**Impact of Exchange Rate on Manufacturing Sector Performance in Nigeria (1986 - 2023)**

**By**

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**Abstract**

This study investigates the impact of exchange rate on the performance of Nigeria’s manufacturing sector, using annual time series data from 1986 to 2023. Specifically, it examines how the exchange rate affects two key indicators of sector performance: manufacturing output and manufacturing capacity utilization. The study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach and Vector Autoregression (VAR) models to analyze both long-run and short-run dynamics. Findings reveal that there is no long-run cointegration between exchange rate and either of the manufacturing indicators, indicating that exchange rate levels do not exert a lasting impact on the sector. However, in the short run, the exchange rate has a statistically significant positive effect on manufacturing output, though this influence is temporary and diminishes over time. No significant short-run relationship is observed between exchange rate and manufacturing capacity utilization. The study concludes that while exchange rate stability may provide short-term production incentives, it is not sufficient to drive sustainable industrial performance. Structural challenges such as infrastructure, finance, and energy supply remain more critical determinants of manufacturing efficiency. The study recommends a holistic policy approach, combining sound exchange rate management with investment in local input sourcing, infrastructure, long-term industrial financing, and macroeconomic coordination to enhance Nigeria’s manufacturing sector performance.

**Keywords:** Exchange Rate, Manufacturing Output, Capacity Utilization, ARDL, VAR, Nigeria, Industrial Policy

**1. Introduction**

The manufacturing sector is widely acknowledged as a critical driver of economic growth, employment generation, and structural transformation in both developed and developing economies. In the context of Nigeria, the sector holds significant potential to diversify the economy away from crude oil dependence, boost non-oil exports, and accelerate inclusive development. However, despite successive government efforts and industrialization policies, the performance of Nigeria’s manufacturing sector has remained suboptimal over the years. This underperformance has been attributed to a wide range of macroeconomic challenges, among which the exchange rate occupies a central position.

An economy’s exchange rate system, the price of its domestic currency relative to others plays a vital role in determining international competitiveness, investment flows, production costs, and the profitability of domestic industries. In Nigeria, exchange rate management has undergone several transitions, from fixed to floating regimes, with the naira experiencing persistent depreciation since the mid-1980s. This depreciation has had mixed implications for the manufacturing sector. On one hand, it increases the cost of importing essential inputs such as machinery, equipment, and raw materials, thereby raising production costs. On the other hand, a weaker naira could potentially boost exports by making Nigerian goods more competitively priced in global markets. The extent to which exchange rate behavior supports or hinders manufacturing sector performance is therefore an important empirical and policy issue.

While numerous studies have explored the impact of exchange rate fluctuations on economic growth and sectoral performance, much of the existing literature has focused on exchange rate volatility rather than the direct relationship between exchange rate levels and manufacturing sector indicators such as output and capacity utilization. Moreover, empirical evidence from Nigeria has been somewhat mixed. For instance, Adeniran, Yusuf, and Adeyemi (2014) found that exchange rate movements negatively affect Nigeria’s manufacturing output, while Ogun (2000) emphasized that a depreciating exchange rate tends to increase the cost of imported inputs, ultimately harming productivity. Other scholars such as Gylfason and Schmid (1983) have argued that exchange rate misalignments can distort resource allocation and impede industrial performance. Conversely, Ezeala-Harrison (1993) contended that in economies with strong institutional frameworks, the long-run impact of exchange rate changes on industrial output may be minimal if supportive macroeconomic conditions are maintained.

This study contributes to the body of knowledge by providing contemporary empirical evidence on the impact of exchange rate on manufacturing sector performance in Nigeria, using recent time series data spanning 1986 to 2023. The analysis distinguishes itself by focusing on two distinct but complementary dimensions of performance, manufacturing output and manufacturing capacity utilization, both of which are critical indicators of industrial activity and economic resilience. While manufacturing output reflects the quantity of goods produced, capacity utilization captures the efficiency with which available industrial resources are employed. Understanding how the exchange rate affects both indicators provides a more holistic view of the sector’s responsiveness to currency trends and macroeconomic shifts.

