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FISCAL POLICY AND MANUFACTURING CAPACITY UTILIZATION IN NIGERIA

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ABSTRACT
This study critically examined the impact of fiscal policy on sustainable manufacturing capacity utilization in Nigeria, providing empirical insights relevant to emerging economies. Utilizing a comprehensive dataset spanning various fiscal measures including taxation, government spending, and budget deficits. This research isolates the effects of these variables on the manufacturing sector. Data from 1986 to 2022 were sourced from the Central Bank of Nigeria's Statistical Bulletin. Following rigorous diagnostic tests, the time series data were validated for empirical analysis. The study employed the Autoregressive Distributed Lag (ARDL) model to estimate both the short-run and long-run impacts of fiscal policies on manufacturing capacity utilization, with appropriate controls for macroeconomic indicators such as interest rates and exchange rate stability. The findings revealed significant variations in how different fiscal policies influence manufacturing capacity utilization, underscoring the importance of coherent and effective policy frameworks to support sustainable industrial growth. The study concluded with policy recommendations tailored to optimize fiscal interventions, thereby enhancing industrial productivity and bolstering economic resilience in the face of both domestic and global challenges. These insights are crucial for policymakers seeking to refine economic strategies in Nigeria and other emerging economies.

***Key words:** Fiscal Policy, Manufacturing Capacity Utilization, Taxation*

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1. INTRODUCTION

The development trajectory of any nation is intricately tied to its ability to generate revenue for infrastructural provision. Over the past decade, the importance of domestic resource mobilization has surged to the forefront of economic policy discussions in many developing countries. Nigeria faces a delicate balancing act: generating revenue for infrastructure development while fostering a robust manufacturing sector operating at full capacity. This capacity is crucial for economic growth and job creation (Agbaku et al.,2023). Recent policy discussions have highlighted an increasing focus on domestic resource mobilization to address debt and financial imbalances, leading to the adoption of stabilization and adjustment policies aimed at improving domestic financial collection (Eghele & Osunde, 2024). However, it is important to consider the potential impact of these revenue-focused policies on manufacturing capacity utilization. High corporate taxes can leave manufacturers with less capital for investment in equipment upgrades, expansion, and hiring additional workers, ultimately reducing their production capacity (Owolabi & Adegbite, 2014). Conversely, tax breaks or incentives for specific industries can encourage investment and expansion, leading to increased capacity utilization. Government spending on infrastructure projects, such as reliable power grids and transportation networks, can significantly improve the operational efficiency of manufacturers, reducing production bottlenecks and allowing them to utilize their capacity more effectively. However, excessive spending financed by high budget deficits can lead to inflation, eroding manufacturer profit margins and hindering investment in capacity expansion.

Targeted government subsidies for specific manufacturing sectors can provide financial relief for raw materials or energy costs, incentivizing manufacturers to increase production and operate closer to full capacity. However, untargeted subsidies can distort markets and create inefficiencies in the long run. High interest rates set by the central bank can make borrowing more expensive for manufacturers, discouraging investment in new machinery, expansion projects, and inventory, ultimately limiting their ability to increase production capacity. Conversely, lower interest rates can stimulate borrowing and investment, leading to higher capacity utilization. However, excessively low interest rates can also lead to inflation, which can erode manufacturer profits and hinder investment. A controlled increase in the money supply by the central bank can make credit more accessible and affordable for manufacturers, stimulating investment in capacity expansion and production growth. However, an uncontrolled increase in money supply can lead to inflation, with negative consequences as mentioned earlier. It is important to note that fiscal and monetary policies often work together. For instance, government spending on infrastructure projects can be financed by issuing bonds, influencing interest rates set by the central bank. This highlights the need for a coordinated approach where both fiscal and monetary policies are designed to create an environment that fosters investment, reduces production costs, and ultimately encourages manufacturers to operate at full capacity.

1.1 **Objectives**

The broad objective of the study is to evaluate the effect fiscal variables on capacity utilization in Nigeria within the manufacturing sector. The other objectives of this study are to:

1. examine the effect of Company Income Tax on manufacturing capacity utilization in Nigeria
2. assess the effect of Petroleum profit tax on Manufacturing capacity utilization in Nigeria
3. investigate the effect of Custom and exercise duty on Manufacturing capacity utilization in Nigeria
4. examine the effect of Value added tax on Manufacturing capacity utilization in Nigeria

2. LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Fiscal Policy

Fiscal policy refers to the use of government spending and taxation to influence the economy. Governments adjust their spending levels and tax rates to monitor and influence a nation's economy. It is primarily used to stabilize the economy over the business cycle, aiming for economic growth, stable prices, and sometimes social equity. (Mankiw, 2016)

