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IMPACT OF DEPOSIT MONEY BANKS ON MANUFACTURING SECTOR OUTPUT IN NIGERIA

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ABSTRACT

This study uses annual time series data spanning 1990 to 2023 to investigate the impact of deposit money banks on manufacturing sector output in Nigeria. The result of the ARDL model shows that credit to manufacturing sector (LCMS) has an insignificant negative impact on manufacturing output (LMSO), exchange rate (LEXR) has a positive insignificant impact on manufacturing output (LMSO), interest rate (INT) has a negative insignificant impact and inflation rate (INF) shows a positive insignificant impact on manufacturing sector output (LMSO) in the long-run. However, the short-run results revealed that the lag value of manufacturing sector output has a positive impact on the current value of the exchange rate and inflation, and all their lags have a positive impact on the performance of the manufacturing sector. In contrast, credit to the manufacturing sector and interest rates all have a negative impact on manufacturing sector output, and all have a negative impact on manufacturing sector output, as well as their lag years. Therefore, this study recommends that the Nigerian government implement specialized credit programs, such as low-interest-rate loans and a credit guarantee scheme, improve the capacity of financial institutions, create frameworks for assessing credits, and incentivize lending by banks. In addition, policymakers should create a monetary policy that will lower interest rates, improve access to tailored credit, support local production, boost financial literacy through training programs, promote long-term investments with incentives, and implement a multifaceted approach to mitigate the impact of inflation on manufacturing output in Nigeria.

Keywords: *Deposit Money Banks(DMBs), Bank Credit and Manufacturing Sector Output*
JEL Classification Code: *G21, E51, L60*

1.0 Introduction

Deposit Money Banks (DMBs) are critical to the global financial system as they mobilize funds and allocate credit to productive sectors like manufacturing. Globally, DMBs enhance industrial development by providing long-term financing and facilitating capital formation for industries (Diamond & Dybvig, 2022). The manufacturing sector, in turn, transforms raw materials into finished goods, contributes to GDP, and supports industrialization, particularly in emerging economies.

Regionally, in Africa, manufacturing has been recognized as essential for structural transformation, especially in countries such as Ethiopia, Angola, South Africa, and Nigeria. These nations rely on manufacturing to absorb labor, drive innovation, and enhance economic diversification. However, the sector faces significant obstacles foremost among them being limited access to affordable credit due to high interest rates and unstable financial markets (Chirwa & Mlachila, 2020). In Nigeria, DMBs serve as key financial intermediaries by channeling household savings into investment through credit extension to the private sector,

especially manufacturers. These loans are, however, often priced at double digit interest rates averaging 16.9% for prime lending and 31.09% for maximum lending (CBN, 2023). This misalignment between the high cost of credit and manufacturers' need for affordable financing constrains productivity and expansion (Adelodun, 2022; Adelodun, 2023).

Despite the sector's vital role in economic growth, job creation, and GDP contribution, manufacturers struggle with inadequate financing, weak infrastructure, and unfavorable policy environments. Consequently, firms remain underproductive, with many trapped in stagnation and unable to expand operations (Nwabuisi et al., 2020). The challenges posed by financial constraints underscore the need for a robust banking sector that supports long-term industrial development through effective credit delivery and risk mitigation frameworks (Chirwa & Mlachila, 2020). Given this context, this study aims to examine the impact of deposit money banks on manufacturing sector output in Nigeria from 1990 to 2023 using the Autoregressive Distributed Lag (ARDL) model. The findings are expected to inform targeted policy interventions that can strengthen the role of DMBs in supporting Nigeria's industrial growth and economic diversification.

1.2 Statement of the Problem

Despite the recognized role of Deposit Money Banks (DMBs) in facilitating economic development through credit provision, Nigeria's manufacturing sector continues to underperform. While DMBs are expected to support industrial growth by extending credit, the prevailing lending conditions characterized by high interest rates, stringent collateral demands, and limited accessibility have hindered the sector's ability to expand output and compete globally (CBN, 2023; Adelodun, 2023). This contradiction raises concerns about the effectiveness of DMBs in fulfilling their developmental role.

