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Selected Macroeconomic Variables and Capacity Utilization in Nigeria

EKWUNIFE, I. J.[1], NDUKA, A. J. (PhD)[2*]& OGINI, P. (PhD)[3]
[1,2&3]Department of Banking and Finance, Faculty of Management Sciences
Chukwuemeka Odumegwu Ojukwu University, Anambra, Nigeria
***Correspondence: aj.osita@coou.edu.ng**

Abstract

Capacity utilization is the extent to which an enterprise or a nation uses its installed productive capacity. It is the relationship between output that is produced with the installed equipment, and the potential output which could be produced with it, if capacity was fully used. The study examined selected macroeconomic variables and capacity utilization in Nigeria. Specifically, the study examines the effect of monetary policy rate, exchange rate, interest rate, inflation rate and treasury bill rate on capacity utilization in Nigeria. Econometric techniques, including Descriptive Statistics, Augmented Dicker Fuller tests for unit roots, Autoregressive Distributive Lag (ARDL) approach which is capable of handling both stationary at level I(0) and first difference I(1). The study revealed that interest rate, exchange rate, monetary policy rate and treasury bill rate have 71% significant short run policy effect but no significant long run effects on capacity utilization in Nigeria. This suggests that selected macroeconomic variables have not been effective long run policy instruments that can largely influence capacity utilization in Nigeria. The study therefore concludes that selected macroeconomic variables have been effective short run policy instruments that largely influenced capacity utilization in Nigeria. Amongst the recommendations is that Central Bank of Nigeria should employ an expansionary monetary policy that can increase the money supply to the real sectors to boost capacity utilization in Nigeria. That the regulatory authorities in Nigeria should employ different set of measures to safeguard the value of the domestic currency in order to reduce the level of exchange rate fluctuations and improve capacity utilization in Nigeria. The monetary authorities in Nigeria should reduce interest rate to attract low interest rates that can encourage credit and boost productivity across the sectors which will improve capacity utilization in Nigeria.

Key Words: Selected Macroeconomic Variables, Capacity Utilization, Nigeria

Introduction

INTRODUCTION

One of the major objectives of macroeconomic approach is to realize feasible financial development and improvement. In Nigeria the government tries to impact the performance of the national economy through monetary and financial policies such as changing the level of tax collection, government spending, or the supply of cash or credit to the economy.

Changing macroeconomic approaches influence national wage, costs, intrigued rates and trade rates all of which impact financial advancement (Aroriode & Ogunbadejo, 2014).

Macroeconomics is still an advancing science but the objectives of macroeconomic approach have been consistently universally. These incorporate price stability, foreign trade soundness, full employment, adjust of payment equilibrium, economic growth and development. Although these policies are very important, they could not be pursued simultaneously because some of them conflict with one another. Therefore, there is always a tradeoff between the various objectives, hence a country pursues a policy which is relevant to its stage of development at different times and in different circumstances (Ebikila, Agada, Lucky & Matthew, 2018).

Economists use different indicators to measure the level of economic development in a country. These include per capita income, poverty rate, literacy rate, declining infant mortality and maternal mortality, increasing life expectancy, real gross domestic product, capacity utilization, human capital development and industrial output etc. Concurring to Adegbemi, (2018) financial development leads to the creation of more openings within the division of education, wellbeing sector, inquire about, human improvement, capacity utilization, mechanical yield, full business and natural preservation.

After freedom in 1960, the prompt challenge that confronted the Nigerian economy was how to quicken financial development in arrange to reduce extreme poverty, improve health care, overcome absence of education, fortify equitable and political solidness, move forward the quality of the characteristic environment, lessen the frequency of wrongdoing and savagery, and ended up a speculation goal for universal capital. Long-term broad-based financial advancement is basic for Nigeria to extend salaries and empower her reach her potential of getting to be a critical trade and speculation accomplice within the world. Whereas quick developments in China, Malaysia and India for occasion, have lifted millions past subsistence living, Nigeria and numerous other African nations have, be that as it may, experienced the inverse by recording moo development rates (Olawale, 2015).

