Determinants of Manufacturing Sector Performance and Its Contribution To Gross Domestic Product In Nigeria

Victoria Kenny S

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Abstract

The Manufacturing sector is regarded as a very important sector in an economy because of its capacity to foster wide and efficient backward and forward linkages among other sectors of the economy. This study examines the determinants of manufacturing sector performance and its contribution to gross domestic product in Nigeria using a time series data from 1981 to 2015 using Johansen Cointegration and the Vector Error Correction Model. The study found that while labour force, gross fixed capital formation and exchange rate showed a positive long run relationship with the manufacturing value added, the average manufacturing capacity utilisation, lending interest rate and government expenditure showed a long run negative relationship. The study recommends that policies should be geared towards making the exchange rate, lending interest rate and government capital expenditure more favourable and productive in the manufacturing sector.

1. Introduction

The Manufacturing sector is regarded as a very important sector in an economy because of its capacity to foster wide and efficient backward and forward linkages among other sectors of the economy. In fact, Kayode (2000) described the manufacturing sector as the engine room for any economy. The manufacturing sector contribution to gross domestic product (GDP) in Nigeria have been in one figure not climbing above 10% since 1980 except in 1982 when its contribution was 11.21%. Its contribution to GDP in 2012 was 4.16% and stands at 6.8% in July 2014 (Business Day, 2014). The sector is highly import dependent, inward production oriented (establishing solely domestic goods for domestic markets) and has low degree of usage of the rich local raw materials. Furthermore, exchange rate has been identified as one of the cause of the abysmal performance of the manufacturing sector. This is vital because it links two different countries price systems to make it possible for international trade to make direct comparison of traded goods (Enekwe, 2013).

The Nigerian economy depends mostly on imports for factors of production –input, due to failure on the part of the manufacturing sector to source locally for input essential to the manufacturing process. Depreciation in naira reduces the funds available to the manufacturer to import factor input as the cost of input increases thereby, making the production process more expensive. Increase in cost of production would result in price increase for the output. Difficulties in the ability of the consumer to afford the product at the new price, would lead to sales reduction and make the manufacturer's product less competitive at local and global markets. If the naira appreciates, cost of input and production will reduce which will lead to an

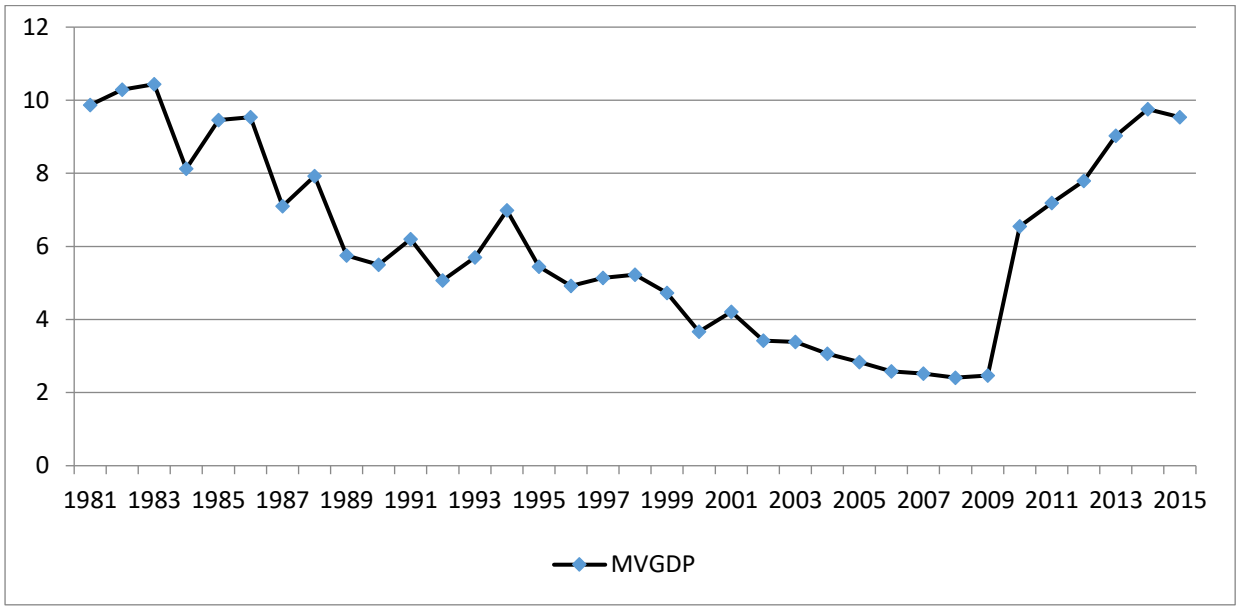
increase in sales where these products can then compete with other products both at local and global markets.