2.1.2 Manufacturing Capacity Utilization

Manufacturing capacity utilization is a measure of how fully the productive capacity of a manufacturing sector is being used. It is the percentage of a country's potential manufacturing output that is actually produced. High-capacity utilization typically indicates strong demand and can lead to inflationary pressures, while low utilization suggests economic weakness and spare capacity. (Federal Reserve System, undated)

2.2 Theoretical Review

2.2.1 Wagner's Theory

The economist Adolph Wagner from Germany, who lived from 1835 to 1917, established a theory on public spending after researching other countries as well as his own. Wagner (1890) stated that "for any nation, government expenditure rises continuously as revenue expands." As a result, it is anticipated that the expansion of a manufacturing-based economy will be followed by an increase in the proportion of public expenditure in the GDP. The idea is that government expenditures should generally have a positive effect on the economy, which will encourage additional spending and consequent economic growth. Singh (2008) averred that increased government participation and expenses are essential given the state's rising social, governmental duties, defensive, and welfare functions.

2.2.2 The New Keynesian Theory

This work is anchored on the New Keynesian Economics framework built upon Keynesian economics but incorporated microeconomic foundations and rational expectations. It was developed primarily by economists such as Stanley Fischer, Gregory Mankiw, Olivier Blanchard, and others in the 1970s and 1980s. Fischer (1977) and (Taylor, 1979) sought to address some of the criticisms of traditional Keynesian economics, particularly its lack of microeconomic foundations and the inability to explain short-term economic fluctuations. The New Keynesian models emphasize individual decision-making within the framework of imperfect competition and nominal rigidities, which are crucial for understanding how firms in the manufacturing sector adjust their production in response to fiscal and monetary policy changes. Unlike traditional Keynesian models, New Keynesian economics incorporates rational expectations, implying that economic agents form expectations based on all available information. This is relevant for studying how manufacturers anticipate and respond to policy changes affecting capacity utilization. The New Keynesian Economics framework, with its emphasis on microeconomic foundations, rational expectations, and policy transmission mechanisms, provides a robust theoretical basis for investigating the effects of fiscal and monetary policies on manufacturing capacity utilization in Nigeria. It offers tools to analyze the dynamics of policy interventions and their implications for economic performance in the manufacturing sector.

2.3 Empirical Review

Adegboye and Ojo (2022) investigated the impact of fiscal policy on the performance of the manufacturing sector in Nigeria. They employed a quantitative research approach using econometric models to analyze time-series data from 1990 to 2020. The study found that fiscal policy, particularly government expenditure and tax incentives, significantly influences the performance of the manufacturing sector. Increased government spending on infrastructure and tax reliefs were positively correlated with manufacturing output. The authors concluded that effective fiscal policies are crucial for enhancing the performance of the manufacturing sector in Nigeria. They recommend that the government should increase spending on infrastructure and provide more tax incentives to boost the manufacturing sector.

Eze and Nwosu (2023) examined the relationship between taxation and economic growth in Nigeria. The study utilized a panel data analysis covering the period from 2000 to 2020, employing regression models to determine the impact of various tax components on economic growth. The findings indicate that while direct taxes (such as income tax) have a negative impact on economic growth, indirect taxes (such as VAT) positively influence economic growth. The study concludes that the structure of the tax system plays a significant role in economic growth, with indirect taxes being more growth-friendly. The authors recommend a restructuring of the tax system to focus more on indirect taxes to stimulate economic growth.

Okoro and Uche (2024) explored strategies to improve tax compliance in Nigeria. They used a mixed-method approach, combining qualitative interviews with quantitative surveys of taxpayers and tax officials. The study found that factors such as taxpayer education, simplification of tax processes, and enforcement measures significantly enhance tax compliance. The authors concluded that improving tax compliance requires a multifaceted approach that addresses both the administrative and behavioral aspects of taxation. They recommend enhancing taxpayer education, simplifying tax procedures, and strengthening enforcement mechanisms to improve compliance.

D’Amico and King (2023) analyzed the effects of recent monetary policy tightening by the Federal Reserve on the U.S. economy. They used a survey-augmented Vector Autoregression (VAR) model to estimate the impact of monetary policy changes on economic indicators such as GDP and inflation. The study found that the majority of the effects of the policy tightening have already been felt, but further impacts on GDP and inflation are expected in the coming quarters. The authors concluded that the current monetary policy tightening is sufficient to bring inflation near the Fed’s target by mid-2024 without causing a recession. They suggest that the Federal Reserve should monitor the lagged effects of the policy tightening before making further adjustments.

