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# EFFECT OF FOREIGN DIRECT INVESTMENT AND VALUE ADDED TAX ON MANUFACTURING SECTOR PERFORMANCEIN NIGERIA

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## ABSTRACT

*This study investigates the extent to which foreign direct investment, value added tax, inflation, and exchange rate affect manufacturing sector performance in Nigeria for the period 1981-2022. The study deployed the Autoregressive Distributed Lag (ARDL) bounds test approach and Toda and Yamamoto Granger causality tests. The findings of the study unraveled a negative and statistically significant effect of foreign direct investment on manufacturing value added in the long run. Similarly, the study documented a negative and statistically significant effect of value added tax on manufacturing value added, confirming its potential to hinder manufacturing growth. However, inflation exhibits a counter intuitive positive and significant impact on manufacturing value added in both the long and short run, warranting further exploration. Also, the study discovered that exchange rate stimulates manufacturing sector performance in both short and long run. The outcome of Toda-Yamamoto causality analysis reveals the presence of unidirectional causality from direct investment to manufacturing sector performance without feedback. However, the two-way causality relationship has been observed between value added tax and manufacturing sector performance. Thus, the study recommends that government should review value added tax structure to minimize its negative impact. Secondly, government should develop a comprehensive foreign direct investment strategy focused on technology transfer and knowledge spillovers. Implementing sound macroeconomic policies to control inflation and maintain a stable environment. And finally, maintaining a flexible exchange rate policy with targeted interventions.*

## 1.0 Introduction

The manufacturing sector is seen as not only one of the accelerators of economic growth but also the means of attaining structural transformation in most economies (Dagim, 2020). United Nations Industrial Development Organization (UNIDO) (2011) considered the manufacturing sector as one of the highly important sectors of the economy, with a huge potential to generate wealth, job opportunities and enhance quality of life. Among the role played by manufacturing sector is; acting as a catalyst that accelerates the pace of structural transformation and diversification of the economy; enabling a country to take the advantage its factor endowment, and to also able to provide not only the raw materials but also boost its output capable of stimulating economic growth, development and sustainability. In addition, the

manufacturing sector's growth is essential in building national technological capacity, productivity, and capital accumulation within the industry (Manoj, 2018).

In Nigeria, the manufacturing sector growth has slowed to the lowest in three years from 2021 to 2023 on account of challenging macroeconomic activities (Ologunagbe, 2023). Specifically, the contribution of manufacturing sector to GDP as reported by the National Bureau of Statistics (NBS, 2023) stood at 2.2 percent in the second quarter of 2023, the lowest since the second quarter of 2020. In addition, the share of manufacturing sector to GDP is less when juxtaposed with that of service and agriculture sectors. For instance, the share of manufacturing sector to GDP during the period 1997-2017 was just 4.9% compared with the 38.89% for service and 41.86% for agriculture sectors' value added, respectively. Meanwhile, incompetent and weak industrial development policies have been recognized as part of the factors affecting the socio-economic and well-being of people in developing countries including of great nation (Nigeria), and such policies are part of the major contributing factors to low contribution of manufacturing sector's to GDP (Ajudua & Ojima, 2016).

The interaction between FDI and VAT within the manufacturing sector is complex. On the one hand, FDI can enhance the capacity of domestic firms to absorb and adapt to the financial burden imposed by VAT through improved efficiency and productivity. On the other hand, high VAT rates might deter FDI by increasing the cost of doing business in Nigeria, thus negatively impacting the manufacturing sector's performance (Okoli & Afolayan, 2015). Understanding the balance between attracting FDI and maintaining a VAT regime that does not stifle manufacturing growth is crucial for policymakers aiming to foster sustainable economic development. It is against this background that the presence study examines the extent to which FDI and value added tax affect manufacturing sector performance in Nigeria.

