INT	-3.523090	-3.621023	-9.559080	-3.626784*	I(1)
INF	1.226823	-3.621023	-4.514850	-3.626784*	I(1)

Source: Authors' Computation 2024

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

Table 1.4: Unit Root Test Result using Phillips-Perron

Variable	Level		First Difference		Status
	PP Critical Value	t*	PP Critical Value	t*	
LM-GDP	-0.721492	-3.621023	-3.096562	-2.945842**	I(1)
LINV	-0.642565	-3.621023	-3.634350	-3.626784*	I(1)
EXCH	1.517424	-3.621023	-4.174258	-3.626784*	I(1)
INT	-3.484039	-2.943427**	-	-	I(0)
INF	0.978672	-3.621023	-4.499868	-3.626784*	I(1)

Source: Authors' Computation 2024

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

Since the interest rate is stationary at level and the other variables are stationary at first difference, as shown in Table 1.4, a long-run co-integration assessment utilizing the Johansen co-integration technique and figuring out the number of co-integrating equations is required.

Co-integration Test

The link revealed the real tested using the Johansen co-integration test. With trace and maximum statistics values below critical values, the results demonstrate that variables move together over time. The long-term association between the variables is revealed real-the p-values, which are higher than 0.05.

Table 1.5A: Johansen Co-integration Result (Trace)

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.648053	75.77135	69.81889	0.0155
At most 1	0.385127	38.17751	47.85613	0.2943
At most 2	0.326068	20.66931	29.79707	0.3786
At most 3	0.159040	6.462787	15.49471	0.6408
At most 4	0.006290	0.227165	3.841466	0.6336
Trace test indicates 1 co-integrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Authors' Computation 2024

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

Table 1.5B: Johansen Co-integration Result (Maximum Eigenvalue)

Unrestricted Co-integration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.648053	37.59384	33.87687	0.0172
At most 1	0.385127	17.50820	27.58434	0.5365
At most 2	0.326068	14.20653	21.13162	0.3483
At most 3	0.159040	6.235622	14.26460	0.5832
At most 4	0.006290	0.227165	3.841466	0.6336
Max-eigenvalue test indicates 1 co-integrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Authors' Computation 2024

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

The long run result of the effect of exchange rate and interest rate on manufacturing output

Table 1.6: Long Run Coefficients

Variables	Coefficient	Std. Error	t-statistic	Pro.
EXCH	-0.055447	0.007889	-7.028091	0.0000
INV	0.001479	0.025059	0.059027	0.9539
INT	-0.230225	0.090272	-2.550344	0.0254
INF	-0.204465	0.028956	-7.061362	0.0000
C	18.96848	8.134061	2.331982	0.0379

Source: Authors' Computation 2024

According to the study, Nigerian manufacturing output is adversely affected by inflation, interest rates, and exchange rates at a 1% level, resulting in a 0.06 drop in output. Investment has a small positive effect on output, whereas interest rates have a 5% negative influence on output, resulting in a 0.2 decline in performance. At the 1% level, inflation has a negative effect on output, resulting in a 0.2 decline.

The short run effect of exchange rate and interest rate on manufacturing output

Table 1.7: Error Correction Model (ECM) on the Effect of exchange fluctuation, interest rate and inflation on manufacturing output in Nigeria

	Model on the Effect of exchange rate fluctuation and interest rate on manufacturing output in Nigeria
Variables	Coefficient with p-value
D(LINV(-1))	0.39725[0.0126]**
D(EXCH(-1))	-0.00099 [0.0914]***
D(INT(-1))	-0.01005 [0.0027]*
D(INF(-1))	-0.00102 [0.3281]
C	0.31218 [0.1458]
ECM(-1)	-0.22867 [0.0096]*
R-squared	0.99921
Adjusted R-squared	0.99903
F-statistic (Prob)	5879.691[0.000]*
Durbin-Watson Stat.	1.64685

Source: Authors' Computation 2024

Note that *;** & *** represent 1%, 5% & 10% level of significant respectively

According to the report, Nigerian industrial production is greatly impacted by borrowing rates, investment, and fluctuations in the exchange rate. Manufacturing output is positively impacted by investment, but it is negatively impacted by inflation and fluctuations in exchange rates. Manufacturing production rises by 0.4% for every 0.4% increase in investment. On the other hand, output increases by 0.01% for every 1% increase in exchange rate volatility. Lowering loan interest rates promotes the production of manufactured goods. Additionally, the study discovered that it takes roughly four years and three months to reach homeostasis. There is no autocorrelation, according to the Durbin-Watson statistic of 1.64685 and the adjusted R-squared of 0.99921. At the 1% level, the entire model is statistically significant.

