PUBLIC DEBTS AND MANUFACTURING CAPACITY IN NIGERIA

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BEING A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF ECONOMICS, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B.SC), ECONOMICS, FACULTY OF SOCIAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY.

NOVEMBER, 2025

CERTIFICATION

We, the undersign confirm that certify that SMART STEPHEN IFEANYI with Matriculation Number SSC2105619 conducted this research, that is adequate in scope and quality, and that it is hereby approved for partial fulfilment of the award of Bachelor of Science (B.Sc) Degree in Economics at the University of Benin, Benin City.

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DEDICATION

This project is wholeheartedly dedicated to God Almighty, the source of wisdom, knowledge, and understanding. His unending grace, divine guidance, and unfailing love have been my strength throughout this academic journey.

I owe every success and achievement in this work to His mercy, grace and faithfulness, which have continually sustained me in moments of challenge and triumph. To Him be all the glory, honor, and praise, now and forever.

ACKNOWLEDGEMENT

My indebt gratitude goes to the Almightly God for making it possible for me to carry out this research. My gratitude goes to my supervisor, Dr. N. L. Arodoye, for the understanding and assistance to carry out this project successfully.

My gratitude goes to my parents Mr. Smart Kingsley and Mrs. Smart Esther for their financial support and moral support. May God grant you your heart desire. My appreciation also goes to my uncles and aunties for contributions towards my academic pursuit. God bless you.

My sincere gratitude goes to the Head of Department Prof. C. A. Ighodoro and other lecturers including Prof. D. E. Oriakhi, Dr. J. N. Izevbigoe, Dr. J. W. Okweshine, Prof. Izilien and Dr. Success O. Abusomwan for their intellectual contribution during my academic programme in the University of Benin.

I want to also acknowledge my friends and course mates for their friendship and support. May God richly bless you all.

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ABSTRACT

This study empirically analyzes the impacts of public debt on manufacturing capacity in Nigeria. The broad objective of this study is to empirically analyze the impacts of public debt on manufacturing capacity in Nigeria. The Ordinary Least Squares method was adopted to analyze the relationship between public debt and manufacturing capacity, private sector loan, Gross Domestic Product, consumption expenditure and interest rate. Secondary data which spans from 1981 to 2024, sourced from the Central Bank of Nigeria statistical bulletin for real sector, public sector and World Development Index, was extracted and utilized for empirical analysis. Some forms of pre-estimation tests were carried out in order to obtain satisfactory results. Such tests are the unit root test: test for stationarity, the co-integration test which tests for long run equilibrium relation between the variables of interest of this study. This study seeks to discover the effect of public debt on manufacturing capacity in Nigeria. Therefore, in conclusion public debt positively impacts on manufacturing capacity in Nigeria and it is significant, private sector loan has a significant positive impact on manufacturing capacity, Gross Domestic Product has a significant positive impact on the manufacturing capacity however both consumption expenditure and interest rate have negative impact on manufacturing capacity. Haven discovered from this study the significant positive impact of public on manufacturing capacity in Nigeria, it is therefore recommended that: The federal government should ensure that enough capital is available for the manufacturing sector given the importance of the manufacturing sector to the Nigerian economy. The monetary authority should ensure that the level of interest rate (cost of capital) does not discourage domestic manufacturing industries that need capital from both the money market and the capital market for investment purpose.

CHAPTER ONE

INTRODUCTION

1.1 Preamble

Capacity utilization is the output that is produced by a manufacturing industry with the installed equipment in relation to the potential output which could be produced with it if capacity was fully used (Rimo and Tin, 2017). The level of infrastructural development in a country provides a very strong base for capacity utilization by the manufacturing industry. Because capacity utilization has become an important key performance indicator (KPI) for assessing the operating efficiency of a manufacturing industry all over the world, therefore this study examined government spending and public debt on manufacturing industry, and the development of manufacturing capacity of the manufacturing sector in Nigeria (Olajire, 2024). According to Aremu (2024), manufacturing enterprises play a critical role in the economy of any country, depending on its relative level of development. Manufacturing industries, particularly small and medium-sized ones, generate personal income, savings, job possibilities, and propel the real sector of a rising economy (Alematu, 2020). These businesses are seen as the locomotives that propel entrepreneurial talents and local technical improvements that are required for capacity utilization. Manufacturing sector growth and capacity utilization are two connected phenomena such that the more the capacity utilized, the larger the outputs produced, and the faster the rise of manufacturing productivity or output (Alematu, 2020).

Governments often use borrowed funds to invest in infrastructure projects, such as roads, ports, and power supply. Improved infrastructure can lower transportation costs and enhance the efficiency of manufacturing process (Okoye, 2023). Public debt can finance loans or grants to manufacturers, allowing them to invest in new technologies, expand operations, or upgrade equipment. This leads to increased productivity and capacity. Investment funded by public debt can support R&D initiatives, allowing manufacturers to innovate and develop new products. This can lead to increased competitiveness in global market. Investments financed by public debt can lead to job creation in the manufacturing sector (Eze, 2019). An increase in employment can boost local economies and further stimulate demand for manufactured goods. While public debt can enhance manufacturing capacity, it is crucial to manage it responsibly (Eze, 2019). Excessive debt can lead to economic instability, higher interest rates, and reduced fiscal flexibility. Hence, the effectiveness of public debt in boosting manufacturing capacity largely depends on how the debt is utilized, ensuring it is directed towards productive investments that yield long-term economic benefits (Okoye, 2023).

Public debt occurs because of the low level of revenue generated by the Nigeria government to finance projects that are expensive. Items such as electricity, manufacturing of steel plants, construction of roads, railways and refinery requires finance, however there is not enough resources to fund these projects (Sydney, 2021). For continuous development of the manufacturing capacity of a nation, it requires lots of investments, and these investments are usually financed by domestic savings which are

insufficient (Saka, 2021). Public borrowing accelerates the growth of the industrial sector, the manufacturing sector and the level of manufacturing capacity and thus brings about economic growth especially when domestic financial resources are inadequate and need to be supplemented with funds abroad (Saka, 2021). No government can exist on its own; it would require aid so as to perform efficiently and effectively. Governments borrow majorly to finance public goods that increase welfare and promote economic growth (Orji and Chukwuani, 2019). However, it is expected that when these Less Developed Countries (LDCs) which are characterized by low capital formation due to low levels of domestic savings and investment are facing a scarcity of capital, they resort to borrowing from either internal or external sources so as to supplement their domestic saving and boost the level of investment in the manufacturing sector (Sydney, 2021).

1.2 Statement of Research Problem

The relationship between public debt and manufacturing sector capacity is complex. On one hand, carefully managed public debt can provide necessary funding for infrastructure and capacity-building initiatives; on the other hand, excessive debt can crowd out private investment, lead to higher interest rates, decrease government flexibility in economic policy, and ultimately constrain manufacturing growth. Balancing public debt while fostering a robust manufacturing sector is crucial for sustainable economic development (Udoh & Ogbuagu, 2022). Governments often use borrowing to finance infrastructure projects and investments that can enhance manufacturing capacity. Investments in

transportation, utilities, and technology can improve efficiency and production capabilities in the manufacturing sector.

Higher public debt can lead to increased borrowing costs due to higher interest rates, which may crowd out private investment in manufacturing. This could limit expansion and modernization efforts within the sector. High public debt levels can lead to concerns about a country's fiscal sustainability, affecting investor confidence (Sydney, 2021). This uncertainty can hinder long-term investments in the manufacturing sector and reduce capacity utilization. When governments borrow heavily, resources can become constrained (Alematu, 2020). Increased demands for financing public debt may divert capital away from the manufacturing sector, limiting its growth and investment capacity. Governments may leverage public debt to fund programs that directly benefit the manufacturing sector, such as subsidies, tax incentives, or research grants, which can enhance production capacity and competitiveness (Okoye, 2023).

There have been a continuous increase in the public debt of Nigeria. Most economies including Nigeria, have resorted to the use of fiscal policy to solve the harsh economic situation and to support businesses that were already trying to survive structural challenges (Henry, 2022). Statistics from the Central Bank of Nigeria Bulletin indicate that the overall output of the industrial sector for 2015 and 2016 declined by 13.62% and 2.85%, respectively. The sectorial outputs for subsequent years have been growing but at a declining rate with 37.54% growth recorded in 2017, 29.56% in 2018, 20.05% in 2019,

and 9.16% in 2020. The public debt profile of the country increased steadily during the same period. At the same time, the 2022–2024 Medium Term Expenditure Framework/Fiscal Strategy Paper (MTEF/FSP) statistics obtained from the Budget Office of the Federation indicate that the public debt level will continue to build up for the conceivable future. An overview of the government's fiscal deficit and deficit financing plan for the three-year period ending in 2024 indicates that budget deficit projection for the 2022 fiscal year was N5.62 trillion compared to N5.60trillion in 2021. The 2022, budget deficit projection amounted to 3.05% of the gross domestic product (GDP) estimates for the year, and this was in clear breach of the budget deficit limit, which should not exceed 3% of the estimated GDP for any given year, as stated in the Fiscal Responsibility Act. The justification provided by the government for the planned increase in fiscal deficit is that it will allow for some fiscal space to sustain the recovery from economic recession through the development of the industrial sector, as well as ensure that critical ongoing infrastructure projects are completed (Henry, 2022).

According to Iyoha 1999, two among the primary macroeconomic objectives of Nigeria is the attainment of full potential output (the absence of excess capacity) and low level of unemployment. Nigeria in attempting to achieve these objectives has gone into borrowing both from it's citizens and foreigners to finance projects aimed at provision of employment, poverty reduction and the development of the manufacturing sector and growth in manufacturing capacity (Orji & Chukwuani, 2019). However, from the post-colonial period where government has been seeking overseas aid to run the economy,

many of these objectives of obtaining the loan were not met. This has resulted in economic downturn, high level of unemployment and slow down the growth pace of the industrial sector in Nigeria (Saka, 2021).