Therefore, this study departs from the previous studies as follows; while most of the previous contributions have examined the effect of either foreign direct investment or value added tax on manufacturing sector performance, this study extends the literature by examining the effect of both FDI and VAT on manufacturing sector performance in Nigeria. Second, the study employed the Autoregressive Distributed Lag ARDL estimation technique. Third, the study uses the Toda-Yamamoto causality test framework to examine the causal relationship among the explained and explanatory variables. Four, the study extends the frontier of knowledge by enlarging the scope of the study rather than just taking a small-time frame as done by earlier studies.

The rest of the paper is configured into five sections by taking the above introduction as the first section. Sections two and three are devoted for literature review and methodology, respectively. Section four and five focuses on empirical results and conclusion and policy recommendations, respectively.

## 2.0 Literature Review

### 2.1 Conceptual Review

Manufacturing as defined by Obikwelu (2018) "as the branch of industry that is preoccupied with the deployment of tools and processes in order to turns raw materials into finished products. It's encapsulated all the intermediate processes and integration of various product's components."

Foreign direct investment defined by John (2016) "as an investment in the form of either establishing a business or acquiring business assets by an individual or a company in a country other than the country of origin of the investor." On the other hand, Idoko andTaiga (2018) viewed FDI "as the sum of

equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments".

Value Added Tax (VAT) defined by Emmanuel and Opeyemi (2019) "as a consumption tax that is relatively easy to administer and difficult to evade which endeared it to many countries as a revenue-generating mechanism thereby embracing it. It is also the process that is infused into each stage of the consumption chain and is borne by the final consumer".

## 2.2 Empirical review

The study reviewed a number of empirical studies conducted by other scholars looking at methodologies employed, selection of variables, timeframe and results obtained as well as the weaknesses. For instance, Sokunle et al. (2016) focused on 26 Sub-Saharan economies to unravel the determinants of manufacturing sector output in the period 2008 to 2010. The study utilized FDI, interest rates, labour cost as explanatory variables against the manufacturing sector growth as explained variable. The findings displayed that all the explanatory variables have negatively influence manufacturing sector growth. Furthermore, Idoko and Taiga (2018) examined the extent to which FDI stimulate manufacturing sector output in Nigeria via the application of Vector autoregression and Johansen maximum likelihood test. The outcomes of the study showed a long run equilibrium relationship between FDI and manufacturing sector performance. Also, findings from the response function and variance decomposition analysis demonstrated a positive but insignificant influence of FDI on manufacturing sector performance in Nigeria.

Olusegun (2021) deployed the cointegration and causality methodologies to unravel the determinants of manufacturing sector performance in Nigeria spanning from 1994-2019. The author used manufacturing sector output, tax rate, interest rate, real exchange rate, trade openness and money supply. The outcome showed the presence of long equilibrium relationship among the variables. The study also demonstrated that tax rate, real exchange rate and trade openness significantly determined output of manufacturing sector in Nigeria. However, the result causality test showed bidirectional causal relationship tax rate, real exchange rate and manufacturing sector performance, respectively.

Sakanko et al. (2022) studied the extent to which taxes influence the performance of manufacturing sector in Nigeria covering the period 1994Q1-2020Q4 via the application of cointegration test in the form of ARDL bounds testing and causality test. The outcome showed that both the company income tax and import tax positively stimulate manufacturing sector output. However, value added tax showed a negative and significant effect on manufacturing sector output in not only the short but also long run. Also, the findings from Granger causality test revealed one-way causal flow running from taxes to manufacturing sector output without feedback.

In light of the above-reviewed literature, it is evident that studies across different regions have investigated a series of determining factors that could influence manufacturing sector performance. Researches conducted are either between the manufacturing sector and VAT; manufacturing sector and FDI; manufacturing sector and GDP but not the combination of both FDI and VAT on the same study. Similarly, previous studies mostly used small or inadequate sample size (see Sokunle et al., 2016; Idoko and Taiga (2018); Sakanko et al., (2022); Olusegun, 2021). Therefore, the present study contributes to the existing literature by investigating the extent to which FDI and VAT influence manufacturing sectors in Nigeria, using annual data for the 1981-2021 periods. Finally, the study utilized the ARDL bounds test approach to

cointegration that can simultaneously examine both the short and long run effect of explanatory variables on the explained variable.