In Nigeria, this goal was not reached in spite of the fact that the country embarked on devaluation to promote export and stabilize the rate of exchange. Following the introduction of the Structural Adjustment Programme in 1986 to achieve an export led growth economy to 1993 when it was terminated, Nigeria's debt service payment continue to increase while the country's capital expenditure was less than 30 percent of the total budgetary expenditure. The meagre capital expenditure in the country compounded by the poor budgetary performance was responsible for the inadequate performance of the infrastructures such as electricity generation and inadequate road network. These non-availability or deterioration of the infrastructure due to forced reduction in public investment has imposed heavy costs, and shifted resources away from productive private investment in Nigeria. Hence, it is essential to evaluate the productivity of the Nigerian manufacturing sector in terms of its contribution to GDP and to examine the determinants (such as exchange rate, manufacturing capacity utilization, interest rates, foreign direct investment, credit to private sector, technology, labour, energy, monetary and fiscal policies) of the manufacturing sector performance alongside.

2. Stylized Facts

The contribution of the manufacturing sector to gross domestic product in Nigeria was above 10 percent only in 1982 and 1983 but decline significantly to less than 5 percent until 2009 (as shown in Figure below. The performances of this sector remain a single digit which shows typical premature deindustrialization that is long term decline in manufacturing after 1983 relative to other sectors.

Manufacturing Value added as a percent of Gross Domestic Product (MVGDP)