Bullard (2020) examined the monetary and fiscal policy responses to the economic impact of the COVID-19 pandemic in the U.S. The author used a descriptive analysis of policy measures implemented during the early stages of the pandemic. The study found that both monetary and fiscal policies were effective in mitigating the initial economic shock caused by the pandemic. The swift actions helped stabilize financial markets and provided essential support to businesses and households. The author concluded that the coordinated policy response was crucial in preventing a deeper economic crisis. The study recommends maintaining flexibility in policy responses to address ongoing and future economic challenges posed by the pandemic.

Richard and Eric (2003) conducted a study on tax policy design and development, utilizing co-integration tests, unit root tests, and ordinary least squares regression to analyze variables. They discovered that while globalization and other factors may push for the convergence of tax systems, the size and structure of taxation in most countries are still predominantly influenced by domestic factors. They recommend that governments should consider global tax structures, review changes in tax patterns over recent years, and adapt accordingly.

Abiola and Asiweh (2012) examined recent developments in corporate income taxation in Nigeria through a quantitative survey method. The study found the Nigerian tax system to be overly complex, poorly administered, and characterized by low revenue yield, inequity, and numerous overlapping taxes that are more burdensome than beneficial. The study suggested amendments of the tax administration act to reflect current realities to improve administrability and enforcement.

3. MATERIAL AND METHODS

The Manufacturing capacity utilization is the dependent variable, while, Company income tax , Petroleum profit tax , Custom and exercise duties, Value added tax , Monetary policy rate and exchange rate are the independent variables. The model for the impact of fiscal policy variables on manufacturing capacity utilization in Nigeria could be stated as follows:

$$MCU = F(CIT, PPT, CED, VAT, MPR, EXCH) \quad \ldots\ldots\ldots\ldots\ldots\ldots\text{Eqn 1.}$$

where

MCU= Manufacturing capacity utilization

CIT= Company income tax

PPT= Petroleum profit tax

CED= Custom and exercise duties

VAT= Value added tax

MPR=Monetary policy rate

EXCHR = Exchange rate

Assuming a linear relationship between the dependent variable and independent variables, and using the econometrics model can be specified as follows:

$$MCU = \alpha_0 + \alpha_1 CIT + \alpha_2 PPT + \alpha_3 CED + \alpha_4 VAT + \alpha_5 MPR + \alpha_6 EXCH + \mu_t \quad \ldots\ldots\text{Eqn 2}$$

where μ_t = Error term

α_0 = the constant term

α 's = the parameters to be estimated

In time series analysis, before running the cointegration test the variables must be tested for stationarity. For this purpose, we use the conventional ADF tests. The ARDL bounds test is based on the assumption that the variables are I(0) or I(1). The objective is all variables should not be I(2) so as to avoid spurious results. In the presence of variables integrated of order two we cannot interpret the values of F statistics provided by Pesaran et al. (2001) or it will go boasted. In order to empirically analyse the long-run relationships and short-run relationship between real wage, inflation and production, this study apply the autoregressive distributed lag (ARDL) cointegration technique as a general vector autoregressive (VAR). The ARDL cointegration approach was developed by Pesaran and Shin (1999) and Pesaran et al. (2001). This approach enjoys several advantages over the traditional cointegration technique documented by (Johansen & Juseline, 1990). Firstly, it requires small sample size. Two set of critical values are provided, low and upper value bounds for all classification of explanatory variables into pure I (1), purely I(0) or mutually cointegrated. Indeed, these critical values are generated for various sample sizes. However, **Narayan (2005)** argues that existing critical values of large sample sizes cannot be employed for small sample sizes. Secondly, Johensen's procedure require that the variables should be integrated of the same order, whereas ARDL approach does not require variable to be of the same order. Thirdly, ARDL approach provides unbiased long-run estimates with valid t-statistic if some of the model repressors are endogenous (Narayan, 2005; Odhiambo, 2008). Fourthly, this approach provides a method of assessing the short run and long run effects of one variables on the other and as well separate both once an appropriate choice of the order of the ARDL model is made, (see Bentzen and Engslted, 2001). In this regard, Pesaran and Shin, (1999) explain that AIC and SC perform well in small sample, but SC is relatively superior to AIC. The ARDL model is written as follow:

$$\Delta MCU_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i}\Delta MCU_{t-1} + \sum_{i=0}^{n} \beta_{2i}\Delta CIT_{1t-1} + \sum_{i=0}^{n} \beta_{3i}\Delta PPT_{2t-1} + \sum_{i=0}^{n} \beta_{4i}\Delta CED_{3t-1} + \sum_{i=0}^{n} \beta_{5i}\Delta VAT_{4t-1} + \sum_{i=0}^{n} \beta_{6i}\Delta MPR_{5t-1} + \sum_{i=0}^{n} \beta_{7i}\Delta EXCH_{6t-1} + \beta_8 MCU_{t-1} + \beta_9 CIT_{t-1} + \beta_{10} PPT_{t-1} + \beta_{11} CED_{t-1} + \beta_{12} VAT_{t-1} + \beta_{13} MPR_{t-1} + \beta_{14} EXCH_{t-1} + \varepsilon_t$$