## 3.0 Methodology

### 3.1 Theoretical Framework

The theoretical underpinning for examining the effect of FDI and VAT on the manufacturing sector's performance in Nigeria is based on two primary economic theories: Investment-Led Growth Theory and Taxation Theory. These theories provide insights into how FDI and taxation can affect manufacturing sector performance by affecting productivity, capital accumulation, and cost structures.

Investment-Led Growth Theory posits that FDI plays a crucial role in promoting economic growth by bringing in capital, technology transfer, managerial skills, and knowledge that can improve the productivity of domestic firms. According to this theory, FDI contributes to manufacturing sector performance through capital injections and enhanced technological capacity, leading to increased production efficiency, innovation, and competitiveness. When foreign investors set up or expand operations in the manufacturing sector, it can stimulate productivity by introducing more efficient production techniques and access to international markets, which can result in higher output. Furthermore, benefit-received theory emphasizes the influence of tax policies on investment decisions and business performance. According to this theory, Value Added Tax (VAT) can have mixed effects on the output of manufacturing sector.

### 3.2 Model specification

In order to empirically investigate the influence of FDI and VAT on the performance of the manufacturing sector in Nigeria, a relevant model based on theoretical framework and empirical insights from related studies is that Idoko and Taiga (2018) and is therefore adopted with sight modification as follows:

$$MVA = \alpha_0 + \beta_1 FDI_{t-1} + \beta_2 VAT_{t-1} + \beta_3 INFL_{t-1} + \beta_4 EXR_{t-1} + \varepsilon_t \quad (1)$$

where: MVA = Manufacturing sector performance (measured manufacturing sector's contribution to GDP), FDI = Foreign Direct Investment inflows, VAT = Value Added Tax, INFL =Inflation rate, and EXR = Exchange rate, $\alpha_0$ = Intercept term, β1, β2, β3, and β4 = Coefficients representing the effects of each independent variable on manufacturing performance, and $\epsilon_t$ = Error term capturing other factors affecting manufacturing sector performance.

Table 1: Variables definition, Measurement and Data sources

| S/N | Variables | Measurement | Source |
|---|---|---|---|
| 1 | MVA | The measurement of MVA is based on manufacturing output as a share of a country's economy. | World Bank (2023) |
| 2 | FDI | FDI is calculated as the net value of inflows minus outflows. | World Bank (2023) |
| 3 | VAT | Measuring VAT involves calculating the tax amount at each stage of the production and distribution process. The VAT is measured in | National Bureau of Statistics (2023) |

| | | | |
|---|---|---|---|
| | | nominal terms and has not been adjusted for inflation. | |
| 4 | INFL | Inflation measures how much more expensive a set of goods and services has become over a certain period, usually a year. It is measured by the GDP deflator. | World Bank (2023) |
| 5 | EXR | An official real exchange rate is used as a proxy of exchange rate source from WDI, and it is measured as the amount of US dollars per unit of Nigerian currency (Naira) (Ngozika, 2016). | World Bank (2023) |

### 3.3 Estimation Procedures and Techniques

The study subjected the variables for stationary tests with the aid of both Augmented Dickey-Fuller and Phillips-Perron tests in order to determine the order of integration of the variables and ensure that none of study variables is integrated of order two. This is because the assumptions of ARDL collapses in the presence of I(2) (Inuwa & Modibbo, 2012).

After checking the order of integration of the variables, the study deployed ARDL to examine the impact of FDI, VAT, inflation, and exchange rate on the output of manufacturing sector in Nigeria. The choice of ARDL is justified because of its superiority over the previous cointegration techniques. For instance, the ARDL can be employed in the presence of the variables that are stationary at level, first differenced or even the combination of both (Pesaran et al., 2001; Zuhroh et al., 2018; Appiah et al., 2019). Similarly, the technique has the capacity to not only produces robust results in the presence of small sample sizes but simultaneously unravel the effect of not only short but long run of explanatory variables on the explained variable. Another notable of advantage of the technique lies on its ability to estimate error correction technique via a simple linear transformation (Dantama et al., 2012; Gamalet al., 2019; Abu & Gamal, 2020). Unlike the previous traditional cointegration methods, endogeneity and serial correlation are easily corrected since ARDL takes sufficient number of lags as detailed in Pesaran and Shin (1995). Thus, the ARDL version of model (1) is presented as follows