Since the introduction of the Structural Adjustment Programme (SAP) in 1986, the Nigerian economy has become more open to market forces and their attendant problems. All those whiles, the Nigerian economy had to bargain with issues of high inflation rate and unsteady economic growth and development,

high and expanding rate of unemployment, exchange imbalances, unsteady trade rate and high interest rate which had antagonistically influenced capacity utilization in Nigeria (Abdul & Marwan, 2013). The relationship between major macroeconomic factors such as gross domestic product, buyer cost index, current employment measurements, inflation, the labor market, currency exchange rate, interest rate and GDP development rate depends on the state of financial development (Paul & Akindele, 2016).

Government and policy makers have embarked on various macroeconomic policies to address these issues. Some of the policies involved the use of monetary and fiscal policy, export promotion strategy, imports substitution strategy, National Economic Empowerment Development Strategy (NEEDS). The basic goals of the approaches incorporate cost solidness, upkeep of adjust of installments harmony, advancement of work, development and maintainable improvement. These goals are vital for the achievement of inner and outside adjust of esteem of cash and advancement of long run financial improvement (Nwoko, Ihemeji & Anumudu 2016).

Past endeavors to get it the impact of macroeconomic factors on capacity utilization in Nigeria have come about in clashing conclusions. The extant considers oppose this idea both within the line of importance and heading of relationship. A number of the discoveries highlight critical impact from macroeconomic factors particularly the directing impact of cash supply (Gatawa, Akinola, Muftau, 2017; Olawale, 2015; Muftaudeen, Hussainatu, 2014; Ojede, Amin, Daigyo, 2013; Madito, Khumalo, 2014). Despite agreeing that capacity utilization responds to macroeconomic variables, these studies are at variance as to the direction of the effects. For instance, Holden, Sparman, (2013) Pitia, Lado, (2015) Paul, Akindele, (2016) argued that all the macroeconomic variables they employed have a negative effect on capacity utilization in both the long and short run suggesting that growing money supply, interest rate, exchange rate and credit extension will rather hamper capacity utilization in Nigeria; as against the belief from studies like Onwanchukwu, (2015), Ozei, Sezgin, Topkaya, (2013), that macroeconomic variables enhance capacity utilization of the economy. A number of studies outrightly argued that macroeconomic variables have no effect on capacity utilization (Onuorah and Osuji 2014; Olawunmi and Adedayo 2016; Aroriode and Ogunbadejo, 2014)

These conflicting results have created a knowledge gap in the literature which this study intends to close. Therefore, it is against

this backdrop that this study tends to examine the selected macroeconomic variables and capacity utilization in Nigeria for period of 1988-2021.

LITERATURE REVIEW

Macro-economic Variables

Macroeconomic variables are indicators or main signposts signaling the current trends in the economy. Keynes identified some main macroeconomic variables that relate to the economy as a whole as Gross Domestic Product (GDP), Exchange rate (EXR), Interest Rate, Inflation and Money Supply. Gross Domestic Product (GDP) is the broadest quantitative measure of a nation's total activity. It represents the monetary value of all goods and services produced within a nation's geographic borders over a period of time especially one year (Aroriode & Ogunbadejo, 2014)

What is important is that the production takes place inside the territory of the country. Exchange rate is the rate at which one nation's currency is exchanged for another country's currency. If one nation's exchange rate is higher than another one, it affects the purchasing power of the lower exchange rate of a particular country, for example, if the naira rate is lower in comparison to the American dollar, Americans will have a higher purchasing power than Nigerians. Interest rate is the cost of borrowing money. Rising interest rate signals an expanding economy and when already high interest rate begins to rise even further and faster, it is a sure sign of the onset of inflation. Inflation in an economy can be the result of an increase in aggregate demand that is not accompanied by an increase in aggregate supply. A rise in any component of aggregate demand can bring about demand-pull inflation. Inflation can also result from a decrease in aggregate supply that occurs when businesses find that production inputs prices have risen. Such occurs when labour cost and the price of raw materials have risen. Money supply is the total money stock in the economy. It is an important macro-economic tool for stabilizing the economy when there is recession (Ullah, & Rauf, 2013).

Macroeconomic approaches allude to those arrangements of Government pointed at the total economy, ordinarily to advance the large scale objectives of full business, steadiness, and development. Common macroeconomic approaches are financial and financial. Fiscal policy is the macroeconomic approach where the government makes changes in government investing or assess to invigorate financial exercises whereas financial approach bargains

with changes in cash supply and credit or changes with the parameters that influence the supply of cash within the economy. The goals of this approach incorporate the accomplishment of financial development and advancement, steady costs and full work. A few of the destinations set are possibly in conflict with each other, which suggests that in endeavoring to attain one objective, another one is 'sacrificed; for example, in endeavoring to realize full work within the short-term, cost expansion may happen within the longer term (Siyasanga, & Hlalefang, 2017).

Nwoko, Ihemeje, and Anumadu (2016), stated that a sound macroeconomic arrangement needs to do generally with the reliable administration of short-term arrangement disobedient seeking after a feasible and unsurprising pace for total financial factors and major costs (compensation, expansion, intrigued rates and trade rates). They built up encourage that monetary, fiscal and trade rate arrangements, in conjunction with basic change, have major results for the social prosperity of social orders, not as it were in terms of assurance against stuns and emergencies but too in terms of value. Numerous, on the off chance that not all, of the essential social arrangements are of a residential nature. Seeking after them, be that as it may, depends to a significant degree on the universal empowering environment in which the worldwide monetary framework, the unsettled obligation emergency and expanding Official Advancement Help (ODA) streams play a noteworthy part.

Iwedi, (2016) declared that Macroeconomic steadiness is the basic premise of economical financial advancement, since, it increments national saving and private venture conjointly progresses trades and adjust of installments with making strides competitiveness. A macroeconomic solidness, subsequently, to a huge degree, ensures financial prosperity of the individuals. To this conclusion, there are a few components recognized as potential determinants of macroeconomic soundness such as moo expansion, moo shortfall, solidness of genuine trade rate and trade relationship. These aforementioned variables are genuine drivers of financial development. Iwedi observationally inspected the development-effects of macroeconomic solidness variables in Nigeria. Using time series data for the period 1980 to 2011 and adopting various econometric techniques such as Granger causality test, and Error Correction Mechanism (ECM), the results reveal that real interest rate has direct and significant effects on Nigeria's economic development while external debt and real exchange rate impact negatively on development in the country. The study

concluded that for macroeconomic stability to be achieved in Nigeria, each of the factors should be examined individually such that its respective effect on development could be identified while appropriate macroeconomic policy would be formulated and implemented where required.

Capacity Utilization

Capacity utilization is the degree to which a venture or a country employments its introduced profitable capacity. It is the relationship between yield that's delivered with the introduced hardware, and the potential output which may well be created with it, on the off chance that capacity was completely utilized. Capacity utilization is the degree or level to which the profitable capacity of a plant, firm, or nation is being utilized in era of products and services. Expressed more often than not as a rate, it is computed by partitioning the full capacity with the parcel being utilized (Greenwood & Gregory, 1988). The capacity utilization rate measures the extent of potential financial yield that's really realized. Shown as a rate, the capacity utilization level gives understanding into the overall slack that's in an economy or a firm at a given point in time. The formula for finding the rate is:

(Actual Output / Potential Output) x 100 = Capacity Utilization Rate

The capacity utilization rate is an important operational metric for businesses, and it's also a key economic indicator when applied to aggregate productive capacity. A company with less than 100% utilization can theoretically increase production without incurring expensive overhead costs associated with purchasing new equipment or property. Economies with ratios of under 100% can absorb significant increases in production without pushing past previous highs. The concept of capacity utilization is best applied to the production of physical goods, which are simpler to quantify.

Low capacity utilization is a concern for fiscal and monetary policymakers who use either policy to engage in stimulation. In 2015 and 2016, several European economies, such as those in France and Spain, were struggling with the effects of low capacity utilization. Despite the onset of monetary stimulus leading to historically low interest rates, inflation remained below target levels for extended periods, and the threat of deflation loomed. Low capacity utilization and high unemployment created so much slack in those economies that prices were slow to react to simulative efforts. With so much excess capacity, rising product activity

did not require significant capital investment (Greenwood, & Per Krusell 1992).

The Capacity Utilization figure can vary among different industries, inventor, production models, stock building cycle, seasonal demand cycles and warehousing practices. It is important to set the aim capacity utilization rate with consideration to customer demands first and the other factors mentioned above. It may be that several aim rates will be set for different times in a year or business cycle. When Capacity utilization is at a high level it is important that most gross production is actually saleable production. This means the production process must produce minimal waste, monitor its safety stock and be efficient. Lean manufacturing principles are valuable in achieving these required efficiencies, as a lean well-run production process will maximize revenue for the business and also cut down customer lead times (Hansen, 1985)

Theoretical Framework

This study is anchored on Solow's Theory. Robert Solow and Swan introduced the Solow's model in 1956. Their model is also known as Solow-Swan model or simply Solows model. In Solow's model, other things being equal, states that saving, investment and population growth rates are important determinants of economic development. Higher saving, investment rates, lead to accumulation of more capital per worker and hence more output per worker. On the other hand, tall populace development incorporates a negative impact on financial advancement essentially since a better division of sparing in economies with high population development has got to go to keep the capital-labour proportion consistent. Within the nonattendance of mechanical alter and advancement, an increment in capital per specialist would not be coordinated by a corresponding increment in yield per specialist since of reducing returns. Thus capital developing would lower the rate of return on capital.

Solow's neoclassical growth model is an extension of the theory of Cobb Douglas, explaining that the output or gross domestic product (GDP) depends on the technology, number of employees, amount of physical capital, the amount of human capital, as well as the amount of natural resources. So it can be written by the following equation.

$$Y = A\, f(L, K, H, N)$$

where f is the function that shows how the inputs are combined to produce output. *A* is a

variable that indicates the availability of production technology. *L* is the amount of labor. *K* is the amount of physical capital. *H* is the amount of human capital, and *N* is the number of natural resources.

The first factor that determines the output of a country is labor. Economists argue that population growth will affect life in society. The most impact is the change in the total labor force. Large population will have a large labor force in producing goods and services. In addition, economists believe that growth is the engine of the world's population in technological progress and economic prosperity

The second factor is the physical capital. Physical capital is the completeness of the equipment and structures used to produce goods and services. Investment is one form of physical capital in the production function. Both domestic and foreign investment holds the contribution in accelerating the economic growth of a country.

Human capital is the third factor in the neoclassical growth model. Human capital acquired knowledge and skills of workers through education, training, and experience. Quality human capital will enhance the ability of a country to produce goods and services.

The fourth factor is the natural resources. Natural resources are inputs in the production activities provided by nature, such as land, rivers and mineral content in the earth. Many countries have good natural resources, bringing the country towards economic development.

The fifth factor that determines the output of a country is the mastery of science and technology. Technological knowledge is an understanding of the best ways to produce goods and services. When there is a technological development, it will need less labor. So most of the workforce will be able to produce other goods and services, the result will be increased productivity.

Empirical Review

Simon-Oke, and Awoyemi, (2010) examined the effect of manufacturing capacity utilization on industrial improvement in Nigeria amid the period of 1976 – 2005. Fabricating capacity utilization, esteem included and work era were relapsed on file of mechanical efficiency (which served as the intermediary for mechanical advancement) utilizing the co-integration and mistake rectification component as expository instruments. The time arrangement properties of the factors were explored by conducting a unit

root test and assist to the cointegration investigation. The econometric prove affirms that there's a long run positive relationship between Fabricating capacity utilization, esteem included and list of mechanical efficiency in Nigeria.

Atume, Igberi, Udude, and Odo (2016) inspected power supply; normal introduced manufacturing capacity utilization and unemployment in Nigeria from 1980 to 2013 utilizing slant investigation and progressed econometrics test to found out the critical long-run relationship between normal fabricating capacity utilization and control supply in Nigeria and inspected the critical causal relationship between normal fabricating capacity utilization and control supply in Nigeria. The result of the examination appears that there's long run critical relationship that existed among unemployment rate, normal fabricating capacity utilization and control supply in Nigeria but there's no noteworthy causal relationship between normal fabricating capacity utilization and control supply.

Augustine and Kenneth (2015) received an altered conventional consequence request system to look at the impacts of capacity utilization rate (CUR) on imports of crude materials (IMRM) in Nigeria. A number of striking comes about risen from the investigation of information. 1% increment in Dog causes IMRM to extend by 1.1%. 1% increment within the genuine trade rate (deterioration of the Naira) decreases IMRM by 0.12% while 1% increments in domestic swelling comes about into a 0.72% diminish within the importation of crude materials. Expectedly, the study found that a 1% increment in genuine net household item triggers a 77% increment in IMRM. In line with the conventional purport work, we found that outside trade profit emphatically and essentially decide IMRM. On the premise of their discoveries, they suggest that the pertinent stake holders ought to make honest to goodness endeavors towards boosting Nigeria's CUR.

Richard (2018) examined the effect of interest rate mechanism on economic development of Nigeria (1986-2016). The study used secondary data sourced from World Bank, UNDP, Bureau of Statistics and the Central Bank of Nigeria; The research selected Nigeria as its sample and used the OLS, Co-integration, Granger-causality and Error Correction model data Analysis techniques, to test the effect of the independent variables (interest rates and Monetary policy rates) on the dependent variable, economic development (proxied by Human Development index) and tested at the 5% level of significance. The findings showed that discount rates represented by

interest and monetary policy rates; both had significant effect in the short-run and showed positive and significant effect in the long-run on economic development with significant speed of adjustments.

Muhammad and Sahibzada (2017) examined the effect of interest rate on financial advancement in Asian Nations. This investigate is conducted rising 20 nations in Asia inside the period of 2006-2015. The Target populace of the study is 48 nations whereas the test of 20 companies was chosen utilizing comfort inspecting strategy. The free variable utilized in this investigate is intrigued rate and subordinate factors are development residential item, outside coordinate venture and swelling. The study utilized expressive examination, relationship examination and relapse investigation utilizing E-view computer program. The discoveries of the study appeared that interest rate has negative affect on gross domestic product

Modebe, and Ezeaku (2016) inspected the linkage between inflation and manufacturing sector development in Nigeria utilizing annualized time arrangement information from 1982 to 2014. The standard relapse comes about uncovered that expansion and intrigued rate have negative and non-significant impact on fabricating division development whereas trade rate show up to emphatically and essentially impact the development of fabricating segment esteem included. Granger causality comes about uncovered a unidirectional causality running from trade rate to yield development. Swelling and intrigued rate in any case are not causal for yield development

Tajudeen, Taofeek, and Abdul (2017) examined the basic interaction of the interest rate liberalization-growth nexus through the consideration of financial advancement factors, for sub-Saharan African economies traversing the periods 1980-2012. The board unit-root tests, board cointegration and board blunder adjustment models were utilized for experimental examinations. The result of the research showed that openness on exchange and cost solidness are much more critical for intrigued rate liberalization and financial development in sub-Saharan African nations. More so, the degree and the degree of budgetary advancement moderately helped in lessening interest rate

Okoye, Nwakoby, and Modebe (2015) explored the impact of the interest rate liberalization approach of the government (presented in 1986 beneath the structural adjustment programme) on the execution of the mechanical division in Nigeria. Particularly, the study examined the degree to

which developments in lending or credit rate and its major determinants like exchange rate, inflation rate and monetary profundity (independent factors) account for the drift in yield performance of Nigeria's mechanical division (dependent variable). Yearly information on the factors, sourced from the distributions of the Central Bank of Nigeria, were analyzed utilizing the expository procedure of the vector mistake adjustment demonstrate (VECM). The study appears that exchange rate instability has an inconsequential positive affect on industrial output performance. It too appears prove of critical positive affect of lending rate and financial profundity on industrial output development. In any case, prove from the study appeared that inflation includes a critical negative impact on the output of the sector.

Hammed, Irwan, and Joel, (2017) examined the impacts of interest rates on private utilization conduct in Nigeria between the period of 1981 and 2013 utilizing autoregressive distributed lag (ARDL) cointegrations system. The information were sourced from the World Bank development indicators and the interest rate was augmented with other macroeconomic factors such as per capita income, money supply, and banking sector credit to the private sector as regressors in deciding the conduct of private utilization in Nigeria. The results affirmed the presence of a relationship between private utilization and its determinants, but genuine interest rate and the sham for the effect of interest rate deregulation.

Okoh and Nkechukwu (2014) examined the nexus of interest rate deregulation and financial development in Nigeria. The study utilized auxiliary information generated from the Central Bank of Nigeria (CBN) statistical bulletins from 1986-2010 and utilized the Ordinary Least Square Regression. The dependent variable is financial development proxied as Real Gross Domestic Product (RGDP) whereas Interest rate and other control factors served as autonomous factors. The result appeared that the coefficients of Interest rate, Investment, Trade openness, Real exchange rate and inflation contributed emphatically to the level of development and improvement in Nigerian economy amid the period beneath audit.

Babalola, Danladi, Akomolafe and Ajiboye (2015) decided the impact of interest rate and inflation on financial development in Nigeria between 1981- 2014. Auxiliary information sourced from World Bank databank and Central Bank of Nigeria was utilized within the study. The study adopted Ordinary Least Square (OLS) strategy of investigation. The long run relationship between the factors was analyzed utilizing the Johansen integration test. Be that as it may, the Augmented Dickey Fuller test performed showed that as it were inflation isn't

stationary at first difference. The course of causality and drift investigation was too performed on factors. It found out that Inflation and Interest rate contains a negative impact on financial development but not one or the other inflation nor interest rate granger causes financial development.

Davis and Emerenini (2015) investigated the impact of interest rate on investment in Nigeria. Multiple regressions were used as the statistical method for the study which reveals that high interest rate negatively affects investment. In line with the findings, the study made the following suggestions; that relevant monetary authority should evolve policies that will encourage savings and reduce prime lending rate to genuine investors, among others.

Udoka and Roland (2012) explored the effect of interest rate variability on economic growth in Nigeria. Two main research focuses were identified. Firstly, to explore the relationship between interest rate and economic growth and the variance in economic growth before and after interest rate deregulation regime in Nigeria. The research design employed here was Ex-post facto. The data sourced from CBN Statistical Bulletin was analyzed using the ordinary least square multiple regression model. The result of the findings showed an inverse relationship existed between interest rate and economic growth in Nigeria, thus interest rate retards growth of the real sector.

METHODOLOGY

The study adopted the ex-post facto research design because secondary data were sourced from the Central Bank of Nigeria Statistical Bulletin, CBN Annual Report and Statement of Accounts, Independent variables are money supply, exchange rate, interest rate, inflation rate, monetary policy rate, treasury bill rate, imports, exports, foreign direct investment and unemployment rate while capacity utilization is the dependent variable. The data were analyzed with econometric techniques involving Descriptive Statistics, Augmented Dickey Fuller Tests for Unit Roots, The Autoregressive Distributive Lag (ARDL) Approach which is capable of handling both stationarity at level I(0) and first difference I(1) is used. The Autoregressive Distributive Lag (ARDL). Bounds test for cointegration is applied. The nature of the Autoregressive Distributive Lag (ARDL) long run relationship and speed of correction to equilibrium and the Autoregressive Distributive Lag (ARDL)

short run relationship were used for the data analysis using E-view**.**

Analyze the Effect of Selected Macroeconomic Variables on Capital Utilization in Nigeria

The model which is adopted for objective three is the model of Utile, Okwori and Ikpambese, (2018) who studied the effect of interest rate on economic development in Nigeria

The Model is stated thus:

IPI= f (ITR, EXR, IFR)

Where:

IPI = Industrial Product Index

ITR= Interest Rate

EXR = Exchange Rate,

INFR = Inflation rate,

The model is modified as follows:

CU= f (ITR, EXR, MPR, INFR, TBR)

Where:

CP = Capacity Utilization (proxy for economic development)

ITR= Interest Rate

EXR = Exchange Rate

MPR= Monetary Policy Rate

INFR = Inflation Rate

TBR= Treasury Bill Rate

The Econometric Equation Form of the Model is:

$LnCU = \beta_0 + \beta_1 LnITR + \beta_2 LnEXR + \beta_3 LnIFR + \beta_4 LnMPR + \beta_5 LnTBR + \mu$ - - - - - 3

μ = Stochastic Disturbance (Error Term)

f = Functional Relationship

$\beta 0$ = Intercept of Relationship in the Model Constant

$\beta 1, \beta 2, \beta 3, \beta 4, \beta 5$= are the Coefficients of the Independent Variables

Ln = natural log of the variables introduced to smoothen the stochastic effects of the times series

RESULTS AND DISCUSSION

Descriptive Statistics

These measures the individual characteristics of the variables used in this study. The result of the descriptive statistics is presented in Table1

Table 1: Descriptive Statistics for Selected Macroeconomic Variables and capacity utilization in Nigeria

	CPU	EXR	ITR	IFR	MPR	TBR
Mean	45.97758	101.9850	18.73242	20.26091	13.77273	11.73545
Median	43.97000	118.5669	17.95000	12.20000	13.50000	12.00000
Maximum	61.47000	306.0802	29.80000	76.80000	26.00000	26.90000
Minimum	29.29000	2.020600	10.50000	0.200000	6.000000	0.950000
Std. Dev.	9.942110	86.01953	3.732175	18.92252	3.895291	5.550300
Skewness	-0.158849	0.658010	0.993324	1.668332	0.705133	0.302246
Kurtosis	1.659421	2.894125	4.735360	4.595530	4.748653	3.327741
Jarque-Bera	2.609864	2.396790	9.567581	0.80869	6.939126	0.650135
Probability	0.271191	0.301678	0.648364	0.674082	0.581131	0.722479
Sum	1517.260	3365.507	618.1700	668.6100	454.5000	387.2700
Sum Sq. Dev.	3163.057	236779.5	445.7322	11457.98	485.5455	985.7864
Observations	33	33	33	33	33	33

Source: Authors computation from Eviews 9.0

The descriptive statistics showed the mean and standard deviation. The mean is the average value of each variable over the years while the standard deviation shows the variability of the values. The descriptive statistics also showed the maximum and minimum values. The Jarque-Bera statistics is the test of normality of the time series variables. The variables of the study shown on Table 2 above indicate that capacity utilization had a mean of 45.97% and standard deviation of 9.942 with minimum and maximum values of 29.29% and 61.47% respectively.

Capacity had a mean of 45.9% with standard deviation of 316 with minimum and maximum values of 29 % and 61% respectively. Exchange rate had a mean of 101% with standard deviation of 23 with minimum and maximum values of 2.0% and 306% respectively. Interest rate had a mean of 18.7% with standard deviation of445 with minimum and maximum values of 10.5% and 29.8% respectively. Inflation rate had a mean of 20.26% with standard deviation of 114 with minimum and maximum values of 0.20 % and 276.8% respectively.

Monetary policy rate had a mean of 13.7% with standard deviation of 485 with minimum and maximum values of 6.00% and 26.0% respectively. treasury bill rate had a mean of 11.73% with standard deviation of 685 with minimum and maximum values of 0.95% and 26.9% respectively

Unit Root Test

Table 2: Summary Unit Root test for Stationarity

Variables	At Level 1(0)	At First Difference 1(1)	At Second Difference	Order of Integration	Probability
LnLCPU	-5.814004			1(0)	0.0022
LnEXR	-3.907281			1(0)	0.0053
: LnITR	-5.045210			1(0)	0.0003

LnIFR	-4.116993			1(0)	0.0501
D(LnMPR)		-5.193801		1(1)	0.0002
D(LnTBR)		-4.830614		1(1)	0.0005

Source: Researcher's Estimation using Eviews 9.0

The variables used in the analysis were subjected to Augmented Dickey Fuller (ADF) Tests, to determine whether they are stationary series or non-stationary series. The result on Table 3 revealed that at level capacity utilization, exchange rate, interest rate and inflation rate were stationary at [1(0)] while monetary policy rate and treasury bill rate were stationarity at first difference [1(1)].

From the analyses of stationarity of the variables, it was seen that the variables have mixed stationarity of level and first differences. The Autoregressive Distributive Lag (ARDL) approach which is capable of handling both stationary at level I(0) and first difference I(1) were used for the data analysis. Thus, the most suitable tool of analyses is the ARDL test that accommodates both the short and long run trends in testing the relationship between the dependent and independent variables.

ARDL (Bounds) Test for Cointegration

Table3. Result of the ARDL (Bounds) Test for Selected Macroeconomic Variables and Capacity Utilization in Nigeria

ARDL Bounds Test
Date: 02/05/22 Time: 14:22
Sample: 1988 2021
Included observations: 33
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	1.820823	5

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Eviews 9.0

The bound test is shown in Table 4. The result compared the F-statistics with the critical bound values. The F-statistics is 1.820823. The results showed that the F-statistic is less than the lower bounds at 2.62 and upper bounds at 3.79 of the critical values at 0.05 level of significance. This means that there is no cointegration or long run relationship between selected macroeconomic variables on capacity utilization in Nigeria

Short Run Relationship

Table4: Short Run Model of the Relationship Between Selected Macroeconomic Variables and Capacity Utilization in Nigeria

Dependent Variable: LNCP
Method: ARDL
Date: 02/05/22 Time: 14:21
Sample (adjusted): 1988 2021
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNCP(-1)	1.036024	0.202610	5.113384	0.0001
LNCP(-2)	0.060935	0.285089	2.213741	0.0333
LNCP(-3)	-0.317858	0.162367	-1.957645	0.0669
LNITR	0.022889	0.119637	3.191323	0.0505
LNITR(-1)	0.024461	0.101729	2.240455	0.0129
LNITR(-2)	0.272011	0.097520	2.789293	0.0126
LNEXR	3.151232	0.007805	3.157904	0.0764
LNEXR(-1)	-0.010030	0.007451	1.346177	0.1959
LNEXR(-2)	-0.010521	0.008246	-1.275914	0.2191
LNIFR	0.018348	0.009079	2.021034	0.0593
LNMPR	0.259738	0.015575	3.625224	0.0001
LNTBR	0.018049	0.020226	2.892323	0.0047
C	-0.301440	0.906272	-0.332616	0.7435

R-squared	0.759074	Mean dependent var	3.776087
Adjusted R-squared	0.710185	S.D. dependent var	0.228310
S.E. of regression	0.060325	Akaike info criterion	-2.479455
Sum squared resid	0.061865	Schwarz criterion	-1.872269
Log likelihood	50.19182	Hannan-Quinn criter.	-2.285211
F-statistic	3.219869	Durbin-Watson stat	2.052413
Prob(F-statistic)	0.000000		

Source: Eviews 9.0

The short run effect of selected macroeconomic variables on capacity utilization in Nigeria is explained in the result in Table 10. The analyses are interpreted based on the coefficient of the explanatory variables, and the coefficient of determination (R2). The statistical significance was confirmed using the t-statistics for the coefficient of regression, and F-statistics for the coefficient of determination.

Log of Capacity Utilization (LNCPU): The results showed that the coefficient for log of capacity utilization is positive at 1.036024 with t-Statistic of 5.113384 and probability value of 00.0001 which means that capacity utilization is an endogenous variable in the short run

Log of Interest Rate (LNITR): The coefficient for log of interest rate (LNITR) in the first year is positive at 0.022889 and after one year, is positive at 0.024461 with t-Statistic of 3.191323 and 2.240455 and probability value of 0.0505 and 0.0129 this means that interest rate has significant positive effect on capacity utilization in the short run

Log of Exchange Rate (LNEXR): The coefficient for log of exchange rate (LNEXR) in the first year is positive at 3.151232 and after one year is negative at -0.010030 with t-Statistic of 3.157904 and 1.346177 with probability value of 0.0764 and 0.1959 this indicates that exchange rate has no significant effect on capacity utilization in the short run

Log of Inflation Rate (LNIFR): The coefficient for log of inflation rate (LNIFR) in the first year is positive at -0.018348 and after one year is negative at -0.259738 with t-Statistic of 2.021034 and 1.625224 and probability value of 0.0593 and 0.3401 this indicates that inflation rate has no significant effect on capacity utilization in the short run

Log of Monetary Policy Rate (LNMPR): The coefficient for log of monetary policy rate (LNMPR) is positive at -0.259738 with t-Statistic of 3.625224 and probability value of 0.0001 which means that monetary policy rate has significant effect on capacity utilization in the short run

Log of Treasury Bill Rate (LNTBR): The coefficient for log of treasury bill rate (LNTBR) is positive at 0.018049 with t-Statistic of 2.892323 and probability value of 0.0047 this indicate that treasury bill rate has significant effect on capacity utilization in the short run.

CONCLUSION

Our findings revealed that Interest rate, exchange rate, monetary policy rate and treasury bill rate have 71% significant short run policy effect but no significant long run effects on capacity utilization in Nigeria.

This suggests that selected macroeconomic variables have not been an effective long run policy instruments that can largely influence capacity utilization in Nigeria. The study therefore concludes that selected macroeconomic variables have been effective short run policy instruments that largely influenced capacity utilization in Nigeria.

Amongst the recommendations is that Central Bank of Nigeria should employ an expansionary monetary policy that can increase the money supply to the real sectors to boost capacity utilization in Nigerian. That the regulatory authorities in Nigeria should employ different set of measures to safeguard the value of the domestic currency in order to reduce the level of exchange rate fluctuations and improve capacity utilization in Nigeria. The monetary authorities in Nigeria should reduce interest rate to attract low interest rates that can encourage credit and boost productivity across the sectors which will improve capacity utilization in Nigeria. Concerted effort should be made by policy makers to increase the level of output in Nigeria by improving productivity in order to reduce the prices of goods and services (inflation) so as to enhance economic development in Nigeria and that government should embark on improvement of the quality of education and health services (healthy mind and a sound mind) to usher knowledge –driving economy.

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