Public debt, private sector debt and the cost of borrowing have profound implications for the manufacturing sector's capacity. High levels of debt and rising borrowing costs can constrain investment, reduce operational flexibility, and increase risks. Conversely, manageable debt levels and favorable borrowing conditions can support growth, innovation, and ultimately enhance manufacturing capacity. Policymakers and financial institutions must consider these dynamics when formulating strategies to support the manufacturing sector (Hayati, 2022). High private sector debt may limit access to additional financing for manufacturers, restricting their ability to invest in new technologies, equipment, and facilities. When borrowing costs rise (due to increased interest rates), manufacturers may be deterred from taking on loans to expand capacity or improve operational efficiency (Eze, 2019). High levels of debt mean that a significant portion of cash flow is directed towards servicing that debt (interest and principal payments), reducing the funds available for reinvestment in capacity and operations (Eze, 2019). High borrowing costs may force firms to prioritize cost-cutting measures, potentially leading to underinvestment in critical areas that support capacity. Firms with high debt levels face a greater risk of default, especially if borrowing costs increase. This can lead to bankruptcies, resulting in decreased overall manufacturing capacity (Aremu, 2024).

1.3 Research Questions

The following are the various research questions to be answered:

1. Does Public debt impacts manufacturing capacity performance in Nigeria?
2. Does Private sector loan impacts manufacturing capacity in Nigeria?
3. Does Interest rate impacts manufacturing capacity in Nigeria?

1.4 Objectives of the Study

The broad objective of the study is to ascertain the impact of public debt and manufacturing capacity Nigeria, and the specific objectives are to:

1. investigate the relationship between public debt and manufacturing capacity performance in Nigeria.
2. examine whether private sector loan impact on the manufacturing capacity in Nigeria.
3. examine the relationship between interest rate and manufacturing capacity in Nigeria.

1.5 Research Hypothesis

1. Public debt does not significantly impact on the manufacturing capacity in Nigeria.

2. Private sector loan does not significantly impact on the manufacturing capacity in Nigeria.

3. Interest rate does not significantly impact on manufacturing capacity in Nigeria.

1.6 Scope of the Study

For the purpose of this study, the Nigeria economy was chosen based on the fact that there is ease to access valid information, and the researcher has better understanding of economic activities in the industrial sector. This study used secondary data from 1981 to 2024. The data used for this study is sourced from the Central Bank of Nigeria (CBN) statistical bulletin for real sector 2022 edition.

1.7 Significance of the Study

Public debt occurs because of the low level of revenue generated by the Nigeria government to finance projects that are expensive. Public borrowing accelerates the growth of the industrial sector, manufacturing sector and manufacturing sector capacity and thus bring about economic growth especially when domestic financial resources are inadequate and need to be supplemented with funds abroad. No government can exist on its own; it would require aid so as to perform efficiently and effectively. This work is

done with the focus of delving into the effect of public debt, federal government capital expenditure and the level of economic growth on the manufacturing sector in Nigeria. Therefore this work will be very useful particularly to the government and policy makers. The findings of this work can be used to make appropriate policies and initiate programs that are necessary for boosting the level of industrialization in Nigeria through the appropriate channeling of government borrowing and expenditure. Also, this work will be useful to students in various tertiary institutions who want to analyze the effect or significant role of federal government capital expenditure on the industrial sector in Nigeria. Also, this research work will be found fascinating to researchers who want to carry out further research on this aspect.

1.8 Limitations of the Study

The study is limited to the Nigerian manufacturing factor and how public debt, private sector loan, cost of borrowing (interest rate) impacts on the manufacturing sector. This study is limited by the time frame within which this study was carried out. Also, the researcher has a limited access to the data needed to carry out the analysis needed for the purpose of this research work. This research work utilized secondary data for the purpose of analysis and discussion of findings.

1.9 Structure of the Study

The content of this study was structured into chapters. There are six chapters in this study; chapter one deals with introduction of the study, statement of research problem, research questions, research objectives, research hypothesis, scope of the study, limitation of the study and significance, the other chapters are as follows; chapter two contains facts and information on the Nigerian environment or economy which is the focus of this study and it also contains statistical facts on public debt, the manufacturing sector and manufacturing sector capacity, chapter three deals with literature review. The forth chapter encompasses the theoretical framework, model specification and methodology. Chapter five is on data analysis, presentation and interpretation of results and finally the sixth chapter which concludes the study is concern with the summary of findings, recommendations and conclusions.

CHAPTER TWO

BACKGROUND TO THE STUDY

2.1 Introduction

This chapter provides an evaluation of the study environment (Nigeria). It also focuses on examining the relationship between tax revenue generated by the Nigeria government and the Nigeria, that is, how tax revenue has impacted on the Nigeria economy. This chapter will also examine the relationship between the environment and the Nigeria economy and the combined impact of tax revenue and the environment on the Nigeria economy. The chapter concludes with an appraisal.

2.2 The Study Environment

Nigeria comprises of 36 states and the federal capital territory Abuja. Lagos is the largest in Nigeria by population. Nigeria is comprised of over 250 ethnic groups and 500 distinct languages, all identifying with a wide variety of cultures. The major ethnic groups include Hausa, Yoruba, and Igbo. Nigeria is often referred to as the Giant of Africa mainly because of her large population and economy. The Nigeria economy is classified as a mono-economy because it's major source of foreign revenue is crude oil since its discovery in the 1958. Crude oil accounts for over 95% of her total foreign revenue as at 2021 (CBN statistical bulletin, 2021).

Nigeria is the most populous country on the African continent, with its capital Abuja as the largest city in Africa and is now also the country with the largest economy in Africa. Establishing the conditions for strong economic growth at home is the first step in creating an economic climate that promotes manufacturing competitiveness. Fostering a climate that encourages significant corporate investment, particularly in the manufacturing sector, necessitates a risk-free economic environment. The manufacturing sector is one of the biggest contributors to the Nigerian economy, especially since the discovering of crude oil in Nigeria and the manufacturing sector cannot operate at full capacity without sufficient synergy and support from the government.

2.3 Stylized Facts

2.3.1 Manufacturing Sector capacity utilization and the Nigerian Economy

Manufacturing involves producing goods for use or sale by using labour, machinery and bio-chemical processes. The manufacturing process is rooted in industrial production and development which includes an extensive use of technologically based tools to achieve availability of goods and services on a large scale and at a low cost hence achieving desirable improvement in the standard of living of the citizens (Adofu, 2020). The Nigerian manufacturing sector has suffered huge set back sequel to the discovery of oil in commercial quantity in the 1960s as this has led to the undue concentration on the oil sector and the inadvertent neglect of other sectors that have contributed to the gross domestic product hitherto. The adoption of the Structural Adjustment Programme (SAP)

in 1986 which was purported to revamp the economy and set it on the path of long term growth has not been able to achieve its objective as the economy still lags behind in terms of economic prosperity. Nigeria fell sharply from a middle income country in the 1970s and 1980s to among 30 poorest nations in the world. Although the country is rich in crude oil, yet, it is revealed that vast majority of Nigerians are poor with 84.5% of the population living below the benchmark of $2 per day (World Development Index, 2012). The issue of poverty in Nigeria is an offshoot of overdependence on oil sector, maladministration and inability to harness the country's resources especially in the manufacturing sector which could have provided windows of opportunity for employment generation and economic development.

The Nigerian manufacturing sector has experienced significant structural changes over the years despite the besetting challenges which include government intervention, lack of technical know-how, adoption of import substitution strategy and protectionism (Adeoye, 2016). The focal point of industrial planners in Nigeria involve the desire to increase the share of manufacturing sector's contribution to GDP, substituting ex ante imported goods with indigenously produced goods, enhancing innovation, competition and job creation. Furthermore, the contribution of the manufacturing sector to GDP is 7.2% in 1970 and decreases to 5.4% in 1980 and increases to 8.1% in 1990 and keeps falling to 6% in 2000 and4.1% in 2011 (CBN, 2012) but rise to 6.83% in 2013.

The contribution of the manufacturing sector has been unstable in the last two decades. However, the performance of the manufacturing sector has been improved significantly by 8.41% in Q1 2013 which is an improvement over 7.70% recorded in Q4 2012 (NBS, 2013). On the other hand Ayorinde (2021) opined that the manufacturing sector is a dynamic sector of the Nigerian economy and this is accompanied by a low capacity utilization rate. In this light, capacity utilization ranges between 78.7% in 1977 to 29.29% in 1995 which represents the highest and lowest rate of capacity utilization (Ayorinde, 2021). Although it rises to 32.46% in 1996, it falls slightly to 30.4% in 1997 and rise to 32.4% in 1998 and it averages 43% between 2000 and 2004 but it increases to 58.92% in 2009 but decreases slightly to 55.82% in 2010. Given these evidences in the manufacturing sector, has the sector been able to meet the rising demand for finished capital and consumer goods in Nigeria and contribute to net export earnings? This paradox still remains unraveled in the Nigerian context and has beckoned the attention of researchers and policy makers over the years.

Most scholars have examined the impact of manufacturing sector on economic growth in Nigeria by including different variables ranging from fiscal policy, to stock market development and exchange rate (Alematu, 2020). However, this current study distinguishes itself by providing an empirical analysis on the impact of manufacturing sector's capacity utilization on economic growth in Nigeria between 1980 and 2018 focusing on periods after the adoption of Structural Adjustment Programme (SAP) and

various development plans. Specifically, the study will examine the response of manufacturing sector due to a shock in economic growth in Nigeria.