$$LMVA = \alpha_0 + \sum_{i=1}^{p} \alpha_1 LMVA_{t-1} + \sum_{i=1}^{p} \alpha_2 LFDI_{t-1} + \sum_{i=1}^{p} \alpha_3 \Delta LVAT_{t-1} + \sum_{i=1}^{p} \alpha_4 \Delta INFL_{t-1} + \sum_{i=1}^{p} \alpha_5 \Delta EXR_{t-1} + \beta_1 LMVA_{t-1} + \beta_2 FDI_{t-1} + \beta_3 VAT_{t-1} + \beta_4 INFL_{t-1} + \beta_5 EXR_{t-1} + \mu_t \quad (2)$$

The long-run equilibrium relationship between explained and explanatory variables is unraveled using Bond Test. The long run co-movement among variables is established when the estimated F-statistic exceeded the upper bond critical values (Pesaranet al., 2001). However, absent of long run equilibrium relationship is established when the F-statistic falls below the lower bond critical value. The test is inconclusive when the estimated Wald or F-statistic falls in between the upper and lower bound critical values. Once cointegration is confirmed, the long-run equilibrium relationship is estimated using the conditional ARDL model specified as:

$$LMVA = \alpha_0 + \beta_1 LMVA_{t-1} + \beta_2 FDI_{t-1} + \beta_3 VAT_{t-1} + \beta_4 INFL_{t-1} + \beta_5 EXR_{t-1} + \mu_t \quad (3)$$

After the estimation of long run impact of explanatory variables on explained variable, the short run effect is examined and also the error correction model (ECM) is computed via the ARDL model and its specification is expressed as follows:

$$\begin{aligned} LMVA = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta LMVA_{t-1} + \sum_{i=1}^{p} \alpha_2 \Delta LFDI_{t-1} \\ + \sum_{i=1}^{p} \alpha_3 \Delta LVAT_{t-1} + \sum_{i=1}^{p} \alpha_4 \Delta INFL_{t-1} + \sum_{i=1}^{p} \alpha_5 \Delta EXR_{t-1} + \beta_t ECT_{t-1} + \mu_t \end{aligned} \quad (4)$$

Where: $\alpha_0$ = Constant term; $\mu_t$: Stochastic error term; $\alpha_1$ to $\alpha_5$ :Short-run elasticities (coefficients of the first-differenced explanatory variables); $\beta_1$ - $\beta_5$: Long-run elasticities (coefficients of the explanatory variables), $ECM_{t-1}$:Error correction term lagged for one period ($\theta$) :Speed of adjustment, $\Delta$:First difference operator; ( p q, r, s, & t) are the lag lengths. The null hypothesis of no cointegration between manufacturing sector performance and its determinants is given as:

H0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$

The alternative hypothesis was given as:

H0: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$

## 4.0 Empirical Results

**Table 2. Results of Unit Root Test**

| Variables | ADF | | Order of integration | PP | | Order of integration |
|---|---|---|---|---|---|---|
| | Level | First diff | | Level | First diff | |
| LMVA | -0.411 | -3.696** | I(1) | -1.101 | -6.237*** | I(1) |
| LFDI | -1.726 | -4.967** | I(1) | -2.935 | -11.572*** | I(1) |
| LVAT | 0.457 | -4.959*** | I(1) | 0.552 | -4.962*** | I(1) |
| INFL | -4.130** | -6.538*** | I(0) | -2.717 | -7.010*** | I(1) |
| *EXR* | -0.131 | -4.380** | I(1) | 0.959 | -4.503*** | I(1) |

**Source:** Researchers' estimation output using E-view 10 **.**
Notes:(***), (**) and (*) denotes significance level at 1%, 5% and 10% level, respectively.