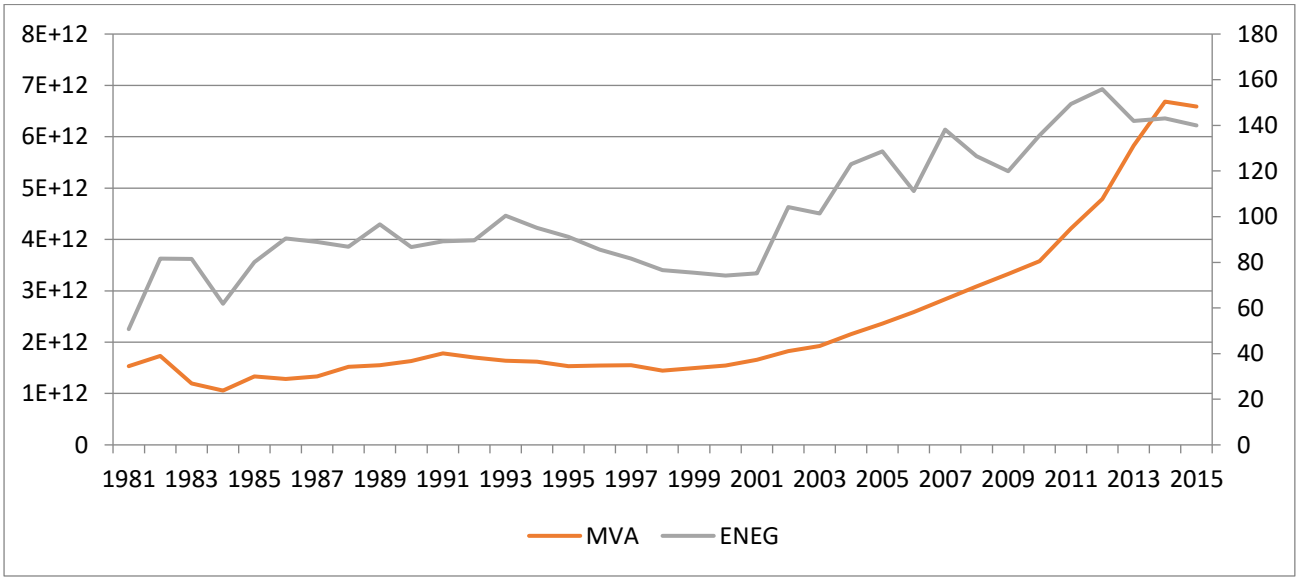


Source: Central Bank of Nigeria Annual Statistical Bulletin 2015

Trend of Manufacturing Value Added and Electricity Consumption in Nigeria

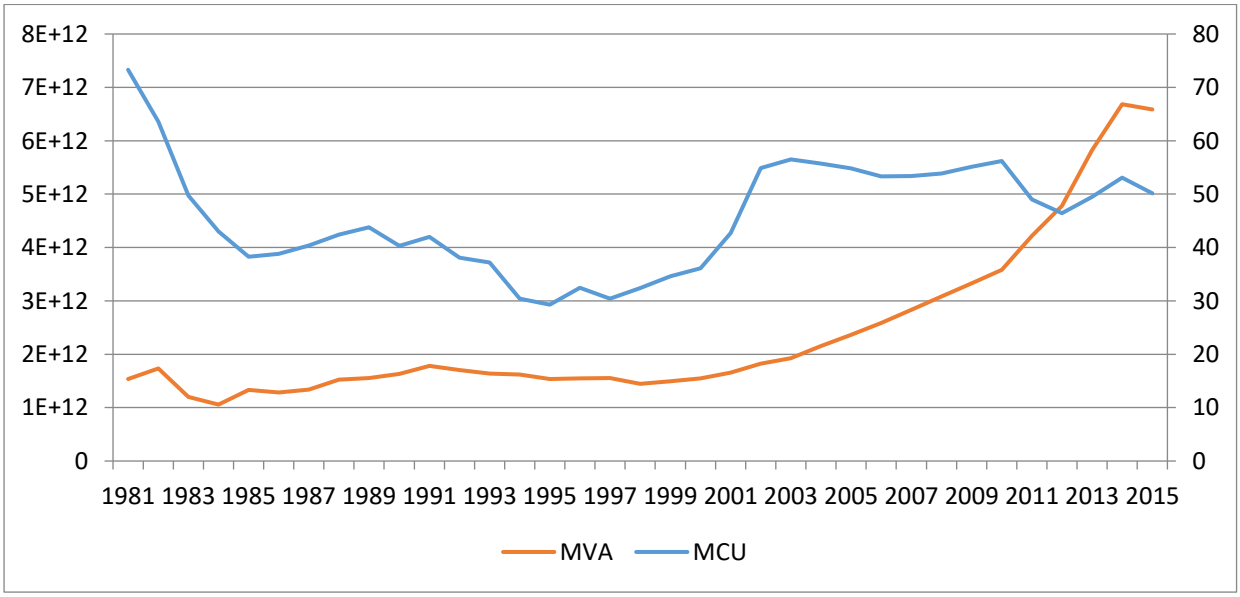
According to the Power Holding Company of Nigeria (PHCN), the electric demand in February 2011 was 7,600 megawatts (MW), but actual generation capability was 3,600 MW. The discrepancy between electricity demand and actual generation is mostly due to low water levels and inadequate maintenance Oluwole (2012). This situation is exacerbated by a grossly inefficient, poorly maintained distribution system as the available energy generated is not enough to meet the demands of the users, leading to constant load- shedding and blackouts. Electricity generation and consumption in Nigeria exert inverse and insignificant influence on value adding capacity utilization of the manufacturing sector in the country which is due to the inadequate and epileptic supply of electricity in Nigeria raising the cost of production.

Manufacturing Value Added and Electricity Consumption in Nigeria.



Source: World Bank, World Development Indicators (2015).