2.3.2 Public Debt, Government Expenditure and the Nigerian Economy

The vital need for government to participate in the economy can be seen from the need to enforce contracts, protect property, and develop infrastructure (Ibekwe, 2021). This was the reason John Maynard Keynes in 1930 argued that increase in government spending boosted growth by injecting purchasing power into the economy. Public expenditure is the most powerful economic tool in all modern societies (Imide, 2019). Its size and organization determine the pattern and form of growth in output of the economy. Its structure is categorized into capital and recurrent expenditure. In Nigeria, total government expenditure increased from N4.8 billion in 1981 to N66.6 billion in 1991. This further increased to N4, 712.1 billion in 2021 from N1018 of 2001. In the year 2021, government expenditure was N19, 965 billion and rose to N24, 431 billion in 2022 (CBN statistical Bulletin 2022).

Odebode (2017) stated that government expenditure patterns are influenced by budgetary priorities, revenue availability, and fiscal policies aimed at promoting economic growth and development. The major source of this expenditure is tax revenue which according to Abubakar and Yusuf (2018) is insufficient in meeting the expenditure requirements leading to fiscal deficit.

This assertion was theorized by Chenery and Strout (1966) that domestic savings of developing countries is not enough to sustain the expected capital formation that will lead to economic growth thus necessitating the need for borrowing in form of public debt. Public debt can be seen as the practice of seeking to stimulate a nation's economy by increasing government expenditures beyond revenue sources (CBN, 2018). Public debt as a percentage of GDP is often utilized as an indicator of the ability of a government to meet its future obligations. It rises as obligations of government increases. Funds borrowed by the government are termed public debt and it could classified into external and domestic debt. Nigeria's public debt figure has been on the rise steadily in recent years. According to Debt Management Office (2023) public debt figure has reached a significant level of N97.34trillion. It stood at N46. 25 trillion (US$103.11 billion) in Q4 2022. In 2021 the value was N39.556 US$95,779.64 while in 2020 the value was N32.915 (US$86,392.54), a 17.46% increase from 2019.

2.4 Trends in Public Debts and Manufacturing Capacity in Nigeria: An Appraisal

Over the years, the performance of the manufacturing sector of the Nigerian economy has not been a satisfying one. The capital and recurrent expenditure has been inconsistence since 1982 to 2020. The relationship between government capital expenditure, government recurrent expenditure and manufacturing sector output in Nigeria presents a mixed result. The data on the variables reveal that capital expenditure, recurrent expenditure and manufacturing sector output in Nigeria from 1982 to 2020 increased

steadily with few fluctuations in some years. Nigeria's government capital expenditure recorded negative growth of 16.08%, from 1982 to 1984. From the period of 1987 to 2000 government capital expenditure grew by 23.87%. From the period of 2002 to 2014 government capital expenditure grew at an average rate of 29.25%. Between the period of 2016 and 2020 government capital expenditure grew at a rate of 25.27%. Apart from these years, the capital expenditure increased from year to year. The highest increase compared to the previous year was observed in 2001, which recorded 83.21% increase. This was followed by 1989, when the increase was 80.26% and in 1996 when it increased by 75.77%. Again within these periods, the years with the least increase in capital expenditure was in 2011 with government capital expenditure increased by 3.92%, followed by 2006 with an increase of 6.33% and 1998 (14.60%) in ascending order.

The data also revealed that recurrent expenditure, recorded negative growth in 1983, 1994, 1996 and 2014 by 13.72%, 34.19%, 2.62%, and 7.11% respectively. Apart from these years, the recurrent expenditure increased from year to year. The highest increase compared to the previous year was observed in 1993 there was a 157.81%% increase, this was followed by 1999, when the increase was 152.48% and in 1987 when it increased by 103.28%. Again within these periods, the years with the least increase in recurrent expenditure was in 2012 with government recurrent expenditure increased by 0.32%, followed by 2009 with an increase of 0.50% and 1986 (1.59%) in ascending order. The highest increase in manufacturing sector within the period was in 1995 when MOP increased by 67.46%, this was followed by 1994 when manufacturing sector growth rate

was 60.23%. However, the collapse of the world crude oil market from the early 1980's drastically reduced foreign exchange earnings, and this negatively affected the sector that it could no longer import needed inputs. Hence, manufacturing output growth fell drastically to an annual average of about 2.6% during the period 1986-78 even with the introduction of SAP in 1986 up till 1993 growth in the sector was negative. In 2020, the manufacturing sector growth is 9.06% (CBN, 2021).

Adebiye and Babatope (2019) found that the manufacturing sector in Nigeria has been experiencing a stunted growth and its contribution to gross domestic product has remained low. For instance, the manufacturing sector as a whole remains small, accounting for only 6.6% of GDP in 2016 and 12% of employment (World Bank, 2018). From statistical report, it has been observed that the contribution of manufacturing to GDP has not been encouraging inspite of the several policies put in place to encourage production for export. For instance, in 2021, its contribution to GDP was 8.98% (CBN Statistical Bulletin, 2021). It is evident that manufacturing sub-sector of the Nigerian economy has not reached a desired stable level to perform its function as an engine of growth. This shows that there is gross underutilization of resources. Therefore, the major concern of this study is to determine the impact of fiscal policy on the performance of the Nigerian manufacturing sector output. The major problem is that the performance of the manufacturing sector of the Nigerian economy has not been a satisfying one. The capital and recurrent expenditure has been inconsistence since 1982 to 2020.

CHAPTER THREE

LITERATURE REVIEW

3.1 Introduction

Finance is the most important factor for the survival of both public and private institutions. Both the public sector and private sector depend on various sources of funds to finance investments and projects which will lead to capacity development (Edeh, 2024). Due to limitation of funds, the government borrows from both domestic sources and foreign sources to finance projects needed for manufacturing sector operations and development (Iwerebor, 2015). The funds obtained by the government through borrowing are channeled to among others, construction of roads and bridges, granting of loan to businesses involved in manufacturing operations, establishment of manufacturing industries and the building of healthcare system (Rimo, 2017).

This chapter focused on examining various literatures which involves conceptual issues, theoretical discourse and empirical analysis by various authors. The chapter concludes by highlighting the gap or gaps in the literatures reviewed.

3.2 Conceptual Literature Review

3.2.1 Concept of Public Debt

Government debt, also known as public debt or national debt, is different from the annual government budget deficit, which is the difference between government receipts and spending in a single year (Orji & Chukwuani, 2019). The needs of countries constantly increase; therefore, the government has to spend more to meet these needs. Public expenditures are generally met by ordinary public revenues such as taxes, duties, fees, property and enterprise revenues, taxes, and penalties (Hayati, 2022). However, the state is faced with the public sector deficit due to reasons such as large infrastructure investments, war, development financing, natural disasters, and increasing ordinary public expenditures. Public debt can be defined as the money or resources a government acquires on behalf of its citizens to provide basic needs for the welfare of the mass populace. Public debt arises as a result of nation's inability to generate enough finance from its own treasury. It can also happen when a government lacks the technological and managerial skills involved in executing a project and as such requires foreign expertise. Public debt may occur when government aim at producing pure public goods. Goods that would not have been produced ordinarily if there was no government intervention in an economy (Saka, 2021).

3.2.2 Classification of Public Debts

According to Salimatu (2024) public debts are classified into various types according to their characteristics. It is classified into maturity and resources.

1. Public Debts According to Maturities: This can be classified into short, medium, and long-term public debts Short-term Public Debts (floating debts): Short term borrowings are normally of a maturity less than one year at the time of issue and consists items like treasury bills, treasury certificate and borrowing from the banking system for a short period or 'ways and means advances. They are also called floating debt. Floating debt may not have any specific maturity but part of them might be repayable subject to various terms and conditions. Examples are; provident funds, reserve funds and deposit, small savings. In some cases, the government issues special securities to finance specific project and these are known as special floating debt. They are financial obligation that is expected to be paid off within a year.

Medium-term Public Debts: This is debts which a nation owes and payback period of interest and principals is between one to five years (1-5 years). It is usually listed under the current liability of a government's account.

Long-term Public Debts: This refers to debts more than 5 years. The instrument of long-term borrowing is the government bond. These debts are provided from the capital

markets and have a higher interest rate than the interest rate of short-term borrowing. Long-term debts are classified as redeemable debts and irredeemable debts.

2. Public Debts According to Sources: Internal debts and external debts Internal Borrowing: Internal debt is otherwise known as domestic debt. Domestic debts are public debt which a government of country owes its subject. For example, they are owed by a government of a state to another government of another state within a country.

Internal debt can be described as the payment of interest or repayment of principal. It is simply done by transfer from tax payers to security holders. Domestic debt is the gross liability of government, and if properly considered should include federal, state and local governments transfer obligations to the citizens and corporate forms within the country. They are debt instrument issued by the federal government and denominated in local currency. State and Local government can also issue debt instrument, but instrument currently in use consist of Nigerian treasury bills, government development stock, treasury bonds and federal government bonds.

3.2.3 Problems of Public Debt in Nigeria

Public debt is one of the most critical tool that has been used to boost the productive capacity of the manufacturing sector in Nigeria. Despite the importance of public debt, it is faced with several problems as indented by different authors, which are discussed below.

Debt servicing: Government acquires funds from external sources when the domestic funds are not enough to meet expenditure. The resources gotten externally are invested and this bring about growth and development in the country. In some cases, the debt acquired results in heavy debt servicing on the economy (Ibekwe, 2021). Expenditures on debt servicing may shift the public expenditures from social sectors (like health and education) to public investment which affects the growth severely. Servicing external debt takes the scarce resources away from the poor and makes the country to be highly indebted. This makes the government's ability in providing sufficient public investment needed to stimulate growth and development to be limited (Ibekwe, 2021).