Furthermore, although several empirical studies (e.g., Okojie, 2019; Ayoola, 2018; Nwagu & Udeagbala, 2024) have explored the relationship between bank credit and manufacturing performance, their findings are inconsistent—ranging from positive to negative or insignificant effects. This inconsistency creates ambiguity in policy direction and highlights the need for updated evidence, especially with changing macroeconomic conditions such as inflation, exchange rate volatility, and fluctuating interest rates. Thus, the core problem this study seeks to address is whether DMBs have effectively influenced the output of the manufacturing sector in Nigeria, and to what extent credit from these banks contributes to or hinders sectoral performance between 1990 and 2023.

The rest of the paper is divided into the following sections: Section Two is the literature review, which comprises conceptual literature, theoretical review, and empirical literature; Section Three presents the methodology; Section Four outlines data analysis and results interpretation; and Section Five concludes with policy recommendations.

2.1 Literature Review

The following concepts were reviewed Deposit Money Bank, Bank Credit, and Manufacturing Sector Output.

2.1.1 Concept of Deposit Money Banks(DMBs)

Deposit Money Banks (DMBs) are financial institutions that mobilize savings from the public, provide payment services, and extend credit to households and businesses, serving as key players in financial systems. Adelodun(2022). However, Nwosu (2022) states that deposit money banks are financial institutions licensed to accept deposits and provide credit facilities

to customers. According to Nwosu (2022), deposit money banks play a crucial role in financial intermediation and monetary policy transmission by providing credit facilities to customers.

2.1.2 Concept of Bank Credit

Bank credit refers to the lending activities provided by banks to individuals, businesses, and other borrowers. This can include various forms of credit, such as term loans, mortgages, overdraft facilities, and credit lines. The European Central Bank (ECB) defines bank credit as "Loans granted by banks to the private sector" (ECB, 2023). Additionally, the International Monetary Fund (IMF) elaborates that bank credit "encompasses loans and advances, as well as debt securities held by banks" (IMF, 2023). This indicates that bank credit includes both lending activities and banks' investments in debt instruments. Bank credit's availability and terms such as interest rates and repayment schedules, signifiscantly impact economic activities and borrower's access to capital. Borrowers repay the loan amount with additional interest, highlighting the importance of understanding loan terms.

2.1.3 Concept of Manufacturing Sector Output

Manufacturing output is the total production of industries involved in manufacturing goods within a specified timeframe (Financial Times, 2017). The manufacturing sector consists of businesses that mechanically, physically, or chemically transform substances, components, or materials into new products (United States Bureau of Laour Statistics, 2017). The manufacturing sector is a component of an economy, as it generates revenue and makes significant contributions to economic growth. It offers crucial material assistance for the country's infrastructure.

2.2 Theoretical Review

2.2.1 Financial Intermediation Theory

Financial Intermediation theory is a central concept in finance, which describes how financial institutions, such as banks, facilitate the transfer of funds from savers to borrowers. A recent study by Diamond and Dybvig (2022) provides a comprehensive analysis of this concept.

According to Diamond and Dybvig (2022), financial intermediaries play a crucial role in transforming the maturity of financial assets, a process known as "maturity transformation." Savers, who typically prefer liquid and short-term investment options, can deposit their funds with financial intermediaries. These institutions can then use these deposits to provide longer-term loans to borrowers, who may have a greater need for capital. Furthermore, Diamond and Dybvig (2022) explain that financial intermediaries engage in "risk transformation," where they pool the risks of individual savers and borrowers, diversifying the overall risk exposure. This allows savers to access a more stable and diversified investment option, while borrowers can obtain financing at a lower cost.

2.2.2 Endogenous Growth Theory of Interest Rate

The Endogenous Growth Theory influences the long-term economic growth of an economy. According to a recent study by Romer (2019), this theory challenges the traditional Loanable Funds Theory, which suggests that implying the supply and demand of loanable funds solely determine the interest rate.

Romer (2019) argues that the Endogenous Growth Theory acknowledges that the interest rate can also have a feedback effect on the economy's long-term economic growth. Specifically, a lower interest rate can stimulate investment in physical and human capital, leading to higher

productivity and economic growth. This increased economic growth can then further influence the supply and demand of loanable funds, the equilibrium interest rate.