Outcome of unit root tests are depicted in Table 2, the outcome revealed that all the variables except for inflation rate which stationary at its level values in the ADF unit root test. However, the remaining variables became stationary at their first differenced. It is interesting to note that most of variables becomes stationary at 1% and 5% level of significance for PP and ADF tests, respectively.

**Table 3. Result of ARDL Bounds Test**

| Test Statistic | Value | Significance | Bound | |
|---|---|---|---|---|
| | | | I(0) | I(1) |
| F | 4.587*** | 10% | 2.65 | 3.79 |
| | | 5% | 2.56 | 3.49 |
| | | 1% | 3.21 | 4.49 |

Sources: Authors' calculation. (***) denotes a rejection of the null hypothesis of no co-integration at 1% level

Finding depicted in Table 3 represented the ARDL bound test result. The result of the of bound test showed that the value of F-statistic is 4.587 which is higher than the upper bond critical values at 1% level of significance. Thus, the null hypothesis is rejected, and accepted the alternative hypothesis that there is indication of long run relationship between the variables in Nigeria from 1981 to 2022. This implies that there is long run covement between the dependent variable (log of manufacturing value added) and independent variables (log foreign direct investment (LFDI), log of value added tax (LVAT), Inflation **(**INFL**)** and exchange rate) in Nigeria. Since there is co-integration between the dependent and independent variables, it is therefore necessary to estimate error correction model in so as to test for the dynamics of the estimates in the short run.

**Table 4. Results of ARDL model (**1,1,0,2,0**) selected based on AIC**

| **Long-run Coefficient Estimates- Dependent variable: LMVA** | | | | |
|---|---|---|---|---|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| LFDI | -0.133* | 0.074 | -1.799 | 0.082 |
| LVAT | -0.258** | 0.113 | -2.27 | 0.030 |
| INFL | 0.015*** | 0.0045 | 3.387 | 0.002 |
| EXR | 0.0028** | 0.0012 | 2.167 | 0.038 |
| C | 4.938*** | 1.641 | 3.009 | 0.005 |

Sources: Authors' calculation. Note: ***, ** and * denotes a level significance at 1%, 5% and 10% levels respectively

From Table 4, the coefficient of FDI is negative and statistically significant at 10% level of significance. This suggests that 1% surge in foreign direct investment leads to 0.133% decrease in manufacturing value added in long-run. This outcome corroborated with the theoretical prediction as posited by Agrawal (2001) that foreign direct investment can crowd out domestic firms. Also, the value added tax was found to have negatively affected significantly manufacturing value added, suggesting that a rise in the value added tax leads to a decline in manufacturing value added in long-run. Thus, a 1% rise in value-added tax would decline manufacturing value added by 0.26%. This outcome supported the a priori expectation that higher taxes reduce the profitability of firms and discourage production (Keen et al., 2010).

Furthermore, the coefficient of inflation rate in long-run is positive and statistically significant at 1% level of significance, signifying that a 1% rise in inflation will leads to 0.02%increase in manufacturing value added. Similarly, the long-run coefficient of exchange rate is positive and statistically significant at 5% level of significance, suggesting that an appreciation of the currency (a decrease in the exchange rate) leads to surge in manufacturing value added. This finding corroborated with the expectation that a weaker currency can make exports more competitive and increase production. But it is interesting to note that the influence is relatively small.

**Table 5. Results of ARDL model (**1,1,0,2,0**) selected based on AIC**

| **Short-run Coefficient Estimates- Dependent variable: LMVA** | | | | |
|---|---|---|---|---|
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.** |
| DL(FDI) | 0.009 | 0.028 | 0.327 | 0.746 |

| | | | | |
|---|---|---|---|---|
| DL(FDI(-1)) | -0.059** | 0.029 | -2.007 | 0.054 |
| DL(VAT) | -0.096*** | 0.037 | -2.563 | 0.017 |
| D(INFL) | 0.003*** | 0.001 | 2.785 | 0.009 |
| D(INFL(-1)) | -0.005*** | 0.001 | -3.734 | 0.001 |
| D(EXR) | 0.001*** | 0.333 | -33.082 | 0.004 |
| ECM | -0.371*** | 0.124 | -2.988 | 0.005 |
| C | 1.833 | 1.039 | 1.764 | 0.880 |
| | | | | |
| R-Square | 0.961 | | | |
| Adj. R-Square | 0.951 | | | |