The causality relationship between exchange rate, inflation, interest rate and manufacturing output in Nigeria

To examine the causality relationship between exchange rate, inflation, interest rate and manufacturing output in Nigeria, there is need to conduct granger causality test.

Table 1.8 Test for Causality

Null Hypothesis	Observations	F-Statistic	Prob
EXCH does not Granger cause M-GDP	44	5.65990	0.0242
M-GDP does not Granger cause EXCH		6.91967	0.0135
INT does not Granger cause M-GDP	44	0.04306	0.8371
M-GDP does not Granger cause INT		5.75002	0.0231
INF does not Granger cause GDP	44	13.5768	0.0009
GDP does not Granger cause INF		0.07278	0.7892
EXCH does not Granger cause INT	44	7.11542	0.0124
INT does not Granger cause EXCH		13.9911	0.0008
INF does not Granger cause EXCH	44	4.93139	0.0343
EXCH does not Granger cause INF		0.22009	0.6425

Source: Authors' Computation 2024 E-view 12

The study looks into the causal relationships between Nigeria's manufacturing production, interest rates, inflation, and exchange rates. According to the null hypothesis, manufacturing gross domestic product is not influenced by exchange rates. The findings indicate that there is a unidirectional causal relationship between interest rates and manufacturing gross domestic product, but a bidirectional causal relationship between exchange rates and manufacturing output. The manufacturing gross domestic product is not caused by the rate of inflation, yet it is. Exchange rates and output have a bidirectional causal link, but inflation and exchange rates have a unidirectional one, according to the Granger causality test.

Diagnostic Tests

Normality test

Table 1.9: Normality test of the models of the study

Models	Jarque-Bera statistic	P-value
M-GDP	0.835930	0.6683

Source: Authors' Computation 2024

A normal distribution analysis is performed on the models. The models' normality is checked using the Jarque-Bera (JB) statistics. The models' normal distribution is the null hypothesis. If the p-value is less than the 0.05 level of significance, the null hypothesis is to be rejected. For M-GDP, the p-value of JB is 0.6683, which is higher than 0.05. Thus, the model's normal distribution is accepted as the null hypothesis in the investigation.

Serial Correlation Test

The Breusch-Godfrey Serial Correlation LM Test is used to determine whether serial correlation is present. The absence of serial correlation is the null hypothesis. If the p-value is less than the 0.05 level of significance, the null hypothesis is to be rejected. According to Table 5.6's results, the model's p-value of 0.3265 is higher than 0.05, indicating that it is not serially corrected at the 5% level of significance.

Table 1.10: Breusch-Godfrey Serial Correlation result of the models

Models	F-statistic	P-value
M-GDP	1.663546	0.3265

Source: Authors' Computation 2024 E-view 12

Heteroskedasticity Test

The existence of heteroskedasticity in linear regression analysis suggests that the ordinary least squares (OLS)-estimated model coefficients are skewed. This happens when the model or the variance of errors varies for each observation. The residuals heteroscedasticity is the alternative hypothesis, while the null

hypothesis is that they are homoscedastic. If the p-value is less than the 0.05 level of significance, the null hypothesis is to be rejected. According to the results in Table 4.11, the model's p-value of 0.4756sc is higher than 0.05, indicating that it is homoscedastic at the 5% level of significance.

Table 1.11: Test of homoscedastic of the models

Models	F-statistic	P-value
M-GDP	1.165463	0.4756

Source: Authors' Computation 2024 E-view 12

Regression Specification Error Test (RESET Test)

To determine whether the constructed linear regression model contains any significant nonlinear relationships, the Ramsey Reset test is utilized. The regression model's linear relationship is the null hypothesis. If the p-value is less than the 0.05 level of significance, the null hypothesis is to be rejected. According to the results in Table 5.8, the model's p-value of 0.2846 is higher than 0.05, indicating that, at the 5% level of significance, the connections in the model are linear.