2.2.3 Loanable Funds Theory of Interest Rate

The Loanable Funds Theory is a context that explains how the interest rate is determined in an economy based on the supply and demand for loanable funds. According to Mankiw and Taylor (2020), the Loanable Funds Theory posits that the equilibrium between the supply of loanable funds and the demand for loanable funds in the financial markets determines the interest rate. The supply of loanable funds comes from household savings, corporate savings, and government budget surpluses, while the demand for loanable funds comes from business investment, consumer borrowing, and government budget deficits. Jain and Ghosh (2021) explain that when the supply of loanable funds increases, the interest rate decreases, as there is more capital available for borrowing. Conversely, when the demand for loanable funds increases, the interest rate rises, as there is greater competition for the limited capital available.

Mishkin and Eakins (2022) further discuss influencing the supply and demand for loanable funds can include demographic changes, changes in household savings rates, government fiscal policies, and the expected rate of return on investments. These factors can shift the supply and demand curves, leading to changes in the equilibrium interest rate.

2.2.4 Loan Pricing Theory of Deposit Money Banks (DMBs)

The Loan Pricing Theory explains how Deposit Money Banks (DMBs) determine loan interest rates based on three key factors: cost of funds, administrative expenses, and a risk premium (Dutta & Dinuka, 2021). Bhattacharya and Thakor (2020) describe the cost of funds as the interest paid to depositors or other funding sources, which banks must recover. Surendranath and Kahn (2021) note that administrative costs—such as processing and monitoring loans also influence pricing. Saunders and Cornett (2019) emphasize the role of the risk premium, which compensates for potential borrower defaults based on creditworthiness, collateral, and economic conditions. Overall, this theory shows that DMBs set rates to recover costs and earn profits. It aligns with the loanable funds theory, linking credit pricing to business borrowing and manufacturing sector output.

2.3 Empirical Review

Nwagu and Udeagbala (2024) examined the effect of bank credit on the performance of the manufacturing sector in Nigeria from 1981 to 2021 using the ARDL model. Their analysis revealed that while the exchange rate had a statistically significant positive effect on manufacturing output, bank credit and interest rate were not significant predictors of performance during the period. Building on this theme, Okechukwu et al. (2023) assessed the relationship between bank lending and the performance of Nigeria's manufacturing subsector. Applying the OLS technique, the study identified bank demand deposits, lending rates, exchange rate, and employment generation as key variables influencing manufacturing output.

A similar investigation by Adebiyi et al. (2022), spanning 1995 to 2020, applied OLS estimation to assess the influence of bank credit on manufacturing output. Although the results showed that lending rate, exchange rate, and inflation had negative but insignificant impacts, a consistent relationship was observed between credit availability and manufacturing performance.

The study conducted by Dumani (2021) focused on the implications of banking sector reforms for private sector expansion in Nigeria. Using OLS analysis, the findings suggested that increased credit to the real sector played a substantial role in fostering private sector growth.

In contrast, Onwuka (2021) investigated the impact of exchange rate volatility on manufacturing productivity in Nigeria between 1981 and 2020 using the ARDL model. The findings indicated that fluctuations in exchange rate, interest rate, and inflation had long-run negative effects on manufacturing output, while factors such as imports and gross capital formation exerted a positive influence.

Using ARDL Bound testing and Parsimonious Regression, Yua et al. (2021) analyzed data from 1981 to 2018 to determine the impact of deposit money bank credit on industrial output. Their results showed that bank credit had a significant positive effect, whereas inflation and lending rates had limited influence on output. The contribution by Okere et al. (2020), which explored the relationship between bank loans and manufacturing output over the 1981–2018 period using ARDL bound cointegration, established a statistically significant and positive relationship between bank credit and sectoral output. On the other hand, the findings of Ogundele et al. (2020), who employed the ARDL technique to assess the impact of lending rates on the manufacturing sector from 1986 to 2018, revealed a negative but statistically insignificant effect. No direct causal link was found between the lending rate and manufacturing output during the study period.