Conversely, this study fills a notable gap in the Nigerian empirical literature by assessing the direct impact of exchange rate on manufacturing sector performance, not merely its volatility, and by using a robust time-series methodology supported by relevant theoretical frameworks. The outcomes are expected to guide both monetary and industrial policy decisions, particularly as Nigeria continues its push for economic diversification and sustainable industrial growth. By identifying the specific dynamics through which exchange rate movements shape sectoral outcomes, the study also aims to inform broader debates on how to build a more competitive, productive, and resilient manufacturing base in Nigeria.

**2. Literature Review and Theoretical Framework**

**2.1 Empirical Literature Review**

The relationship between exchange rate and the performance of the manufacturing sector has been a prominent subject of research in both advanced and developing economies. In developing countries such as Nigeria, where the manufacturing sector is heavily dependent on imported machinery and raw materials, the exchange rate plays a significant role in shaping the cost structure and competitiveness of the sector.

Several empirical studies have attempted to evaluate this relationship from different perspectives. Adeniran, Yusuf, and Adeyemi (2014) examined the impact of exchange rate fluctuations on economic growth in Nigeria and found that exchange rate depreciation negatively affects output in the manufacturing sector. Similarly, Ogun (2000) argued that the depreciation of the naira worsens the competitiveness of local industries due to the increased cost of production inputs that are imported, thereby reducing output and growth potential.

In the broader context, Gylfason and Schmid (1983) highlighted how exchange rate misalignments can lead to stagflation (simultaneous stagnation and inflation) by distorting resource allocation and creating inefficiencies in the production process. Ezeala-Harrison (1993), however, presented a contrasting view, asserting that in countries with strong institutional frameworks and macroeconomic stability, the exchange rate does not necessarily exert a significant influence on industrial performance in the long run.

Domestically, few studies have differentiated between manufacturing output and capacity utilization in relation to the exchange rate. This is a critical gap, considering that capacity utilization measures how efficiently an economy uses its productive assets. Studies that do include this metric often use it as a supplementary indicator without evaluating its dynamic behavior in response to exchange rate policy or macroeconomic changes.

**2.2 Theoretical Framework**

This study is grounded in two key economic theories that offer valuable insights into the expected relationship between exchange rate behavior and manufacturing sector performance: the Theory of Production and the Accelerator Theory.

**2.2.1 Theory of Production**

The Theory of Production posits that production output is a function of input combinations, including labor, capital, and raw materials. In the context of Nigeria’s manufacturing sector, a substantial portion of capital and raw materials are imported. Therefore, fluctuations in the exchange rate affect the cost of these inputs, which in turn influences the output levels. For example, when the domestic currency depreciates, the local cost of imported inputs rises, increasing production costs. If manufacturers are unable to pass these costs on to consumers through higher prices (due to weak demand or competition), output may fall. Conversely, in theory, a depreciated currency could stimulate exports by making locally manufactured goods cheaper in foreign markets, thereby increasing production. However, in practice, this benefit is often offset by Nigeria’s import dependence and supply-side constraints.

**2.2.2 Accelerator Theory of Investment**

The Accelerator Theory posits that investment in capital goods (such as machinery or infrastructure) is driven by changes in output or national income. The theory implies that when national income increases, firms anticipate higher future demand and invest more in productive capacity, thereby increasing capacity utilization.

By applying these two theoretical perspectives to separate but related models, the study captures both the level of industrial output and the efficiency of resource utilization within the manufacturing sector, offering a richer understanding of how the exchange rate influences industrial performance in Nigeria.

**3. Methodology**

**3.1 Type of Data and Sources**

This study utilizes annual time series data covering the period 1986 to 2023, drawn from reliable national and international sources. Specifically, the data were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin, the National Bureau of Statistics (NBS), and the World Bank’s World Development Indicators (WDI). The choice of this period is informed by the series of exchange rate policy reforms in Nigeria, particularly following the adoption of the Structural Adjustment Programme (SAP) in 1986, which marked a shift towards a more market-driven exchange rate system .