Where Δ is the difference operator. The bounds test is mainly based on the joint F-statistic whose asymptotic distribution is non-standard under the null hypothesis of no cointegration. The first step in the ARDL bounds approach is to estimate the six equations (6) by ordinary least squares (OLS). The estimation of this equation tests for the existence of a long-run relationship among the variables by conducting an F-test for the joint significance of the coefficients of the lagged levels of the variables. The null hypothesis of no co-integration and the alternative hypothesis which are presented in below as thus:

null hypothesis of no co-integration	alternative hypothesis	Equation
$\beta_8 = \beta_9 = \beta_{10} = \beta_{11} = \beta_{12} = \beta_{13} = \beta_{14} = 0$	$\beta_8 \neq \beta_9 \neq \beta_{10} \neq \beta_{11} \neq \beta_{12} \neq \beta_{13} \neq \beta_{14} \neq 0$	6

Two sets of critical values for a given significance level can be determined (Narayan 2005). The first level is calculated on the assumption that all variables included in the ARDL model are integrated of order zero, while the second one is calculated on the assumption that the variables are integrated of order one. The null hypothesis of no cointegration is rejected when the value of the test statistic exceeds the upper critical bounds value, while it is not rejected if the F-statistic is lower than the lower bounds value. Otherwise, the cointegration test is inconclusive. In the spirit of Odhiambo (2009) and Narayan and Smyth (2008), we obtained the short-run dynamic parameters by estimating an error correction model associated with the long-run estimates. The equation, where the null hypothesis of no cointegration is rejected, is estimated with an error-correction term (Narayan and Smyth, 2006; Morley, 2006). The vector error correction model is specified as follows:

$$\Delta MCU_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta MCU_{t-1} + \sum_{i=0}^{n} \alpha_{2i} \Delta CIT_{1t-1} + \sum_{i=0}^{n} \alpha_{3i} \Delta PPT_{2t-1} + \sum_{i=0}^{n} \alpha_{4i} \Delta CED_{3t-1} + \sum_{i=0}^{n} \alpha_{5i} \Delta VAT_{4t-1} + \sum_{i=0}^{n} \alpha_{6i} \Delta MPR_{5t-1} + \sum_{i=0}^{n} \alpha_{7i} \Delta EXCH_{6t-1} + \lambda ECM(-1) + \mu_t$$

To ensure the goodness of fit of the model, diagnostic and stability tests are conducted. Diagnostic tests examine the model for serial correlation, functional form, non-normality and heteroscedasticity. The stability test is conducted by employing the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) suggested by Brown et al. (1975). The CUSUM and CUSUMSQ statistics are updated recursively and plotted against the break points. If the plots of the CUSUM and

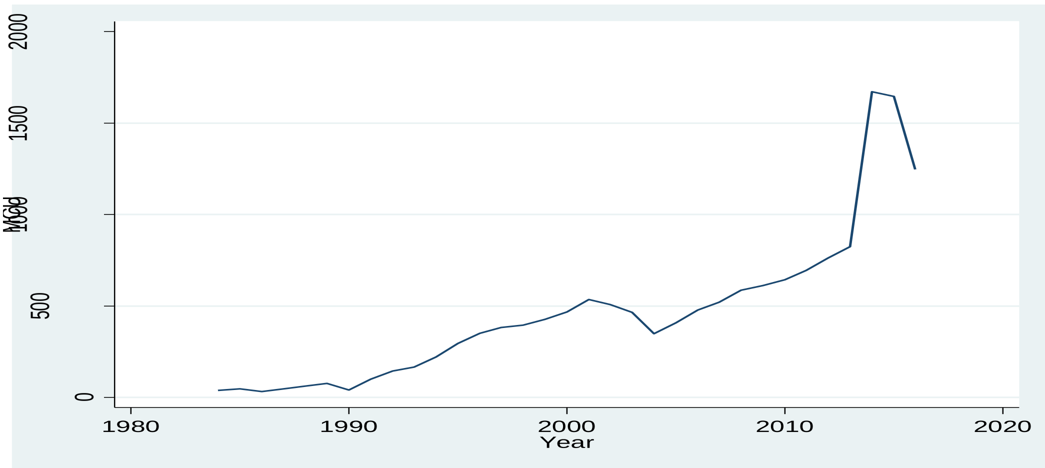
CUSUMSQ statistics stay within the critical bonds of a 5 percent level of significance, the null hypothesis of all coefficients in the given regression is stable and cannot be rejected.