However, the existing empirical studies have thoroughly documented the impact of deposit money banks on the manufacturing sector output in Nigeria, but there seems to be incoherence in their findings as studies such as Okechukwu et al. (2023), Adebiyi et al. (2022), Dumani (2021), Yua et.al. (2021), and Okere et al. (2020), reported positive impact between deposit money banks and manufacturing sector output, while others Nwagu and Udeagbala (2024),and Ogundele et al. (2020) reported negative impact between deposit money banks and manufacturing sector output. Furthermore, it has also been observed that most past studies reviewed primarily employed Ordinary Least Squares (OLS), Vector Error Correction Model (VECM), and Autoregressive Distributed Lags techniques for their regression analysis. Since the result is mixed, meaning the debate on the impact of deposit money banks and manufacturing sector output is still ongoing, this current study aims to contribute to that ongoing debate to see what the findings will be. The review reveals that none of the previous studies have included the nominal exchange rate in their models, which can influence the prices of manufacturing inputs such as raw materials.

3.1 Methodology

The methodology used in this model is Autoregressive Distributed Lag (ARDL) Model. This study adapted the model of Okere et al (2020) who investigated the effects of bank credits on the manufacturing sector output in Nigeria from 1981-2018.

3.2 Data Source and Variable Measurement

This study relies on annual time series data spanning from 1990 to 2023, obtained primarily from the Central Bank of Nigeria (CBN) Statistical Bulletin (2023). The data were carefully selected to evaluate the influence of deposit money banks on manufacturing sector output in Nigeria over the specified period. Both the dependent and independent variables were defined and measured using standard macroeconomic indicators, ensuring comparability and consistency with existing literature.

The dependent variable, Manufacturing Sector Output (MSO), is measured by the annual contribution of the manufacturing sector to Nigeria's Gross Domestic Product (GDP),

expressed in current basic prices. This indicator captures the real output and productivity of the manufacturing industry within the economy.

The primary explanatory variable, Credit to the Manufacturing Sector (CMS), refers to the total loan facilities provided by deposit money banks specifically to the manufacturing sector. It is measured in billions of naira and serves as a proxy for the availability of bank credit to industrial firms.

In addition, the study includes key macroeconomic control variables. Exchange Rate (EXR) is represented by the average annual official naira-to-US dollar rate, reflecting the cost of foreign currency which directly affects import-dependent manufacturers. Interest Rate (INT) is proxied by the maximum lending rate offered by deposit money banks, measured annually as a percentage. This rate indicates the cost of borrowing for manufacturing firms. Inflation Rate (INF), also expressed as a percentage, is measured using the annual percentage change in the Consumer Price Index (CPI), capturing the general movement in price levels which may influence both input costs and consumer demand. All variables were transformed into their natural logarithm form (where applicable) to stabilize variance and improve the robustness of the regression estimates.

3.3 Model Specification

The model is specified as follows:

$$MSO = f\left(CMS, FSD, INF, INT\right) \tag{1}$$

The above functional relationship of the model can be transformed to econometric form as presented below:

$$\ln MSO_t = \alpha_0 + \alpha_1 \ln CMS_t + \alpha_2 \ln FSD_t + \alpha_3 INT_t + \alpha_4 INF_t + \mu_t \tag{2}$$

Where, MOS = Manufacturing Sector Output, CMS = Credit to Manufacturing Sector, FSD= Financial Deepening, INT = Bank Interest Rate, INF= Inflation Rate., α0= Constant

α1- α4= are the estimated coefficients of the explanatory variables, t=time period, μ= Error term and ln= logarithm,

Therefore, this study adapted the model used by Okere et al. (2020) by removing lnFSD, which is not considered in the current study because financial deepening has been captured in credit to the manufacturing sector. Bank credit often translates into enhanced manufacturing productivity, often associated with economic growth. Consequently, lnLogFSD was replaced with the exchange rate (EXR), which is a determinant factor as it significantly influences both the cost of imported inputs and the competitiveness of exports, thereby affecting overall manufacturing performance. Hence, expressed in an explicit econometric equation as:

$$\ln MSO_t = \alpha_0 + \alpha_1 \ln CMS_t + \alpha_2 \ln EXR_t + \alpha_3 INT_t + \alpha_4 INF_t + \mu_t \tag{3}$$

