



The Dynamics of Fiscal Policy Measures on Manufacturing Sector Growth: Evidence from Nigerian Economy

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ABSTRACT

This study investigates the dynamics of fiscal policy measures on manufacturing sector output growth: evidence from Nigeria economy for the period 1981 to 2021 using the estimation technique of the Autoregressive Distributed Lag (ARDL) model. The research utilized an ex-post facto design and collected time series data from Central bank of Nigeria and National Bureau of Statistics on manufacturing sector output growth rate, economic growth rate, company income tax, tariff and government expenditure on infrastructure. The findings indicated that a negative and significant relationship exist between company income tax, tariff and the manufacturing output growth rate while a positive and significant relationship exist between government expenditure on infrastructure and manufacturing output growth rate in the long run. A positive and significant relationship exists between manufacturing output growth rate and economic growth rate. The Toda-Yamamoto causality test showed a uni-directional relationship between company income tax, government expenditure on infrastructure and manufacturing output growth . Based on this finding, the study made the following recommendation: the Federal Inland Revenue Service may consider carefully evaluating the current company income tax structure. A reduction in company income tax rates or the implementation of incentives for businesses particularly the infant industries could stimulate manufacturing growth over the long term. The federal ministry of trade and industry should assess the impact of existing trade policies. A gradual reduction in tariff rates or the implementation of trade policies that encourage manufacturing activities may contribute to long-term growth. Government should prioritize infrastructure development projects as a means to support and sustain the manufacturing sector. Policymakers should continue to support policies that promote a robust and dynamic manufacturing industry since its growth subsequently affects the economy's overall growth positively.

Keywords: Fiscal Policy, Manufacturing Sector, ARDL, Economic Growth, Toda-Yamamoto.

1.0 INTRODUCTION

Nigeria, as one of the largest economies in Africa, has experienced both economic growth and challenges in recent years. The manufacturing sector is a crucial component of Nigeria's economic landscape, contributing significantly to employment, industrialization, and export earnings. However, the sector has faced various constraints, and its growth has been influenced by a myriad of factors, including fiscal policy measures implemented by the government.

Fiscal policy, encompassing government spending, taxation, and other revenue-related initiatives, plays a central role in shaping the economic landscape of a country. Understanding the dynamics of fiscal policy measures on the manufacturing sector growth rate is essential for policymakers, economists, and stakeholders aiming to enhance economic performance and foster sustainable development, (Audu, 2012).

Despite the acknowledged importance of fiscal policy, there is a notable gap in the literature regarding the specific and nuanced impact of fiscal policy measures on the manufacturing sector in the context of Nigeria. Previous studies have explored the broader economic implications of fiscal policy but have not sufficiently delved into the sector-specific dynamics, especially within the manufacturing domain.

Economies all over the world are governed by various policies developed and deployed by government. A policy can be described as a plan or action that is intended to influence decisions. Economic policies are plans or actions that are put in place to control the performance of the economy. Economic policies could either be fiscal or monetary. Fiscal policy is a macroeconomic tool used by government to stabilize the economy by influencing its revenue and expenditures. Government revenue relates to the generation of income for funding expenditure and it includes tax, foreign aid, trade surplus and so on. Of all these sources of revenue, tax is the most dependable source of revenue for the government. Government expenditure is the spending of funds that the government has raised through revenues. The major components of government expenditure are recurrent and capital expenditures (Aluthge , Jibir & Abdu, 2021)

Therefore, we can say that fiscal policy is a technique of government management of the economy through fiscal policy instruments such as taxation, government expenditure and deficit financing in order to achieve macroeconomic objectives so as to direct the economy towards achieving the policy goals of internal and external balance (Chukuigwe & Abili., 2008). The objective of fiscal policy as stated by Anyawu (1993), is to promote economic conditions conducive enough to promote business growth particularly the manufacturing sector while ensuring that any government actions are consistent with government stability. Fiscal policies used by the government could either be contractionary or expansionary. A contractionary policy is employed when the government wants to slow the growth of the economy to a healthy economic level while the expansionary policy is implemented during periods of recession to propel the growth of the economy.

Fiscal policy may be implemented simultaneously along with monetary policy (an instrument the central bank of a nation uses to influence money supply in the nation). Effectively, these two policies are used by a government to attain macroeconomic goals it set out for a nation. These macroeconomic goals include price stability, full employment, reduction of poverty levels, high and sustainable economic growth that will influence growth in the other sub sectors of the economy particularly the manufacturing sector, favourable balance of payment, and the reduction in a nation's debt.

