

Impact of Government Fiscal Expansion on Manufacturing Output in Nigeria

¹Bamidele Vincent Olawale; ²Victor Ushahemba Ijirshar; ³Ashifa Tersugh & ⁴Onumoh Ahmed Yahaya

^{1,4}Department of Accounting, School of Business Education
Federal College of Education (Technical) Gusau, Zamfara State, Nigeria

^{2,3}Department of Economics, Benue State University, Makurdi, Nigeria

Corresponding Author: Victor Ushahemba Ijirshar

ABSTRACT

The study investigated the impact of government fiscal expansion on manufacturing output in Nigeria from 1970 to 2014. Secondary data were used for the analysis through Auto-Regressive Distributed Lag (ARDL) Approach. The study was anchored on two theories; Keynesian and the Solow's augmented model. The result of the stationarity test shows that some variables captured in the model were stationary at level $I(0)$ and other variables integrated of order $I(1)$. This is the justification for the application of the Auto-Regressive Distributed Lag (ARDL) model. The study found a positive but insignificant impact of government expenditure on manufacturing output in Nigeria. The study therefore recommended that the Nigerian government should manage and monitor effectively her expenditure, allow the importation of machineries or technology with reduced tariffs/duties and enhance restriction on finished goods that are produced locally, create an enabling business environment for both foreign and domestic investors in the country and encourage research and innovations in the sub-sector.

Keywords: Government Expenditure, Government Fiscal Expansion, Manufacturing Output and Technology

JEL Classification: H50, L60, N67, O30

INTRODUCTION

Economic growth is one of the main macroeconomic objectives of an economy, and to achieve this, all sectors within an economy are involved, manufacturing sector, being one of this sectors remains critically important for the realization of this objective. Eber and Osundina (2014) have argued that the faster trend through which a nation can achieve sustainable economic growth and development is neither by the

level of its endowed material resources, nor that of its vast human resources, but technological innovation, enterprise development (commercial farming of various types inclusive) and industrial capacity of which manufacturing Sector is inclusive.

An early economic development theory that found wide acceptance among developing countries was that, as a country developed, the share of agriculture in national income fell while that of manufacturing and services rose (Kuznet, 1956). This was interpreted to mean that if a country wanted to develop, it had to pay particular attention to the manufacturing sector of its economy. In Nigeria, the acceptance of this argument found an expression in the adoption of an economic policy based on import substitution development strategy and a number of incentives to the industrial sector such as tax holiday, generous tax allowances, high duty on imported finished product combined with low duties or complete exemption from duties on imported machinery and raw materials.

In addition to this, the Nigerian government paid attention to the implementation of economic reforms, including the Structural Adjustment Programme (SAP) in mid-1986 and the adoption of a three-year rolling national plan. The SAP emphasized the diversification of the economy's productive base, export orientation and increased domestic sourcing of industrial inputs through monetary and fiscal incentives. As part of the reforms, the direct involvement of government in production activities was reduced through the privatization and commercialization programmes (Mordi, Abwaku & Banji, 2010).

The most important expression to the acceptance of the argument was the increase in government spending on the sector. In 1990, government spending on the manufacturing sector rose from ₦903.90 million to ₦4,164.30 in 1995, ₦4,354.30 in 2000, ₦9,255.60 in 2010 and ₦7,300.60 in 2014 (CBN, 1990, 1995, 2000 & 2014). In support of this, is the

Keynesian macroeconomic theory which asserts that, increase in government spending can be an effective tool to stimulate aggregate demand in a stagnant economy, subscribers to this theory therefore, advocate a continuous injection of additional purchasing power to the market through direct public investment or fiscal expansion which should lead to a stimulation of investment and consumption activities. This direct investment is part of public expenditure which will lead to economic growth.

Of equal importance was the direct involvement of government in the manufacturing sector through heavy injection of funds and by setting up of manufacturing ventures. Given the government involvement in the manufacturing sector of the Nigerian economy in the last five and half decades, especially in direct production and other support through injection of funds, it is pertinent to enquire into the effectiveness of government fiscal expansion. It is in the light of this that this paper set out to ascertain the effect of government fiscal expansion on manufacturing output of the Nigerian economy.

Research Hypothesis

H₀: There is no significant impact of government fiscal expansion on manufacturing output in Nigeria.