Debt servicing is the major problem for acquiring public debt. It occurs when the borrowed resources are not canalized into the productive sector of the economy or when government revenue is insufficient to repay the principal and interest rate (Salimatu, 2024).

Mismanagement of Public Funds: When borrowed funds are mismanaged or are entrusted into the hands of inexperienced policy makers, it leads to mismanagement of public funds. Persistent mismanagement of public debt makes it unavailable, and this causes further declining in the growth rate of the economy. Dauda and podivinsky (2014), argued that whether debt fosters or hinders economic growth, depends on the efficiency of the institutions. The positive effect occurs when institutional quality is high enough to ensure well-functioning government, which effectively distributes and allocates the borrowed

funds to high value-added sectors (Ogbeifun, 2017). Diversification of Borrowed Funds: This refers to a situation where the resources gotten from borrowing are diverted to cater for emergency purposes e.g. the outsourcing of funds to construct railway may be diverted to the procurement of arms and ammunition in case of war.

3.2.4 The Concept of Government Expenditure

Government spending or expenditure includes all government consumption, investment, and transfer payments. In national income accounting, the acquisition by governments of goods and services for current use, to directly satisfy the individual or collective needs of the community, is classed as government final consumption expenditure. Government acquisition of goods and services intended to create future benefits, such as infrastructure investment or research spending, is classed as government investment (government gross capital formation). These two types of government spending, on final consumption and on gross capital formation, together constitute one of the major components of gross domestic product (Ogbeifun, 2017).

Government spending can be financed by government borrowing, taxes, custom duties, the sale or lease of natural resources, and various fees like national park entry fees or licensing fees. When Governments choose to borrow money, they have to pay interest on the money borrowed. Changes in government spending is a major component of fiscal policy used to stabilize the macroeconomic business cycle (Salimatu, 2024).

3.2.5 Government Public Expenditure

Public expenditure is spending made by the government of a country on collective or individual needs and wants of public goods and public services, such as pension, healthcare, security, education subsidies, emergency services, infrastructure, etc. Until the 19th century, public expenditure was limited due to laissez faire philosophies. In the 20th century, John Maynard Keynes argued that the role of public expenditure was pivotal in determining levels of income and distribution in the economy. Public expenditure plays an important role in the economy as it establishes fiscal policy and provides public goods and services for households and firms (Ibekwe, 2021).

3.2.6 The Industrial Sector

Economic experts divide the economy into sectors to understand how different industries function and to track certain data points. The industrial sector is one of these broad sectors that composes most of what's known as the secondary sector. Understanding how the industrial sector functions and relates to the other major sectors can help you better understand how your job supports the overall economy. In this article, we explain what the industrial sector is, describe what makes up the industrial sector and list the other primary economic sectors (Okodu, 2022).

The industrial sector is a segment of the economy made up of businesses that aid other businesses in manufacturing, shipping or producing their products. The industrial sector

is what's known as a secondary sector because the products and services this sector offers to go to other businesses rather than directly to consumers. Supply and demand in other sectors often drive the growth or minimization of the industrial sector, since it's reliant on purchasing from businesses in other sectors (Saka, 2021). The industrial goods sector is made up of companies involved in the manufacturing and construction of finished goods and services. These are products that are used directly by consumers. The sector includes companies involved with manufacturing capital goods, such as aerospace and defense goods and building products.

When the economy contracts during recessions, activity in this sector drops because companies postpone expansion and produce fewer goods. However, with this sector covering a wide range of subsectors, there is usually at least one area of growth in the industrial goods sector. The industrial goods sector goes through life cycles that see different subsectors in growth phases (Okodu, 2022).

The major stages of the growth cycle are accelerating growth, decelerating growth, accelerating decline, and decelerating decline. Investors do well when they pay attention to the industry trends and progression of the growth cycle. Companies in the accelerating growth and decelerating decline phases have the best performance and are given higher multiples due to their upcoming growth (Hayati, 2022).

3.2.7 Challenges Faced by the Industrial Sector in Nigeria

In line with the study carried out by Okodu (2022) the industrial sector in Nigeria faces several challenges that hinder its growth and development. Some of these challenges include:

Inadequate Infrastructure: Poor infrastructure, particularly unreliable power supply, limited access to water, inefficient transportation networks, and insufficient technological infrastructure, significantly hampers industrial operations.

Energy Crisis: Frequent power outages and high energy costs force industries to rely on expensive generators, raising production costs and reducing competitiveness.

Inconsistent Government Policies: Frequent changes in government policies, lack of clear long-term industrial strategies, and regulatory uncertainty make it difficult for businesses to plan and invest in industrial ventures.

Import Dependency: Nigeria's industrial sector heavily relies on imported raw materials and machinery, which increases production costs and exposes industries to exchange rate volatility.

Limited Access to Finance: Many industries struggle to access affordable and long-term financing, making it difficult to expand or modernize facilities and operations.

Insecurity: Pervasive security challenges, including insurgencies, banditry, and kidnappings, particularly in northern Nigeria, disrupt industrial operations and deter foreign and local investment.

Skilled Labor Shortage: A lack of adequately trained and skilled workers limits the productivity and efficiency of the industrial sector. Vocational training and education systems are often misaligned with industry needs.

3.3 Theoretical Literature Review

3.3.1 The Classical Theory of Public Debt

Edeh (2024) citing the classical school of thought considered that government debt was an impediment to economic progress. They were a proponent of laissez-faire and advocated a market economy. The individual were characterized as rational decision makers who are far sighted unlike myopic individuals as assumed by the Keynesian school. These individuals respond to real changes in their wealth and plan their consumption behavior over their entire life cycle.

David Hume, a classical economist was perhaps the first one to convey his thoughts on public debt. In 1752, he said, “either the nation must destroy public credit or public credit will destroy the nation.” Accordingly he was skeptical about the power vested in the hands of creditors who could abuse the debtors. Public debt, according to him can pose adverse social- political consequences and was threat to the security of the state as it

encourages an idle and useless renter class and oppresses the poorer class. J.B say made a distinction between a private borrowing and the government borrowing. The purpose of private debt is to create beneficial employment whereas public debt creates barren production and consumption and the burden is transferred to the future generations. Adam smith (1776) held the view that," The progress of the enormous debts which at present oppress, and will in the long-run probably ruin, all the great nations of Europe, has been pretty uniform." He considered the state as wasteful. Public debt takes away resources from the private capitalist; the annual produce is directed towards servicing of debt rather than to capital formation and towards the maintenance of unproductive labor. He argued that land and capital will be burdened by the higher taxes imposed to service debt. Public debt will lead to a transfer of resources to unproductive creditors and as a result "the ruin of trade and manufacture will follow the declension of agriculture."

David Ricardo were concerned with consequences of public debt- the usage to which it was put. The consequence of debt is the destruction of capital caused by it. Ricardo advocated one-time capital levy as a means of redemption of debt and use of tax revenues for the financing of the war. The aim should be to be debt free within the period of three years. According to him, a nation free from public debt will witness high private capital formation and thus enjoy higher economic growth. One time tax in form of a capital levy will free the nation from the debt otherwise continuous tax burden will drive resources out of the economy and thus discourages economic growth.

3.3.2 Structural Theory of Public Debt

The Structural Theory of Public Debt focuses on the unique challenges faced by developing economies, like Nigeria, and how public debt should be used as a tool for economic transformation rather than solely for stabilization or consumption. Structural economists argue that developing countries have distinct economic structures, constraints, and development needs that require a tailored approach to economic policy, especially concerning public debt (Nwaoha et.al, 2017).

According to Udeh (2016), Structural economists argue that developing countries often face systemic barriers, such as weak infrastructure, low levels of industrialization, dependence on exports of primary goods, and underdeveloped financial systems. These constraints prevent these countries from easily transitioning to an industrialized economy and achieving sustainable growth through traditional free-market policies alone. Public debt is therefore seen as a potential tool to overcome these structural barriers, with a focus on transforming the economy to an industrialized economy. The theory suggests that public debt, if used effectively, should finance projects that address structural weaknesses in the economy. Instead of using debt to fund consumption or unproductive expenditures, debt should be invested in long-term projects that stimulate industrialization, innovation, and infrastructural development. Structural economists argue that the use of public debt should focus on building resilience to these external vulnerabilities by supporting industries that add value domestically, creating a diversified

economy less susceptible to global market fluctuations. Investment in the industrial sector, manufacturing, energy, education, healthcare, transportation, and technology are examples of sectors where debt can create long-term value and reduce reliance on imports.

3.3.3 The Keynesian Theory

According to Imide (2019), the General Theory of Employment, Interest, and Money, was published by John Maynard Keynes in 1936. The publication constituted an enormous attack on the classical economics tradition in which Keynes was brought up. Keynes canvassed for an inclusive socialization of investment" and the state's taking "an ever-better accountability for openly organizing investment in the economy." Keynes believe that government should borrow money to spend on such things as public works; and that deficit spending, in turn, would create jobs and increase purchasing power in the economy as striving to balance the government's budget during a recession would make things worse, not better. Keynes view fiscal policy as the best policy that brings about growth in any economy since it acts in the interest of the general public. According to Keynes, when the government embark on public borrowing to finance its expenditure, unemployed funds are withdrawn from the private pockets such that the consumption level of private individuals remains unaffected. This funds when injected back into the economy by the government leads to a multiple increase in aggregate demand causing an increase in output and employment. Hence, public borrowing can be used to influence

macroeconomic performance of the economy. On the other hand, the indirect effect of public borrowing is its effect on investment. The transmission mechanism through which debts affect growth is its reduction on the resources available for investment by debt servicing. Also, public debt can act as an implicit tax on the resources generated by a country and create a burden on future generations which come in the form of a reduced flow of income from a lower stock of private capital. This in turn, may lead to an increase in long-term interest rates, a crowding out of private investments necessary for productivity growth, and a reduction in capital accumulation.