The manufacturing sector in Nigeria plays a crucial role in the country's economy, contributing to employment generation, industrialization, and economic diversification. The manufacturing sector contributes significantly to Nigeria's Gross Domestic Product (GDP). It has historically accounted for around 8-10% of the country's GDP. It encompasses a wide range of industries, including food processing, textiles and apparel, cement production, chemicals and petrochemicals, pharmaceuticals, automotive, and electronics, among others. The manufacturing sector in Nigeria faces several challenges, including infrastructural deficiencies, unreliable power outage , high production costs, inadequate access to finance, and other issues relating to regulatory and policy constraints.

Nigeria has been heavily dependent on imports for many finished goods, which has hindered the growth of the domestic manufacturing sector. This reliance on imports has had adverse effects on the country's trade balance and foreign exchange reserves.

The Nigerian government has equally taken steps to support the manufacturing sector through various policies and initiatives. These include the Nigerian Industrial Revolution Plan (NIRP) and the National Industrial Policy (NIP). These policies aim to promote industrialization, encourage local production, and attract investment into the manufacturing sector.

Despite all these steps, there is still need for the country to provide infrastructure and incentives to attract both local and foreign investors to set up manufacturing facilities as there are great opportunities for growth in the Nigerian manufacturing sector. A growing population, rising middle-class consumer demand, and abundant natural resources present opportunities for businesses to expand their manufacturing activities.

Nigeria's manufacturing sector, a vital contributor to economic development, faces multifaceted challenges that impede its optimal growth and performance. Amidst these challenges, the role and impact of fiscal policy measures on the manufacturing sector growth rate remain insufficiently understood. While fiscal policy is recognized as a potent instrument for economic management, its specific dynamics and implications for the manufacturing sector in the Nigerian context require comprehensive investigation.

Several pressing issues prompt the need for an in-depth examination of the relationship between fiscal policy measures and the growth of the manufacturing sector in Nigeria: In assessing macroeconomic indicators, which help in reflecting the result of fiscal and monetary policies, within the context of Nigeria, particularly within the fourth republic which began in 1999, it can be observed that since 2015, when the Buhari-led administration began to govern, Nigeria has experienced a deterioration in these indicators. Findings reveal that while the average GDP growth rate between 1999 and 2014 was 6.74%, the average GDP growth rate from 2015 to 2021 was at 1.9% (World Bank, 2021). Findings also revealed that manufacturing growth rate between 1999 and 2014 was 5.34%, the average manufacturing growth rate from 2015 to 2021 is 0.18% (World Bank, 2021). Also, findings from labour force data published by the Nigerian Bureau of Statistics (NBS), revealed that the unemployment rate has increased from 8.19% in the second quarter of 2015, to 33.28% in the fourth quarter of 2020 (NBS, 2021).

Studies have been conducted on the effects of fiscal policy on manufacturing output growth rate of Nigeria as seen in the literature review, and these studies focused mainly on how the economy has been impacted by the different individual components of fiscal policy such as government expenditure on infrastructure, taxation and tariff. Existing research on fiscal policy in Nigeria has predominantly focused on its overall macroeconomic impact. However, there is a noticeable gap in the literature concerning a nuanced examination of fiscal policies tailored to the manufacturing sector. Understanding the unique challenges and opportunities within this sector is essential for designing effective policy interventions.

In light of these challenges and gaps in the literature, this research aims to investigate the dynamics of fiscal policy measures on the manufacturing sector growth in Nigeria. By addressing these issues, the study aims to provide evidence-based insights that can guide policymakers in formulating targeted and effective fiscal policies conducive to the sustained growth and development of the manufacturing sector in Nigeria.

2.0 LITERATURE AND THEORETICAL REVIEW

Researchers have attempted to examine the effect of fiscal policy on manufacturing and economic growth in different countries and periods, using different techniques. The purpose of this subsection is to review a few of the literature in this area.

Okwara and Jonathan (2022) examined the effect of taxation on the return on asset (ROA) and earnings per share (EPS) of the manufacturing sector performance from 2005-2021 using flour mills plc as a case study. The study used the ex-post research design and ordinary least square regression analysis. The results showed no significant relationship between taxation and the performance of manufacturing companies in Nigeria. However, the independent variable of tax showed a weak and negative relationship with ROA and a weak and positive relationship with EPS. The study recommends improvements in tax administration effectiveness, good relationships with professional associations like Chartered Institute of Taxation of Nigeria (CITN) and Institute of Chartered Accountants of Nigeria (ICAN), and urgent overhaul of the entire tax system.

Odunlade and Adegbe (2022) studied the impact of government spending on infrastructure on the export performance of manufacturing companies in Nigeria. The study used data from 20 selected manufacturing companies over the period of 2001 to 2015. The findings indicate that government spending on power, roads, security, and human capital development collectively had a negative and insignificant effects, while spending on human capital development had a positive but insignificant effect on manufactured exports. In conclusion, the study suggests that government spending on infrastructure did not significantly influence the earnings from the export of manufactured products in Nigeria and recommends a restructuring of government expenditure to better support the manufacturing industry.