4. RESULT AND DISCUSSIONS

4.1 Data Analysis

From the trend analysis of manufacturing capacity utilization (MCU) from (1986-2022) It can be observed that there has been an upward trend in the growth of the manufacturing capacity from 1990 to 2000;and also from 2011 to 2012. Although the trend indicated smooth ups and downs which clearly indicate that there are fluctuations in the manufacturing sector growth during the period under review. Though, it is also very uncertain whether it is a function as a result of taxes imposed on the sector until it is ascertained by its significant impact on the manufacturing capacity utilization in Nigeria economy.

Figure 1: the trend of manufacturing capacity utilization from 1986- 2022



Source: Authors' computation, 2024

4.1.1 Descriptive Statistics

The Jarque-Bera (JB) test statistic was used to determine whether or not fiscal policy variables (control variables) follow the normal probability distribution. The descriptive statistics for the variables under consideration are therefore presented as follows:

Table 1: Descriptive Statistics

	MCU	CIT	PPT	CED	VAT	MPR	EXCH
Mean	465.4138	10.91569	11.23699	10.66674	8.494413	6.374708	81.85746
Median	417.2897	10.70091	10.98702	10.78026	11.00000	6.709583	111.0182
Maximum	1671.055	15.69339	13.60877	13.11337	16.23000	11.06417	158.5526
Minimum	32.03466	9.001734	9.682235	9.208441	0.000000	0.316667	0.808300
Std. Dev.	419.9921	1.679742	1.060193	1.022948	5.555061	3.153946	64.99533
Skewness	1.475565	1.302406	0.381713	0.333483	-0.771289	-0.336799	-0.129165
Kurtosis	5.046895	4.387393	2.222909	2.597175	1.927674	2.191757	1.204548
Jarque-Bera	17.19860	11.61320	1.582253	0.809481	4.705908	1.475987	4.387175
Probability	0.000184	0.003008	0.453334	0.667150	0.095088	0.478072	0.111516
Sum	14893.24	349.3021	359.5836	341.3356	271.8212	203.9907	2619.439
Sum Sq. Dev.	5468195.	87.46755	34.84428	32.43909	956.6197	308.3687	130956.2
Observations	37	37	37	37	37	37	37

Source: Authors' computation, 2024

From the result table 1, the descriptive statistics indicates that from 1986 to 2022, the growth rate of the manufacturing capacity utilization, company income tax, petroleum profit tax, custom and exercise duties, value added tax, monetary policy rate and exchange rate show an averaged positive mean values from 8.494413 to 465.4138. The maximum values of the variables shows values ranging from 1671.05, 15.69339, 13.60877,13.11337,16.23000 ,11.06417 to 158.5526; while the minimum values ranges from 32.03466,9.001734,9.682235, 9.208441, 0.000000,0.316667, 0.808300 respectively. The standard deviation showed that the highest standard deviation of (419.9921) is recorded by the MCU while the least standard deviation of (1.022948) is recorded by CED . The JarqueBera test of normality for the variables revealed biasness (for MCU,CIT,VAT and EXCH) as can be seen with its high probability value and no bias (for PPT ,CED and MPR) as indicated by its low probability values.

4.1.2 Correlation

Under the correlation test, we conduct the test to ascertain the degree of relationship that exists between the dependent variable and the independent variables. This is done using the correlation matrix . In the correlation test, we test the variables to ascertain the degree of relationship that exist between the independent variables and the dependent variable. The relationships among the studied variables depicted in the model were tested using correlation matrix and the result presented below:

Table 2: Correlation matrix

	MCU	CIT	PPT	CED	VAT	MPR	EXCH
MCU	1.000000	0.922121	0.771840	0.920351	0.761456	0.711442	0.780729
CIT	0.922121	1.000000	0.884943	0.891443	0.734262	0.792638	0.720609
PPT	0.771840	0.884943	1.000000	0.860974	0.710203	0.763410	0.751940
CED	0.920351	0.891443	0.860974	1.000000	0.879110	0.783982	0.907181
VAT	0.761456	0.734262	0.710203	0.879110	1.000000	0.812845	0.832890
MPR	0.711442	0.792638	0.763410	0.783982	0.812845	1.000000	0.684562
EXCH	0.780729	0.720609	0.751940	0.907181	0.832890	0.684562	1.000000

Source: Author's computation, 2024

The correlation result shows that all of the variables have positive relationships with the MCU. The relationships are actually at 92%, 77% 92%, 76%,71% and 78% respectively .This result suggests these variables have a direct relationship with manufacturing capacity utilization in the Nigerian economy.