3.4 Empirical Literature Review

Okodua, Henri and Ewetan (2022) studied public debt, fiscal space and industrial sector performance in Nigeria using ARDL and data from 1981 to 2020. The result of the research showed that total debt stock and debt services over export ratio significantly affect manufacturing sector performance in the long run while fiscal balance and debt services over export ratio significantly affect its performance in the short run.

Hayati, Liztiara and Muchtar (2022) carried out study on debt financing and firm performance on manufacturing companies using samples from 21 companies listed on the Indonesia Stock Exchange for the period 2016 - 2020. Sample was collected using purposive sampling technique and analyses using panel data regression. The results of this study state that the Short term debt ratio (STDA) has no effect on Return on Assets , Long term debt ratio (LTDA) has a negative and significant effect on Return on assets,

Sales Growth (GROWTH) has a positive and significant effect on Return on assets, Short term debt ratio (STDA) has no effect on Net Profit Margin, Long term debt ratio (LTDA) has a negative and significant effect on Net Profit Margin , Sales Growth (GROWTH) has a positive and significant effect on Net Profit Margin.

Abuamsha and Shamali (2022) studied debt structure and its impact on financial performance in Paleusibg 41 companies and panel data regression analysis. The study found out that the Return on Asset (ROA) increases when long-term debts are used for financing the assets in the insurance, investment, and industrial sectors. On the other hand, in the service sector, the ROA is negatively affected by the use of long-term debt. The study also found out that the ROA of companies in the insurance and investment sectors is positively impacted by short-term debts.

Ibekwe and Ibekwe (2021). Examined the effect of public debt financing of capital expenditure on small and medium scale enterprises in Nigeria. The result of the study indicates that public debt financing of capital expenditure on roads, capital expenditure on agriculture, capital expenditure on education, recurrent expenditure have positive and significant effect on small and medium scale.

Ighoroje and Akpokerere (2021), examined the fiscal policy and manufacturing sector capacity in Nigeria from 1987 to 2019. Fiscal policy was disintegrated into government expenditure, tax revenue and budget deficit while manufacturing sector capacity was measured as the GDP contribution from the manufacturing sector. The model developed

was analysed using Error Correction Modelling.

Ozuzu and Isukul (2021), examined the effect of government expenditure on the growth of the manufacturing sector output in Nigeria and the study used regression analysis in the estimation of the data. The study revealed that government capital expenditure has a positive and significant effect on the manufacturing sector; public debt has a positive and significant effect on the manufacturing sector; monetary policy rate has a positive and significant effect on the growth of the manufacturing sector, while real interest rate has a negative and no significant effect on the growth of the manufacturing sector.

Omankhanlen, Chimezie, and Lawrence (2021) examined Public debt, capital expenditure and recurrent expenditure on the manufacturing sector in Nigeria. This research study found out that government expenditure is statistically insignificant but has a positive effect on manufacturing capacity development. Public debt is however statistically significant and negatively impacts industrial output. Also, a change in capital stock i.e. Gross Fixed Capital Formation (GFCF) leads to a significant but negative change in industrial development.

Yunasa and Adeyemi (2021) studied the effect of debt financing on financial performance of manufacturing enterprises in Nigeria. Data from 2008 to 2018 was employed and vector error correctin model were employed. The result of their study shows positive and significant relationship between debt financing and return on equity of firms.

Ehikioya, L.I (2020) studied external financing and industrial sector output in a deregulated economy: econometric evidence from Nigeria. Auto Regressive Distributed Lag (ARDL) and data from 1986 to 2018 was employed for the study. The result shows that in the short-run, external financing has significant impact on manufacturing output. External debt has direct but insignificant effect on Nigeria manufacturing output while foreign portfolio investment has inverse and insignificant effect on Nigeria manufacturing output.

Jeff-Anyeneh, Ezu, and Ananwude, (2019), also estimated the long-run and short dynamics between government expenditure and debt on manufacturing and industrial output in Nigeria from 1981 to 2016 with the view to evaluating how the industrial sector has been influenced by variation in government expenditure. The Autoregressive Distributed Lag (ARDL) was the technique applied. The paper found that government debt and expenditure negatively affected manufacturing sector output in Nigeria both in the long run and short run.

Imide (2019) examined the impact of fiscal policy on the manufacturing sector capacity in Nigeria from 1980 to 2017. The manufacturing sector was proxied as the Index of Manufacturing Sector while the explanatory variables were government expenditure, company income tax rate and federal government domestic debt outstanding. The results reveal that the government expenditure have positive relationship with the index of

manufacturing sector capacity while federal government domestic debt outstanding has negative linear relationship with the index of manufacturing sector capacity.

Cuong Phu, Amélie, Duc (2019) studied Government expenditure, external and domestic public debt, and economic growth. In particular, the relation between public spending and the tax rate has a bell shape. Domestic debt unambiguously increases with tax whereas external debt displays an inverted U-shaped curve. The relation between public spending and the tax rate has a bell shape. Domestic debt unambiguously increases with tax whereas external debt displays an inverted U-shaped curve. A high tax rate leads to a reallocation of public debt in favor of domestic debt (to the detriment of external debt). The effect of taxation on consumption (and production) also displays a nonlinear pattern when the output elasticity of capital is lower than unity (the effect is monotonously increasing if this elasticity is unity).

Ugwu, Asogwa and Ugwuanyi (2017) examined the impact of external debt on manufacturing capacity in Nigeria. Employing the Ordinary Least Squares (OLS) method on annual time series data for the period between 1982 and 2013. The results obtained shows that in the short-run,

foreign direct investment has an inverse and insignificant effect on manufacturing output and also foreign aid inflow and external debt have inverse but significant reduction in manufacturing output.

Nwanne, (2015).Investigate the effect of government capital expenditure and public debt on the manufacturing sector capacity in Nigeria. The study used quantitative time series data and multiple regression techniques in the analysis. The result of the co-integration test indicates long run relationship between dependent and independent variables. It also reveals that capital expenditure on road infrastructure (CEXR) and telecommunication (CEXT) affects the manufacturing sector capacity in Nigeria significantly while government capital expenditure on power has insignificant effect on manufacturing capacity in Nigeria.

3.5 Summary of Literature Reviewed

Name	Year	Topic	Location	Methodology	Findings
Nwanne et.al	2015	The effect of government capital expenditure and public debt on manufacturing capacity.	Nigeria	Ordinary Least Squares (OLS)	The result of the co-integration test indicates long run relationship between dependent and independent variables. It also reveals that capital expenditure on road infrastructure (CEXR) and telecommunication (CEXT) affects the manufacturing sector output and capacity in Nigeria significantly while

					government capital expenditure on power has insignificant effect on manufacturing capacity utilization in Nigeria.
Jeff et.al	2019	Long run and short run dynamics between government expenditure and debt on manufacturing and industrial output.	Nigeria	Ordinary Least Squares (OLS)	The paper found that government debt and expenditure negatively affected manufacturing sector development in Nigeria both in the long run and short run.
Omkhantan	2021	Public debt, capital expenditure and recurrent expenditure on the manufacturing sector in Nigeria.	Nigeria	Ordinary Least Squares (OLS)	This research study found out that government revenue is statistically insignificant but has a positive effect on manufacturing capacity development. Capital expenditure is however statistically significant and

					negatively impacts industrial output. Also, a change in capital stock i.e. Gross Fixed Capital Formation (GFCF) leads to a significant but negative change in industrial development
Ibekwe and Ibekwe	2021	Effects of Public Debt Financing of Capital expenditure on SME's	Nigeria	Ordinary Least Squares (OLS)	The result of the study indicates that public debt financing of capital expenditure on roads, capital expenditure on agriculture, capital expenditure on education, recurrent expenditure have positive and significant effect on small and medium scale.
Ighoroje	2021	The impact of fiscal policy on manufacturing sector output and capacity utilization	Nigeria	OLS	The results revealed that fiscal policy has a long-run and short-run effect on manufacturing sector output. The

					result also revealed government expenditure and budget deficit have a significant positive impact on manufacturing sector output in Nigeria; while tax revenue has a positive but insignificant effect on the manufacturing sector output in Nigeria and the study concluded that fiscal policy drives the industrial sector output growth in Nigeria.
Ozuzu and Isukul	2021	The effect of government expenditure on the growth of the manufacturing sector output in Nigeria.	Nigeria	Ordinary Least Squares	The study revealed that government capital expenditure has a positive and significant effect on the manufacturing sector; public debt has a positive and significant effect on the manufacturing

					sector; monetary policy rate has a positive and significant effect on the growth of the manufacturing sector, while real interest rate has a negative and no significant effect on the growth of the manufacturing sector.
Ugwu, Asogwa and Ugwuanyi	2017	The impact of external debt on manufacturing capacity in Nigeria.	Nigeria	OLS	The results obtained shows that in the short-run, Foreign direct investment has an inverse and insignificant effect on manufacturing output and also foreign aid inflow and external debt have inverse but significant reduction in manufacturing output.
Imide	2019	The impact of fiscal policy on the manufacturing sector	Nigeria	Ordinary Least Squares (OLS)	The results reveal that the government expenditure have positive