Sources: Authors' calculation. Note: ***, ** and * represent the level of significance at 1%, 5% and 10% levels, respectively

The table 6 of short-run coefficient estimation revealed that current coefficient of FDI is positive but statistically insignificant. This suggests that an increase in FDI will insignificantly stimulate manufacturing value added. However, the coefficient past FDI (FDI(-1)) is negative and statistically significant at 5% level of significance, suggesting that a potentially negative impact in the previous period. This could be due to factors like time lags in realizing benefits from FDI or initial challenges associated with new investments. Also, the study unraveled the negative effect of value added tax on output of manufacturing sector at 1% level of significance. Thus, a 1% rise in VAT would retard manufacturing sector performance by 0.10%, which invariably suggests that VAT increases production costs and reduces demand in the immediate term.

As for the effect of the inflation on manufacturing sector output, both current and first lagged inflation coefficients are small and statistically significant, with positive and negative signs respectively. This indicates a potentially complex relationship where short-term inflation might have a slightly positive effect on manufacturing sector ouput, while lagged inflation might have a slightly negative effect. The coefficient of exchange rate displayed a positive and statistically significant effect on manufacturing value added at 1% level of significance. Thus, a 1% rise in exchange rate will stimulate manufacturing value added by 0.001%. This aligns with the theory that a weaker exchange rate can improve export competitiveness in the immediate term. Coefficient of constant is 1.8334 and insignificant p-value 0.88 indicates that the constant term might not be statistically different from zero and may not contribute significantly to explaining the short-run relationship.

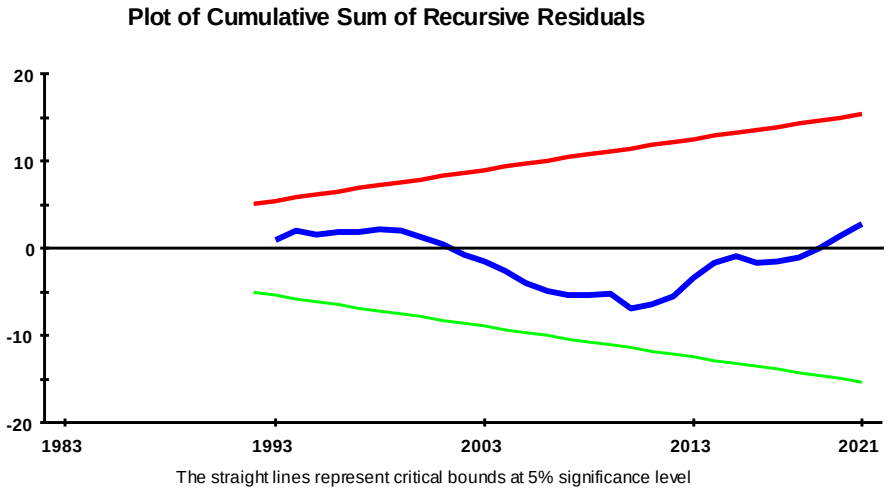
Furthermore, the coefficient of ECM is negative and statistically significant, suggesting that the inherent error in the model is rectified by 37.127% annually. In other words, the speed of adjustment for the variables to return to their equilibrium state when there is a short – run distortion is 37.127% per annum. The value of the coefficient of determination is 0.961, implying that 96.14% of the behaviour of the manufacturing sector output has been determined by FDI, VAT, inflation, and exchange rate in the model. This implies a strong fit between the model and the data.

**Table 6. Diagnostic tests**

| Test | Statistics | Value | P-value |
|---|---|---|---|
| Serial Correlation | Breusch-Godfrey LM test | 1.1668 | .280 |
| Functional Form | Ramsey RESET test | .094294 | .759 |
| Normality | Skewness/Kurtosis tests | .17506 | .916 |
| Heteroscedasticity | Breusch-Pagan test | 2.4905 | .115 |

Source: Authors' calculation.