Where, MOS = Manufacturing Sector Output, CMS = Credit to Manufacturing Sector, EXR= Exchange Rate, INT = Interest Rate, INF= Inflation Rate., α0= Constant, α1- α4= are the estimated coefficients of the explanatory variables, μ= Error term and ln= Logarithm

The equation (3) is re arranged into ARDL form adapted from the work of Okere et al. (2020) to examine whether there exists long-run relationship between the variables. The long-run form of the model can be specified as:

$$\begin{aligned}\Delta \ln MSO_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta \ln MSO_{t-1} + \sum_{i=0}^{q} \alpha_2 \Delta \ln CMS_{t-1} \\ + \sum_{i=0}^{q} \alpha_3 \ln EXR_{t-1} + \sum_{i=0}^{q} \alpha_4 \Delta INT_{t-1} + \sum_{i=0}^{q} \alpha_5 INF_{t-1} + \beta_1 \ln MSO_{t-1} \\ + \beta_2 \ln CMS_{t-1} + \beta_3 \ln EXR_{t-1} + \beta_4 INT_{t-1} + \beta_5 INF_{t-1} + \mu_t\end{aligned} \tag{4}$$

The parameter α0 and μ represent the intercept and disturbance error term, respectively. Equation (4) tests the null hypothesis that α1 = α2 = α3 = α4 = α5 = 0, indicating no cointegration relationship between the variables, against the alternative of cointegration using the bound testing procedure to test the long-run relationship of the model. Then the ARDL technique provides a unified framework for testing and estimating of cointegration relations in the context of a single equation. However, since the ARDL procedure is sensitive to a given lag length, the number of appropriate lags in the dependent variable will be chosen using the Akaike Information Criterion (AIC) and the Schwarz Information Criterion (SIC) to ensure that the errors are white noise (Katircioglu, 2019). Therefore, to measure the speed of adjustment from the -short-run dynamic to long-run equilibrium, the short-run model is also specified by including the error correction term as follows,

$$\begin{aligned}\Delta \ln MSO_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta \ln MSO_{t-1} + \sum_{i=0}^{q} \alpha_2 \Delta \ln CMS_{t-1} \\ + \sum_{i=0}^{q} \alpha_3 \ln EXR_{t-1} + \sum_{i=0}^{q} \alpha_4 \Delta INT_{t-1} + \sum_{i=0}^{q} \alpha_5 INF_{t-1} + \lambda ECM_{t-1} + \mu_t\end{aligned} \tag{5}$$

Where δ is the coefficient of the error correction term, which measures the speed of adjustment from the short-run dynamics to the long-run equilibrium, and μt represents the error term. In theory, the coefficient δ is expected to be significant and negative for short-run convergence to take place.

3.4 Pre-estimation test

3.4.1 Unit Root Test

In order to overcome the problem of spurious regression that is common in the time series analysis of non-stationary variables, the study applied unit root testing techniques using the Augmented Dickey-Fuller (ADF) test to determine whether the variables are stationary or not.

3.4.2 ARDL Bound Test for Co-integration

The study used distributed lag (ARDL) bound testing procedure to examine the cointegration (longrun) relationship between manufacturing sector output (MSO) and its independent variables (commercial bank credit to manufacturing sector (CMS), exchange rate (EXR), interest rate (INT) and inflation rate (INF)) as well as the short-run dynamics.

3.5 Diagnostic test

Post estimation tests are tests that check the predictive power of the econometric results whether they are robust, efficient and consistent. They are called the 'residual diagnostics' because they are on the residuals, and model stability which is stability diagnostics that tests whether the residuals are normally distributed, unbiased and if the model is stable. These tests include, serial correlation test, heteroscedasticity test, normality test, Cusum and Cusum and Cusum of square test.

4.1 Results and Discussion of Findings

Table 1: Results of the ADF Unit Root Test

Variables	ADF @ Level	ADF @ First Diff.	Remark
LMSO	-1.000787	-4.117783**	I(1)
LCMS	-2.858147	-4.239966**	I(1)
LEXR	-8.875179**	-5.260326**	I(0)
INT	-3.614174**	-3.112977	I(0)
INF	-2.387109	-9.798387**	I(1)

Note: ** denotes stationarity order
C.V @ 5% = (-3.603202)
Source: Author's computation using E-views 10, 2025

The unit root test for stationarity was carried out using the Augmented Dickey-Fuller (ADF) unit root test. The results of the ADF tests in Table 1 revealed that LMSO, LCMS, and INF are stationary at the first difference (I (1)), while LEXR and INT are stationary at the level (I(0).