Table 1.12: Ramsey RESET Test

Models	F-statistic	P-value
M-GDP	1.523795	1.523795

Source: Authors' Computation 2024 E-view 12

Hypotheses Testing

Diagnostic testing have confirmed the reliability of the ECM model estimation results. It was discovered that all of the models had a normal distribution, were free of serial correlation and muitcolinearity, and had no model specification errors. Subsequently, the Bound F-statistics test for long-term effects and the F-statistics test for short-term impacts served as the foundation for the hypothesis testing.

Null hypothesis: exchange rate fluctuation has no significant effect on the manufacturing output.

The ECM model's p-value is 0.000 and its F-statistic is 5879.691. The study may reject the null hypothesis that "exchange rate fluctuation has no significant effect on the manufacturing output" because the p-value is less than 0.05. According to the study, changes in exchange rates have a big impact on manufacturing output.

3. Summary of Major Findings

The study looks at how Nigeria's manufacturing production was affected by changes in currency rates between 1980 and 2020. Despite the implementation of exchange rate rules, the economy is currently dealing with a rise in poverty, volatility, and low living conditions. The study used a straightforward model that includes variables like manufacturing output, interest rates, inflation rates, investment rates, and exchange rates. The long-term findings indicate that while investment has no discernible impact, rises in inflation, interest rates, and the currency rate reduce manufacturing output. Interest rates, currency rates, and investment all have statistically significant short-term effects on industrial production, with investment having a particularly large impact. A two-way causal relationship between output and exchange rate is also revealed by the study.

4. Conclusion

Nigerian manufacturing production is greatly impacted by exchange rate fluctuations; a well-managed rate may result in higher output. This impact is influenced by various factors, including tax, interest, and total assets. Manufacturing output is directly impacted by investment, and output improves when exchange rate volatility are reduced drastically.

5. Recommendations

The report suggests putting in place a sensible currency rate strategy to control volatility and rigidities and avoid limiting investors, business people, and international traders. Additionally, it recommends that financial institutions employ a

hedging strategy mechanism in currency risk accounting and establish a centralized body for exchange rate forecasting in the economy system.

References

1. Adebanjo, J. F., Oluwasegun, E., Adegbola, O., Asamu, F., Peter, O., Ben-Caleb, E., and Eluyela, F. D. (2019).Impact of exchange rate on the manufacturing sector in Nigeria. *International Journal of Mechanical Engineering and Technology (IJMET)*, *10*(2), 1568-1583.

2. Akeem, R.O. (2019). Impact of exchange rate on the performance of manufacturing sector in Nigeria. *Journal of Social Sciences and Public Policy*, 11(3), 36-59.

3. Ali, N. (2020). Analysis of the effect of exchange rate fluctuation on the manufacturing Performance in Nigeria (1981-2018). International Journal of Developing and Emerging Economies, 8(1), 31-49.

4. Amadi, A.N., Nwidobie, B.M., & Adesina, J.B. (2018). Macroeconomic implications of Exchange rate fluctuations on the manufacturing sector performance in Nigeria. Business & Entrepreneurship Journal, 7(2), 1-14

5. Andrew, O. A., Joseph, A. I., Barnabas, O., Ohwofasa, B., Damilola, E.,and Olabisi, P. (2022).Exchange Rate, Foreign Direct Investment and Economic Growth Nexus in Nigeria.

6. Areghan, I., Felicia, O., Maria, A., Godswill, O., & Chisom, N. (2018). Exchange rate management and sectoral output performance. International Journal of Supply Chain Management, 7(5), 129-134. doi: 10.59160/ijscm.v7i5.2029.

7. Asaleye, A. J., Maimako, R. F., Inegbedion, H., Lawal, A. I., and Ogundipe, A. A. (2021).Real Exchange Rate and Manufacturing Performance in Nigeria. *Academic Journal of Interdisciplinary Studies*, *10*(2), 279-279.

8. Asaleye, A. J., Maimako, R. F., Inegbedion, H., Lawal, A. I., and Ogundipe, A. A. (2021).Real exchange rate and manufacturing performance in Nigeria. *Academic Journal of Interdisciplinary Studies*, *10*(2), 279.

9. Asaleye, A. J., Okodua, H., Oloni, E. F., and Ogunjobi, J. O. (2017). Trade Openness and Employment: Evidence from Nigeria. *Journal of Applied Economic Sciences*, *12*(4).