Nkeobuna and Ugoani (2022) studied the dynamics of fiscal policy and national development in Nigeria. The study was designed to explore the relationship between fiscal policy and national development. The exploratory research design was adopted in the investigation. Data were generated from both primary and secondary sources, which were found useful for the study and the data for the study were analyzed through the regression method, and the result showed positive association between fiscal policy and national development. Based on this finding, it was recommended among others that proper fiscal budgeting is essential for national development. The study did not discuss or account for any potentially confounding variables that it was unable to control for.

Olisah (2022) analyzed fiscal imbalances and economic growth in Nigeria: causes, consequences, and remedies. Maintaining a sound and stable fiscal policy is desirable for maintaining macroeconomic stability and achieving sustainable national development. This is because fiscal imbalance and deficit pose serious challenges to governance and economic management. In augmenting these fiscal imbalances, the government applies several policies toward financing them. Such financing can in Nigeria emanate from domestic debt, foreign debt, and the banking system (including the central bank, deposit money banks, nonbank public, and privatization proceeds). The continuous cycle of fiscal imbalance affects national growth and economic development. This paper interrogates secondary literature on the causes, consequences, and remedies to fiscal imbalances and economic growth in Nigeria. It examines trends in other countries and provides evidence for policy adjustment as a remedy to the existing challenges. The paper concludes and recommends the need for financial discipline by public officers, which can be achieved through an independent fiscal institution to monitor fiscal activities in Nigeria. The suggestions for future action are not either based on practical significance or on statistical significance, hence the study did not avoid confusing practical and statistical significance.

Didia and Tahir (2022) studied enhancing economic growth and government revenue generation in Nigeria: the role of diaspora remittances. Even though remittances constitute the second-largest source of foreign exchange for Nigeria, with a \$24 billion inflow in 2018, its impact on economic growth remains unclear. This study, therefore, examined the short-run and long-run impact of remittances on the economic growth of Nigeria using the vector error correction model. Utilizing World Bank data covering 1990–2018, the empirical analysis revealed that remittances hurt economic growth in the short run while having no impact on economic growth in the long run. Our parameter estimates indicate that a 1% increase in remittances would result in a 0.9% decrease in the gross domestic product growth rate in the short run. One policy implication of this study is that Nigeria needs to devise policies and interventions that minimize the emigration of skilled professionals rather than depending on remittances that do not offset the losses to the economy due to brain drain. The study suffered from significant variable omission bias and the methodology used was inadequate in accounting for complex relationship between the study variables.

In the empirical review of various studies undertaken by different authors, it was observed that these studies focused mainly on how the economy has been impacted by the different individual components of fiscal policy such as government expenditure, taxation, and public debt. Moreover, the review of the various growth theories in the Theoretical review section revealed divergent views as to the effect of fiscal policy on economic growth through the manufacturing output growth.

The theoretical underpin for this paper is the Wagner (1883) theory of economic growth and government expenditure in economic literature. The law states that as the per capita income of a country rises, the share of public spending to gross domestic product also rises - which connote direct positive relationship between them. Put differently, industrialization-driven growth in per capita income incentivizes government to increase its expenditures with direct bearing on social welfare (education, health, etc.), which in turn encourages industries to produce more goods and services as aggregate demand goes up. Increased industrial production finally raises aggregate output. Since the emergence of Wagner's law, there has been debate over the role of government spending on the performance of an economy both at theoretical and empirical level.

Fiscal policy deals with government deliberate actions in spending money and levying taxes with a view to influencing macroeconomic variables in a desired direction. This includes sustainable economic growth, high employment creation and low inflation (Stainback, B. S. 2004). From the foregoing, the Endogenous growth theory according to Romer (1990) is more relevant and will form the theory upon which this study will stand.

The development of endogenous growth theory has provided many new insights into the sources of economic growth. The essence of the new theory is that growth is a consequence of rational economic decisions. Firms expend resources on research and development to secure profitable innovations. Consumers invest in education to develop human capital and increase lifetime earnings. Governments increase growth by providing public inputs, encouraging foreign direct investment, and enhancing educational opportunities. Through the aggregation of these individual decisions the rate of growth becomes a variable of choice, and hence a variable that can be affected by the tax policies of governments. Viewed from an endogenous growth perspective the link between Fiscal policy and growth seems self-

evident when for an instance taxation, a component of fiscal policy, is analyzed. Corporate taxation affects the fund allocation to innovation and hence must affect the optimal amount of research and development. Personal income taxation reduces the fund allocation to education so must reduce the accumulation of human capital. In simulations of economic growth models, the effect of taxation on growth has frequently been demonstrated to be considerable. The rate of growth can be affected by policy through the effect that taxation has upon economic decisions. An increase in taxation reduces the returns to investment (in both physical and human capital) and Research and Development. Lower returns mean less accumulation and innovation and hence a lower rate of growth. This is the negative aspect of taxation. Taxation also has a positive aspect.