**3.2 Model Specification**

To evaluate the relationship between exchange rate and the performance of Nigeria’s manufacturing sector, the study employs two econometric models, each focusing on a distinct performance indicator:

**Model 1:**

Examines the effect of exchange rate on Manufacturing Output (MO):

MO\_t = f(EXR\_t, GFCF\_t, EMPR\_t)

**Model 2:**

Examines the effect of exchange rate on Manufacturing Capacity Utilization (MCU):

MCU\_t = f(EXR\_t, GNI\_t)

Where:

* MO\_t = Manufacturing Output at time t
* MCU\_t = Manufacturing Capacity Utilization at time t
* EXR\_t = Exchange Rate at time t
* GFCF\_t = Gross Fixed Capital Formation at time t
* EMPR\_t = Employment Rate at time t
* GNI\_t = Gross National Income at time t

**4. Results and Discussion**

This section presents the empirical findings from the study and interprets them in relation to the study objectives. Pre-estimation diagnostics were first carried out to determine the appropriate estimation techniques, followed by short-run model estimation and causality testing.

**4.1 Summary Statistics**

To better understand the data characteristics, Table 1 presents the summary statistics for all variables over the study period (1986–2023).

**Table 1: Summary Statistics (1986–2023)**

| **Variable** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| --- | --- | --- | --- | --- |
| MO | 27.88 | 17.58 | 8.08 | 64.41 |
| MCU | 46.37 | 9.46 | 29.30 | 60.30 |
| GFCF | 30.81 | 12.55 | 14.17 | 54.95 |
| EXR | 150.92 | 168.85 | 1.75 | 881.03 |
| EMPR | 85.72 | 9.46 | 66.70 | 97.10 |
| GNI | 220.63 | 179.84 | 25.40 | 555.00 |

***Source: Author’s Computation from EViews 10 (2025)***

The summary statistics in table 1 shows that manufacturing output and capacity utilization varied moderately over the study period, while the exchange rate exhibited significant volatility. This high fluctuation in exchange rate highlights its potential impact on imported inputs and cost of production. The relatively low average capacity utilization also suggests persistent underperformance in the sector.

**4.2 Stationarity and Cointegration Tests**

The Augmented Dickey-Fuller (ADF) test was first conducted to check for stationarity in the variables, and it showed that the variables in both models were integrated of mixed order I(0) and I(1), justifying the use of the ARDL and VAR frameworks.

**Table 2: ADF Unit Root Test Results**

| **Variable** | **Level** | **First Difference** | **Order** |
| --- | --- | --- | --- |
| MO | -3.26 | -4.31\*\* | I(1) |
| EMPR | -5.40\*\*\* | — | I(0) |
| GFCF | -0.22 | -5.39\*\*\* | I(1) |
| EXR | -5.86\*\*\* | — | I(0) |
| MCU | -2.39 | -7.92\*\*\* | I(1) |
| GNI | -1.42 | -3.95\*\* | I(1) |

*\*\*\*p<0.01, \*\*p<0.05*

***Source: Author’s Computation from EViews 10 (2025)***

The ADF unit root test result as shown in table 2 indicate that the variables are integrated of mixed order, some were stationary at level [I(0)] while others became stationary after first differencing [I(1)]. None of the variables were integrated at the second difference [I(2)], confirming the suitability of the ARDL and VAR estimation techniques for this study.

**4.2 ARDL Bounds Test Results**

Before proceeding to the short-run analysis, the study employed the Autoregressive Distributed Lag (ARDL) Bounds Testing approach to determine whether a long-run relationship (cointegration) exists between the exchange rate and the manufacturing sector indicators.

**Table 3: ARDL Bounds Test for Cointegration**

| **Model** | **F-Statistic** | **I(0) Lower Bound** | **I(1) Upper Bound** | **Conclusion** |
| --- | --- | --- | --- | --- |
| Model 1 (MO) | 2.42 | 3.79 | 4.85 | No Cointegration |
| Model 2 (MCU) | 3.11 | 3.79 | 4.85 | No Cointegration |

***Source: Author’s Computation from EViews 10 (2025)***

From table 3, the F-statistics for both models are below the lower critical bound values at the 5% level, indicating that there is no statistically significant long-run relationship between the variables in either model. This implies that fluctuations in the exchange rate, GFCF, EMPR, or GNI do not maintain a consistent, stable relationship with manufacturing output or capacity utilization over the long term.