4.1.3 Unit Root /Staionarity Test

Economic variables are generally non-stationary and they are a random process. Linear combination of non-stationary series in general is a non-stationary series and closely associated with economic theory. Because economic theory guarantees stagnation of combination of economic variables, in this study Dickey Fuller's generalized Test for investigation of stationary variables is used. In order to assess the time series properties of the data, unit root tests was conducted. As Engle and Granger (1987) argued, if individual time series data are non-stationary, their linear combinations could be stationary if the variables were integrated of the same order. The assumption is stated as follows: If the absolute value of the Augmented Dickey Fuller (ADF) test is greater than the critical value either at 1% ,5%,or 10% level of significance at order zero, one or two, it shows that the variable under consideration is stationary otherwise it is not. The results of the Augmented Dickey Fuller (ADF) test obtained are as follow:

Table 3: The Unit root test

Variable	Level difference	Probability	Order of integration	First difference	probability	Order of integration
MCU	-0.595412	0.8580	I(0)	-5.158744	0.0002	I(1)
CIT	-1.904260	0.3253	I(0)	-6.467848	0.0000	I(1)
PPT	-1.444825	0.5480	I(0)	-5.549341	0.0001	I(1)
CED	-0.096448	0.9408	I(0)	-4.986769	0.0004	I(1)
VAT	-1.288292	0.6218	I(0)	-5.194029	0.0002	I(1)

MPR	-1.784632	0.3810	I(0)	-5.510496	0.0001	I(0)
EXCH	-0.593191	0.8585	I(0	-4.705674	0.0007	I(0)

Source: Author's computation, 2024

From the table above the results clearly shows that all the variables are non-stationary at level. This suggests the need to difference the series to obtain stationarity. At first difference, these variables are integrated of order one at 5% level of significance in ADF test procedure. Therefore a cointegration test is therefore conducted.

4.1.4 Analysis Result

Table 4: Regression Output

Dependent Variable: MCU

Method: Least Squares

Date: 08/24/24 Time: 12:18

Sample: 1986 2022

Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.53664	57.00549	-0.202378	0.8413
CIT	3.437523	3.111989	1.104606	0.2798
PPT	-4.364341	3.816552	1.143530	0.2637
CED	8.055725	7.883905	1.021794	0.3167
VAT	-1.338878	0.802995	1.667356	0.1079
MPR	-1.764751	1.123070	-2.571363	0.0287
EXCH	0.074936	0.071194	2.052555	0.0026

R-squared	0.845891	Mean dependent var	46.38389
Adjusted R-squared	0.826865	S.D. dependent var	10.99902
S.E. of regression	9.488117	Akaike info criterion	7.528597
Sum squared resid	2250.609	Schwarz criterion	7.849227
Log likelihood	-113.4576	Hannan-Quinn criter.	7.634877
F-statistic	2.776519	Durbin-Watson stat	2.508792
Prob(F-statistic)	0.032939		

From the result in table 4, the coefficient of CIT is positively sign and statistically insignificant at 5% critical level. It implies that, any unit change in company income tax will lead to 88% increases in in the manufacturing capacity utilisation. The coefficient of the variable CED is positive. This result indicates that there is a positive relationship between custom and exercise duties and manufacturing capacity utilisation in Nigeria. Equally, the coefficient of the variable VAT is positive though insignificant statistically at 5% critical level. Also, the coefficient of MPR and EXCH indicate negative signs, which imply that the variables are negatively related to the manufacturing capacity utilisation during the period under review and the variables are statistically insignificant.

Statistically, the F-statistic is 120.2789, and the probability of the null hypothesis for no significance in that regression is [0.000]. The DW-statistic (d) is 2.910545. Furthermore, the T-ratios for those regressors are also meaningful, and their probabilities are below $\alpha(0.05)$. Thus, the null hypothesis $\beta i = 0$ is rejected, and those regressors are significant even at a confidence level of 95%.