The decision rule is that if the ADF test statistic is greater than the test critical values or the P-value is less than the 5% level of significance, we reject the null hypothesis and conclude that the time series is stationary; otherwise, the null hypothesis cannot be rejected. More so, if the variables are integrated of order zero I (0), the model will be estimated at levels i.e. without differencing otherwise, they are estimated at whatever level of integration they assumed. Therefore, the variables under study are of mixed order I (0) and I (1) justifying the use of ARDL bounds tests for cointegration to test for long-run relationships among the variables of study.

Table 2: Result of Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-272.3090	NA	23.16242	17.33181	17.56084	17.40773
1	-129.3414	232.3225*	0.014875*	9.958836*	11.33296*	10.41432*
2	-110.6916	24.47780	0.025028	10.35573	12.87496	11.19078

Source: Author's computation using E-views 10, 2025

Table 2 presents the lag order selection by five different criteria. All the lag selection criteria suggest one (1) lag length as the optimal for the F-bound cointegration test. Therefore, this study used one (1) lag for the cointegration test as suggested by AIC information criteria.

Table 3 : ARDL Bound Testing for Cointegration

Test Statistic	Value	Signif.	I(0)	I(1)

			Asymptotic: n=1000	
F-statistic	13.49568	10%	2.45	3.52
K	4	5%	2.86	4.01
		2.5%	3.25	4.49
		1%	3.74	5.06

Source: Author's computation using E-views 10, 2025

The result of the F-bound test for the long-run relationship among deposit money banks' variables and manufacturing sector output is shown in Table 3. The result revealed that the value of F-statistics is 13.49568, which is greater than both the upper bound critical value of (4.01) and lower bound critical value of (2.86) at 5% level of significance. This implies that there is a cointegration (long-run relationship) between the manufacturing sector output (LMSO) and independent variables such as credit to the manufacturing sector (LCMS), exchange rate (LEXR), interest rate (INT), and inflation rate (INF). Therefore, the null hypothesis of no cointegration between the variables is rejected and the alternative hypothesis is accepted. Hence, there is long-run equilibrium relationship among the variables.

Table 4: ARDL Long-run estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LCMS	-0.106	0.363	-0.293	0.778
LEXR	2.373	1.968	1.206	0.267
INT	-0.239	0.215	-1.115	0.302
INF	0.187	0.139	1.352	0.218

Source: Author's computation using E-views 10, 2025

The relationship among the variables is shown in Table 4, where the coefficient of the log of credit to manufacturing sector in the long run has an insignificant negative relationship with the log of manufacturing sector output. This is inconsistent with the apriori expectation. The coefficient of the log of credit to the manufacturing sector is -0.106, which implies that a 1% increase in the log of credit to manufacturing decreases the log of manufacturing output by about 0.11%, holding other factors constant. This result agrees with the findings of Nwagu and Udeagbala (2024) and Ogundele et al. (2020), but is inconsistent with the findings of Okechukwu et al. (2023), Adebiyi et al. (2022), Dunami (2021), Yau et al. (2021), and Okere et al. (2020). The negative relationship between log of credit to manufacturing sector and the log of manufacturing sector output could be attributed to high-interest rates, inefficient credit allocation, economic instability, poor infrastructure, limited financial literacy, market access challenges, overreliance on imports, inconsistent policies, lack of diversification, and unfavourable global market conditions. Conversely, the log of exchange rate was found to have an insignificant positive relationship with the log of manufacturing sector output in the long run, with an estimated coefficient of 2.373. This implies that, all other factors being constant, a one percent increase in the log of exchange rate would increase the log of manufacturing sector output by 2.37%. This is consistent with economic theory and apriori expectation. The result is consistent with the findings of Nwagu and Udeagbala (2024) and Okechukwu et al. (2023), but not in line with Adebiyi et al. (2023), Adebiyi et al. (2022), and Onwuka (2021). The positive relationship between exchange rate and manufacturing output could be due to factors such as currency fluctuations, reliance on imported inputs, structural constraints in the manufacturing sector, limited export orientation, broader macroeconomic conditions, access to credit issues, and prevailing market conditions, indicating that exchange rates are not the primary drivers of manufacturing performance.

Furthermore, the results from Table 4 show that the interest rate has an insignificant negative relationship with the log of manufacturing sector output, with an estimated coefficient of -0.239 in the long run. This is consistent with economic theories, implying that a 1% increase in the interest rate will cause a decrease of approximately 0.23% on the log of manufacturing sector output in the long run. The result supports the findings of Onwuka (2021) and Ogundele et al. (2020), but is inconsistent with the findings of Okechukwu et al. (2020) and Okechukwu et al. (2023). The negative relationship between interest rate end manufacturing output is driven by factors such as urgent capital needs leading to continued borrowing despite high rates, ineffective utilization of credit for productive investments, persistent structural challenges, weak market demand, reliance on alternative financing sources, broader economic conditions, risk aversion among manufacturers, and a focus on short-term operational stability. While inflation rate in the long run has a positive insignificant relationship with the log of manufacturing sector output. The coefficient is 0.187, which implies that a percent increase in the inflation rate will increase manufacturing sector output by 0.18% in the long run. This means that a 1% increase in the inflation rate will increase manufacturing sector output by 0.18% in the long run. This result, however, is inconsistent with the findings of Adebiyi et al. (2022) and Onwuka et al. (2021). The positive but insignificant relationship between the inflation rate and manufacturing sector output in Nigeria during the period under review was due to factors such as manufacturers' ability to pass costs to consumers, strong pricing power, and increased consumer demand during moderate inflation. In addition, strategies for improving efficiency, maintaining inventory, and securing long-term contracts, as well as the sector's resilience, mitigate the impact of inflation, resulting in a positive yet insignificant relationship with output.

Table 5: Results of ARDL Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.064305	0.022114	2.907864	0.0227
D(LMSO(-1))	0.708599	0.173033	4.095166	0.0046
D(LMSO(-2))	1.047358	0.161627	6.480096	0.0003
D(LMSO(-3))	0.786285	0.191587	4.104066	0.0045
D(LCMS)	-0.138684	0.054033	-2.566665	0.0372
D(LCMS(-1))	-0.204929	0.056375	-3.635073	0.0083
D(LCMS(-2))	-0.227916	0.064250	-3.547311	0.0094
D(LEXC)	0.115404	0.057790	1.996971	0.0860
D(LEXC(-1))	0.134387	0.038372	3.502209	0.0100
D(LEXC(-2))	0.276332	0.041861	6.601125	0.0003
D(LEXC(-3))	0.314234	0.047014	6.683804	0.0003
D(INT)	-0.007064	0.004095	-1.724979	0.1282

D(INT(-1))	0.048717	0.006228	7.822223	0.0001
D(INT(-2))	0.029987	0.005621	5.334543	0.0011
D(INF)	0.010443	0.001454	7.181919	0.0002
D(INF(-1))	-0.026400	0.002858	-9.235792	0.0000
D(INF(-2))	-0.023441	0.002967	-7.899877	0.0001
D(INF(-3))	-0.016173	0.002288	-7.068117	0.0002
ECT(-1)*	-0.270525	0.026271	-10.29745	0.0000

R-squared	0.955801	Mean dependent var	0.033671
Adjusted R-squared	0.883476	S.D. dependent var	0.113483
S.E. of regression	0.038738	Akaike info criterion	-3.400618
Sum squared resid	0.016507	Schwarz criterion	-2.513193
Log likelihood	70.00928	Hannan-Quinn criter.	-3.116724
F-statistic	13.21537	Durbin-Watson stat	2.399035
Prob(F-statistic)	0.000052		