This result justifies the study’s transition to Vector Autoregression (VAR) for exploring short-run dynamics, as the absence of cointegration implies that ARDL Error Correction Models (ECMs) are not applicable.

**4.3 Short-Run Estimates (Model 1: Manufacturing Output)**

**Table 4: VAR Estimates for Manufacturing Output**

| **Variable** | **Coeff.** | **t-Stat** | **p-value** |
| --- | --- | --- | --- |
| D(MO)(-1) | 1.08\*\*\* | 2.70 | 0.008 |
| D(GFCF)(-1) | -0.82\*\* | -1.80 | 0.073 |
| D(GFCF)(-3) | -0.94\*\* | -2.15 | 0.033 |
| EXR(-1) | 0.26\*\*\* | 2.63 | 0.009 |
| EMPR(-1) | -1.12\*\*\* | -2.58 | 0.010 |
| R-squared | 0.50 |  |  |

***Source: Author’s Computation from EViews 10 (2025)***

From table 4, exchange rate (EXR) has a statistically significant positive impact on manufacturing output in the short run, particularly at lag 1. Employment rate (EMPR) shows a negative effect in the first lag, but becomes slightly positive in later lags. Gross Fixed Capital Formation (GFCF) negatively affects output at lags 1 and 3. This implies that while exchange rate movements can temporarily stimulate output (possibly due to export gains), the effects are not sustained, and capital-related investments may take longer to yield output gains.

**4.4 Short-Run Estimates (Model 2: Manufacturing Capacity Utilization)**

**Table 5: VAR Estimates for Capacity Utilization**

| **Variable** | **Coeff.** | **t-Stat** | **p-value** |
| --- | --- | --- | --- |
| D(MCU)(-1) | -0.33 | -1.46 | 0.153 |
| EXR(-1) | -0.01 | -0.39 | 0.702 |
| D(GNI)(-2) | -0.03 | -0.98 | 0.335 |
| R-squared | 0.17 |  |  |

***Source: Author’s Computation from EViews 10 (2025)***

As shown in Table 5, none of the variables have a statistically significant short-run effect on MCU. Exchange rate and national income do not appear to influence the short-term utilization of capacity. The low R-squared (0.17) indicates that other structural or institutional factors may play a larger role.

**4.5 Granger Causality Tests**

Granger causality tests were conducted to check whether past values of one variable could predict another. The results are presented in the table below;

**Table 6: Granger Causality Summary**

| **Causal Direction** | **F-Stat** | **p-value** | **Conclusion** |
| --- | --- | --- | --- |
| EXR → MO | 1.87 | 0.172 | No causality |
| MO → EXR | 2.17 | 0.132 | No causality |
| EXR → MCU | 0.50 | 0.614 | No causality |
| GNI → MCU | 0.94 | 0.404 | No causality |

As shown in table 6, exchange rate does not Granger-cause manufacturing output or capacity utilization. This reinforces the earlier findings that the exchange rate does not have strong predictive power over Nigeria’s manufacturing performance.

**4.6 Discussion of Findings**

This study provides evidence that the exchange rate does not have a long-run effect on either manufacturing output or capacity utilization in Nigeria. However, short-run impacts were observed in Model 1, where the first lag of exchange rate significantly affects manufacturing output positively. This suggests that manufacturers may respond to short-term exchange rate changes, possibly by adjusting their pricing strategies or sourcing alternatives, but these responses do not translate into long-term productivity gains. For capacity utilization, the exchange rate appears largely irrelevant in both the short and long run. Instead, factors such as infrastructural availability, policy consistency, and input costs may play more influential roles in determining how much of Nigeria’s manufacturing potential is actually utilized. These findings emphasize that exchange rate policy alone is insufficient to drive industrial growth. Holistic strategies that address structural bottlenecks, investment incentives, and macroeconomic stability are essential for sustained manufacturing sector performance.