Manufacturing Value Added and Manufacturing Capacity Utilisation

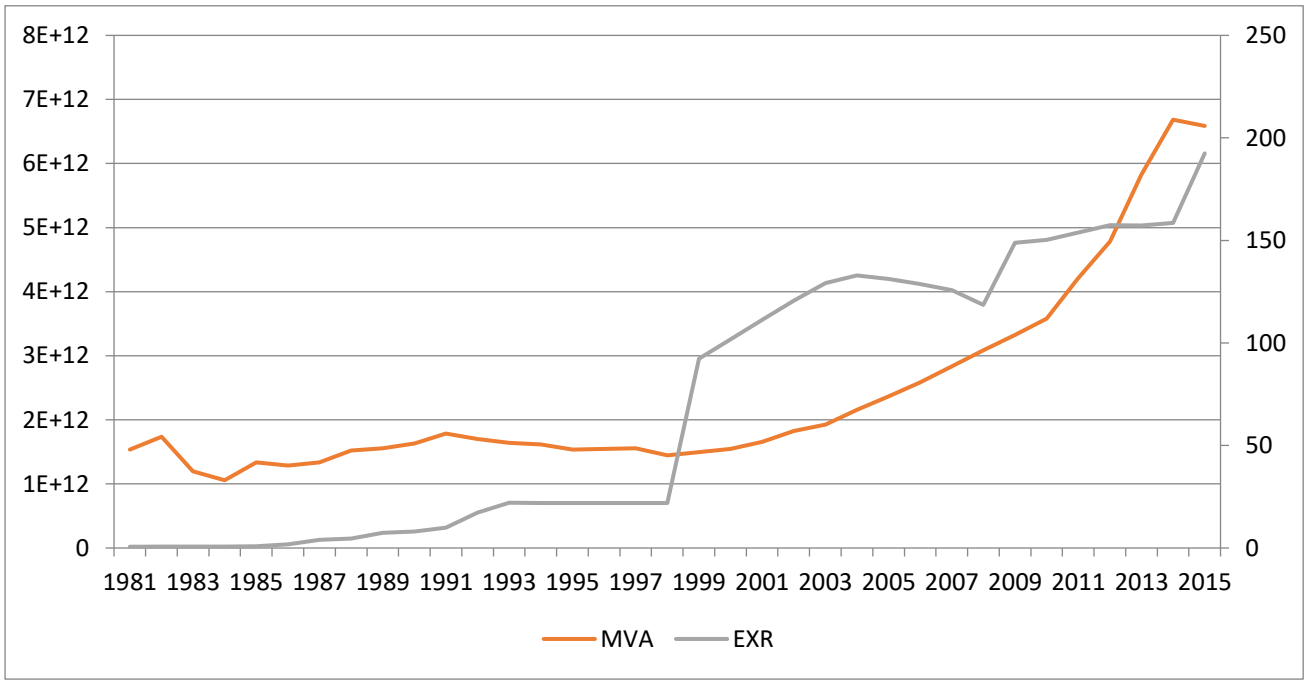


Source: Central Bank of Nigeria Annual Statistical Bulletin 2015 and World Bank, World Development Indicators (2015).

Trend Analysis of Manufacturing Value Added and Exchange Rate in Nigeria

Trend analysis of exchange presented in Figure 4 reveal that the Nigeria exchange rate (EXR) was trending upwards most of the time. The exchange rate experience a sharp fall in two post-SAP periods in 1998 and 2008. During this period the exchange rate was market driven resulting the CBN intervention in 2008 in order to curtail the fall in exchange rate depreciation yet the rate continue to raise. This depreciation of the currency coupled with the epileptic power supplied raises the production cost of the manufacturing firms in the country, thereby reducing their outputs and impeding optimal productivity of the sector.

Manufacturing Value Added and Exchange Rate

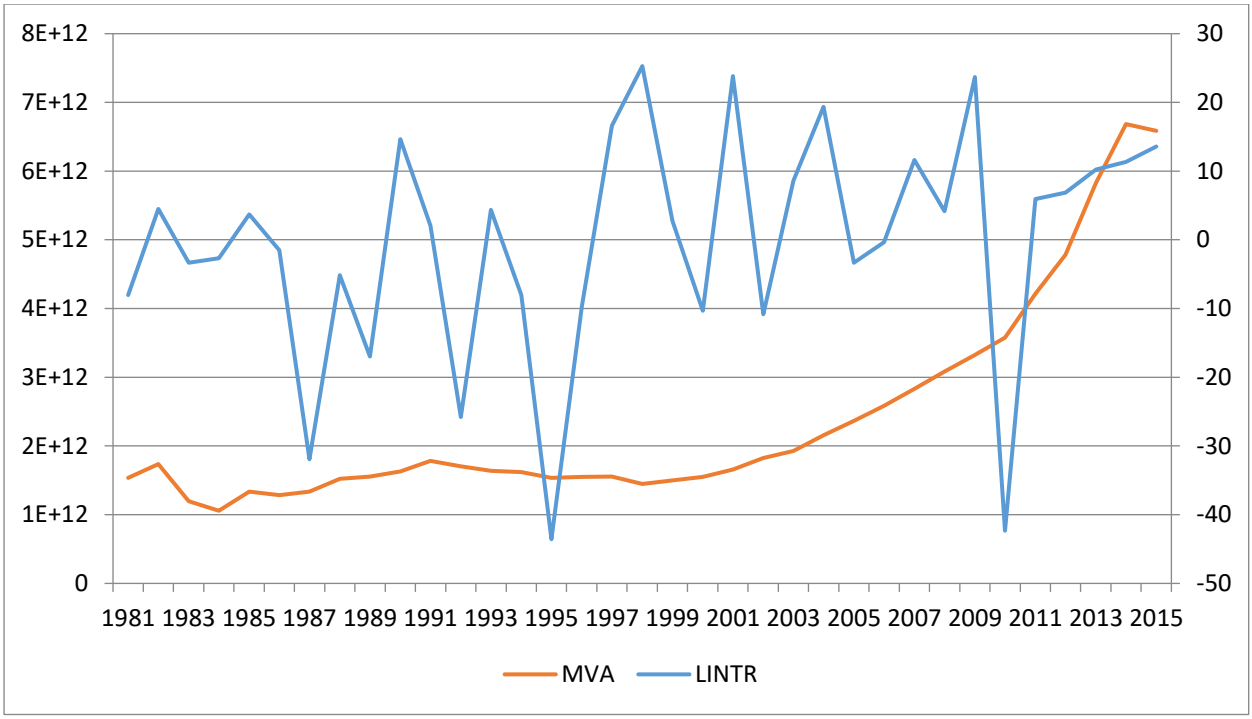


Source: Central Bank of Nigeria Annual Statistical Bulletin 2015.

Trend Analysis of Manufacturing value added and Interest rate in Nigeria

The high volatility nature of the lending interest rate was due to the uncertainty created by the inflationary pressure in the country. These uncertainty coupled with the high lending interest rate discourage manufacturing private investment and productivity of the sector in the country (Figure 5). Also, the core reasons behind the low growth and performance of the Nigerian manufacturing sector during the last few years include "high production costs caused by energy, high interest and exchange rates, influx of inferior and substandard products from other nations, multiplicity of taxes and levies, poor sales partly as a result of low purchasing power of the consumers, bogged down with delay in clearing consignments due to existence of multiple inspection agencies at the ports, etc." (MAN, 2007

Manufacturing Value Added and Lending Interest rate in Nigeria.



Source: Central Bank of Nigeria Annual Statistical Bulletin 2015.

3. Estimation and Discussion Of Results

Co-Integration Test

Johansen co-integration test was used since all the variables in the model became stationary after first difference and the Johansen cointegration is preferred amongst others because it allows for more than one co-integrating vector.

Test of co-integration Hypotheses:

H_0: $\gamma = 0$ (No Co-integrating equation)

H_1: $\gamma \neq 0$ (Co-integrating equations)

Table 1: Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05	
No. of CE(s)	Statistic	Critical Value	Prob.**
None *	254.0513	150.5585	0.0000
At most 1	166.7741	117.7082	0.0000
At most 2	109.0049	88.80380	0.0008
At most 3	68.39537	63.87610	0.0198
At most 4	40.31020	42.91525	0.0890

Source: Researcher's Compilation from EVIEWS 9.0

Table 2: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05	
No. of CE(s)	Statistic	Critical Value	Prob.**
None *	87.27715	50.59985	0.0000
At most 1	57.76923	44.49720	0.0011
At most 2	40.60951	38.33101	0.0269
At most 3	28.08517	32.11832	0.1438

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The table 1 presents the Unrestricted Co-integration Rank Test (Trace), the trace statistic (254.05) is greater than 5% critical value (150.56) therefore, reject the null hypothesis of no co-integrating equation and accept the alternate hypothesis of co-integrating equations. To confirm this, the p-value of the null hypothesis from the trace table (0.000) which is greater than 0.05. Therefore, reject the null hypothesis and accept alternate hypothesis. Therefore, using the unrestricted co-integrating rank test (trace), there are four co-integrating equations.

Another way to check for the presence of co-integration is the use of Unrestricted Co-integration Rank Test (Maximum Eigenvalue) as shown in table 2. Here, the Max-Eigen statistic (87.28) is greater than 5% critical value (50.60). Hence, reject the null hypothesis of no co-integrating equations and accept the alternate hypothesis of the presence of co-integration. Also, the p-value of the null hypothesis from the Max-Eigen table (0.000) which is greater than 0.05. Therefore, reject the null hypothesis and accept the alternate hypothesis. Therefore, using the unrestricted co-integrating rank test (Max-Eigen), there are three co-integrating equations.

Therefore, we concluded that both unrestricted co-integrating rank test (Trace) and unrestricted co-integrating rank test (Max-Eigen) confirmed the presence of co-integrating equations. Hence, we can deduce that there is long run relationship between manufacturing value added (LMVA) and labour force (LLAB), gross fixed capital formation (LGFCF), average manufacturing capacity utilization (LMCU), exchange rate (LEXR), lending interest rate (LINTR) and government capital expenditure (LGCAP) implying that labour force (LLAB), gross fixed capital formation (LGFCF), average manufacturing capacity utilization (LMCU), exchange rate (LEXR), lending interest rate (LINTR) and government capital expenditure (LGCAP) exact influence on manufacturing value added (LMVA) in Nigeria.

Vector Error Correction Model

The VECM measures the speed of adjustment co-efficient and indicates whether there is convergence to the equilibrium path, given an initial disequilibrium. The coefficient is expected to have a negative sign between 0 and 1. If it meets these criteria then it would mean that there is a meaningful correction of the errors in that equation as well as convergence of the variables in the long run.

Table 3: Vector Error Correction Results

Error Correction:	D(LMVA)	D(LLAB)	D(LGFCF)	D(LMCU)	D(LEXR)	D(LINTR)	D(LGCAP)
CointEq1	-0.224585	0.010097	-0.048256	-0.231252	0.102938	-0.917581	-0.645279
	(0.06452)	(0.00951)	(0.12724)	(0.04734)	(0.23223)	(2.21964)	(0.19200)
	[-3.48067]	[1.06171]	[-0.37924]	[-4.88458]	[0.44326]	[-0.41339]	[-3.36085]

Source: Researcher's Computation from Eviews 9.0

The coefficient of the error term has a negative sign. This shows that there is a long run convergence between manufacturing value added (LMVA) and the independent variables (labour force (LLAB), gross fixed capital formation (LGFCF), average manufacturing capacity utilization (LMCU), exchange rate (LEXR), lending interest rate (LINTR) and government capital expenditure (LGCAP)). The co-efficient shows that for the model 0.22 percent of errors generated in the current period will be corrected in the subsequent period respectively which implies a slow speed of adjustment.

Summary of Results

Labour force indicates a positive and insignificant relationship with manufacturing value added in the long run and this conformed to economic theory in terms of the sign and the magnitude in terms of its significance makes economic sense. Labour being one of the key factor inputs used in production is expected to show a positive relationship with manufacturing value added coupled with the labour intensive nature of the Nigerian economy. The statistical insignificant relationship shows the priority of the factor inputs in the manufacturing sector as less of labour is used.

Gross fixed capital formation found a positive and significant relationship with manufacturing value added in the long run and this agrees with economic theory. Capital is one of the key factor inputs used in production and given the limited supply of this factor input in the Nigerian economy, it is expected to have a positive and significant relationship with manufacturing value added in the long run.

The average manufacturing capacity utilization showed a negative and significant relationship with manufacturing value added in the long run and this does not conform to economic theory. Since, the manufacturing capacity utilization is given as the actual output divided by the target output, this occurs when the target production rate of growth is higher than the actual production rate of growth. Thus, leading to a negative relationship between the average manufacturing capacity utilization and manufacturing value added. Another explanation could be when the capacity utilized is not for value added goods.

The exchange rate revealed a positive and significant relationship with manufacturing value added in the long run and this conforms to economic theory on the condition that the economy or sector is producing. An increase in the exchange rate is indicative of a depreciation and this

makes imports more costly and exported goods more competitive hence encouraging local production which will lead to an increase in the manufacturing value added.

The lending interest rate indicated a negative and significant relationship with manufacturing value added in the long run and this conforms to economic theory as the higher the lending interest rate the more costly and discouraging borrowing becomes and this could lead to a decrease in the level of investment as well as a decline in the production rate thus, decreasing the manufacturing value added. Lastly, the government capital expenditure showed a negative and significant relationship with manufacturing value added in the long run and this does not agree with economic theory as an increase in government capital expenditure is expected to improve the manufacturing value added.

4. Conclusion

Based on the findings in this study, policy makers should propose and implement policies that will improve the productivity in the manufacturing sector through the various determining factors such as the gross fixed capital formation, exchange rate, lending interest rate, labour force and government expenditure.

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