Source: Author's computation using E-views 10, 2025

Table 5 shows the results of the short-run relationship between the log of manufacturing sector output and deposit money banks variables (i.e. credit to manufacturing sector, exchange rate, interest rate, and inflation rate). The result revealed that there exists a positive relationship between the lag values of the log of manufacturing sector output ((D(LMSO(-1)), D(LMSO(-2)), D(LMSO(-3))) , the log of exchange rate in the current year and its lags (D(LEXC), D(LEXC(-1)), D(LEXC(-2)), D(LEXC(-3))), the lags values of interest rate (D(INT(-1)), D(INT(-2))) and inflation rate in the current year (D(INF)). Their coefficients, as revealed by the table, are 0.708599, 1.047358, 0.786285, 0.115404, 0.134387, 0.276332, 0.314234, 0.048717, 0.029987, and 0.010443, respectively. This imply that a percent increase in these variables will lead to about 0.71%, 1.05%, 0.79%, 0.12%, 0.13%, 0.13%, 0.28%, 0.31%, 0.02%, 0.03%, and 0.01% increase in manufacturing sector output in the short run.

Furthermore, the short run result also revealed that the log of credit to the manufacturing sector in the current year and its lags (D(LCMS), D(LCMS(-1)), D(LCMS(-2))), interest rate in the current year (D(INT)), lags of inflation rate (D(INF(-1)), D(INF(-2)) and D(INF(-3)) has negative relationship with manufacturing sector output (LMSO). Their respective coefficients are -0.138684, -0.204929, -0.227916, -0.007064, -0.026400, -0.023441, and -0.016173. This implies that a percent increase in the variable mentioned and its lag values will reduce manufacturing sector output by 0.14%, 0.21%, 0.023%, 0.01%, 0.03%, 0.02%, and 0.02% in the short run.

Results from Table 5 also show that the slope coefficient of the error correction term (ECT (-1)) is negative and statistically significant at a 0.05 probability level. The slope coefficient which is -0.270525 represents the speed of adjustment from shortrun dynamics to the longrun

equilibrium. The coefficient of the error correction term (ECT) suggests that, in the absence of variation in the specified deposit money banks variables in the short run, approximately 27% of the divergence between actual and equilibrium manufacturing sector output is corrected annually in the country. Furthermore, the table's results also show that 96% of variations in the manufacturing sector's output (LMSO) are explained by changes in the explanatory variables (credit to the manufacturing sector, exchange rate, interest rate, and inflation rate). The Durbin-Watson value of 2.399035 however, indicates the presence of negative serial correlation in the model.

The study examines the impact of deposit money banks on Nigeria's manufacturing sector output from 1990 to 2023, utilizing Autoregressive Distributed Lag (ARDL) techniques based on a model adapted from Okere et al. (2020). The long-run analysis indicates an insignificant negative impact. At the same time, the exchange rate exhibits a positive but insignificant relationship, and interest and inflation rates show negative and positive, but insignificant, impacts of credit on the manufacturing sector's output. In contrast, the exchange rate exhibits a positive but insignificant relationship, and interest and inflation rates show negative and positive, but insignificant, impacts, respectively. In the short run, positive relationships are identified between lagged manufacturing output, current and lagged exchange rates, and lagged interest rates. Conversely, current credits to the manufacturing sector, current interest rates, and several lagged inflation rates have a negative impact on output. The F-statistic value of 13.49568 supports the study's objectives at the 5% significance level, and the Error Correction Term (ECT) of -0.270525 suggests that approximately 27% of short-run disequilibrium is corrected in the long run, indicating a notable adjustment speed towards equilibrium. Consequently, the findings indicate that deposit money banks have a significant influence on manufacturing sector output in Nigeria, both in the short and long term.

In line with the significant short-run findings of the study, the following recommendations are made under two thematic areas:

1. **Monetary and Credit Policy Reform**

Given the negative impact of credit to the manufacturing sector in the short run, there is a need to strengthen credit allocation frameworks and enhance loan monitoring to ensure efficient utilization. Interest rate policies should be predictable and gradual to support planning within the sector. Moreover, inflation should be kept within moderate levels to avoid adverse long-term effects on output.

2. **Exchange Rate and Sectorial Support Measures**

The positive effect of lagged exchange rates suggests a need for stable and supportive exchange rate policies that enhance competitiveness. Government should also sustain sector-specific incentives such as tax reliefs and infrastructure support to reinforce internal growth momentum and encourage long-term investment in manufacturing.

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