Table 6 shows that there is no significant autocorrelation in the residuals of the model of the formal Breusch-Godfrey serial correlation Lagrange Multiplier (LM) test. This is a good sign as it means the model doesn't suffer from serial dependence, where past errors influence future errors. Also, the heteroscedasticity test has a value of 2.491 with a p-value of 0.115. This suggests that the variance of the residuals is constant over time. This means the model doesn't have unequal variance across different parts of the data, which can lead to unreliable estimates. The normality test also suggests that the residuals are normally distributed. Furthermore, the functional form test in indicates that there is no evidence of misspecification in the model's functional form since the Ramsey RESET test is 0.094 and has probability value of 0.759 which is above 5% level of significance. This means the chosen functional form adequately captures the relationship between the variables. In addition, the study conducted not only the CUSUM test but also the CUSUMSQ test of residuals to confirm the stability of the estimated models and results are depicted in Figure 1 and 2. The outcomes showed that both plots are within the 5% significant lines, suggesting that the estimated model is stable.



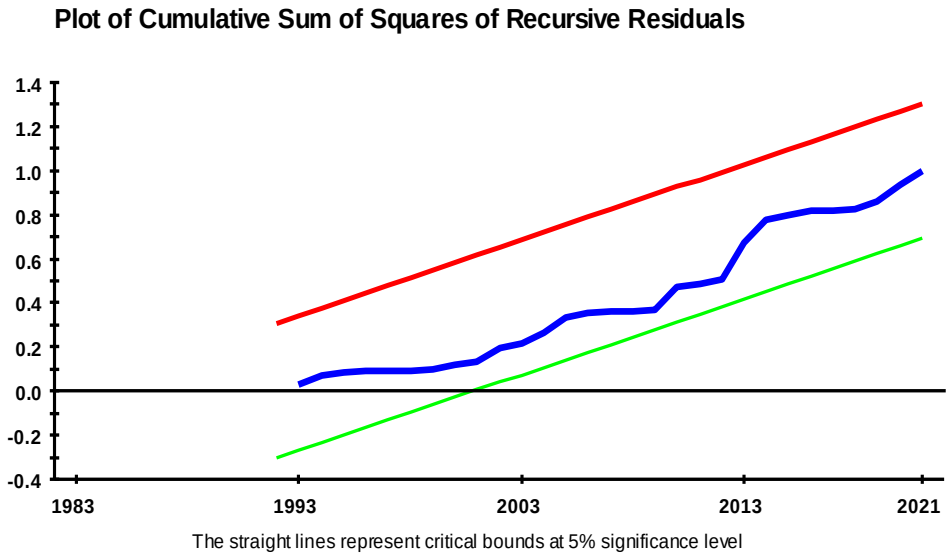



Table 8: Results of the Toda and Yamamoto Causality Test

| Null Hypothesis | MWALD | Df | Prob. | Decision | Direction of Causality |
|---|---|---|---|---|---|
| LFDI→ LMVA | 6.146 | 2 | 0.029 | Reject | Unidirectional |
| LMVA→ LFDI | 1.821 | 2 | 0.402 | Do not Reject | No causality |
| LVAT→ LMVA | 5.527 | 2 | 0.063 | Reject | Bidirectional |
| LMVA→ LVAT | 8.805 | | 0.012 | Reject | Bidirectional |
| INFL→ LMVA | 0.038 | | 0.860 | Do not Reject | No causality |
| LMVA→ INFL | 5.028 | | 0.081 | Reject | Unidirectional |
| EXR→ LMVA | 5.335 | | 0.0694 | Reject | Bidirectional |
| LMVA→ EXR | 7.656 | | 0.022 | Reject | Bidirectional |

Note: → denotes 'does not Granger cause'; Df indicate degree of freedom and MWALD is the modified Wald chi-square of the Toda-Yamamoto (1995) causality test.
Source: Author's Computation