4.1.5 The Short Run Relationship between Fiscal Policy Variables and Manufacturing Capacity Utilisation

There is long-run equilibrium relationship among the variables in the regression model; however, it is the short-run that transmit to the long-run. Thus, Error Correction Mechanism (ECM) is therefore used to correct or eliminate the discrepancy that occurs in the short-run. The coefficients of the explanatory variables in the error correction model measure the short-run relationship. The assumption of the ECM states that if two variables are cointegrated, then, there is error correction mechanism to revise instability in short term (Engle and Granger, 1987).ECM is used to see the speed of adjustments of the variables to deviations from their common stochastic trend. ECM corrects the deviations from the longrun equilibrium by short-run adjustments. This shows us that changes in independent variables are a function of changes in explanatory variables and the lagged error term in cointegrated regression. The ECM result is therefore presented below:

Table 5: The short run error correction dynamics

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MCU(-1))	1.136369	0.162045	7.012667	0.0000
D(CIT)	191.641011	33.932010	5.647794	0.0001
D(CIT(-1))	-88.678915	38.841651	-2.283088	0.0399
D(PPT)	-192.507898	49.365584	-3.899638	0.0018
D(CED)	318.188682	66.672924	4.772382	0.0004
D(VAT)	-12.638739	7.098501	-1.780480	0.0984
D(MPR)	-24.708593	9.824863	-2.514905	0.0259
D(MPR(-1))	11.228756	8.489027	1.322738	0.2087
D(EXCH)	4.087854	1.106900	3.693065	0.0027
ECM(-1)	-1.238031	0.202772	-6.105525	0.0000

ECM = MCU - (210.2349*CIT -155.4953*PPT + 92.7229*CED -0.0963 *VAT -9.5870*MPR + 1.5027*EXCH -1181.0530)

In the short run result, the coefficient of the regressor on the dependent variable -88.678915 and is negative, which means that a decrease in the company income tax can push the growth of the manufacturing capacity utilization in the short term. The equilibrium error-correction coefficient ECM (-1) is -1.230831 which has the expected negative sign. The error correction term here is negative and significant meaning that there is a long run causality running from independent variables to dependent variable. It also confirms that all the variables are cointegrated or have long run relationship. We can therefore states that 123 percent gap between long run equilibrium value and the actual value of the dependent variable (MCU) has been corrected. It can be also said that speed of adjustment towards long run equilibrium is 123 percent annually Its t-ratio is $-6.$ 105525, and the probability of the null hypothesis being true for zero is [0.000], which :is significant even when $\alpha = 0.05$. Thus, it can also be concluded that the adjustment is quite meaningful in the short-run ARDL relationship.

4.1.6 The Long Run Relationship between Company Income Taxation and Manufacturing Capacity Utilisation

Table 6: The long run relationship result

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CIT	210.234854	36.440920	5.769197	0.0001
PPT	-155.495255	22.501284	-6.910506	0.0000
CED	92.722930	79.159641	1.171341	0.2625
VAT	-0.096346	5.818991	-0.016557	0.9870
MPR	-9.587044	9.572925	-1.001475	0.3349
EXCH	1.502677	0.609205	2.466619	0.0283
C	-1181.053030	538.882829	-2.191669	0.0472

The long-run elasticity of CIT contributing to MCU is – 210.234854 from 1984 to the present. Thus, we show that CIT has a positive effect on MCU in the long run.

4.1.7 Stability and Diagnostic Test

To ensure the goodness of fit of the model, diagnostic and stability tests are conducted. Diagnostic tests examine the model for serial correlation, functional form, non-normality and heteroscedasticity. The stability test is conducted by employing the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) suggested by Brown et al. (1975). The CUSUM and CUSUMSQ statistics are updated recursively and plotted against the break points. If the plots of the CUSUM and CUSUMSQ statistics stay within the critical bonds of a 5 percent level of significance, the null hypothesis of all coefficients in the given regression is stable and cannot be rejected.

4.1.8 Cusum and Cusumsq Tests

To further confirm the stability of the estimated ARDL model, we use the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) test method to examine the recursive residuals, which are shown in the figures below:

Figure1: the CUSUM test result

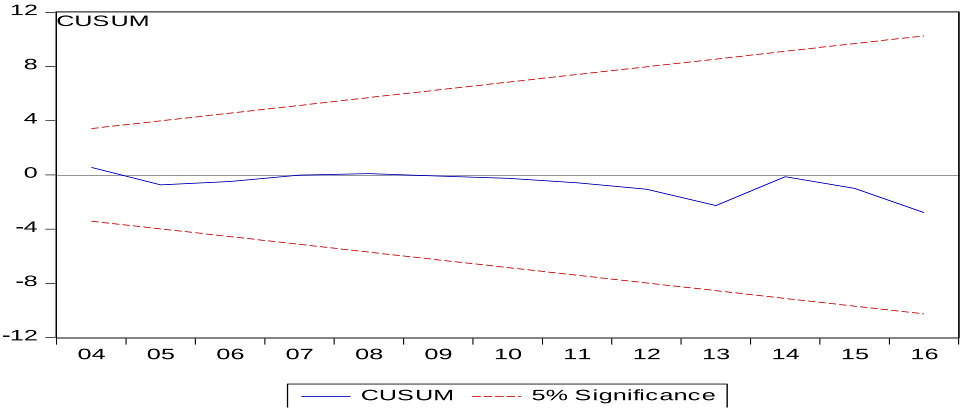
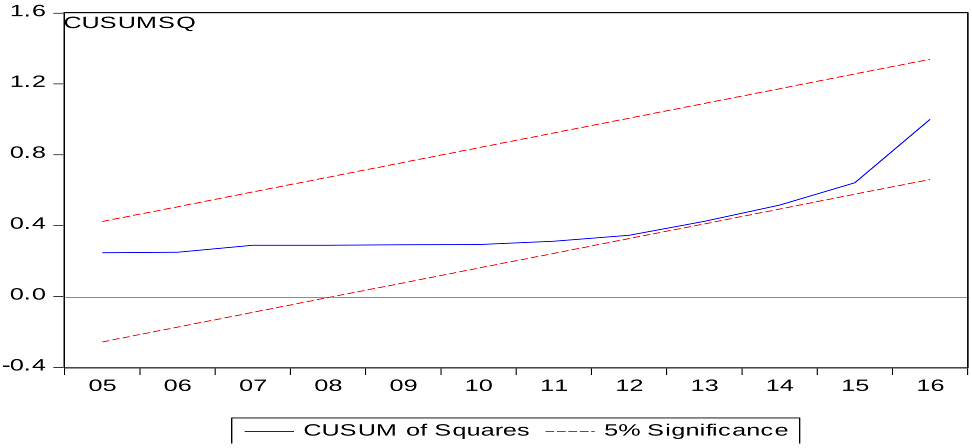


Figure2: the CUSUMQ test result



The straight lines represent the critical bounds at the 5% significance level. When the CUSUM and CUSUMSQ of the recursive residuals move outside of these two straight lines, the null hypothesis of instability is accepted. However, from the two figures the CUSUM and CUSUMSQ tests remain within the area restricted by the lines; thus, we reject the null hypothesis for CUSUM and CUSUMSQ and conclude that the estimated ARDL model is effective with stable recursive residuals.

5. CONCLUSION AND RECOMMENDATIONS

Nigeria has the potential to develop a prosperous economy, significantly reduce poverty, and provide essential services such as health, education, and infrastructure to its population. However, evidence suggests that resources have not been effectively utilized to meet the needs of the population in terms of human capital development. From 1981 to 2006, Nigeria generated about 23 trillion naira (191 billion US dollars) from oil, accounting for approximately 83% of total government revenue. Despite this, tax revenue remains a crucial component of national income in modern economies and the primary source of government recurrent revenue in most developed countries. In contrast, developing countries, including Nigeria, often rely heavily on commodity export earnings, particularly crude oil.

The study concluded that the positive and significant relationship between Fiscal policy variables and Manufacturing Capacity Utilization (MCU) indicates the need for policy measures to enhance economic growth through more effective policy blend of fiscal and monetary variables.

Based on the findings, the study offers the following recommendations:

a. Enhance Company Income Tax (CIT) Policies for Productivity Growth: Since CIT has a positive impact on productivity within the manufacturing sector, policies should be developed to further streamline tax collection and provide targeted tax incentives that encourage investment in technology and innovation, boosting productivity.

b. Reinvest Petroleum Profit Tax (PPT) Revenues into Manufacturing Infrastructure: To maximize the effect of PPT on manufacturing capacity utilization, a portion of PPT revenues should be reinvested in energy infrastructure and subsidies, which are essential for reducing operational costs and improving capacity in the sector.

c. Revise Customs and Excise Duties for Improved Capacity Utilization: Customs and excise duties should be adjusted to facilitate easier access to critical raw materials for manufacturers. This can be achieved by reducing tariffs on key inputs or offering duty waivers for sectors that enhance local production capacity.

d. Adjust Value-Added Tax (VAT) to Support Manufacturing Growth: VAT on essential manufacturing inputs should be reviewed to lower the cost burden on manufacturers. This will help improve manufacturing capacity utilization by reducing production costs and enhancing competitiveness.

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