3.0 MODEL SPECIFICATION

The traditional econometric methodology procedure includes the specification of both the mathematical and econometric models to ascertain if a relationship exists among the variables under study (Gujarati, 2004). While the mathematical model assumes that there is an exact relationship among economic variables, the statistical or econometric model modifies such relationship expressed in mathematical terms by introducing the error term. Since relationships among these variables in economics are hardly exact, the use of the disturbance term becomes necessary to capture the influence of other variables that are not represented in the model.

This study is in line with Odunlade and Adegbe (2022) studied the impact of government spending on infrastructure on the export performance of manufacturing companies in Nigeria. The study used data from 20 selected manufacturing companies over the period of 2001 to 2015. The findings indicate that government spending on power, roads, security, and human capital development collectively had a negative and insignificant effects, while spending on human capital development had a positive but insignificant effect on manufactured exports. In conclusion, the study suggests that government spending on infrastructure did not significantly influence the earnings from the export of manufactured products in Nigeria and recommends a restructuring of government expenditure to better support the manufacturing industry.

This study adapts their model by introducing tariff and company income tax. The model further follows Paul Romer and Robert Lucas endogenous growth theory of the late 1980s and early 1990s showing the relationship between the underlying variables thus;

$$Y_t = \alpha_0 + \alpha_i + \mu_i + \beta X_t + \varepsilon_t \tag{3.1}$$

Where Y is economic growth and X represents a vector of explanatory variable.

In line with the theoretical underpinnings regarding the relationship between fiscal policy, manufacturing sector output and economic growth, the model is specified as follows:

Model one;

$$MFGR = f(CIT, TARIFF, EXPINF) \tag{3.2}$$

Where?

MFGR= Growth Rate of Manufacturing output

CIT= Company Income Tax

TARIFF = Tariff on manufacturing export

EXPINF = Government Expenditure on Infrastructure

Model two

$$EGR = f(MFGR) \tag{3.3}$$

Where?

EGR = Economic Growth Rate

MFGR= Growth Rate of Manufacturing output

3.1 Econometric Specification.

$$MFGR_t = \beta_0 + \beta_1 CIT_t + \beta_2 TARIFF_t + \beta_3 EXPINF_t + \mu_t \text{-----} (3.4)$$

Where

β_0 = the intercept or constant of the regression line

β_1 = Parameter coefficient of Company Income Tax

β_2 = Parameter coefficient of Tariff on manufacturing export

β_3 = Parameter coefficient of Government Expenditure on Infrastructure

μ_t = error term or stochastic term.

$$EGR_t = \beta_0 + \beta_1 MFGR_t + \mu_t \text{-----} (3.5)$$

Where

β_0 = the intercept or constant of the regression line

β_1 = Parameter coefficient of manufacturing output.

μ_t = error term or stochastic term.

This study employed the autoregressive distributive lag (ARDL) technique for the analysis due to its ability to analyse dynamic relationships with time series data in a single-equation model where the current value of the dependent variable is influenced by its own past values as well as the current and past values of other explanatory variables. Furthermore, the variables can be stationary, nonstationary, or a mixture of the two types. In addition, in its equilibrium correction (EC) representation, the ARDL model can be used to separate the long-run and short-run effects, and to test for cointegration or, more generally, for the existence of a long-run relationship among the variables of interest (Kripfganz & Schneider, 2018).

The ARDL equation takes the following form:

$$\Delta MFGR_t = \alpha_0 + \sum_{i=1}^n \beta_{1i} \Delta CIT_{t-i} + \sum_{i=0}^n \beta_{2i} \Delta TARIFF_{t-i} + \sum_{i=0}^n \beta_{3i} \Delta EXPINF_{t-i} + \beta_1 MFGR_{t-1} + \beta_2 CIT_{t-1} + \beta_3 TARIFF_{t-1} + \beta_4 EXPINF_{t-1} + \varepsilon_t \text{.....} (3.6)$$

$$\Delta EGR_t = \alpha_0 + \sum_{i=1}^n \beta_{1i} \Delta MFGR_{t-1} + \beta_1 EGR_{t-1} + \beta_2 MFGR_{t-1} + \varepsilon_t \text{.....} (3.7)$$

3.2 Sources of Data and measurement

The method of data collection used in this study was secondary. The data comprised secondary time series data from 1981 to 2021. The variables considered were economic growth rate (EGR) as the dependent variable for model one, growth rate of manufacturing sector output (MFGR) which is dependent variable for model two sourced from the National Bureau of Statistics (NBS).. The target independent variable were company income tax (CIT) sourced from Federal Inland Revenue Services (FIRS). Tariff on manufacturing export and government expenditure on infrastructure were sourced from NBS.

4.0 DATA ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Descriptive Statistics of Study Variables

This sub-section presents the descriptive statistics of the specific fiscal policy indicators that determine the manufacturing sector and economic growth in Nigeria. It displays their mean, median, maximum/minimum value, standard deviation, and the Jarque-Bera normality test, which is a goodness-of-fit test to determine if the sample data has the skewness and kurtosis that indicate normal distribution. This is a prerequisite for fitting the panel regression model

Table 4.1: Results of Descriptive Statistics and Test of Normality

Statistics	MFGR	EGR	CIT	TARIFF	EXPINF
Mean	0.484	3.041	28.815	22.027	94.848
Median	0.810	3.360	28.700	23.620	94.210
Maximum	21.800	15.330	35.000	86.480	109.660
Minimum	29.030	-13.130	20.000	9.680	76.950
Std. Dev.	10.924	5.385	4.224	14.207	6.702
Skewness	0.258	-0.818	-0.336	2.617	-0.246
Kurtosis	3.075	4.620	2.544	12.044	3.458
Jarque-Bera	0.464	9.069	1.129	186.545	0.774
Probability	0.792	0.010	0.568	0.000	0.679
Observations	41	41	41	41	41

Source: Out of Stata 15 Output

4.2 Unit Root Test Results

The series must be stationary in order to execute the cointegration bounds test. The unit root test was performed using the Augmented Dickey-Fuller test at the level and at the first difference of each series on the condition that the null hypothesis is non-stationary, hence rejection of the unit

root hypothesis supports stationarity.

The hypothesis tested is:

$$H_0: \gamma = 0 \text{ (unit root is present) vs. } H_1: \gamma \neq 0 \text{ (unit root is not present)}$$

$$\alpha = 0.05, \text{ Test statistic} = \text{ADF test statistic}$$

Critical region: Reject H_0 if, ADF test statistic > Mackinnon critical value for rejection of the hypothesis of a unit root at a 5% significance level.

Table 4.2 Augmented Dickey-Fuller Test Results at Level, and 1st Difference with Intercept and trend

Augmente d Dickey- Fuller test statistic	MFGR		EGR		CIT		TARRIF		EXPINF	
	t- Statistic	Prob. Value	t- Statistic	Prob. Value	t- Statistic	Prob. Value	t- Statistic	Prob. Value	t- Statistic	Prob.Value
Levels	-3.773	0.003	-3.142	0.023	-1.728	0.416	-3.221	0.018	-2.015	0.280
1st Difference	-	-	-	-	-5.168	0.000	-	-	-5.442	0.000
Order of Integration	I(0)		I(0)		I(1)		I(0)		I(1)	

Source: EViews 12 Output

Table 4.2 presents the results of the Augmented Dickey-Fuller (ADF) test for the study variables, including the t-statistics and p-values. The ADF test is used to determine the presence of a unit root and assess the stationarity of time series data. In the Table 4.2, the ADF test statistics and their corresponding probabilities (p-values) are reported for each variable under two scenarios: at the levels, and 1st difference.

Analyzing the results for each variable, we find that at levels, most variables, including MFGR, EGR and TARIFF exhibited stationarity that is $I(0)$ with p-values lower than the significance level of 0.05. However, CIT and EXPINF were stationary at first difference $I(1)$.

Given the mix of integration orders in the variables, with some being $I(0)$ at the levels and $I(1)$ at first difference suggests the possibility of long-run relationships (cointegration) among the variables. The Autoregressive Distributed Lag (ARDL) model is particularly suitable for analyzing cointegrated time series. The ARDL model allows for capturing both the short-term dynamics (through lagged terms) and the long-term equilibrium relationships (through cointegrating terms) among the variables.

4.3 Optimal Lag Selection.

Optimal lag selection was carried out before cointegration, and all the lag length selection criteria (AIC, LR, FPE, SC and HQ) chose lag length 1. So we used AIC criteria at lag one.

Table 4.3: ARDL Bound Cointegration test for Model

ARDL Bounds Test

Sample: 1981- 2021

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	7.806	3

Critical Value Bounds

Significance	I(0) Bound	I(1) Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source: *EViews 12 Output*

In Table 4.3, the F-statistic test (7.806) which is greater than the critical value upper bound (4.35) indicates the presence of cointegrating among the variables, denoting the rejection of the null hypothesis of no cointegrating equation between the fiscal policy and economic growth variables at 5 per cent level of significance. The existence of a cointegrating equation indicated that there exist long-run relationships between the five variables and hence, the ARDL long-run model with error correction term is employed to study the long-run effect of the independent variables on the dependent variables.

4.4 ARDL Model Estimation

Analysis of Estimates of Long and Short run ARDL Regression of the Model

Table 4.4: Long and Short run ARDL Regression Estimates of MFGR Model.

Variables	coefficients	Std. Error	T - statistics	Prob.
Adjusted D.MFGR	-0.7103	0.1529	-4.64	0.000
LONG-RUN ESTIMATE				
CIT	-0.1155	0.3165	0.37	0.044
TARIFF	-0.1493	0.0997	-1.56	0.032
EXPINF	0.3890	0.1632	-2.38	0.023
SHORT-RUN ESTIMATE				
D CIT	-0.3568	0.4379	0.81	0.013
D TARIFF	0.0680	0.0571	1.19	0.005
D EXPINF	0.2199	2.1238	1.78	0.085
C	33.2748	13.4156	2.48	0.019
R – squared				0.7984
Adjusted R – Squared				0.6304
Durbin – Watson Statistics				2.008
Heteroskedasticity				(Prob>chi2) 0.4125
Normality test (Jacque Berra)				(Prob-chi2) 0.7318

Source: Author's Computation using stata15, 2022

The table 4.4 shows the results of an Autoregressive Distributed Lag (ARDL) regression with Manufacturing Growth Rate (MGFR) as the dependent variable and Company Income Tax (CIT), Tariff (TARIFF), and Government Expenditure on Infrastructures (EXPINF) as independent variables. The results are presented for both long-run and short-run estimates.

The probability value of 0.044 for Company Income Tax (CIT) variable is statistically significant at the 5% level. The negative coefficient of -0.1155 implies that, in the long run, an increase in company income tax is associated with a decrease in Manufacturing Growth Rate. This findings conform the findings of Odunlade and Adegbe (2022) who studied the impact of government spending on infrastructure on the export performance of manufacturing companies in Nigeria.

Again, in the long run, the Tariff variable with p-value of 0.032 is statistically significant at the 5% level. The negative coefficient suggests that, in the long run, an increase in tariff rates is associated with a decrease in Manufacturing Growth Rate. This conforms with apriori and in line the work of Odunlade and Adegbe (2022) who studied the impact of government spending on infrastructure on the export performance of manufacturing companies in Nigeria.

The Government Expenditure on Infrastructures (EXPINF) variable is statistically significant at the 5% level with p-value of 0.023. The positive coefficient of 0.3890 implies that, in the long run, an increase in government expenditure on infrastructures is associated with an increase in Manufacturing Growth Rate.

In the short run, a decrease in company income tax (D CIT) is associated with an increase in Manufacturing Growth Rate. This is so giving its coefficient of -0.3568 and p-value of 0.013. This again conform with apriori expectation that excessive taxation levied on manufacturing companies will reduce their profit and hence their output.

Tariff has a positive and significant effect on manufacturing output growth rate with a coefficient of 0.0680 and p-value of 0.005 in the short run. An increase in tariff rates (D TARIFF) is associated with an increase in the Manufacturing Growth Rate. This result, although contradicted the apriori expectation can be explained since most tariffs are imposed to protect local industries.

In the short run, government expenditure on infrastructures (D EXPINF) has a positive and significant effect on manufacturing growth rate in Nigeria. An increase in government expenditure on infrastructures (D EXPINF) is associated with an increase in Manufacturing Growth Rate. This result conforms with apriori and in line the work of Odunlade and Adegbe (2022) who studied the impact of government spending on infrastructure on the export performance of manufacturing companies in Nigeria.

The constant term (C) is statistically significant at the 5% level. This represents the baseline level of Manufacturing Growth Rate when all independent variables are zero.

From the estimate, the coefficient of the error correction term is correctly and negatively signed (-0.7103) and is statistic ally significant. The coefficient estimate of the error correction term which is -0.7103, means that the model corrects its short-run disequilibrium by about approximately 71 percent (71%) speed of adjustment in order to return to the long-run equilibrium. More so, the coefficient of multiple determination of the model, that is, the R - squared showed that the explanatory variables jointly explained 79% of the variations in the performance of the EGR, while the remaining 21% of the variation is explained by other variables not included in the model and the result of the coefficient of multiple determination showed that the model has a very good fit.

Also, the result of the Durbin - Watson statistics shows that the estimate of the model is free from the problem of serial auto-correlation and that the model estimate is appropriate and can be used for policy recommendation. The Prob > chi2-value of 0.4125 indicates the absence of heteroskedasticity. The Normality test result of Jacque-Berra shows that the model is normally distributed as the p-value is greater than 0.05.