		capacity in Nigeria from 1980 to 2017.			relationship with the index of manufacturing sector capacity while federal government domestic debt outstanding has negative linear relationship with the index of manufacturing sector capacity.
Cuong Phu, Amélie and Duc	2019	Government expenditure, external and domestic public debt, and economic growth.	China	Normal distribution curve.	The relation between public spending and the tax rate has a bell shape. Domestic debt unambiguously increases with tax whereas external debt displays an inverted U-shaped curve. A high tax rate leads to a reallocation of public debt in favor of domestic debt (to the detriment of external debt). The effect of taxation on consumption (and production)

					also displays a nonlinear pattern when the output elasticity of capital is lower than unity (the effect is monotonously increasing if this elasticity is unity).
Ehikioya	2020	External financing and industrial sector output in a deregulated economy: econometric evidence from Nigeria.	Nigeria	ARDL	The result shows that in the short-run, external financing has significant impact on manufacturing output. External debt has direct but insignificant effect on Nigeria manufacturing output while foreign portfolio investment has inverse and insignificant effect on Nigeria manufacturing output.
Yunasa and Adeyemi	2021	The effect of debt financing on financial performance of manufacturing	Nigeria	ECM	The result of their study shows positive and significant relationship between debt

		enterprises in Nigeria.			financing and return on equity of firms.
Okodua, Henri and Ewetan	2022	Public debt, fiscal space and industrial sector performance in Nigeria.	Nigeria	ARDL	The result of the research showed that total debt stock and debt services over export ratio significantly affect manufacturing sector performance in the long run while fiscal balance and debt services over export ratio significantly affect its performance in the short run.
Hayati, Liztiara and Muchtar	2022	Debt financing and firm performance on manufacturing companies.	Indonesia	Purposive sampling technique and ratio analysis	The results of this study state that the Short term debt ratio (STDA) has no effect on Return on Assets , Long term debt ratio (LTDA) has a negative and significant effect on Return on assets, Sales Growth (GROWTH) has a

					positive and significant effect on Return on assets, Short term debt ratio (STDA) has no effect on Net Profit Margin, Long term debt ratio (LTDA) has a negative and significant effect on Net Profit Margin , Sales Growth (GROWTH) has a positive and significant effect on Net Profit Margin.
Abuamsha and Shamali	2022	Debt structure and its impact on financial performance in Paleusibg 41 companies	Paleusibg	Panel data regression technique	The study found out that the Return on Asset (ROA) increases when long-term debts are used for financing the assets in the insurance, investment, and industrial sectors. On the other hand, in the service sector, the ROA is negatively affected by the use of long-

					term debt. The study also found out that the ROA of companies in the insurance and investment sectors is positively impacted by short-term debts.

3.6 Gaps in the Literature Reviewed

Structural economists argue that developing countries often face stringent barriers, such as weak infrastructure, low levels of industrialization, dependence on exportation of primary goods, and underdeveloped financial sector. The structuralists advocated for the use of public debt to solve these pressing developmental concerns. However the structuralists did not lend so much voice on the effectiveness of private sector credit (debt) and cost of capital (interest rate) on manufacturing sector capacity.

A critical examination of the above empirical works done by different authors, show that public debt is actually critical for the growth and development of the manufacturing sector in Nigeria. The studies focused on the effect of public debt, government expenditure, taxation, external debt, foreign investment on manufacturing sector capacity in Nigeria. However the private sector is one of the critical factors that drives the growth of the manufacturing sector in Nigeria and causes the development of the manufacturing

capacity of the manufacturing sector in Nigeria. Hence a critical examination of private sector debt needs to be considered in analyzing the critical factors or variables that drives the growth or development of manufacturing sector capacity in Nigeria. Cost of capital (interest rate) is a critical factor that affects the level of borrowing and investment in the manufacturing sector in Nigeria. Hence cost of capital (proxy with interest rate) is an important factor that affects the level of manufacturing sector capacity.

3.7 Critique of the Literature Audit

Some critics argue that structuralist theories lack robust empirical backing. They may rely on historical examples that do not necessarily reflect current realities or present-day challenges in the manufacturing sector. Critics assert that structuralists' views on debt often overlook the conditionality imposed by creditors and international financial institutions, which can exacerbate the debt burden instead of supporting productive investments in manufacturing. Structuralism can sometimes promote rigid frameworks that may not adapt well to the unique circumstances of specific countries, leading to ineffective or harmful policy recommendations.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

This chapter will be focused on discussing the relevant theory on which this study will be based, the relevant model which will be specified to capture the linear relationship and impact of public debt on manufacturing sector capacity in Nigeria. The chapter will also focus on the appropriate estimation technique that will be adopted for the estimation of the proposed model. Lastly the source(s) of the data that will be used for the empirical analysis will be highlighted, the measurement of the data and the apriori expectation.

4.2 Theoretical framework

4.2.1 The Keynesian Theory

This study is be built on the structuralist theory of public debt and its impact on manufacturing sector capacity. This theory posits that economic phenomena must be understood in the context of their structures, particularly focusing on the roles of institutions, systems, and arrangements in shaping economic outcomes. The structuralist framework suggests that public debt significantly impacts the manufacturing sector's capacity through its influence on interest rates, government spending, and overall investment. By applying mathematical expressions, we elucidate the relationships

between public debt, government spending, insertion of private investment, and manufacturing capacity.

High levels of public debt can lead to higher interest rates, reducing private investment in the manufacturing sector.

Let P.D be public debt

Intr be the interest rate and

P.I be private investment.

The relationship can be expressed as:

$I = I_o + I_{Intr}$

Where I_o is the baseline investment (autonomous investment) and I_{Intr} is a positive constant indicating how sensitive investment is to interest rates.

Introducing the government sector, it can be seen that high public debt may restrain government spending on essential infrastructure and services that support the manufacturing sector.

G represents government spending and it is constrained by debt, then:

$G = G_o - k * P.D$

Where G_o is intended spending and k measures the reduction in spending due to the debt burden.

According to the structuralists, manufacturing capacity can be defined as the maximum output that a manufacturing entity can achieve under normal conditions. This capacity is influenced by multiple factors including labor productivity (LP), capital input (K) and technology level (T) investment in structures such as roads, bridges, power, health care facilities and education through borrowing by the government.

MC = f(LP, K, T)

LP = Labor Productivity (output per worker)

K = Capital Input (machinery, tools, and financial capital)

T = Level of Technology (efficiency and advancements)

An increase in public debt can lead to a reduction in G (government investment in infrastructure, education, and R&D) which, in turn, affects MC (manufacturing capacity) since manufacturing capacity often depends on these investments.

The relationship can be illustrated as thus:

MC = f(LP, K, T, (G_o - k *P.D)

This shows that as public debt increases (PD), government spending (G) potentially decreases, negatively affecting manufacturing capacity (MC) in the long term.

The structuralist theory, particularly in the context of public debt and the manufacturing sector, has faced several criticisms. Critics argue that structuralists tend to focus heavily on external factors (like international market dynamics) while underestimating internal conditions, such as governmental inefficiencies and corruption, that also contribute to public debt and industrial capacity issues. Structuralists often depict countries as passive victims of external forces, neglecting the role of domestic policies and agency. Critics contend that this view undermines the potential for local governments to implement effective industrial policies. The theory is sometimes seen as offering a static view of economic structures, failing to account for the dynamic nature of economies. This may lead to outdated conclusions in rapidly changing global markets**.**

4.3 Model Specification

The model specification for this study focuses on how public debt impacts on the manufacturing sector capacity in Nigeria. The study's dependent variable is the manufacturing sector capacity. This variable represents the value of efficiency or productivity of the manufacturing sector in Nigeria. Public debt is the study's main independent variable. The model also takes into account a number of controlled variables that would impact on the level of industrial performance in Nigeria. These include private sector loan, level of income (Real GDP), consumption expenditure and interest rate.

The Use of Natural Log

Natural log helps to compress the time series data and tends to present it in the form of percentage. In order for the selected variables to pass the unit root test and test for co-integration, the natural log of the variables was used. Also the natural log of the variables was used in order to overcome the problem of multi-colinearity and auto correlation in the time series data. The model specified below is the double logged model.

The model is thus written as:

General form of the Model

LNMANC = f (LNFGPD, LNPSL, LNRGDP, LNCONEX, INT) - - --equation 1

Where;

LNMANC = Natural log of Manufacturing Sector (Dependent variable)

LNFGPD = Natural log of Federal Government Public Debt (Independent variable)

LNPSL = Natural log of Private Sector Loan (Independent variable)

LNRGDP = Natural log of Real Gross Domestic Product (Independent variable)

LNCONEX = Natural log of Consumption Expenditure (Independent variable)

INT = Interest Rate

Econometric form of the Model

$LNMANC = \beta_0 + \beta_1 LNFGPD + \beta_2 LNPSL + \beta_3 LNRGDP + \beta_4 LNCONEX + \beta_5 INT + U_t$- equation 2

Where:

β_0 = Constant term

β_1 = Regression coefficient of the natural log of Federal Government Public Debt

β_2 = Regression coefficient of the Natural log of Private Sector Loan

β_3 = Regression coefficient of Natural log of Real Gross Domestic Product

β_4 = Regression coefficient of log Consumption expenditure

β_5 = Regression coefficient of interest rate

U_t = Error Term

4.5 Estimation Technique

Ordinary Least Squares

The simple linear Regression analysis and other econometric techniques are used in this study to examine the relationship amongst the variables. The Multiple Regression Model (MRM) will be used to analyze the effect of public debt on manufacturing sector capacity in Nigeria. The estimation technique that would be adopted would be the Ordinary Least

Square (OLS) technique because it produces values for the variable that are reliable, best, unbiased, linear and efficient.