CONCEPTUAL FRAMEWORK

Government Expenditure/Government Manufacturing Expenditure

According to Bhatia (2006), government expenditure refers to the expenses, which the government incurs for its own maintenance and also for the society and the economy as a whole. In other words, government expenditure is the expenses incurred by the government for maintenance of itself, the economy and the society. Government fiscal expansion is an important mechanism, which government can use to influence significantly people's lives in terms of standards of living and better opportunities. In the words of Anyafo (1996), government expenditure is

the total in cash terms of the federal, state and local government spending plus financial transfers to the parastatals at the three levels of government. On the other hand, government manufacturing expenditure refers to all government spending on manufacturing sector. It is that portion of government revenue that is used in the manufacturing sector to boost its output. Government manufacturing expenditure is that part of government fiscal expansion measures channeled towards stabilizing the various indices of the manufacturing sector. It includes all government consumption, investment, and transfer payments channeled towards developing the sector. The variable is expected to have a direct relationship with manufacturing output.

Manufacturing Output

The United Nations has characterized manufacturing as the “mechanical or chemical transformation of inorganic or organic substance into new products whether the work is done in a factory or the worker’s home, and whether the products are sold at wholesale or retail”(Arikawe, 1984). Steel and Webster (1991) also define manufacturing as “a process of learning to combine resources and applying technology to produce goods that satisfy people’s need”. To Economy watch (2010), manufacturing sector is seen as those industries which involve in the manufacturing and processing of items, and indulge in either creation of new commodities or in value addition. The manufacturing industry accounts for a significant share of the industrial sector in developed countries. The final products can either serves as a finished good for sale to customers or as intermediate goods used in the production process.

THEORETICAL LITERAURE

Two theories formed the basis for this work, Keynesian theory and the Solow Neo classical growth theories. Keynesian theory is encouraging government participation in the economy. According to Keynes an increase in government spending will lead to greater production. This is

where the variable government expenditure or fiscal expansion discipline comes in. On the other hand the Solow Neoclassical growth argued that output growth results from one or more of three factors: increases in labour quantity and quality, increases in capital (through saving and investment) and improvement in technology. Thus there is a possibility for the output of the Nigerian manufacturing sector to increase if government fiscal expansion discipline to increase investment and improve the technology of the sector is enhanced.

Empirical Review

Enu and Havi (2014) examined the macroeconomic factors that influence performance of the manufacturing sector of Ghana using multivariate time series approach. The study found out that manufacturing production and real gross domestic product per capita were inversely related. The study further revealed that in the long-run, macroeconomic variables such as private sector credit, labour and real exchange rate were unfavorable factors that weigh down the manufacturing sector while in the short-run, the past years consumer price index and real exchange rate were unfavorable to the manufacturing production. The study recommended that, private sector credit to the manufacturing sector should be improved, training of labour force should be skilled and technical oriented and policies to stabilize the real exchange rate should be put in place to halt the down trending in manufacturing production. The study fails to include government expenditure among its explanatory variables.

Njoku, Okezie and Idika (2014) investigated the relationship between Nigeria's capital expenditure and the growth of the manufacturing sector from 1971 to 2012. The ordinary least square method was used to show the relationship between capital expenditure and manufacturing output. Manufacturing Gross domestic product was taken as dependent variable while exchange rate, interest rate, political stability, recurrent expenditure, money supply, interest rate, index of energy consumption,

credit to private sector, degree of openness and rate of growth of GDP as independent variables. All the variables used are integrated of order one except political stability which is a dummy variable. The results showed a positive impact of growth of GDP, capital expenditure, money supply, openness of the economy and recurrent expenditure on manufacturing output in the country. In the light of the above, the study recommended that government should increase the capital expenditure and reduce recurrent expenditure and also make sure that government funds are properly managed in a manner that will raise the nation's production capacity and accelerate economic growth. The study fails to recognize the fact that the variables in the model are integrated of order one and as such violates the assumptions of Ordinary Least Squares (OLS) therefore using it, will make the results spurious.

Eze and Ogiji (2013) examined the impact of fiscal policy on the manufacturing sector output in Nigeria. An ex-post facto design (quantitative research design) was used to carry out the study. The results of the study indicated that government expenditure significantly affect manufacturing sector output. The implication of the finding was that if government did not increase public expenditure and its implementation, Nigerian manufacturing sector output will not generate a corresponding increase in the growth of Nigerian economy. The study recommended that fiscal policy should be given more priority attention towards the manufacturing sector by increasing the level of budget implementation, which will enhance aggregate spending in the economy; and consistent government implementation will contribute to the increase performance of manufacturing sector.

Charles (2012) investigated the performance of monetary policy on manufacturing sector in Nigeria, using econometrics test procedures. The result indicates that money supply positively affect manufacturing index performance while company lending rate, income tax rate, inflation rate and exchange rate negatively affect the performance of

manufacturing sector. This means that monetary policy is a vital for the growth of the manufacturing sector in Nigeria which in turn would lead to economic growth. The authors however, focused on monetary policy with no attention to fiscal policy and that forms the research gap.

Ademola (2012) investigated the average contribution of the manufacturing sector to the national earning of Nigeria over the years using a time series spanning 1981 to 2010. The empirical perspective of the study applied the unit root test and co integration, relying on the theoretical backing posited by Solow. It was found that a significant relationship exist between government expenditure in the manufacturing sector and the economic growth of Nigeria

MAERIALS AND METHODS

This study employed secondary data on the relevant variables collected from the Central bank of Nigeria Statistical Bulletins, National Bureau of Statistics and other published literature relevant to the study. The data was analyzed using ARDL approach.

Model Specification

The empirical specification of growth oriented model follows the Solow growth model, which was subsequently modified by Mankiw, Gregory, Romer, and Weil. (1992) and is termed the "Augmented Solow growth model". Solow (1956) postulated that economic growth results from the accumulation of physical capital and an expansion of the labor force in conjunction with an "exogenous" factor, technological progress that makes physical capital and labor more productive. This study adopts a simplified version of the model obtained by including important variables in order to concentrate on issues concerning manufacturing. The model also imported variables from Keynesian theory to capture the involvement of government.

According to Keynesian theory, output growth results from government fiscal expansion (expenditure), thus, the model is stated in this form

$$MOTPUT = f(GOV) \quad (1)$$

Where;

MOTPUT = Manufacturing GDP (Output)

GOV = Government Expenditure

Considering the Augmented Solow (1956) growth model which postulates that output growth results from the accumulation of physical capital and an expansion of labor force in conjunction with an "exogenous" factor, technological progress that makes physical capital and labor more productive, labor force and technological progress proxy with high technological exports are incorporated in the model, thus we have;

$$MOTPUT = f(GOV, LAFOR, TECH) \quad (2)$$

Where;

LABOR = Labor force

TECH = Technological progress

The model also includes power generation to check for the availability of power and interest rate. With these adjustments incorporated into the model, it can therefore, be expressed in its implicit form as:

$$MOTPUT = f(GOV, LAFOR, TECH, POWER, INTR) \quad (3)$$

Taking the stochastic form of the model and transforming it by taking the natural logarithm, it is stated as:

$$\ln MOTPUT = B_0 + B_1 \ln GOV + B_2 \ln LAFOR + B_3 \ln TECH + B_4 \ln POWER + B_5 \ln INTR + u \quad (4)$$

Where;

$\ln MOTPUT$ = Natural logarithm of Manufacturing GDP (output)

$\ln GOV$ = Natural logarithm of Government Expenditure

$\ln LAFOR$ = Natural logarithm of Labor force

$\ln\text{TECH}$ = Natural logarithm of Technological progress

$\ln\text{POWER}$ = Natural logarithm of Power generation

$\ln\text{INTR}$ = Natural logarithm of Interest rate

u = A stochastic disturbance term

The a priori expectation is summarized as follows: $\beta_1 > 0$, $\beta_2 > 0$,
 $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 < 0$

Variable Description/Measurement

The dependent variable used is the manufacturing output which is the annual output of a sub-sector that is involved in the conversion of raw materials into finished consumer goods or intermediate or producer goods. They consist of a wide range of industrial activities such as large to medium and small scale manufacturing enterprises as well as cottage and hand-craft units in the informal sector, which use simple technology. Government expenditure which is captured in this model is that part of public expenditure channeled towards stabilizing the various indices of the manufacturing sector. It includes all government consumption, investment, and transfer payments channeled towards developing the sector. The variable is expected to have a direct relationship with manufacturing output.

Labor force is considered here to include the entire working population/employees in Nigeria. It is argued by Dunne and Uye (2009) that labor force growth boosts aggregate demand. Furthermore, there are economies of scale due to expansion of domestic market, reductions in the cost of public infrastructure, and a greater complexity in the division of labour (Jhingan, 2007). Thus, we might reasonably expect labour force to increase manufacturing sector output, hence its positive sign.

Interest charged on loans to customers and they vary according to perceived risks, duration of loans, and the cost of loanable funds. It is expected to have inverse relationship with the manufacturing output since, given a particular level of income, and an initial equilibrium

between demand and supply of capital, a rise in interest rate will raise the cost of borrowing for investment and hence lower manufacturing output.

To ascertain the level of Technological progress, the study used High-technology exports as a proxy. These are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery. High technology is often used to refer to firms and industries whose products or services embody advanced and innovative technologies. Such firms have in common a reliance on advanced scientific and technological expertise and are often identified by high research and development expenditures (Keeble & Wilkinson, 2000). High technology contributes to rapid growth by changing the key factors of success. It has now emerged as the major source of wealth generation as opposed to the resource-based industries that dominated the twentieth century. Recent data in high technology trade shows that a small number of countries such as the USA and UK show increasing surpluses, while most other countries tend to show chronic deficits. It is expected to have a positive relationship with manufacturing output

Finally, the researcher used energy produced from hydro source as a proxy for power generation. The variable is measured as per capita electricity power generation. This measure takes care of power availability and it is expected to have a direct relationship with manufacturing output.

RESULTS AND DISCUSSIONS

The Augmented Dickey Fuller test was used and the results revealed that some variables captured in the model were stationary at level $I(0)$ while others were integrated of order $I(1)$. This called for the application of the ARDL approach in examining the long-run and short-run impact of government fiscal expansion on manufacturing output in Nigeria.

ARDL Optimal Selection Results

ARDL optimal lag selection test was carried out and results show the optimal lag length of 4 for best performance of the ARDL estimates. The three criteria (AIC, SIC & HQ) were at their minimum levels in each case at the fourth lag.

The Long-run Impact of Government Fiscal Expansion on Manufacturing Output in Nigeria

The result of ARDL Bounds test showed that there is long-run relationship among the variables incorporated in the model. Hence, the long-run impact of government fiscal expansion on manufacturing output in Nigeria was examined using the ARDL long-run test and the results are presented in Table 1

Table 1: Long-run Coefficients of the ARDL Model

Variables	Coefficients	Std. Errors	T. Statistic	Prob
lnGOV	0.033664	0.154911	0.217316	0.8295
lnLABOUR	1.017853	0.377292	2.697786	0.0115
lnTECH	-0.503789	0.491972	-1.024020	0.4458
lnPOWER	0.727151	0.930931	0.781101	0.5452
lnINTR	-0.038417	0.011403	-3.369026	0.0065
C	-146.827066	38.648437	-3.799043	0.0007

Source: Author's Computations from E-views 9.5 Output

The result in Table 1 shows that Government Expenditure (GOV) contributes positively to manufacturing output quite alright but the contribution is not statistically significant at 5% critical level. This is in line with the findings of Ukoha (2000) and Njoku, Okezie and Idika (2014) who also found a positive relationship between government capital expenditure on manufacturing capacity utilization. This also justifies the theoretical postulation of Keynes, that government spending in an economy will boost the economy's output. The insignificant nature of the impact might be attributed to improper utilization of government spending in the sector to ginger up the sector's output. LABOUR on the

other hand has positive and significant relationship with manufacturing sectors output in Nigeria. This is in line with the theoretical postulation of Solow (1956) that increase in LABOUR increases output. This finding does not conform to that of Enu and Hayi (2014) who found out an inverse relationship between labour and manufacturing sector output in Ghana.

The coefficient of technological progress is negative and insignificant at 5% level of significance. The negative and insignificant relationship of technological progress and manufacturing output shows clearly that the technology in Nigeria is very low such that it cannot significantly influence the sector's output in the long-run. The long-run coefficients of the ARDL model show that interest rate is negative which is theoretically plausible and statistically significant at 5% level of significance.

The R-Squared adjusted revealed that 99% of the variations in the dependent variable were accounted by the changes in the explanatory variables. The model was found stable as Akaike Information criteria; Schwartz Information Criterion and Hannan Quinn criterion were least. The diagnostic test for the long-run model also produced desirable results. Residual and stability test were carried out and the results shows that, there is neither serial correlation nor heteroscedasticity in the model. The model was also stable.

The short-run estimates of the model are presented in Table 2. The study revealed the speed of adjustment (ECT) of -0.806805 which is significant at 5% critical level. This implies that even when the variables included in the model drift away in the short run from their equilibrium values, they have the ability to revert to long-run equilibrium at the speed of adjustment of 80.68%.

Table 2: The Result of Short-run Estimates

Variables	Coefficient	Std. Error	T. Statsitic	Prob
GOV	0.052914	0.051983	1.017911	0.3153
LABOUR	0.969531	0.403821	2.400892	0.0420
TECH	-0.031485	0.035844	-0.878402	0.3854
POWER	8.901912	1.055783	8.431574	0.0000
INTR	0.069659	0.181968	0.382807	0.7041
ECT (-1)	-0.806805	0.103496	-7.795508	0.0000
C	-45.67121	5.917968	-7.717381	0.0000
R-Squared	0.974496	Mean dependent Var		5.093785
Adjstued R-squared	0.970360	S.D dependent var		1.607523
S.E of regression	0.276755	Akaikeinfocri		0.413543
Sum Squared Resid.	2.833956	Schwarz Criterion		0.697391
Log Likelihood	-2.097943	HannanQuinin CN		0.518808
F-Statistics	235.6244	Durbin-Watson Stat		2.330739
Prob (F-Statsitic)	0.000000			

Source: Author's Computations from E-views 9.5 Output

The result in Table 2 shows that holding other variables constant, manufacturing output may be influenced negatively by -45.67121. The coefficient of GOV is positive but statistically insignificant at 5% critical level. This means that even in the short run government expenditure does not has any significant influence on the manufacturing output in Nigeria. LABOUR on the other hand is positive and also significant at 5% level of significance. The short run coefficient of TECH is negative (-0.031485) and statistically significant at 5% level of significance. It negates then theoretical relationship and the negative coefficient indicates that technology in the sector is very low to the extent that it cannot exert positive and significant influence on the output of the manufacturing sector but rather discourage output. POWER has a positive but insignificant relationship with Nigerian Manufacturing output in the short run. The short run coefficients of interest rate on the other hand has a negative sign implying that increase in INTR leads to decreases in manufacturing sector output and it is significant at 5% level of significance.

The R-squared adjusted of 97% explains that variations in the manufacturing output are accounted by changes in the explanatory variables by 97% in the short run. Only 3% of the variations in the manufacturing output were accounted for by the stochastic disturbance term in the short run. More so, the residual test shows that residuals were positively skewed and had platykurtic shape. The residuals were normally distributed since the Jarque-Bera statistic value of 41.91834 was insignificant at 5% critical level.

The residual test also shows the absence of serial correlation and heteroscedasticity (that is residuals are homoscedastic) in the model through the application of Breusch-Godfrey serial correlation LM Test and Breusch-Pagan-Godfrey Heteroscedasticity test. Furthermore, the recursive test of normality for stability of the coefficients shows that the estimates are reliable and valid for statistical inference. The study therefore concludes that there is short run positive but insignificant impact of government expenditure on manufacturing output in Nigeria

CONCLUSION/RECOMMENDATIONS

Going by the evidence arising from the empirical results, the study conclude that government expenditure has failed to contribute significantly to manufacturing output in Nigeria. And that government expenditure has not been properly managed for yielding maximum output. The study recommends that:

- i. The Nigerian government should manage and monitor effectively her expenditure generally in order to ensure fruitful yields of the investments.
- ii. The government should also allow importation of machineries or technology with reduced tariffs/duties and enhance restriction on importation of goods that are produced locally. This would help in reducing the dependency of Nigerians on foreign products thereby boosting the local industries.

- iii. The Nigerian government should also create an enabling business environment for both foreign and domestic investors in the country. These include: tax incentives, development of infrastructural facilities, advancement of the weak institutional qualities and capabilities, insecurity, among others.
- iv. The government should encourage research and innovations in technology that would guarantee its advancement thereby leading increased output of the manufacturing sub-sector in Nigeria.

REFERENCES

- Ademola (2012). Government Expenditure in the Manufacturing Sector and Economic Growth in Nigeria 1981 –2010. *International Journal of Scientific & Engineering Research* 3(11).
- Anyafu, A.M.O. (1996). *Finance in a Developing Economy: The Nigerian case*, Ibadan: B & F publications UNEC
- Arikawe, J.O.S (1984). Manufacturing Sector and Direct Public Policy in South–Western Nigeria: 1956– 71. Ibadan: *Nigerian Institute of Social and Economic Research (NISER)*.
- Bhatia H.L (2006). *Public Finance*. VikasPubling House PVT Ltd
Central Bank of Nigeria (1990, 1995, 2000, 2014). *Statistical Bulletin*. Abuja
- Charles, A. N. B. (2012). Investigating the Performance of Monetary Policy on manufacturing Sector in Nigeria. *Arabian Journal of Business and Management Review*.
- Chude N.P and Chude D.I. (2013). Impact Of Government Expenditure On Economic Growth In Nigeria. *International Journal of Business and Management Review*.1(4): 64-71,

- Dunne, P. and Uye, M. (2009). *Military Spending and Development, in the Global Arms Trade* edited by A. Tan. London: Europa/Routledge.
- Ebere, C and Osundina K. C(2014). Government Expenditure on Agriculture and Economic Growth in Nigeria : *International Journal of Science and Research (IJSR)*. 3(9), September 2014. Retrieved on 10th April 10, 2015 from www.ijsr.net .
- Economywatch (2010): Manufacturing sector by economywatch. Retrieved on 27th march, 2015 from <http://www.economywatch.com/world/industries/manufacturing/world/html/>
- Enu P and Havi E. D (2014). The Manufacturing Sector of Ghana: Are There Any Macroeconomic Disturbances? *Asia Pacific Journal of Multidisciplinary Research*.2(3).
- Enu, P. and Havi, E.D (2014).The Manufacturing Sector of Ghana: Are There Any Macroeconomic Disturbances? *Asia Pacific Journal of Multidisciplinary Research*.2(3).
- Eze, O. R and Ogiji, F. O. (2013). Impact Of Fiscal Policy On The Manufacturing Sector Output In Nigeria: An Error Correction Analysis. *International Journal of Business and Management Review (IJBMR)*. 1(3): 35-55.
- Jhingan, M. L. (2007). *The economics of Development and Planning*(39th Edition). India: Vrinda Publication (P) Ltd.
- Keeble, D. and Wilkinson, F. (2000). *High technology clusters, networking and collective learning in Europe*. Aldershot: Ashgate.

- Kuznets, S. (1956). *Modern economic growth: rate, structure and spread new haven*. London: Yale University Press.
- Mankiw, N. Gregory, D. Romer, and Weil, D. N. (1992). A Contribution to the Empirics of Economic Growth. *The Quarterly Journal of Economics*.107(2):407-37.
- Mordi N.O.C, Abwaku E, and Banji S.A. (2010). *The Changing Structure of the Nigerian Economy*. Research Department, CBN, 2010 Pp. 297.
- Njoku, A.C. Okezie A.I and Idika, N. (2014). Is Government Capital Expenditure Productive? Evidence from Nigerian Manufacturing Sector (1971-2012) *Journal of Educational and Social Research*. 4(5). MCSEER Publishing, Rome-Italy
- Partington, I.(1989). *Applied Economics In Banking and Finance*.Oxford University press.
- Solow, Robert M. (1956). A Contribution to the Theory of Economic Growth.*Journal of Economics*, 50(1):65-94.
- Steel, W.F. and Webster, L. M. (1991). Small Enterprises in Ghana: Responses to Adjustment. Industry Series Paper, No. 33, The World Bank Industry and Energy Department, Washington.
- Ukoha, O. O. (2000). Determinants of Manufacturing Capacity Utilization in Nigeria, 1970 1998.*The Nigeria Journal of Economics and Social Studies*.42 (2): 121-130.