In summary, the long-run estimates indicate significant relationships between the dependent variable (MGFR) and the independent variables (CIT, TARIFF, EXPINF). The short-run estimates provide insights into the dynamics of these relationships in the short term. The overall model seems to have a good fit, as indicated by the R-squared value.

4.5 Analysis of Estimates of effect of MFGR on EGR Model

Table 4.5 Analysis of Estimates of effect of MFGR on EGR Model

Variables	coefficients	Std. Error	T - statistics	Prob.
MFGR	0.3285	0.0588	5.58	0.000
Constant	2.8827	0.6357	4.53	0.000

Source: Extract from Stata 15

In other to test the effect of manufacturing growth rate on economic growth, we estimated the ordinary least square regression analysis of the variables since they were all stationary at levels. The result indicated that MFGR has a positive and significant relationship with economic growth rate in the period of study. A unit increase in MFGR will

result to 0.3285 increase in economic growth rate in the period of study. This translate to mean that the increment in MFGR as a result of fiscal policy measures in the period of study significantly affected economic growth rate positively.

4.6 Toda-Yamamoto Causality Test

Table 4.6: Toda-Yamamoto for MFGR model

Null Hypothesis	Chi-Square	Probability	Direction of Causality
MFGR does not cause CIT	0.67	0.955	No Causality
CIT does not cause MFGR	2.08	0.020**	CIT → MFGR
MFGR does not cause TARIFF	6.47	0.166	No Causality
TARIFF does not cause MFGR	3.60	0.462	No Causality
MFGR does not cause EXPINF	3.86	0.425	No Causality
EXPINF does not cause MFGR	33.96	0.000***	EXPINF → MFGR

Source: Extract from Regression Printout using Stata 15

Note: The statistics reported are Chi-square statistics with the associated probability values. If the probability value is less than 0.05 at 5% significant level, we conclude that the first variable granger caused the other as indicated by the arrow

The Toda-Yamamoto model was used instead of the usual Wald test to test for causality for the model since the variables are not in the same order of integration. The results reported in Table 4.6 above show that there exists a negative uni-directional causality between company income tax (CIT) and the growth rate of manufacturing output (MFGR). While CIT granger caused MFGR, MFGR did not granger cause CIT. Also, a positive uni-directional causality exist between government expenditure on infrastructure (EXPINF) and manufacturing sector output growth rate (MFGR). While EXPINF granger caused MFGR, MFGR did not granger cause EXPINF. There is no causality between MFGR and TARIFF. These results were confirmation of the earlier results obtained from the ARDL estimates.

4.7 Post Estimation Diagnostics

Serial Correlation Test

Table 4.2: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.261375	Prob. F(1,33)	0.1421
Obs*R-squared	2.565271	Prob. Chi-Square(1)	0.1092

Source: Extract from Stata 15

Since the p-value associated with the Observed R-squared is greater than 0.05 (5%), indicating that there is no serial correlation in the model.

Stability (CUSUM) Tests

The stability of the regression coefficients is tested using the cumulative sum (CUSUM) and CUSUM of Squares of the recursive residual test for structural stability. Plots of the CUSUM and CUSUM of Square in fig 4.6 show that the regression equations seems stable given that the CUSUM and CUSUM of Squares tests statistics did not exceed the 5% level of significance boundary.

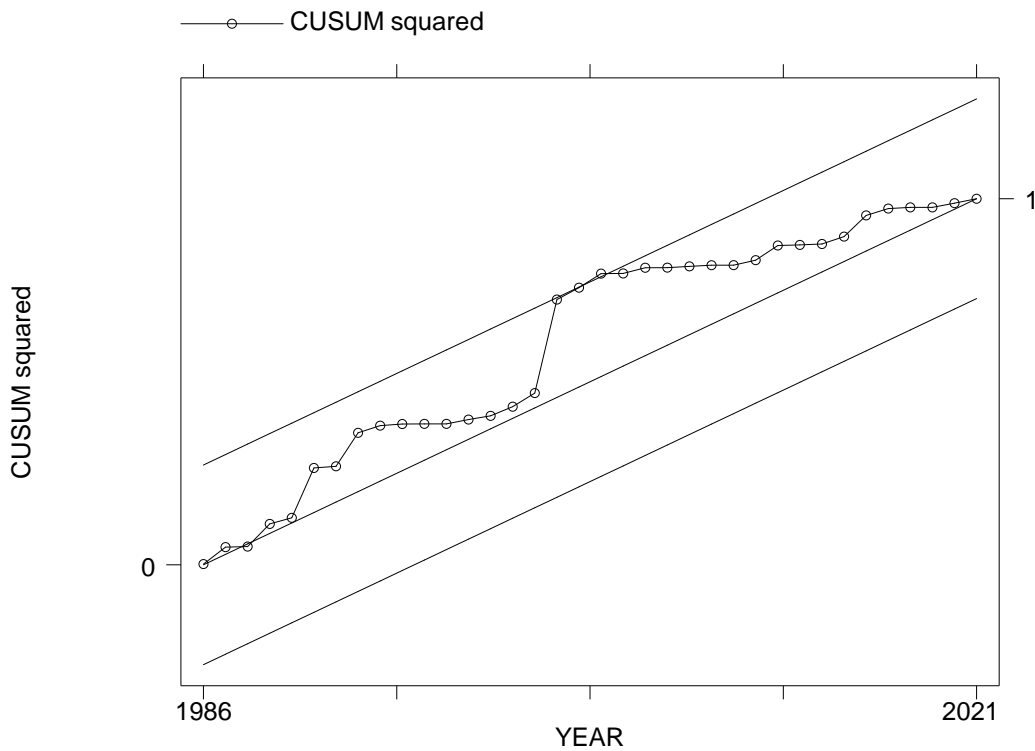


Figure 4.1: CUSUM Graph for the Model

Source: Extract from Stata 15

Heteroscedasticity Test

Table 4.7 Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.902704	Prob. F(6,33)	0.5048
Obs*R-squared	5.639518	Prob. Chi-Square(6)	0.4125
Scaled explained SS	9.217404	Prob. Chi-Square(6)	0.1617

Source: EViews 12 output

The model is also free of heteroscedasticity since the p-value of the Observed R-square is observed to be greater than the level of significance of 0.05 (5%).

Fig 4.1 Residual Normality Test

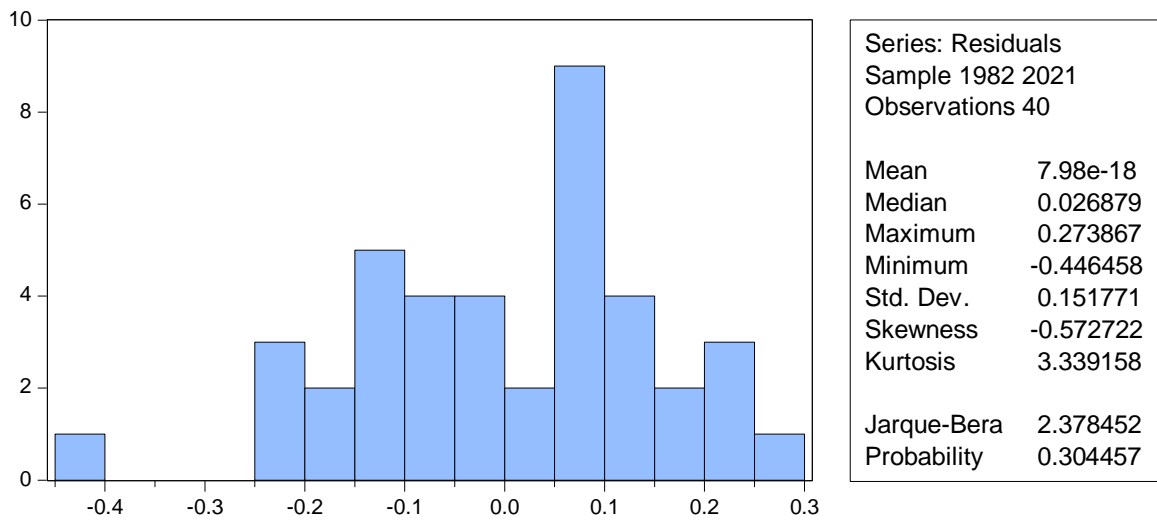


Figure 4.2: Histogram of Model

Source: Extract from Stata 15

As observed from the Jarque-Bera test with a test statistic of 2.378 and p-value of 0.3045 which is greater than 0.05 (5%) level of significance implies that the residual of the model is normally distributed as expected and required for any ordinary least squares which is one of its fundamental assumptions.

5. CONCLUSION

In conclusion, the study provides valuable insights into the dynamics between fiscal policies, specifically Company Income Tax (CIT), Tariff rates, and Government Expenditure on Infrastructures (EXPINF), and their impact on Manufacturing Growth Rate (MFGR) in Nigeria. The findings of the study are that in the long run, an increase in CIT is associated with a decrease in MFGR, an increase in tariff rates is associated with a decrease in MFGR and an increase in EXPINF is associated with an increase in MFGR. A unit increase in MFGR is associated with a 0.3285 increase in economic growth rate.

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