Unit Root Test

Many economic and financial time series exhibit trending behavior or non stationarity in the mean. Leading examples are asset prices, exchange rates and the levels of macroeconomic aggregates like real GDP. An important econometric task is determining the most appropriate form of the trend in the data. For example, in ARMA modeling the data must be transformed to stationary form prior to analysis. If the data are trending, then some form of trend removal is required. Two common trend removal or de-trending procedures are first differencing and time-trend regression. First differencing is appropriate for I(1) time series and time-trend regression is appropriate for trend stationary I(0) time series. Unit root tests can be used to determine if trending data should be first differenced or regressed on deterministic functions of time to render the data stationary. Moreover, economic and finance theory often suggests the existence of long-run equilibrium relationships among non-stationary time series variables. If these variables are I(1), then co-integration techniques can be used to model these long-run relations. Hence, pre-testing for unit roots is often a first step in the co-integration modeling. When testing for unit roots, it is crucial to specify the null and alternative hypotheses appropriately to characterize the trend properties of the data at hand. For example, if the observed data does not exhibit an increasing or decreasing trend, then the

appropriate null and alternative hypotheses should reflect this. The trend properties of the data under the alternative hypothesis will determine the form of the test regression used. Furthermore, the type of deterministic terms in the test regression will influence the asymptotic distributions of the unit root test statistics.

$Y_t = c + \delta_t + \varphi Y_{t-1} + \varepsilon_{t-}$ - - -equation 3

The above model includes a constant and deterministic time trend to capture the deterministic trend under the alternative. The hypotheses to be tested are

$H_0 : \varphi = 1 \Rightarrow Yt \sim I(1)$ with drift

$H_1 : |\varphi| < 1 \Rightarrow Yt \sim I(0)$ with deterministic time trend

Co-Integration Test

The second stage involves testing for co-integration between series with the mix order of integration. The theory of co-integration emerges as a natural extension of the analysis and testing for unit roots. Non-stationary time series variables are the focus of this methodology test. The theory of co-integration, "explains how to analyze the inter-relationships between the long term trends in the variables that are differenced away in the Box-Jenkins technique." This statement is based on the work of Phillips (1998), who was referenced in that work. Co-integration assumes that the difference between two series that are trended but otherwise move closely together in the long run is constant. If there is a long-term correlation between two variables, we say that they are co-integrated.

In the absence of co-integration, the two variables in question are free to deviate from each other indefinitely (Dickey et.al., 1991). The results of co-integration experiments reveal situations in which two or more non-stationary time series are combined in such a way that, they are unable to depart from equilibrium over the long run. For this research, the Maximum Eugene value and the Trace statistics will be used to test for co-integration in this study.

The Error Correction Model

Given that the existence Co-integration is established amongst the series, then an Error Correction Mechanism (ECM) which was first adopted and applied by Phillips (1998) and later popularized by Engel and Granger (1969) is carried out to correct for any disequilibrium in the short-run. The Error Correction Model (ECM) is given below:

$$\Delta VMANU = \lambda_0 + \lambda_1 \Sigma \Delta LNFGPD + \lambda_2 \Sigma\Delta LNPSL + \lambda_3 \Sigma\Delta LNRGDP + \lambda_4 \Sigma\Delta LNCONEX + \lambda_5 \Sigma\Delta INT + \varphi ecm(-1) + \Omega \ldots\ldots\ldots\ldots \text{ equation 4}$$

Where:

ΔVMANU is first difference of the log of value added of manufacturing sector

ΔLNFGPD is first difference of log of federal government public debt

ΔLNPSL is first difference of log of private sector loan

ΔLNLIVST is first difference of the log of real gross domestic product

ΔLNCONEX is first difference of the log of Consumption Expenditure

ΔINT is first difference of interest rate

Φ is the Error Correction Model (ECM) coefficient

Ω is the error term

4.4 Data Measurement Sources and Apriori Expectation

Secondary data obtained from CBN statistical bulletin and for real sector and World Development Index will be used for the purpose of this work. Real Gross Domestic Product will be used as proxy for the level of national income. VMANU will be used as proxy for manufacturing sector capacity. Interest rate is used to capture the cost of borrowing,

Apriori Expectation for the first model

The apiriori sign are: $\beta_0 > 0$ or < 0, $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 < 0$.

CHAPTER FIVE

PRESENTATION OF DATA AND INTERPRETATION OF RESULTS

5.1 Descriptive Statistics

The summary statistics of all the series employed in this study are presented and discussed below. Specifically, we have Measures of Central tendencies and Variability. The mean of each of the series is a pointer to the average of the respective variable. The standard deviation shows how distributed the variable is from the mean. The maximum value shows the highest value for each variable, while the minimum value shows the lowest value for the entire period under study. The skewness value shows whether the data observation for a particular variable is positively skewed or negatively skewed.

Table 5.1

Variables	MANC	FGPD	PSL	GDP	LNCONEX	INT
Mean	5471.368	3429.503	9097.951	48919.40	3.627248	6.860864
Median	1496.792	703.3515	1013.515	12529.21	3.907016	7.243559
Maximum	28442.90	18702.25	52884.78	234425.9	5.151360	11.06417
Minimum	28.22947	2.331200	8.570050	139.3105	1.133546	0.316667
Std. Dev.	8214.048	5370.734	13334.07	64910.11	1.238628	2.330138
Skewness	1.744921	1.966536	1.529160	1.293021	-0.46685	-1.07915
Kurtosis	4.837542	5.665098	4.576914	3.561808	1.894908	4.559358
Probability	0.000001	0.000001	0.000019	0.001629	0.146812	0.001505

Sum	240740.2	150898.1	400309.9	2152454.	159.5989	301.8780
Observations	44	44	44	44	44	44

Source: Author's computation using E-views 13.0, 2025.

From the table above, it can be seen that the average value of manufacturing capacity for the period under study is 5471.368, with a maximum value of 28442.90, a minimum value of 28.22947 and a standard deviation of 8214.048. The result also shows that manufacturing capacity is positively skewed.

From the table above, it can be seen that the average value of federal government public debt for the period is 3429.503 (billion naira), with a maximum value of 18702.25 (billion naira), a minimum value of 2.331200 (billion naira) and a standard deviation of 5370.734 (billion naira). The result also shows that federal government public debt is positively skewed.

From the table above, it can be seen that the average value of private sector loan for the period is 9097.951 million naira, with a maximum value of 52884.78 million naira, a minimum value of 8.570050 million naira and a standard deviation of 13334.07 million naira. The result also shows that private sector loan is positively skewed.

From the table above, it can be seen that the average value of Gross Domestic Product for the period is 48919.40 billion naira, with a maximum value of 234425.9 billion naira, a minimum value of 139.3105 billion naira and a standard deviation of 64910.11 billion naira. The result also shows that Gross Domestic Product is positively skewed.

From the table above, it can be seen that the average value of consumption expenditure for the period is 3.6272 billion naira, with a maximum value of 5.1514 billion naira, a minimum value of 1.1335 and a standard deviation of 1.2386 billion naira. The result also shows that consumption expenditure is negatively skewed.

From the table above, it can be seen that the average value of interest rate for the period is 6.8609, with a maximum value of 11.0642, a minimum value of 0.3167 and a standard deviation of 2.3301. The result also shows that interest rate negatively skewed.

5.2 Unit root Test

5.2.1 Unit root Test at Level

Table 5.2

Variables	Probability at 5% level of significance	Order of integration	Remarks
LNMANC	0.1935	I(o)	Non stationary
LNFGPD	0.478	I(o)	Non stationary
LNPSL	0.5967	I(o)	Non stationary
LNGDP	0.2658	I(o)	Non stationary
LNCONEX	0.0089	I(o)	Stationary
INT	0.0273	I(o)	Stationary

Source: Author's computation using E-views 13.0, 2025.

The unit root test result shows that at 5% level of significance some of the variables are not stationary at level this implies the presence of unit root in the data series obtained. The first difference needs to be taken to determine the absence of unit root in the data series.

5.2.2 Unit root Test at First Difference

Table 5.3

Variables	Probability at 5% level of significance	Order of integration	Remarks
LNMANC	0.0228	I(1)	Stationary
LNFGPD	0.0002	I(1)	Stationary
LNPSL	0.0009	I(1)	Stationary
LNGDP	0.0782	I(1)	Stationary
LNCONEX	0.0016	I(1)	Stationary
INT	0.0001	I(1)	Stationary

Source: Author's computation using E-views 13.0, 2025.

The unit root test result shows that at 5% level of significance and at obtaining the first difference of the data series, all the variables are stationary. This means that there is no unit root in the data series after obtaining the first difference of all the variables

5.3 Co-integration Test

Table 5.4: Johansen Co-integration (Trace and maximum Eugene statistic)

Hypothesized No. of CE(s)	Trace Statistic	Prob.**	Hypothesized No. of CE(s)	Max-Eigen Statistic	Prob.**
None *	135.5146	0.0000	None *	49.07735	0.0038
At most 1 *	86.43730	0.0014	At most 1 *	45.76534	0.0012
At most 2	40.67195	0.1993	At most 2	16.86932	0.5912
At most 3	23.80263	0.2089	At most 3	13.65841	0.3937
At most 4	10.14422	0.2698	At most 4	7.747307	0.4050
At most 5	2.396916	0.1216	At most 5	2.396916	0.1216

Source: Author's computation using E-views 13.0, 2025.

From the table above, the trace statistic shows that there are two co-integrating equations at 5% level of significance. The maximum Eugene statistic show that there are two co-integrating equations at 5% level of significance. This shows that there is a long run relationship among the chosen variables.