Table 8 present the findings of the Toda and Yamamoto Causality Test. This test assesses the causal relationship between these variables, where the Modified Wald (MWALD) chi-square statistic indicates the strength of each causality test, and probabilities provide the significance levels for rejecting or failing to reject each null hypothesis. Each decision on causality is guided by these probabilities, as outlined in the test results. Starting with the causal relationship between FDI and MVA, the null hypothesis of FDI not causing MVA is rejected at a 5% significance level (MWALD = 6.146; p = 0.029), indicating a unidirectional causality from FDI to MVA. This suggests that increases in FDI are likely to positively impact the manufacturing sector's output. Conversely, the reverse causality from MVA to FDI shows no causation, as the alternative hypothesis has been rejected (MWALD = 1.821; p = 0.402). Thus, this unidirectional causality implies that FDI drives manufacturing performance, but manufacturing growth does not necessarily attract additional FDI inflows in this case.

For VAT and MVA, a bidirectional relationship is observed, as both null hypotheses are rejected. The causality from VAT to MVA is significant with a p-value of 0.063, while the reverse causation from MVA to VAT is highly significant at p = 0.012. This bidirectional causality suggests a reinforcing relationship where VAT levels impact the

manufacturing sector, and, in turn, changes in manufacturing output could influence VAT collections, perhaps due to higher economic activities increasing VAT revenues. The results for inflation (INFL) and MVA show no causation running from inflation to manufacturing performance. However, the opposite direction from MVA to inflation shows a unidirectional causality (MWALD = 5.028; p = 0.081), suggesting that manufacturing performance may exert an influence on inflationary pressures, perhaps through supply-side changes in the economy.

Lastly, exchange rate (EXR) and MVA display a bidirectional causality, where both null hypotheses are rejected at p-values of 0.0694 and 0.022, respectively. This implies a feedback causal relationship between EXR and MVA, causality runs in both directions as exchange rate stimulates manufacturing sector performance so does manufacturing sector stimulates exchange rate. This can be intuitively understood as manufacturing sector's reliance on imported inputs could explain this linkage, as exchange rate changes impact input costs, while variations in MVA may also influence exchange rate adjustments through trade balances.

## 5.0 Conclusion and policy implications

This study investigated the influence of foreign direct investment and value added tax on manufacturing value added in Nigeria for the period 1981-2022, by using an Autoregressive Distributed Lag (ARDL) bounds test model with robust diagnostic tests. Other variables incorporated are inflation, and exchange rate. The outcome showed that FDI insignificantly stimulate manufacturing sector output. But in the long run, the study displayed retarding effect on manufacturing sector in Nigeria. Also, value added tax affects manufacturing value added negatively in both long run and short run. This suggests that VAT policies can hinder the growth of the manufacturing sector by increasing production costs and reducing demand. However, the findings regarding inflation and exchange rate are positive and significant. The implications of these findings suggest that while inflation can erode the purchasing power of domestic consumers, leading to decreased demand for manufactured goods and potentially hindering overall production, the exchange rate fluctuations might play a less significant role in creating uncertainty for businesses, discouraging investment in essential areas like new equipment, technology, and capacity expansion, thereby hindering long-term growth prospects (Calvo& Reinhart, 2000) in the Nigerian context.

Based on the results found and their implications reported in the preceding section, the policy measures recommended by this study in order to help the government to ensure potential increase in manufacturing performance in Nigeria include: Government should develop and implement a comprehensive strategy to attract foreign direct investment (FDI) that fosters positive impacts on the manufacturing sector. This strategy could include, improving the investment climate by addressing issues like infrastructure, regulatory hurdles, and corruption. Government should focus on attracting FDI with a strong commitment to technology transfer and knowledge spillovers to enhance local capabilities and promote sustainable growth. Also, the government should review and potentially revise the current value added tax (VAT) structure to minimize its negative impact on the manufacturing sector. This could involve reducing VAT rates on essential inputs or manufactured goods and/or implementing exemptions or tax breaks for specific sectors or activities within the manufacturing industry. Also, government may explore alternative tax structures that are less distortionary for the manufacturing sector, such as income taxes or property taxes.

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