**5. Summary, Conclusion and Policy Recommendations**

**5.1 Summary of Findings**

This study investigated the impact of exchange rate on manufacturing sector performance in Nigeria using two models: one with Manufacturing Output (MO) as the dependent variable, and the other with Manufacturing Capacity Utilization (MCU). The analysis was conducted using time series data from 1986 to 2023, applying the Autoregressive Distributed Lag (ARDL) bounds testing approach and Vector Autoregression (VAR) models. The findings reveal that: There is no long-run relationship between exchange rate and manufacturing output or capacity utilization, as both ARDL bounds tests failed to establish cointegration in either model. In the short run, exchange rate has a statistically significant positive effect on manufacturing output at the first lag, as shown in the VAR estimates. However, this effect is temporary and does not translate into long-term gains. Exchange rate movements have no significant short-run effect on manufacturing capacity utilization, with very weak VAR results and a low R-squared value of 0.17. These findings underscore the limited effectiveness of exchange rate policies as a standalone tool for enhancing manufacturing performance in Nigeria.

**5.2 Policy Implications**

The study’s findings have several important policy implications: first, while exchange rate stabilization may be beneficial for macroeconomic certainty, it is not sufficient to drive manufacturing sector growth on its own. Second, the lack of both short- and long-run causality between exchange rate and capacity utilization suggests that structural issues, such as electricity supply, infrastructure, logistics, and input availability, play a more dominant role in shaping industrial efficiency. Third, Nigeria’s reliance on imported inputs reduces the potential benefit of a depreciated currency, which theoretically should support exports and local production. In essence, addressing the exchange rate alone without tackling deep-rooted structural bottlenecks will likely have minimal impact on industrial growth and resilience.

**5.3 Recommendations**

Based on the findings of this study, several policy recommendations are proposed to strengthen the performance and resilience of Nigeria’s manufacturing sector. First, there is a need to strengthen domestic input substitution policies by incentivizing the local sourcing of raw materials and intermediate goods. This can be achieved through targeted tax rebates, preferential credit facilities, and production-linked incentives that reduce the sector’s reliance on imported inputs and mitigate its vulnerability to exchange rate shocks. Second, the government should invest in infrastructure and energy supply, with emphasis on improving electricity reliability, expanding transport networks, and developing modern industrial zones. These interventions have a more direct and substantial effect on capacity utilization than currency movements.

Furthermore, efforts must be made to promote long-term industrial financing by facilitating access to affordable credit through development finance institutions such as the Bank of Industry and the Development Bank of Nigeria. The uncertainty surrounding exchange rate policy often discourages investment, especially when financing is short-term or volatile. As such, long-term financing mechanisms are crucial for sustaining capital investment and innovation. In addition, policymakers are encouraged to adopt a complementary policy mix that aligns monetary, fiscal, and trade policies. Exchange rate stability must be supported by trade facilitation, export incentives, and selective tariffs to enhance local competitiveness and reduce input price volatility.

The study also recommends a renewed focus on technological upgrading and skills development. Establishing vocational training programs, supporting research and development (R&D), and providing innovation grants will help firms modernize their production processes and improve efficiency, thereby reducing sensitivity to external shocks. Lastly, it is essential to regularly monitor and evaluate foreign exchange (FX) market reforms. Policymakers must maintain transparency and adaptability in managing the FX market and ensure that reform strategies are informed by continuous dialogue with manufacturing stakeholders. This will promote better policy alignment and ensure that reforms are responsive to real sector challenges.

**5.4 Conclusion**

In conclusion, while exchange rate movements have limited short-term influence on manufacturing output and no significant effect on capacity utilization, improving Nigeria’s manufacturing sector requires a more comprehensive and integrated policy framework. Stability in macroeconomic variables should be complemented by structural transformation and a proactive industrial policy agenda. Only then can the manufacturing sector serve as a sustainable engine of growth, employment, and economic resilience in Nigeria.

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