10. Buabeng, E., Ayesu, E., & Adabor, O. (2019). The effect of exchange rate fluctuation on the Performance of manufacturing firms: Empirical evidence from Ghana.   Economics Literature, 1(2), 133-147.

11. Ehinomen, C. and Oladipo, T. I. (2012). Exchange rate management and the manufacturing Sector performance in the Nigerian economy. IOSR Journal of Humanities and Social science, 5(5), 1-12.

12. Enoh, O. H. (2021). Domestic Competitiveness of the Nigerian Manufacturing Sector: Implications for African Free Trade Area. *Gusau International Journal of Management and Social Sciences*, *4*(2), 21-21.

13. Ezie, O., Sulaiman, A. S., and Abdelrasaq, N. A. (2020). Effect of Exchange Rates on Manufacturing Sector Growth in Nigeria: 1986-2014. *FUW-International Journal of Management and Social Sciences,(FUWIJMSS)*, *1*(2), 96-108.

14. Ezie, O., Sulaiman, A. S., and Abdelrasaq, N. A. (2020). Effect of Exchange Rates on Manufacturing Sector Growth in Nigeria: 1986-2014. *FUW-International Journal of Management and Social Sciences,(FUWIJMSS)*, *1*(2), 96-108.

15. Hunegnaw, F. B., and Kim, S. (2017). Foreign exchange rate and trade balance dynamics in East African countries. *The Journal of International Trade & Economic Development*, *26*(8), 979-999.

16. Hunegnaw, F. B., and Kim, S. (2017). Foreign exchange rate and trade balance dynamics in East African countries. *The Journal of International Trade & Economic Development*, *26*(8), 979-999.

17. Keho, Y.(2021). Real Exchange Rate and Trade Balance Dynamics in Cote d'Ivoire. *International Journal of Economics and Financial Issues*, *11*(1), 61.

18. Lawal, E. O. (2016).Effect of exchange rate fluctuations on manufacturing sector output in Nigeria. *Journal of Research in Business and Management*, *4*(10), 32-39.

19. McKinnon, R. I. (2004). Optimum currency areas and key currencies: Mundell I versus Mundell II. *JCMS: Journal of common market studies*, *42*(4), 689-715.

20. Mlambo, C. (2020). Exchange rate and manufacturing sector performance in SACU states. Cogent Business and Management, 7(1), article number 1787735. doi: 10.1080/23311975.2020.1787735

21. Okoye, N.J., Okonkwo, J.J., Okeke, L.N., & Agbo, R.C. (2021). Government spending and exchange rate fluctuation nexus in Nigeria. JETMASE, 3(1), 13-29.

22. Oladipo,O.R., Onabote, A., Adekanye, F., Ogunjobi, O.J., & Folarin, E. (2023). Exchange Rate Fluctuations and Manufacturing output: Stylized evidence in Nigeria. Development Management, 22(3), 32-42. doi:10.57111/devt/3.2023.32.

23. Onabote, A., Abuh, O.,Emmanuel, O., Eseyin, O., & Okafor, V. (2021). Foreign direct investment, energy infrastructure and manufacturing output in Nigeria. International Journal of Energy Economics and Policy, 11(3), 163-269. doi: 10.32479/ijeep.9686. Popoola., M. A. (2019). Entrepreneurship and poverty reduction effect in Nigeria. Unpublished PhD seminary at Kwara State University, Malete, Ilorin. Popoola., M. A. (2021). Impact of Entrepreneurship practices on Poverty Reduction in Informal Sector of South West Nigeria. Unpublished PhD thesis at Kwara State University, Malete, Nigeria.

24. Tams-Alasia, O.,Olokoyo, F.O., Okoye, L.U., & Ejemeyovwi, J.O. (2018). Impact of exchange rate deregulation on manufacturing sector performance in Nigeria. International Journal of Environment, Agriculture and Biotechnology, 3(3), 994-1001. doi: 10.22161/ijeab/3.3.36.

25. Tavlas, G. S. (2009). Optimum-currency-area paradoxes. *Review of International Economics*, *17*(3), 536-551.

26. Taylor, J. B. (2001). The role of the exchange rate in monetary-policy rules. *American economic review*, *91*(2), 263-267.

27. Willett, T. D. (2001). *The OCA approach to exchange rate regimes: A perspective on recent developments* (No. 2001-04). Claremont Colleges Working Papers in Economics