5.4 Estimation Results

5.4.1 Short Run Estimate

Table 5.5

Dependent Variable: D(LNMANC)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	0.019293	0.012087	1.596211	0.1192
D(LNFGPD)	0.014263	0.033995	0.419566	0.6773
D(LNPSL)	-0.07085	0.091224	-0.7766	0.4425
D(LNGDP)	0.738672	0.144438	5.114101	0
D(LNCONEX)	0.011288	0.081373	0.138725	0.8904
D(INT)	-0.00651	0.003205	-2.03062	0.0497
ECM(-1)	-0.13097	0.094882	-1.38036	0.076
R-squared	0.556888	Mean dependent var		0.068829
Adjusted R-squared	0.483036	S.D. dependent var		0.058509
S.E. of regression	0.042068	Akaike info criterion		-3.35116
Sum squared resid	0.06371	Schwarz criterion		-3.06445
Log likelihood	79.04995	Hannan-Quinn criter.		-3.24543
F-statistic	7.540604	Durbin-Watson stat		1.526367
Prob(F-statistic)	0.000028			

Source: Author's computation using E-views 13.0, 2025.

The error correction term (ECM) which represents the speed of adjustment needed to restore equilibrium in the dynamic model after a disturbance appropriately explains the model as both its sign and significance level meets theoretical and statistical expectations. The implication of this is that a shock to Gross Domestic Product in the current period will be restored at a speed of adjustment of about 7.6% in the next period. This confirms the adequacy and statistical efficiency of the model. The ECM coefficient is both negative and significant.

5.4.2 Long Run Estimate

Table 6

Dependent Variable: LNMANC				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.54917	0.202392	-2.7134	0.01
LNFGPD	0.138908	0.027945	4.970819	0.0001
LNPSL	0.029582	0.113356	0.260962	0.7955
LNGDP	1.019647	0.187478	5.438743	0.0001
LNCONEX	-0.23672	0.108193	-2.1879	0.0349
INT	-0.00486	0.00626	-0.77623	0.4424
R-squared	0.994064	Mean dependent var		3.048196
Adjusted R-squared	0.993283	S.D. dependent var		0.967036
S.E. of regression	0.079254	Akaike info criterion		-2.10618

Sum squared resid	0.238688	Schwarz criterion	-1.86288
Log likelihood	52.336	Hannan-Quinn criter.	-2.01596
F-statistic	1272.772	Durbin-Watson stat	1.512114
Prob(F-statistic)	0.000001		

Source: Author's computation using E-views 13.0, 2025.

Interpretation of the Variables and their Statistical Significance

From the table above, it can be seen that federal government public debt has a positive impact on manufacturing sector capacity, and it's significant at 5% level of significance. A 1% increase in federal government public debt will increase the level of manufacturing sector capacity by approximately 0.139%. The federal government borrows funds both from internal and external sources. These funds are channeled into developmental projects such as construction of roads, bridges and fly-overs. The government sometimes encourage the industrial sector by granting funds in order to achieve sectorial growth and development. Also these funds are spent on to purchase manufacturing sector outputs thereby leading to high demand and investment in the manufacturing sector. These activities boost the level of the manufacturing sector outputs, performance and level of capacity.

From the result above private sector loan has a positive relationship with manufacturing sector capacity and it is not statistically significant at 5% level of significance. A 1%

increase in private sector loan will lead to approximately 0.0296% increase in manufacturing sector capacity. The private sector usually obtain loan from financial institutions both at home and abroad. These loans are invested in the purchase of both local and international resources for manufacturing activities. The continuous investment of these loans into the manufacturing sector will increase the level of both physical and financial resources which will lead to the development of manufacturing sector capacity.

From the result above Gross Domestic Product (GDP) or the level of income has a positive impact on manufacturing sector capacity and it is statistically significant at 5% level of significance. A 1% increase in Gross Domestic Product (GDP) or the level of income will lead to approximately 1.0197% increase in manufacturing sector capacity. As the level of income increases, both the level of consumption and savings also increase. The increase in the level of consumption will lead to increase in the demand for manufacturing output. This will trigger continuous increase in the level of manufacturing output. The increase in the level of savings will lead to increase in the level of finance and funds needed for investment activities in the manufacturing output.

From the result above consumption expenditure has a negative impact on the manufacturing sector capacity in Nigeria, and it is statistically significant at 5% level of significance. A 1% increase in consumption expenditure will lead to approximately 0.237% decrease in the manufacturing sector capacity in Nigeria. The inverse relationship exhibited by manufacturing sector capacity and consumption expenditure is

based on the fact that Nigerians consume more of imported products than local manufactured products. As the level of demand of imported products increases, the demand for locally manufactured products decreases and this causes decrease in the level of manufacturing sector capacity in Nigeria.

From the result above interest rate has a negative impact on the manufacturing sector capacity in Nigeria, and it is not statistically significant at 5% level of significance. A 1% increase in consumption expenditure will lead to approximately 0.0049% decrease in the manufacturing sector capacity in Nigeria.

Interpretation of the co-efficient (R^2) of determination F-statistic and Durbin-Watson Statistic

The coefficient of determination (R^2) shows that the entire model has very strong predictive power. The R^2 value which is given as 0.994064 or 99.40% explains that 99.40% of the total variations in manufacturing sector capacity can be explained by variations federal government public debt, private sector loan, Gross Domestic Product, consumption expenditure and interest rate. The p-value of the F-statistic how that the entire model is statistically significant at 5% or 0.05 level or significance. The Durbin Watson Statistic show the absence of auto or serial correlation because the DW statistics is 1.5 which is approximately 2.

5.5 Policy Implication

From the table above, it can be seen that federal government public debt has a positive impact on manufacturing sector capacity. The federal government borrows funds both from internal and external sources. These funds are channeled into developmental projects such as construction of roads, bridges and fly-overs. The government sometimes encourage the industrial sector by granting funds in order to achieve sectorial growth and development. Also these funds are spent on to purchase manufacturing sector outputs thereby leading to high demand and investment in the manufacturing sector. These activities boost the level of the manufacturing sector outputs, performance and level of capacity.

From the result above private sector loan has a positive relationship with manufacturing sector capacity. The private sector usually obtain loan from financial institutions both at home and abroad. These loans are invested in the purchase of both local and international resources for manufacturing activities. The continuous investment of these loans into the manufacturing sector will increase the level of both physical and financial resources which will lead to the development of manufacturing sector capacity.

From the result above Gross Domestic Product (GDP) or the level of income has a positive impact on manufacturing sector capacity. As the level of income increases, both the level of consumption and savings also increase. The increase in the level of consumption will lead to increase in the demand for manufacturing output. This will

trigger continuous increase in the level of manufacturing output. The increase in the level of savings will lead to increase in the level of finance and funds needed for investment activities in the manufacturing output.

From the result above consumption expenditure has a negative impact on the manufacturing sector capacity in Nigeria. The inverse relationship exhibited by manufacturing sector capacity and consumption expenditure is based on the fact that Nigerians consume more of imported products than local manufactured products. As the level of demand of imported products increases, the demand for locally manufactured products decreases and this causes decrease in the level of manufacturing sector capacity in Nigeria.

CHAPTER SIX

6.1 Summary of Findings

This study empirically analyzes the impacts of public debt on manufacturing capacity in Nigeria. The broad objective of this study is to empirically analyze the impacts of public debt on manufacturing capacity in Nigeria. The Ordinary Least Squares method was adopted to analyze the relationship between public debt and manufacturing capacity, private sector loan, Gross Domestic Product, consumption expenditure and interest rate. Secondary data which spans from 1981 to 2024, sourced from the Central Bank of Nigeria statistical bulletin for real sector, public sector and World Development Index, was extracted and utilized for empirical analysis. Some forms of pre-estimation tests were carried out in order to obtain satisfactory results. Such tests are the unit root test: test for stationarity, the co-integration test which tests for long run equilibrium relation between the variables of interest of this study.

Both the long run and short run estimates (using error correction model), were obtained and interpretations were given according to the results obtained. From the long run result obtained in the previous chapter, it can be seen that all the variables meet the apriori expectation as specified except for consumption expenditure. The result shows that public debt positively impacts on the manufacturing capacity and it is significant, private sector loan has a significant positive impact on manufacturing capacity, Gross Domestic Product has a significant positive impact on the manufacturing capacity however both

consumption expenditure and interest rate have negative impact on manufacturing capacity.

6.2 Conclusion

This study seeks to discover the effect of public debt on manufacturing capacity in Nigeria. Therefore, in conclusion public debt positively impacts on manufacturing capacity in Nigeria and it is significant, private sector loan has a significant positive impact on manufacturing capacity, Gross Domestic Product has a significant positive impact on the manufacturing capacity however both consumption expenditure and interest rate have negative impact on manufacturing capacity.

6.3 Recommendations

Haven discovered from this study the significant positive impact of public on manufacturing capacity in Nigeria, it is therefore recommended that:

1. The federal government should ensure that enough capital is available for the manufacturing sector given the importance of the manufacturing sector to the Nigerian economy.
2. The monetary authority should ensure that the level of interest rate (cost of capital) does not discourage domestic manufacturing industries that need capital from both the money market and the capital market for investment purpose.

3. Commercial banks should make loan and other credit facility available to domestic manufacturing industries to boost the level of investment and productivity.

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Appendix

Descriptive Statistics

	MANC	FGPD	PSL	GDP	LNCONEX	INT
Mean	5471.368	3429.503	9097.951	48919.40	3.627248	6.860864
Median	1496.792	703.3515	1013.515	12529.21	3.907016	7.243559
Maximum	28442.90	18702.25	52884.78	234425.9	5.151360	11.06417
Minimum	28.22947	2.331200	8.570050	139.3105	1.133546	0.316667
Std. