Impact of Banks' Credits and Capital Market Dynamics on the Performance of the Manufacturing Sector in Nigeria: An ARDL Bounds Testing Approach

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Abstract

In this study, we examined the impact which bank credits and some capital market variables had on the performance of the Nigerian manufacturing sector. Secondary time series data from 1986 to 2017 was used which was analysed using an ARDL bounds testing to cointegration. The results showed that while MCR negatively and significantly impacted on manufacturing output, TVTR and ASI positively and significantly increased the growth of the manufacturing output. BCRM, on the other hand, impact on manufacturing output was positive but insignificant. We made some recommendations.

Keywords: *Banks Credits, Capital Market Dynamics, Manufacturing Sector, ARDL-ECM*

1.0 INTRODUCTION

It is commonly echoed that finance is the life-wire or life-blood of any business organization. The above statement which shows the importance of finance for the growth of any economy was succinctly buttressed in 1858 by William Gladstone, a former British Prime Minister, who said that: "Finance is, as it were, the stomach of the country, from which all the other organs take their tone." (Duisenberg, 2001). Again, Duisenberg (2001) noted that Walter Bagelot, a former banker and editor of "The Economist", in 1873 said that "In England, however, ... capital runs as surely and instantly where it is most wanted, and where there is most to be made of it, as water runs to find its level". In the turn of the 20th century, Schumpeter (1934), according to Odufuye (2017), also observed the import of the finance-growth nexus when he stressed that bank credits was an important driver for technological innovation and that an efficient allocation of savings to identified entrepreneurs can fasten the innovative production processes that will enhance real economic development. According to Goldsmith (1959), of the numerous academic studies carried out on economic development over the years gone by, financial aspect have almost uniformly been ignored or treated as secondary. This, he said, was rather astonishing since differences in a country's financial habits and financial organization influence the direction of its economic development and even affect the speed of its economic growth**,** unless a contrary opinion demonstrated by factual investigation was established. This position was also supported by Levine (1999) when he affirmed that differences in financial sector development from one country to another can be better explained by differences in cross-

country economic growth rates in the long-run. He noted that Robinson (1952) had earlier declared that "where enterprise leads, finance follows" (meaning that the financial system responds to the growth in the economy) and that we need to seek elsewhere for engines of growth. Lucas (1988) was of the view that the role of financial factors in economic growth by economists was just too "over-stressed".

However, as the debate over the finance-growth relationship ranged on, more theoretical and empirical evidence emerged right from Cameron (1967); Gurly and Shaw (1967), Goldsmith (1969) as cited in Adenuga (2010), but especially McKinnon (1973) and Shaw (1973). McKinnon-Shaw strongly argued against financial repression by government regulation which impose non-market restrictions that hinders financial intermediaries of an economy from functioning at full capacity. Actions like government controls of banking sector, capital controls, ceiling on interest rate, control over liquidity and reserves requirements, etc. discourages both saving and investment and therefore hinders the development of the overall financial intermediation and economic growth. Financial intermediation spurs economic growth, earns higher rate of return on capital while growth promotes the implementation of costly financial structures, and so financial intermediation and economic growth are knitted in accord with the Goldsmith-McKinnon-Shaw view on economic development. (Greenwood and Jovanovic, 1990; King and Levine (1993); Levine (1997); Rajan and Zingales (1998); Levine and Zervos, (1998); Graff (1999); Wurgler (2000); Beck and Levine (2002); Adediran (2017); Algaeed (2021); Awe (2022); Ikeobi (2023) among others empirically supported the finance-growth theory; Demetriades and Hussein (1996); Arestis and Demetriades (1997, 1999); Arestis, Demetriades and Luintel, (2001); Andersen and Tarp (2003); Asongu(2015) among others disagreed; while Rioja and Valev (2004); Demetriades and Law (2006); Efobi, Tanankem, Asongu and Beecroft (2016) among others were cautious in interpreting this relationship since it does not work in all countries as it is being claimed. Levine (2021) noted that even though the importance of finance-growth relationship has been emphasized from Bagehot (1873) to Schumpeter (1912) to Gurley and Shaw (1955) and to Goldsmith (1969) especially, these two field of studies remained largely separate fields of inquiry until the 1990s.

The financial system is composed of financial market (stock or capital market) and financial institutions (banks). Their activities play a complimentary role to each other in that both capital market and banking development have a positive impact on each other and also on the overall growth and development of the economy (Levine, 1999). Banks and capital markets play crucial financial intermediation roles in promoting economic growth and financial stability of any economy by collecting short, medium or long-term deposits from the surplus units and lend it to the various deficit units of the economy (Olokoyo, 2011 & Ayielo, 2016) which, according to Malede (2014), may be individuals, government or business organizations. The capital market, which has played a crucial role in improving the private sector development in Nigeria, has received considerable attention in recent times since it is one of the major determinants of macroeconomic performance in every country (Awe, 2022). Moussa and Chedia (2016) noted that these **b**anks' loans and advances typically constitute the largest asset and the predominant source of income for banks. Thus, a well-established and functioning capital market and banking sector induce liquidity and thus ease credit constraints, identify and fund profitable business opportunities, allocate resources efficiently thereby diversifying risk, reduce the asymmetric

information problem and transaction costs, fasten technological advancement through human and physical capital accumulation. In the opinion of Abramova et al. (2022), there seems to be a unanimous conclusion that the financial development and deepening of countries have impacted positive growth because it provides the economic system opportunities to create value added, allocates resources efficiently and effectively, redistributes funds profitably, reduce the problem of moral hazard, adverse selection, or transaction costs, allows savings to accumulate, accelerate innovation activity in the economy. And so, Miller (1998) asserted that the notion that financial markets contribute to economic growth is too obvious, a proposition, for serious discussion.

In the same vein, the manufacturing sector which is the steering, compass, rudder and propeller of many nations' economic prosperities has been variously described as the engine, catalyst, driver, cornerstone, backbone, bedrock, foundation, veritable vehicle,..., of economic growth. Very few countries, among which are Canada and New-Zealand, have attained high levels of income through either agriculture or other natural resource extraction without developing a manufacturing base (Hallward-Driemeier & Nayyar, 2018). Again, Manyika et al(2012) posited that the transition from agriculture to manufacturing remains the only route to higher productivity and higher per capita income (higher living standards)for developing economies while in advanced economies, manufacturing still matters a great deal as the driving force for innovation and productivity for nearly three centuries since the 18th century. From Kaldor (1966) until now, much more empirical evidence found a significantly positive relationship between manufacturing output and overall GDP growth either for low-income, middle-income or high-income countries. Indeed, the effectiveness of the entire industrialization process is anchored on the effectiveness and efficiency of the manufacturing sector as technical foundations of long-term economic growth (Kaldor, 1967)

The role of the manufacturing sector in promoting economic growth and development is characterized by innovation and trade, learning by doing, creation of skilled jobs, the engine of infrastructural modernization, a wider and stronger multiplier effects(spillover effects) linking different sectors, on a forward or backward integration, for national development and catch up (Tybout, 2000; Szirmai, 2009; Naudé & Szirmai,2012; Okon & Osesie, 2017)

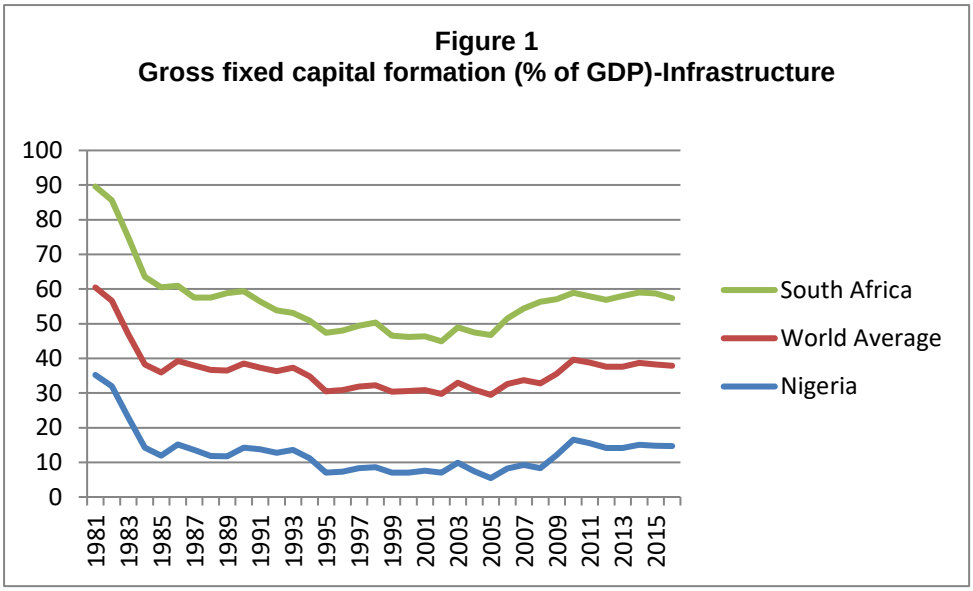
2.0 STATEMENT OF THE PROBLEM.

In Nigeria, the good news of the pivotal role the manufacturing sector plays in economic transformation of nations is still elusive and this has been confirmed empirically. There was a progressive decline in manufacturing rate of growth in Nigeria since independence in 1960. According to the World Bank(1971), between the period 1958/59 and 1962/63, the manufacturing sector grew at an average annual rate of 21%, but 6.7% per annum from1962/63 to 1966/67 and 10% from the 1965/66 to 1969/70. The Bank further observed then that the contribution of the Nigerian manufacturing sector to GDP was still small and that the manufacturing sector was characterized by low value added industries whether for the export industries involved in semi-processing of primary products or the import substituting industries engaged in putting final touches to imported inputs. It has been argued that there is a great disconnect between banks' credits and the output of manufacturing sectors meaning the Nigerian financial system has not been inclusive such that there has been a steady decline in the manufacturing sector (Nwanchukwu et al. ,2022).

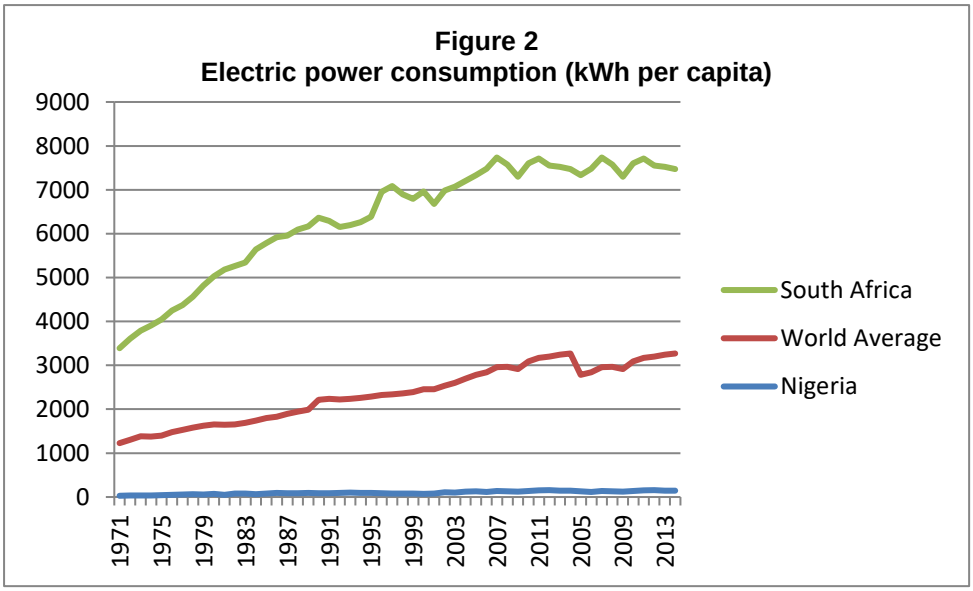
Several factors have been identified as determinants constraining the growth of the manufacturing sector in Nigeria. For example, Kwode and Buzugbe (2015) identified high bank rate of interest, inaccessible long-term funds from the capital market, infrastructural deficiencies, unstable electricity, foreign exchange volatility among others as factors militating against the growth of the manufacturing sector output. And this is in spite of government efforts in rolling out various strategies aimed at stimulating the manufacturing industry so as to enhance capacity utilization and industrial output (Modebe & Ezeaku, 2016). Also, IMF (2016) observed that Nigeria suffers from a serious infrastructure deficit, high cost of production, uncompetitive domestic production, ever-increasing real effective exchange rate and so, sustained effort should be made over the long term to ensure functioning transportation and power supply networks. The report further noted the importance of continuous provision of support for Medium Small and Micro Enterprises (MSMEs) through the use of financial services, and improving financial infrastructure because efforts to increase financial inclusion have not yielded the desired results without which production cost will remain very high. While WEF (2012) noted that accessibility to finance in any financial system has a significant effect on a country's real activity, economic growth, and overall welfare, the World Economic Forum's Global Competitiveness Report 2017-2018 showed that the four top most problematic factors in doing business in Nigeria are: inadequate infrastructure, foreign exchange rate regulations, access to financing and corruption (Akinmurele, 2017). Thus, Nigeria ranked 125th out of 138 countries with Mauritius (45th), Rwanda (58th), South Africa (61st), Botswana (63rd), Senegal (106th), Ethiopia(108th), Ghana(111st), Tanzania(113th) and Uganda(114th). In like manner, Nigeria ranked 161st out of 181 countries in the 2017 Index of Economic Freedom by the Heritage foundation (Heritage, 2017).

Mesagan and Ezeji (2017), Ogunsakin (2014), NBS (2014), Ku, Mustapha and Goh (2013), Akinmulegun & Oluwole (2013), Bigsten and Soderbom (2006), Soderbom and Teal (2001), Chete, Adeoti, Adeyinka and Ogundele (2016) identified poor infrastructure**,** inadequate electricity supply**,** inaccessibility to finance, low market capitalization, more short term loans of less than a year, high bank interest rates, high business risks, weak exchange rate, corruption, inconsistent government policies, overdependence on imported raw materials and finished goods, heavy dependency on agricultural inputs, smuggling of foreign products, very low level of investments among others as factors hindering the growth of the manufacturing output in Nigeria. According to Soderbom and Teal (2001), the problems and opportunities of the Nigerian economy can be better understood by making international comparisons of both macro and micro data as

shown in **Figure 1, Figure 2, Figure 3 and Figure 4** below



About $3 trillion was estimated to be required in infrastructure investment for the next 30 years for Nigeria to make any significant progress in bridging its infrastructure gap which is an enormous task, most especially, when the country is facing a huge fiscal revenue challenges from dwindling crude oil sales (AfDB, 2015)



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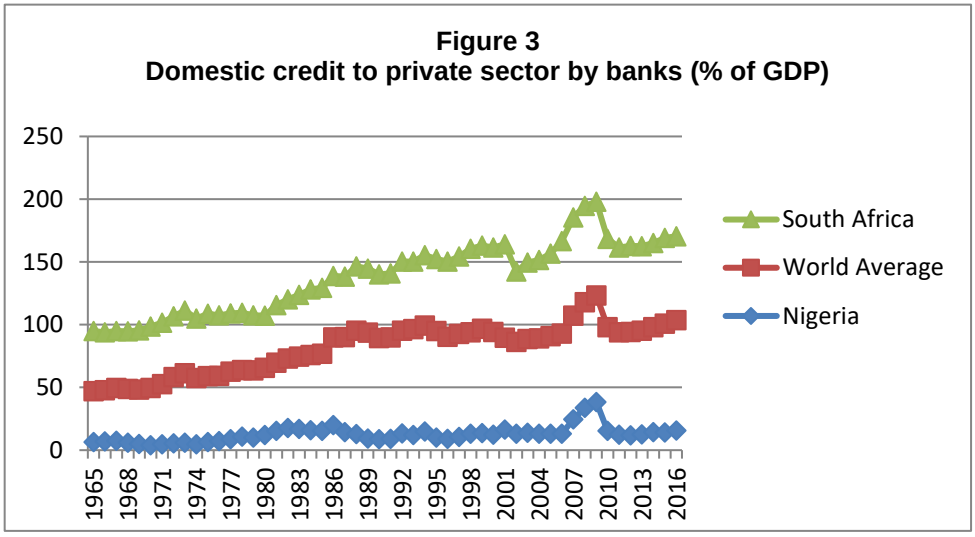

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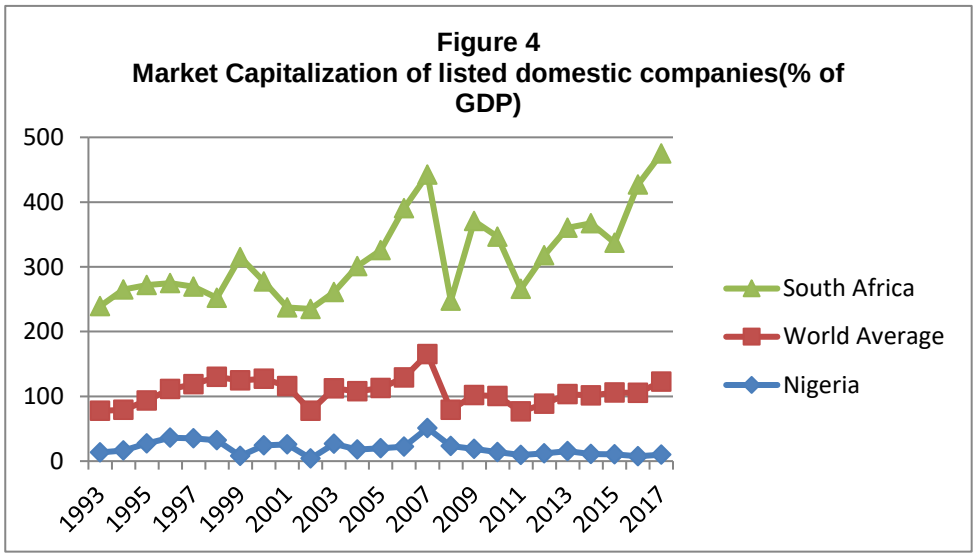

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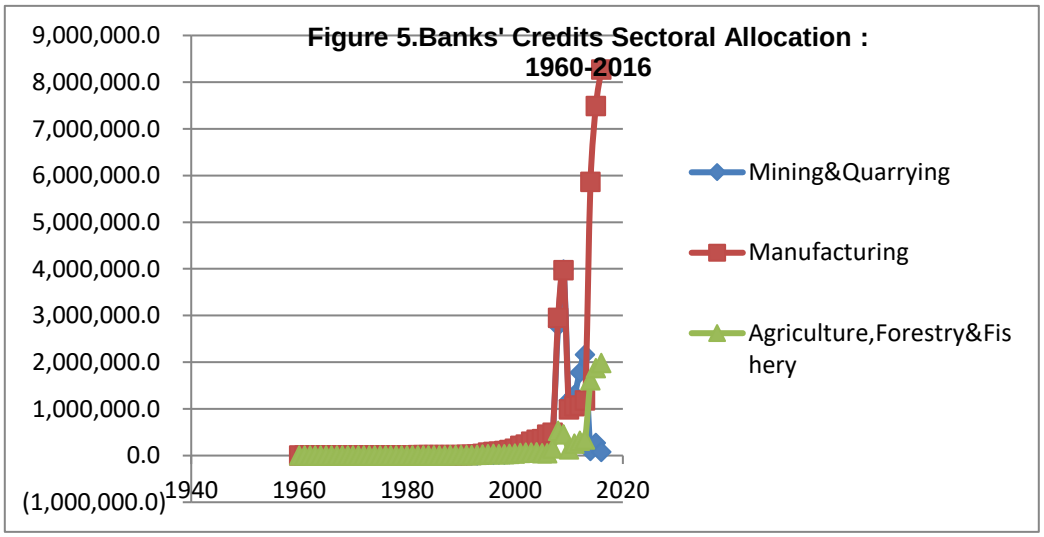
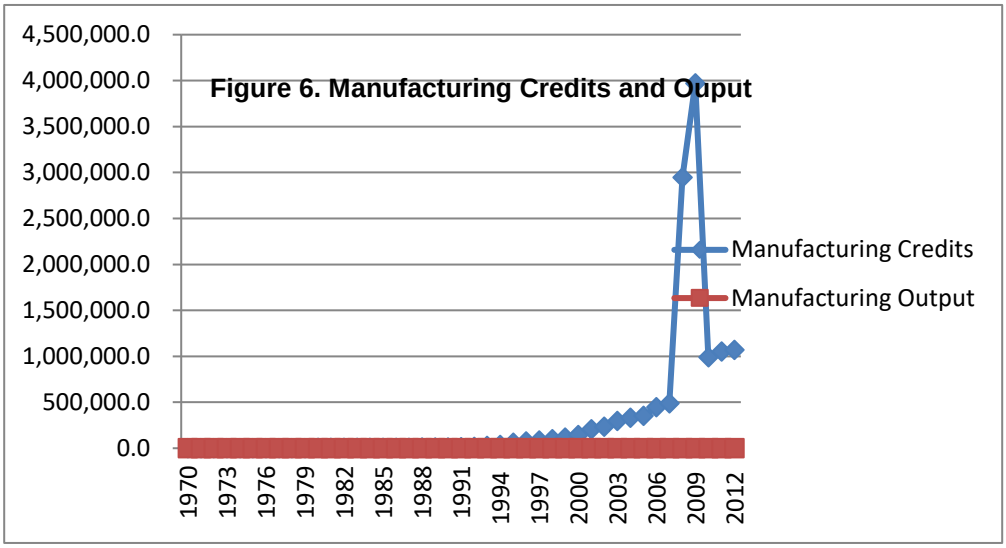
Although Emefiele, Godwin-the governor of Central Bank of Nigeria-was of the opinion that the level of credit in the domestic economy channeled to productive private sector is critically below the levels required to place our economy on the path of balanced, sustainable and economic growth (Nweze, 2018), the manufacturing sector has received the lion share of total domestic credit to the private sector over the years as shown in **Figure 5** below. In spite of this, the output from this sector has not reflected or justified the amount spent on it so far as shown in **Figure 6** below. This

point above was also emphasized by Egbon (1995) when he affirmed that the performance of the Nigerian manufacturing sector had never been impressive despite the fact that it has been the most favoured in the blueprint of various industrial policies meant to enhance the performance of households, firms and industries. The various Nigerian government failed over the years to develop the manufacturing sector due to over dependent on oil revenue, weak demand and low export market for domestically manufactured goods, products which made the manufacturing sector performance to be unimpressive despite various incentives and huge foreign exchange given by the government (Ojo & Oluwole, 2013)

Again, Ebong et al. (2014) stressed that industrialization is very critical to the development of any nation but its processes and performance, with special reference to the manufacturing sector in Nigeria, has not been significantly impressive whether through the import substitution or export promotion strategies.



Source: CBN various issues of statistical bulletin.



Source: CBN various issues of statistical bulletin.

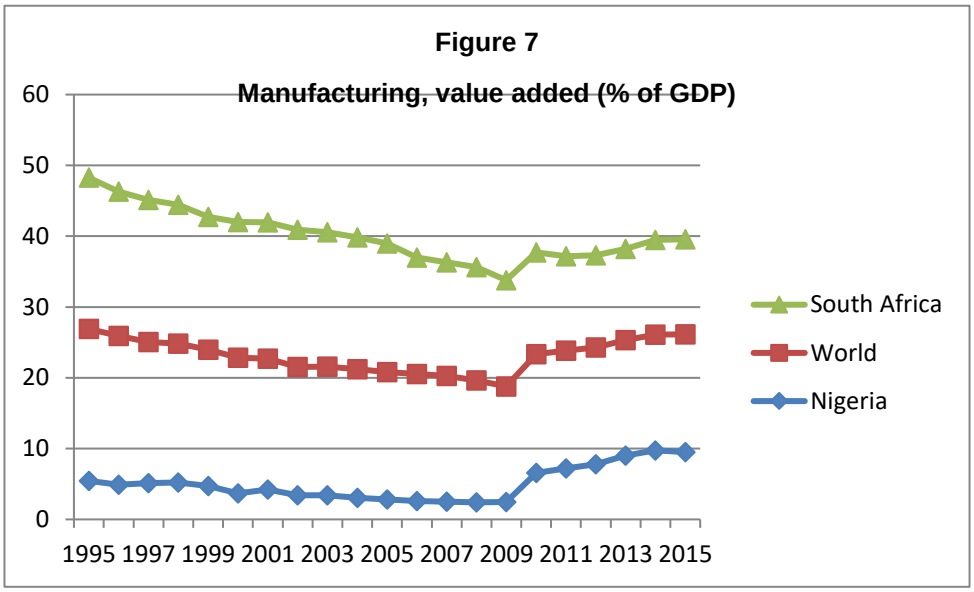
And so, recent international and local data revealed that the current state of the Nigerian manufacturing industry has left much to be desired (Loto, 2012). Report obtained by Vanguard from Rural Electrification Agency(REA) indicated that 13 states in Nigeria, including Bayelsa state, have access to less than 40% of electricity from the national grid. Also, small-scale generators account for about 50% of the population that have either limited or no access to the grid and, therefore, they spend about $14billion annually on inefficient and expensive power generation averaging $0.40/KWh or ₦140/KWh or more which heavily contributes to environmental pollution (Okafor, 2018)

Nigeria, with a very high corruption perception index(CPI), have been advised by Mr Yakubu Dogara-the Speaker of the House of Representatives-on the need for Nigerians to get value for the ₦123billion Nigerian Electricity Market Stabilization Fund (NEMSF) provided as subsidy for the operators in the electricity sector by the federal government noting that continuous unit price increases in electricity tariffs over the years have not profited Nigerians at all (Ovuakporie, 2018). This is coming just a week after the Chairman of the Association of Nigerian Electricity Distributors (ANED)-Mr Sunday Oduntan-hinted that Nigeria may not have a stable power supply in the next five years due to liquidity gap of about ₦1.3trillion, lack of improved generation resulting from electricity pricing mismatched, rising energy theft and lack of adequate investment in transmission and distribution network to mention but a few challenges(Jannah, 2018). Recall how Bill Gates castigated the Economic Recovery and Growth Plan(ERGP) launched in 2017 by the Buhari's administration as its execution priorities do not really reflect the people's needs since it gives more priority to physical capital over human capital. He noted that to anchor the economy over the long term, investments in infrastructure and competitiveness must go pari passu with investment in people since people without roads, ports and factories can never flourish just as good roads, ports and factories without skilled workers to build and manage them can never sustain an economy (Wakili,2018) It is, therefore, neither enough to develop the human capital without

developing alongside the infrastructural capital nor develop the infrastructural capital without developing alongside the human capital as they are both complement of each other.

The end result of the above neglects has been capacity underutilization for in Nigeria**,** most manufacturing firms do not operate at full capacity and this had threatened firms' productivity, growth and development of the sector and country (Okunade, 2018; Anyanwu, n.d.) which consequently led to a very low manufacturing value added to GDP as shown in **Figure 7** below.

Figure 7



Source: World Bank's WDI Metadata.

Thus, if in spite of the civil war the manufacturing sector's contribution to GDP annually from the 1965/66 to 1969/70 period was 10% and which according to the World Bank report was very low almost 50 years ago, how is it that the average contribution from 1995 to 2015 was 6.62% with year 2014 being the highest at 9.75% and year 2007 the lowest at 2.52% as can be seen from **Figure 7** above? This is the million dollar question begging for an answer which successive Nigerian governments woefully failed to proffer. Of the existing literature we reviewed in Nigeria, twenty discussed capital market and the manufacturing output while sixteen discussed bank credits and manufacturing output. To our knowledge, this may be the first combining these two indicators in a single paper. Thus, our main objective is to find out how the banking sector and the capital market have helped the manufacturing sector in Nigeria to achieve industrialization of the nation over the years.

Section one of this paper includes the introduction and statement of the problem while section two reviews the literature. Section three outlines the methodology while section four analyses the data and reports findings. Section five and six carry out some robust checks through granger causality test and model tests respectively while section seven concludes the paper and make some recommendations.

2.0. LITERATURE REVIEW.

2.1 THEORETICAL FRAMEWORK

2.1.1 LOAN PRICING (INTEREST RATE) THEORY.

Loan pricing decision is one important decision that any corporate lender should pay great attention to because it affects the financing, investment and dividend decisions which are core to the existence of that organization. Banks interest income constitute the greatest source of revenue and asset base of the banking industry, and so banks must prudently consider a safe interest rates between "too low" or "too high" level of interest rates. Banks, as rational profit maximizing firms, may desire to give credits to borrowers at a rate where their profits are highest and their risk level lowest. This rate may either be the competitively determined rate by the interplay of demand and supply of loanable funds- a Walrasian equilibrium/interest rate where there is no credit rationing-, or by the " bank-optimal" rate-where the demand for loan is greater than loan supply and this leads to credit rationing (Stiglitz & Weiss, 1981, 1987). Also, Casillas and Mitchell (2003) noted that the competitive equilibrium entails market-clearing prices whereby any excess of supply or demand is eliminated and so there should not be any quantity rationing. However, banks should not or may not be able at all time to charge high interest rates because of agency costs of adverse selection and moral hazard which stem from asymmetric information between lenders and borrowres-a feature of financial markets imperfection. Crawfordy, Pavaniniz and Schivardi (2016) observed that in competitive markets, the presence of more adverse selection causes prices (interest rates) to increase, but the opposite is the case where banks can leverage over their markup to lower prices and attract safer borrowers. Information asymmetry occurs in transactions when one party in a contract is better or more informed than the other party and this creates an imbalance in the ability of the uninformed to negotiate. According to De Wet (n. d.), asymmetrically distributed information are hidden or incomplete information from investors can affects a country adversely and consequently cause other more serious problems which might prove to be very costly in the long run. Aleem (1990) was of the opinion that one possible explanation for high interest rates ("usurious"rates) in non-institutional lender vis-à-vis institutional lender is the problem of asymmetric information where the lender does not have enough information about the ability and willingness of the borrower to repay a loan and so the lender passes on the costs of screening the borrower on the borrower. Again, these informational imperfections do have fundamental effects on how the capital market functions **(**Greenwald, Stiglitz & Weiss, 1984). Since the lender does not have any or enough information about the behaviours of the pool of borrowers, the chance of selecting the ones who may default is very high because "bad or risky borrowers" usually go for loans even when the rates are very high. Capra, Comeig and Fernandez (2007) observed a positive correlation between the chances of selecting "bad" borrowers as the rate of interest rises since increase in interest rates is more costly for safe borrowers than risky borrowers because of the relatively high probability that the risky borrowers may not pay back their debts. Helsen and Chmelar (2014) noted that the negative effects of allowing interest rates to rise unchecked is a reduction in the quality of the pool of borrowers as low-risk, low-yield borrowers are pushed out while riskier borrowers are attracted instead. One consequence of these high interests rates from lenders is that high-risk, high-yield borrowers are pushed to projects with a lower probability of success but with higher payoffs when successful-the moral hazards effect. The end results is that there is a decrease in the overall net returns to the bank due to rising interest rates as the default

losses may rise faster than the increases in interest income. Bester (1985) was also of the opinion that borrowers with high probability of default would like to choose a contract with a higher interest rate and even with a lower collateral than borrowers with low probability of default. Thus, if firms in the manufacturing sectors'(emphasis) have difficulties in obtaining capital, and at a high cost of capital when it can ever be obtained, that may act as important impediments to improvements in productivity (Stiglitz, 1990)

2.2 EMPIRICAL LITERATURE

2.2.1 CAPITAL MARKET DYNAMICS AND THE MANUFACTURING SECTOR

Ikeobi (2023) explored how capital market facilities had responded to the growth of the Nigerian manufacturing sector. Annualized time series data which spanned 2008 to 2020 obtained from Central Bank of Nigeria (CBN) statistical bulletin was used. While the independent variables were corporate bonds, total listed equities (TLE) and market capitalization; the dependent variable was output of manufacturing sector. The ordinary least squares (OLS) results revealed that market capitalization positively and significantly impacted output of manufacturing sector output but corporate bonds negatively impacted it.

Awe (2022) explored how stock market in Nigeria responded to manufacturing growth in Nigeria. Annualized time series data which spanned 1985 to 2020 obtained from CBN statistical bulletin was used. While the independent variables were all share index (ASI), equity (EQT), Industrial loan (INL) and real interest rate (RINT); the dependent variable was manufacturing output (MOT). The Vector Autoregression (VAR) model results revealed that only the lags of ASI and EQT positively and significantly impacted MOT.

Algaeed (2021) carried out an empirical assessment whether capital market development had any influence on the Nigerian economic growth. The study used times series data between 1985 and 2018 which were obtained from Saudi Arabian Monetary Agency. While the independent variables were total market capitalization (MV), value of shares (VS), share price index (INDEX), total number of shares traded (NS) and total volume of transactions (VT); the dependent variable was gross domestic product (GDP). The Fully Modified Ordinary Least Squares (FMOLS) regression results showed that MV and VS had a negative and statistical relationship with GDP; INDEX and VT had a positive and statistical relationship with GDP while NS was insignificant.

Tembo (2020) embarked on an empirical assessment if there was any relationship between capital market and economic growth in Zambia. The study used annual times series data between 1993:1 and 2017:4 which were obtained from The Global Economy data bank, Zambia Central Statistics Office, Lusaka Stock Exchange and World Bank WDI. While the independent variables were market capitalization (MRKTCAP), number of trades (NOTRDS) and volume of shares (VOLSHARE); the dependent variable was economic growth rate (GDP). The OLS regression results showed that only MRKTCAP positively impacted GDP. Ibitomi et al. (2020) carried out a study to assess empirically the impact of capital market on manufacturing sector of the Nigerian economy. Time series data covering the period 1986 to 2010 sourced from National Bureau of Statistics (NBS) and CBN statistical bulletin were used. The dependent variable was

manufacturing output (MANQ) while the independent variables were value of new issues (VNI), total number of deals (TND) and stock market capitalization (SMC). The OLS results revealed that SMC and TND relationship with MANQ was positively significant while that of VNI with MANQ was negatively significant. Egbuche and Nzotta (2020) attempted to analyze the extent to which stock market impacted manufacturing sectors output in Nigeria. The annual time series data which spanned 1981 to 2018 obtained from CBN statistical bulletin was used. While the independent variables were total new issues (TNI), market capitalization (MC), equity stock (EQS) and volume of transaction (VOT); the dependent variable was manufacturing sector output (MSO). The OLS results revealed that MC, TNI and VOT relationship with MSO was positively significant while that of EQS with MANQ was negatively significant. Adoms et al. (2020).sought to examine empirically the impact of capital market on the Nigerian, Kenyan and South African economic development. The study used annual time series data starting from 1990 to 2018. The dependent variable was human development index (HDI) while stock market turnover ratio (TR), value of stock traded (VST) and stock market capitalization (SMC) were the independent variables. The OLS results revealed that for South Africa, TR negatively and statistically impacted HDI while VST positively and statistically impacted it. For Nigeria, only SMC positively and statistically impacted HDI. For Kenya, only VST positively and statistically impacted HDI. Ubesie et al. (2020) attempted to assess if there was any relationship between capital market and economic growth in Nigeria. Time series data from 1980 to 2015 sought from various sources was used. While the independent variable was real gross domestic product (RGDP); stock market capitalization (SMC), labour force (LABF), gross fixed capital formation (GFCF) and savings accumulation (SAV) were the independent variables. The OLS results revealed that all of the variables of interest except LABF positively and statistically impacted RGDP.

Ubesie and Ude (2019) explored how capital market in Nigeria responded to the growth of manufacturing firms. Annualized time series data which spanned 1990 to 2016 obtained from CBN statistical bulletin was used. While the independent variables were all share index (ASI), total listed equities (TLE) and market capitalization (MCAP); the dependent variable was output of manufacturing sector (OMS). The OLS results revealed that only MCAP positively and significantly impacted OMS. Uruakpa (2019) studied the relationship between capital market and the Nigerian industrial sector development. Secondary time series annual data obtained from CBN statistical bulletin covering the period 1985 to 2017 were used. The dependent variable was industrial sector output (IND) while the independent variables were value of transactions (VTR), market capitalization (MCP) and all share index (ASI). The OLS regression results revealed that while MCP and VTR positively and significantly impacted IND; ASI impact was insignificant.

Erhijakpor and Buzugbe (n. d.) sought to investigate the impact which *capital market have had on the Nigerian manufacturing sector growth.* Annualized time series data which spanned 1981 to 2015 obtained from CBN statistical bulletin was used. While the independent variables were all share index (ASI), value of traded securities (VTS), market capitalization (MCAP), exchange rate (ER) and interest rate (IR); the dependent variable was manufacturing sector growth index (MSGI). The OLS results revealed that MCAP and VTS positively and significantly impacted MSGI; ASI and ER negatively and significantly impacted it.

Okunade (2018) investigated the impact that capacity utilisation had on manufacturing firms' output in Nigeria. Time series data spanning 1981 to 2016 were used and the Autoregressive Distributed Lag (ARDL) model technique was employed to carry out the analysis. The results showed that only gross capital formation positively and significantly affect manufacturing firm's output in Nigeria as capacity utilisation rate and labour force participation rate were insignificant in explaining manufacturing firm's output. Onakoya (2018) empirically examined the impact of interest rate, inflation rate, unemployment rate. real exchange rate, money supply and *GDP* in the previous year on the output of the manufacturing sector in Nigeria. The study made use of time series data spanning the period 1981 to 2015 which were analyzed with the Vector Error Correction Model (VECM) technique. The results showed that manufacturing output relationship : with GDP in the previous year and unemployment rate were positively significant, with real exchange rate and money supply were negatively significant but with interest rate and inflation were not significant at all.

Arikpo et al. (2017) evaluated the impact that government revenue and expenditure (fiscal policy) in Nigeria had on the performance of the manufacturing sector. Using time series data from 1982 to 2014 which were analyzed the OLS regression method. The results revealed that government expenditure was positively significant in promoting growth in the manufacturing sector. Ejiogu et al. (2017) investigated the impact of globalization on the performance of manufacturing firms in Port Harcourt. The researchers used the cross-sectional survey method to collect 160 out of 211 copies of the structured questionnaires administered along with personal interviews. The results showed that there was a positive and perfect relationship between globalization and firms performance. Ariwa et al. (2017) empirically assessed how stock market liquidity and efficiency impacted on Nigerian manufacturing sector performance. Time series data covering the period 1985 to 2014 were analyzed with the Autoregressive Distributed Lag (ARDL) bounds test . The result of the test showed that the number of deals and stock market efficiency were positively and significantly related with the manufacturing sector output while turnover ratio, inflation rate and market liquidity were insignificant in explaining manufacturing sector performance.

Madumere and Wokeh (2016) carried out an empirical investigation on how the efficient allocation of funds by the Nigerian capital market triggered the growth of the Nigerian manufacturing sector output. The researchers used time series data between 1998 and 2012 which were analyzed with the OLS regression methods. Their findings revealed that All Share Index was positively and significantly related with the manufacturing sector output; Total Listed Securities was significantly negative in relation to manufacturing sector output while market capitalization and value of transaction were not significant at all in explaining manufacturing sector performance. Campbell and Asaleye (2016) attempted to empirically provide evidence on the impact of financial sector reforms on the growth of the manufacturing sector output in Nigeria. Time series data from 1970 to 1985 (pre-reform era) and from 1986 to 2013 (post-reform era) were analyzed using the descriptive statistics and Vector Autoregressive Model (VAR). The results of the analysis showed that although there was an increase in post-reform gross domestic product (GDP) which indicated that the financial sector performed better in the post-reform era than in the pre-reform era, however, the growth of manufacturing output indicator was lower in the post- reform era than in the pre-reform era. Kamaku and Waari (2016) examined firm-specific determinants of

manufacturing firms growth in Kenya. A panel data of a sample of 30 manufacturing firms previously captured by the World Bank in Kenya from the year 2002 to 2011 were used in this study. The dependent variable used was sales growth while capital stock, number of employees, leverage, labour cost and energy cost were the independent variables. The results of the OLS regression revealed that while capital stock was positively and statistically significant with sales growth, wage bill, electricity costs and fuel costs were significantly negative. Ikeobi et al. (2016) assessed the impact capital market had in the provision of funds to the manufacturing sector in Nigeria. Panel data from 2003 to 2014 on 24 manufacturing firms were employed in this study . While return on equity (ROE) was the dependent variable as proxy for firm performance, share capital, turnover ratio and annual market capitalization of the firms were the independent variables. The results of the OLS regression model revealed that share capital and ROE were positively and significantly related while the relationship between market capitalization and ROE was negative and significant.

Falade and Olagbaju (2015) carried out a research to investigates the extent to which government expenditure affected manufacturing sector output in Nigeria. Time series data between 1970 to 2013 were used and analyzed with the estimated ECM parsimonious models. The results showed a positively significant relationship between government capital expenditure and manufacturing sector output in Nigeria but a negative and significant relationship between recurrent expenditure and manufacturing sector output. Kwode and Buzugbe (2015) sought to investigate the extent to which the contribution of the capital market Nigeria has had in the development of manufacturing industries. The study made use of time series secondary data from 1970 to 2012. The results of the OLS and ECM revealed that market capitalization, exchange rate and interest rate were not significant determinants of the growth of manufacturing sector output except total listed securities which was positively significant and volume of transactions which was negatively significant. Iweriebor et al. (2015) attempted to empirically investigate the impact that public spending had on the industrial sector in Nigeria. Time series data from 1980 to 2013 were analyzed with the ECM technique. The results indicated that public spending had no significant impact on industrial production in the short run and moreover in the long run, the impact of government spending on industrial production was weak. Egbe et al. (2015) used annual time series data between 1980 and 2012 to evaluate the relationship that exists between capital market and the development of the industrial sector in Nigeria. The ECM results revealed that market capitalization, real gross domestic product and number of deals were positively and statistically significant with industrial output while gross domestic investment and value of transaction were negatively but statistically significant except exchange rate which was negatively insignificant. Onakoya et al. (2014) investigated the sustainability of the Nigerian government monetary policy on the growth of the manufacturing sector. Time series data from World Bank Development Indicators between 1981 and 2015 and CBN statistical bulletin from 2005 to 2015 were used in this study. The results of the vector error correction model (VECM) showed that inflation rate and broad money supply were positively and significantly related with manufacturing sector performance while external reserves relationship was negatively significant.

Odior (2013) used time series data between the period 1975 and 2011.to investigate the impact of macroeconomic factors on manufacturing productivity in Nigeria. The results of the ECM

estimate indicated that credit (loans and advances) to the manufacturing sector and foreign direct investment had a positive and significant relation with the level of manufacturing productivity in Nigeria, inflation was negatively significant while broad money supply had insignificant impact. Sola et al. (2013) investigated the performance of the Nigerian manufacturing sector for sustainable economic development. The results of the time series data between 1980 and 2008 showed that capacity utilization and import had a positive and significant relationship with manufacturing performance while export, exchange rate and investment relationship with manufacturing performance was negatively significant. Eze and Ogiji (2013) analyzed the role that fiscal policy played in the growth of the manufacturing sector output in Nigeria. Time series data from 1990 to 2010 obtained from Central Bank of Nigeria statistical bulletin were used in this study. The results of the OLS and ECM showed that government expenditure had a positive and significant impact on manufacturing sector output while the impact of government revenue on manufacturing sector output was also significant but negative.

Onakoya et al. (2012) in their study, evaluated the impact of trade openness on the performance of the manufacturing sector of the Nigerian economy. Time series data between1975 and 2010 were analyzed using Error Correction Model (ECM) technique. The results revealed that trade openness was significantly and positively related to the performance of the manufacturing sector, inflation rate and exchange rate impacted negatively on the sector performance while the ECM coefficient showed that growth in the manufacturing sector adjust slowly in the economy. Ademola (2012) studied the relationship between government expenditures and the contribution of the Nigerian manufacturing sector to the growth of the nation's economy. Time series data between 1981 and 2010 were analyzed with the ordinary least squares (OLS) regression method. The results showed that while manufacturing sector output was significantly and positively related with gross domestic product (GDP), government expenditures relationship with GDP was negatively insignificant.

Tabi and Ondoa (2011) explored the effect which trade opening had on the Cameroonian government's efforts in the industrialization of the manufacturing sector. Data over the period 1967 to 2007 obtained from the World Bank were analyzed using the Error Correction Model(ECM). The results of the research showed that there is a long-run relationship between trade opening and industrialization of the manufacturing sector but that this relationship is negative.

2.2.2 BANKS'CREDITS AND THE MANUFACTURING SECTOR

Rodríguez and Chávez (2023) studied the relationship between bank credits and the Mexican economic activities. Secondary time series monthly data obtained from 7 companies in the manufacturing sectors covering the period July 2009 to March 2020. The dependent variable was manufacturing sector production value while the independent variables were bank credit, real interest rate, money base and industry gross fixed investment. The autoregressive distribution lag (ARDL) regression results showed that bank credit positively and significantly impacted output.

Nwachukwu et al. (2022) studied the relationship between bank credit and manufacturing sector's output in Nigeria. Secondary time series annual data obtained from CBN statistical bulletin covering the period 1981Q1 to 2015Q4 were used. The dependent variable was manufacturing sector output **(**MANPUT) while the independent variables were banks' credit to government (NET), banks' credit to private sector (CPS), maximum Lending Rate (LR) and broad money supply (M2). The Error Correction Model (ECM) regression results revealed that while none of the variables was statistically significant on the short-run, CPS and NET had a negative and significant effect on MANPUT and M2 had a positive and significant effect on MANPUT on the long-run.

Yua et al. (2021) undertook a research to determine the extent to which banks' credits influenced industrial output in Nigeria. The study uses annual secondary time series data obtained from Central Bank (CBN) statistical bulletin spanning the period 1981 to 2018. The dependent variable was manufacturing output (MO) while the independent variables were deposit money bank loans (DMBL), deposit money bank lending rate (LR), broad money supply (MS) and inflation rate (INFL). The regression results of the Autoregressive Distributed Lag (ARDL) bounds test indicated that DMBL negatively and statistically impacted MO; MS positively and statistically impacted MO while LR and INFL were insignificant. Ashiru et al. (2021) researched on the extent to which bank credit impacted manufacturing sector output in Nigeria. Annual secondary time series data obtained from Central Bank (CBN) statistical bulletin and World Bank World Development Indicators spanning the period 1981 to 2019 was used. The dependent variable was manufacturing sector output (MANQ) while the independent variables were credit to the manufacturing sector (CMAN) and lending interest rate (LINT). The regression results of the Non-linear Autoregressive Distributed Lag (NARDL) bounds test indicated that CMAN was positively and statistically related to MANQ, LINT relationship with MANQ was insignificant.

Okere et al. (2020) tried to determine if there was any causal linkage between bank credits and manufacturing sector output in Nigeria. Annual time series data over the period 1981 to 2018 collected from CBN statistical bulletin was used in the study. The dependent variable was manufacturing sector output (MOS) while the independent variables were credit to manufacturing sector (CMS), inflation rate (IFR), financial deepening (FSD) and bank interest rate (ITR). The ARDL results showed that only ITR statistically and positively impacted MOS.

Ademu et al. (2019) reviewed the relationship between bank credit and the Nigerian manufacturing sector output.. The study used annual time series data spanning 1986 to 2017 collected from CBN statistical bulletin. The dependent variable was manufacturing sector outputs (MSO) while the independent variable was bank credits (BC). **The NARDL results showed that both BC_POS and BC_NEG** positively and significantly impacted MSO.

Mesagan et al. (2018) carried out an empirical investigation on how the performance of the manufacturing sector was enhanced by financial development in Nigeria. Using time series annual data which cover the period from 1981 to 2015, the results of the ECM showed that money supply positively enhanced manufacturing capacity utilisation and manufacturing output in the long run, but impacted negatively on manufacturing value added while all the three manufacturing sector indicators were positively enhanced.by credit to private sector . Andabai and Eze (2018) studied

the relationship between the growth of the Nigerian manufacturing sector and bank credit. Secondary data obtained from Central Bank of Nigeria(CBN) Statistical Bulletin covering the period 1990 to 2016 were used. The results of the Vector Error Correction Model showed that bank credit did not significantly and statistically affect manufacturing sector growth in Nigeria.

Ogunmuyiwa et al. (2017) reviewed the relationship between bank credit and the growth of the manufacturing sector in Nigeria. The study used annual time series data from 1999 to 2014 which were analyzed with the and the Autoregressive Distributed Lag (ARDL) Bounds test. The result indicated that bank credits impacted positively and significantly on the growth of the manufacturing output. Ume et al. (2017) studied the impact of bank credit on the output of the manufacturing sector in Nigeria using annual time series data which spanned from 1986 to 2013. The results of the ARDL Bounds cointegration test and ECM showed that while volume of bank credit, ratio of credit to the private sector to GDP and exchange rate positively and significantly influenced the growth of manufacturing output, interest rate negatively and significantly affected the growth. Muchingami et al. (2017) explored the relationship between bank lending and manufacturing output to determine how bank lending stimulates the growth of the manufacturing sector. Using annual times series data between 2009 and 2015 which were analyzed with the OLS regression method, the result showed that while commercial bank loan advances to manufacturing sector was positively significant with manufacturing volume index, exchange rates were negatively significant. Onakoya et al. (2017) sought to investigate the impact which monetary policy has had in sustaining the growth of the manufacturing sector in Nigeria. The study made use of annual time series data spanning the period from 1981 to 2015. The results of the VECM method showed that broad money supply *and* inflation rate were positively and significantly related with manufacturing sector output, external reserves was negatively and significantly related with manufacturing sector output while interest rate and exchange rate were not significant at all. Bada (2017) researched on the relationship that exists between manufacturing and agricultural sectors growth and banks' credits. Annual time series data from 1984 to 2014 were used in the study and analyzed with the vector auto-regressive (VAR) models. The results showed that bank credit to private sector impact on manufacturing output was positive and significant while agricultural credit scheme guarantee fund and broad money supply were negatively significant .

Ogbeide and Joshua (2016) in a study used annual time series data spanning the period between 1981 and 2014 to investigate the extent that domestic financial reform impacted on manufacturing performance in Nigeria. The results revealed that commercial banks' credit to the manufacturing sector, the prime lending rate including the lag of prime lending rate and natural resource rent (% of GDP) were all positively and significantly related to real manufacturing sector GDP. Nwandu (2016) sought to examine empirically the impact of rising interest rates on the Nigerian manufacturing sector performance. The study used annual time series data starting from 1981 to 2015 and data analysis was done using the OLS regression method. The result revealed that rising interest rate was negatively insignificant with respect to the contribution of the manufacturing sector to GDP as well as the average manufacturing capacity utilization. John and Terhemba (2016) attempted to assess the impact of commercial bank credit on the Nigerian manufacturing sector. Time series data from 1980 to 2015 was analyzed with the Cochrane-Orcutt regression method. The results revealed that while loans and advances and broad money supply were

positively significant with manufacturing output while inflation rates and lending rates were negatively but statistically significant.

Toby and Peterside (2014) attempted to analyze the extent to which banks financing impacted on agricultural and manufacturing sectors output in Nigeria. Using annual time series data which spanned from 1981 to 2010, the results of the descriptive and inferential statistics showed that the impact which banks' credits had on the manufacturing and agricultural output was still significantly limited. Ogar et al. (2014) researched on the extent to which commercial bank credit determined the output of the manufacturing sector in Nigeria. The researchers used time series data from 1992 to 2011 which were analyzed with the OLS regression method. The results indicated that commercial bank lending and the manufacturing sector output positive and statistically significant.

Mamman and Hashim (2013) carried out a study to assess empirically the impact of the private sector credit on the real sector of the Nigerian economy. Using time series data covering the period 1986 to 2010 which were analyzed with the OLS regression method, the results showed that credit to private sector (CPS) impacted negatively and significantly on the real sector, aggregate liquid liabilities (M2) impacted positively and significantly on the real sector while deposit money banks' (DMBs) assets impact was insignificant. Owolabi et al. (2013) tried to determine if there was any causal linkage between reforms in the banking sector and manufacturing sector output growth. Annual time series data over the period 1970 to 2008 analyzed with Cointegration and Granger-causality techniques were used in the study. The results revealed that real rate of interest, exchange rate, lending interest rate and bank assets representing proxies for banking reforms all had positive and significant impact on manufacturing sector's output growth in Nigeria. However, deposit money banks' liquid liabilities (M2/GDP i.e. ratio of broad money (M2) to nominal GDP) as well as interest rate spread impact on MGDP (manufacturing output growth) was negatively significant. Imoughele and Ismaila (2013) empirically investigated the impact of commercial bank credit accessibility on agricultural, manufacturing and service sectors output in Nigeria. Time series annual data covering the period from 1986 to 2010 were tested with the OLS regression technique and error correction model (ECM). The results showed that total government expenditure on agriculture, total bank credit to agricultural sector and broad money supply impacted positively and significantly on agricultural sector's output while inflationary rate impact was significantly negative. Interest rate and total bank credit to the manufacturing sector were positively significant with manufacturing sector output while broad money supply and total bank credit to the services sector were positively significant with services sector output.

Obamuyi et al. (2010.) examined the effect that banks' lending on economic growth as well as on the manufacturing output in Nigeria. The study used times series data between 1973 and 2009 which were tested with the cointegration and vector error correction model (VECM) techniques. The results indicated that there was a positive and significant relationship between manufacturing capacity utilization and bank lending rates.utilization and bank lending rates.

3.0 METHODOLOGY

3.1 DATA DESCRIPTION

This study investigates the relationship, if any, that exists between the dependent variable (manor) and each of the independent variables(mcr, bcrm, bcrps, tvtr and asi). Annual time series secondary data obtained from the Central Bank of Nigeria(CBN) statistical bulletin and Index mundi covering the period 1987-2020 was used in this research.

3.2 MODEL SPECIFICATION.

With respect to our variables of interest in this study, the hypothesized functional long-run relationship of manufacturing output equation and four other macroeconomic variables is given below as:

$$MANOR_t = f(MCR_t, BCRM_t, TVTR_t, ASI_t) \quad (1)$$

where MANOR = manufacturing output ratio (manufacturing output/GDP); MCR = market capitalization ratio (market capitalization/GDP); BCRM = bank credit ratio for manufacturing firms (banks' credits for manufacturing firms/GDP); TVTR = total value traded ratio (total value traded/ GDP), ASI (all shares index)

By taking the log of natural numbers on both sides or by expressing it as double log-linear estimation model, equation (1) above can be re-written as:
$$logMANOR_t = \beta o + \beta_1 logMCR_t + \beta_2 logBCRM_t + \beta_3 logTVTR_t + \beta_4 logTVTR_t + \mu_t \quad (2)$$
where: β_0 is the intercept or constant; β_1, β_2, β_3 and β_4 are the regressors coefficients; log is the logarithm of natural numbers; μ_t is the white noise error term/ stochastic disturbance term which is serially uncorrelated disturbance with zero means and constant variance-covariance (Pesaran, 1995); t is the index of time. A priori expected signs of coefficients are $\boldsymbol{\beta_1}>0$, $\boldsymbol{\beta_2}>0$, $\boldsymbol{\beta_3}>0$, $\boldsymbol{\beta_4}>0$.

3.3 DESCRIPTION OF ESTIMATION TECHNIQUE.

This study uses the autoregressive distribution lag (ARDL) bounds testing approach to cointegration, which was developed by Pesaran and Shin (1999) in estimating both the short-run dynamic and long-run relationship among the variables of interest. The test for the existence of cointegration among variables has been considered for decades. The two common ones are the two-step residual-based approaches of Engle and Granger (1987); Johansen(1991, 1995) as well as the system-based reduced rank regression procedure of Johansen & Juselius (1990) which considered the null hypotheses of no-cointegration. These and other methods involve pre-testing for unit roots in which the variables of interest must be integrated of the same order. The ARDL approach, however, has an added advantage of yielding normal asymptotically consistent estimates of the long-run coefficients whether or not the underlying regressors are purely I(1), i.e. nonstationary, purely I(0), i.e. stationary or mutually cointegrated (Pesaran & Shin, 1995, 1999; Pesaran, Shin & Smith, 2001). The essence of pre-testing in ARDL bounds testing approach is only to ensure that none of the variables is of the second order, i. e. I(2) for short. The ARDL-based approach is very efficient when compared to other traditional cointegration techniques more importantly it is applicable for small samples (such as the case in our study) and for finite sample sizes. It permits the use of different optimal lag orders for different variables and the use of an appropriate lag length is sufficient to correct for both residual serial correlation and problem of endogeneity bias in variables (Pesaran & Shin, 1999). It allows a single equation to be used to

estimate the relationships among variables, both for the long-run and the short-run parameters simultaneously. This single-equation set-up makes it very easy to interpret and implement (Salisu, 2015)

The general form of the ARDL (p, q) model is written as:

$$Y_t = \alpha_0 + \sum_{i=1}^{p} Y_{t-1} + \sum_{i=0}^{q} X_{t-i} + \mu_t \quad (3)$$

where p is the optimum lag order of the dependent variable and q is/are the optimal lag order(s) of the independent variable(s).

Equation (2) above can be represented in an ARDL model as:

$$\Delta logMANOR_t = \beta o + \beta_1 logMCR_{t-1} + \beta_2 logBCRM_{t-1} + \beta_3 logTVTR_{t-1} + \beta_4 logASI_{t-1} + \sum_{i=1}^{p} \pi_1 \Delta \log MANOR_{t-1} + \sum_{i=1}^{q} \pi_2 \Delta log MCR_{t-1} + \sum_{i=1}^{q} \pi_3 \Delta log BCRM_{t-1} + \sum_{i=1}^{q} \pi_4 \Delta log TVTR_{t-1} + \sum_{i=1}^{q} \pi_5 \Delta log ASI_{t-1} + \mu_t \quad (4)$$

where β_1 to β_4 are the long-run multipliers of the regressors, π_1 to π_5 are the short-run dynamic coefficients of the regressors. Δ is the first order difference operator.

In order to establish that a long-run relationship exists among the variables considered, we first estimate Equation 4 above to obtain the short-run regression output. Secondly, we perform a joint significance test using the bounds testing to cointegration technique. The null hypothesis of there is no cointegration is Ho: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ against the alternate hypothesis of there is cointegration is Ho: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$.

Pesaran, Shin and Smith (2001) provided two sets of asymptotic critical values which are the I(0) and the I(1) bounds. Of these two polar cases, they assumed that all the regressors/forcing variable ($\mathbf{x_t}$) are either on the one hand, purely I(0) or, on the other hand, purely I(1). We then decide if a long-run relationship exists among the variables or not by comparing the Wald test(F-statistic) with the asymptotic critical I(0), I(1) values. If the F-statistic is higher than the I(1) bound, we reject the null hypothesis of no cointegration and accept the alternate hypothesis that there is cointegration. However, if the F-statistic is lower than the I(0) bound, we would not fail to reject the null hypothesis of no cointegration. If the F-statistic is between the I(0) and I(1) bound, the result is inconclusive.

Once we have established that there is cointegration among the variables of interest, we go ahead and estimate the error correction version of the ARDL model in Equation 5.

$$\Delta logMANOR_t = \pi_0 + \sum_{i=1}^{p} \pi_1 \Delta log MANOR_{t-1} + \sum_{i=1}^{q} \pi_2 \Delta log MCR_{t-1} + \sum_{i=1}^{q} \pi_3 \Delta log BCRM_{t-1} + \sum_{i=1}^{q} \pi_4 \Delta log TVTR_{t-1} + \sum_{i=1}^{q} \pi_5 \Delta log ASI_{t-1} + \gamma ECT_{t-1} + \mu t \quad (5)$$

where π_1 to π_5 are the short-run dynamics coefficients of the model's adjustment long-run equilibrium. γ is the speed of adjustment parameter which is always negative in most cases but could be zero. At -1, γ signifies an instantaneous and perfect convergence to equilibrium while at 0 means that there is no convergence to equilibrium after the process had a shock. ECT_{t-1} is the error correction term/ equilibrium correction term which is the extracted residuals from the regression of the long-run model, i. e., equation 5, forming the ARDL-ECM model.

We shall also carry out some residual diagnostic tests such as serial correlation LM test, normality test and heteroscedasticity for the ARDL model goodness of fit. To test for model stability diagnostics tests, the cumulative sum (CUSUM) test and the cumulative sum of squares test (CUSUMSQ) of the recursive residuals will be used. This ensures that, within the 5 percent critical bounds, there is no structural break/instability or model misspecification.

4.0 DATA ANALYSIS AND DISCUSSION OF RESULTS.

4.1 Unit Roots Tests. Pre-testing for stationarity of the variables is not compulsory or a necessary condition before the application of the ARDL bounds testing approach. However, we do this in order to forestall an exercise in futility when it is later discovered that I(2) variables are included (Nkoro & Uko, 2016). The results of the tests statistics and their p-values are as shown in Table1 below. For the Augmented Dickey Fuller (ADF) unit root tests, while log(manor) and log(bcrm) are I(0); log(mcr), log(tvtr) and log(asi) are I(1). For the Phillips Perron (PP) unit root tests in, while only log(manor) is I(0); log(bcrm), log(mcr), log(tvtr) and log(asi) are I(1). They only have a mixed outcome with respect to log(bcrm). Although the ADF and the PP are commonly used to test for unit roots, the ADF test which is very simple to construct can achieve a better and more reliable results than others (Arltová and Fedorova, 2016). We, therefore, appled the ADF, for it is generally considered to be superior because of its popularity and widespread applicability (Nkoro & Uko, 2016). We can go ahead with the ARDL method of estimation for as much as none of the variables of interest is I(2) which would have invalidated the ARDL model assumption of all variables either be a I(0), a I(1) or a combination of both I(0) and I(1).

Table1:

PP- Unit Roots Tests (5% is the preferred benchmark for significance level compared to 1% or 10%)							
Levels				First Difference			
Variables / Models	Intercept	Trend and Intercept	Order of Integration I(d)	Intercept	Trend and Intercept	Order of Integration I(d)	Final Decision I(d)
Log(manor)	-0.1261(0.9378)	-4.2505(0.0108)	I(0)	-7.1300(0.0000)	-6.8175(0.0000)	I(1)	I(0)
Log(mcr)	-1.5445(0.4982)	-1.0669(0.9187)	Not	-4.2366(0.0024)	-4.4802(0.0065)	I(1)	I(1)
Log(bcrm)	-0.6886(0.8352)	-2.8457(0.1929)	Not	-9.1242(0.0000)	-9.9042(0.0000)	I(1)	I(1)
Log(tvtr)	-0.7502(0.8191)	-1.5607(0.7854)	Not	-4.7231(0.0007)	-4.6819(0.0040)	I(1)	I(1)

Log(asi)	2.9491(0.0512)	-0.4828(0.9790)	Not	-3.8563(0.0063)	-5.9123(0.0002)	I(1)	I(1)
ADF- Unit Roots Tests (5% is the preferred benchmark for significance level compared to 1% or 10%)							
Levels				First Difference			
Variables / Models	Intercept	Trend and Intercept	Order of Integration I(d)	Intercept	Trend and Intercept	Order of Integration I(d)	Final Decision I(d)
Log(manor)	-0.2109(0.9266)	-4.4062(0.0075)	I(0)	-7.1015(0.0000)	-6.7989(0.0000)	I(1)	I(0)
Log(mcr)	-1.4968(0.5219)	-0.9013(0.9432)	Not	-4.3033(0.0021)	-4.4733(0.0066)	I(1)	I(1)
Log(bcrm)	-2.1225(0.2380)	-3.9722(0.0219)	I(0)	-6.3160(0.0000)	-4.5867(0.0063)	I(1)	I(0)
Log(tvtr)	-0.7314(0.8241)	-1.4079(0.8385)	Not	-4.7580(0.0006)	-4.1497(0.0144)	I(1)	I(1)
Log(asi)	-2.5589(0.1122)	-0.8186(0.9528)	Not	-3.8563(0.0063)	-4.3597(0.0113)	I(1)	I(1)

Source: Author's Computation Using Eviews 10+

4.2 Lag Length Selection.

Selecting the appropriate or true lag length is essential in the estimation of a parsimonious model. Some of the most commonly used criteria are the information criteria such as: the Akaike Information Criterion (AIC), the Schwarz-Bayesian Information Criterion (SBIC) as well as the Hannan-Quinn Criterion (HQC). According to Ayalew, Babu and Rao (2012), selecting a lag length which is lesser than the true lag length underestimate the true lag length and picking a lag length which is higher than the true lag length overestimates the lag length. Too few lags lead to autocorrelated errors while too many lags lead to an increase in mean-square forecast errors due to over-fitting (Lütkepohl, 1993, 2005). In this study, all the information criteria consistently choose lag1 for all variable except for all share index(ASI) where only the SBIC choose lag1. We, therefore, use the AIC which is the default criteria as shown in Table 2 below.

Table 2. VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-19.02256	NA	0.310590	1.668547	1.717633	1.681569
1	17.18914	66.38812 *	0.016519 *	-1.265761*	-1.167590*	-1.239717*
2	17.20515	0.028020	0.017947	-1.183762	-1.036506	-1.144695
3	17.24854	0.072311	0.019472	-1.104045	-0.907702	-1.051955
4	17.28266	0.054025	0.021168	-1.023555	-0.778127	-0.958443
5	17.30494	0.033421	0.023072	-0.942078	-0.647565	-0.863944
6	17.38986	0.120315	0.025066	-0.865822	-0.522223	-0.774665
7	17.43414	0.059036	0.027390	-0.786178	-0.393494	-0.681999
8	17.43439	0.000311	0.030128	-0.702866	-0.261096	-0.585664

* indicates lag order selected by the criterion

Source: Author's Computation Using Eviews 10+

4.3 ARDL Approach to Cointegration Testing.

There are two steps to be taken here. The first step is to estimate the Traditional ARDL model where only the results of the short-run dynamics are estimated as shown in Table 3 below.

Table 3. Dependent Variable: LOG(MANOR)
Method: ARDL

Selected Model: ARDL(1, 1, 1, 0, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(MANOR(-1))	-0.012646	0.175649	-0.071996	0.9432
LOG(MCR)	-0.465727	0.127063	-3.665319	0.0013
LOG(MCR(-1))	-0.326364	0.105535	-3.092469	0.0051
LOG(BCRM)	0.022664	0.050505	0.448745	0.6578
LOG(BCRM(-1))	0.060393	0.043218	1.397397	0.1756
LOG(TVTR)	0.081518	0.038368	2.124644	0.0446
LOG(ASI)	0.469699	0.119407	3.933608	0.0007
C	8.440633	1.648577	5.119952	0.0000

R-squared	0.981055	Mean dependent var	-1.417574
Adjusted R-squared	0.975289	S.D. dependent var	0.624015
S.E. of regression	0.098093	Akaike info criterion	-1.588167
Sum squared resid	0.221311	Schwarz criterion	-1.218106
Log likelihood	32.61659	Hannan-Quinn criter.	-1.467536
F-statistic	170.1498	Durbin-Watson stat	1.722076
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.
Source: Author's Computation Using Eviews 10+

In reading a regression result, a variable is considered significant when the value of the t-statistic is at least 2 or the p-value is at least 0.05. In Table 3 above, MCR and its first lag(MCR(-1)) are significant but negatively affected manufacturing output in the period under study. MCR is a measure of a country's stock market size and it is the value of listed domestic shares divided by GDP. MCR is an indicator of stock market development and it is theoretically expected to be positively related to the growth of the economy due to its ability to mobilise capital and diversify risk (Levine and Zervos, 1998). TVTR is one of the measures of liquidity position of the stock market. It directly measures the volume of shares traded in an economy and it is expected to complement MCR and thus positively related to the economy. In this study, TVTR positively and significantly affected manufacturing output in the short run. The All Shares Index (ASI) is usually computed yearly and it is a statistical data meant to measure, guide and judge the overall direction of the market. It is a composite figure of all the prices of all companies' shares in the exchange in percentage. It is used to compare the performance of companies, the financial market as well as the whole economy. Our results indicated that ASI is positive and significant with respect to manufacturing output. The BCRM and its first lag positively but insignificantly affected the manufacturing output. BCRM measure the value of banks' credits for manufacturing firms within the economy. It shows the amount of external resources set aside by deposit money banks (DMBs) exclusively for manufacturing. Banks are expected to help the private investors by channeling savings from the surplus unit and make them available to deficit unit for productive purpose.

The second step is to estimate the long run and bounds tests where we obtain the results of the F-statistic and long run estimates. We then compare the F-statistic value with the I(0) and I(1) sets of asymptotic critical values as shown in Table 4 below.

Table 4. F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	10.70944	10%	2.45	3.52
K	4	5%	2.86	4.01

2.5%	3.25	4.49
1%	3.74	5.06

Since **t**he F-statistic is higher than the I(1) bound, we reject the null hypothesis of no cointegration and accept the alternate hypothesis that there is cointegration among the variables. Accompanying the F-Bounds test is the results of the long run estimates in Table 5 below.

Levels Equation

Table 5. Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(MCR)	-0.782200	0.086472	-9.045664	0.0000
LOG(BCRM)	0.082019	0.041467	1.977928	0.0600
LOG(TVTR)	0.080500	0.036147	2.226995	0.0360
LOG(ASI)	0.463833	0.056263	8.244027	0.0000

Source: Author's Computation Using Eviews 10+

As discussed under the results of the short run estimates, MCR is significant but negatively affected manufacturing output in the long run for the period under study. This result is in line with those of Ikeobi et al. (2016) and Algaeed (2021). It is, however, contrary to those of Tembo (2020), Ibitomi et al. (2020), Egbuche and Nzotta (2020), Adoms et al. (2020), Ubesie and Ude (2019) and Uruakpa (2019).

TVTR positively and significantly affected manufacturing output in the long run. This result is in line with those of Adoms et al. (2020), Uruakpa (2019) and Erhijakpor and Buzugbe (n. d.). It is, however, contrary to that of Egbe et al. (2015). ASI is positive and significant with respect to manufacturing output in the long run. This result is in line with that of Madumere and Wokeh (2016) but contrary to that of Erhijakpor and Buzugbe (n. d.). BCRM positively but insignificantly affected the manufacturing output in the long run. This result is in line with those of Okere et al. (2020), Andabai and Eze (2018) as well as Toby and Peterside (2014). It is, however, contrary to those of Ashiru et al. (2021), Ademu et al. (2019), Ogunmuyiwa et al. (2017), Ume et al. (2017), Muchingami et al. (2017) and Bada (2017)

4.4 Estimation of the Error Correction Model

The ECM specification is a combination of the short run equation and the long run representation. In this study, the most important result we are interested in is the error correction term, CointEq(-1)*. It is expected to have a negative sign and to be significant.

Table 6. ARDL Error Correction Regression
Dependent Variable: DLOG(MANOR)

ECM Regression
Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8.440633	1.067823	7.904525	0.0000
DLOG(MCR)	-0.465727	0.078670	-5.919977	0.0000
DLOG(BCRM)	0.022664	0.033852	0.669497	0.5098
CointEq(-1)*	-1.012646	0.127724	-7.928413	0.0000

R-squared	0.702785	Mean dependent var	-0.032365
Adjusted R-squared	0.669761	S.D. dependent var	0.157545
S.E. of regression	0.090536	Akaike info criterion	-1.846232
Sum squared resid	0.221311	Schwarz criterion	-1.661201
Log likelihood	32.61659	Hannan-Quinn criter.	-1.785916
F-statistic	21.28113	Durbin-Watson stat	1.722076
Prob(F-statistic)	0.000000		

* p-value incompatible with t-Bounds distribution.

Source: Author's Computation Using Eviews 10+

As we can see from Table 6 above, CointEq(-1.012646) is negative and its t-statistic (-7.928413) is significant at the 1% level(p = 0.0000). CointEq(-1.012646) is called the Speed of Adjustment. This shows that the reversion to equilibrium is at an adjustment speed of 101.26%. That is, the previous period deviation from equilibrium is corrected in the correct period by an adjustment speed of 101.26%.. Again, it tells us that about 101.26%.of departure from long-run equilibrium is corrected each period.

5.0 Causality Test.

When the results of the short run regression (t-statistic), the long run regression (t-statistic) as well as the error correction term, ECM_{t-1} are statistically significant, it is an indication that a long-run causality runs from all the regressors, independent/explanatory variables, towards the target/ dependent variable (Ahmed, Muzib and Roy, 2013). They do not, however, tell us the direction of causality. Thus, we run the Granger causality test to know if there is independent causality (No causality between the variables), unidirectional causality (One variable granger causes the other variable) or bidirectional causality (Both variables granger cause each other). Our result in Table 7 below indicated a unidirectional causality except ASI and MCR which are independent. All our independent variables granger cause our dependent variable but our dependent variable do not granger cause any of our independent variables.

Table 7. Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
LOG(MCR) does not Granger Cause LOG(MANOR)	31	24.6065	3.E-05
LOG(MANOR) does not Granger Cause LOG(MCR)		0.36244	0.5520
LOG(BCRM) does not Granger Cause LOG(MANOR)	31	11.1836	0.0024
LOG(MANOR) does not Granger Cause LOG(BCRM)		2.26491	0.1435
LOG(TVTR) does not Granger Cause LOG(MANOR)	31	14.9603	0.0006
LOG(MANOR) does not Granger Cause LOG(TVTR)		0.43874	0.5131
LOG(ASI) does not Granger Cause LOG(MANOR)	31	18.0350	0.0002
LOG(MANOR) does not Granger Cause LOG(ASI)		0.86342	0.3607
LOG(BCRM) does not Granger Cause LOG(MCR)	31	0.01448	0.9051
LOG(MCR) does not Granger Cause LOG(BCRM)		15.8359	0.0004
LOG(TVTR) does not Granger Cause LOG(MCR)	31	1.68567	0.2048
LOG(MCR) does not Granger Cause LOG(TVTR)		11.4659	0.0021
LOG(ASI) does not Granger Cause LOG(MCR)	31	0.89040	0.3534
LOG(MCR) does not Granger Cause LOG(ASI)		0.03013	0.8635
LOG(TVTR) does not Granger Cause LOG(BCRM)	31	5.39651	0.0277
LOG(BCRM) does not Granger Cause LOG(TVTR)		0.63471	0.4323
LOG(ASI) does not Granger Cause LOG(BCRM)	31	8.36073	0.0073
LOG(BCRM) does not Granger Cause LOG(ASI)		1.53456	0.2257
LOG(ASI) does not Granger Cause LOG(TVTR)	31	9.07131	0.0055
LOG(TVTR) does not Granger Cause LOG(ASI)		1.89662	0.1794

Source: Author's Computation Using Eviews 10+

6.0 Model Diagnostics and Stability Tests

The results from Table 8 and Table 9 shows that there is no serial correlation and no problem of heteroskedasticity since their p-values are clearly higher than 0.05. Since the p-value of the Jarque-Bera statistic that is higher than 0.05 as shown in Table 10, the model is normally

distributed. With respect to stability, the model is very stable since the results from Table 11 and Table 12 are within the 5% boundary.

7.0 CONCLUSION AND RECOMMENDATION.

This study examined the impact of bank credits (BCRM) and some capital market variables (MCR, TVTR, ASI) on the performance of the Nigerian manufacturing sector. The results of the ARDL Bounds Test showed that all the variables of interest except BCRM explained the variations in manufacturing output, both in the short and long run for the periods under consideration. While MCR negatively and significantly impacted on manufacturing output, TVTR and ASI positively and significantly boost the growth of the manufacturing output. BCRM's, on the other hand, impact on manufacturing output was positively insignificant. We recommend that the Nigerian government should as a matter of urgency provide basic infrastructure that would help reduce the cost of production in the manufacturing sector. The propose plans to ban the importation of basic food to Nigeria will lead to higher prices for smuggled goods if manufacturing output in Nigeria remain low. The competitiveness of the Nigerian manufacturing sector against other African states in the face of the recent signing of the African Free Trade Zone by the Nigerian government will definitely be a mirage if the cost of production is very high. For the banking sector to play its primary role of channeling savings from the surplus units to the deficit units effectively, government must have the political will to encourage or mandate the banking sector to help the private investors to get the much needed productive funds at the lowest possible cost. These will ensure that the manufacturing output goes above the world average and this will lead to the economic prosperity of the nation.

Appendix

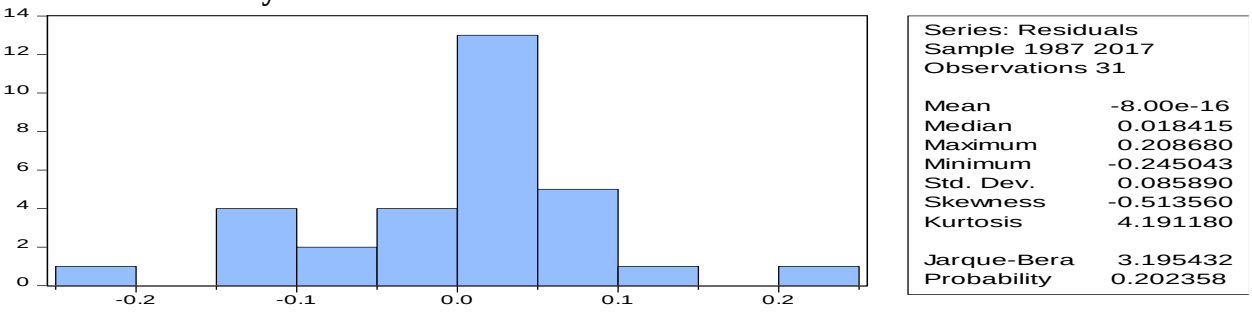
Table 8. Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 1 lag

F-statistic	0.657065	Prob. F(1,22)	0.4263
Obs*R-squared	0.899013	Prob. Chi-Square(1)	0.3430

Table 9. Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	1.091559	Prob. F(7,23)	0.4007
Obs*R-squared	7.730460	Prob. Chi-Square(7)	0.3570
Scaled explained SS	6.789830	Prob. Chi-Square(7)	0.4511

Table 10. Normality Test



Source: Author's Computation Using Eviews 10+

Table 11a CUSUM Test

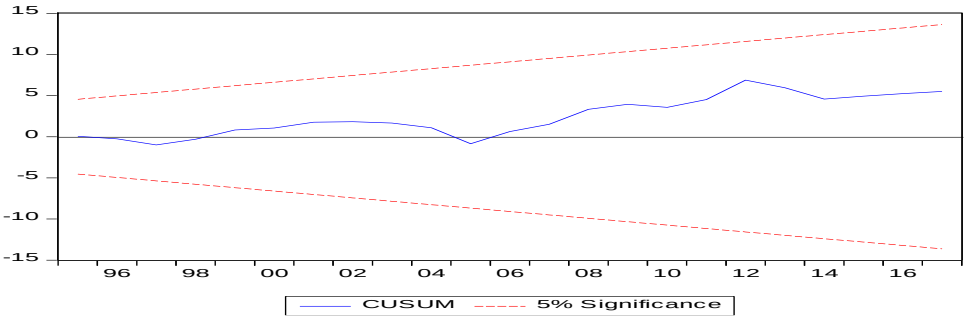
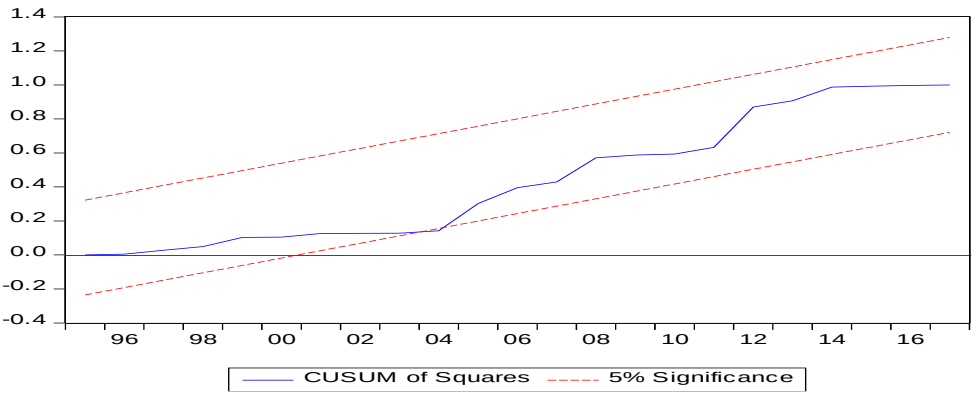


Table 11b CUSUMSQ Test



Source: Author's Computation Using Eviews 10+

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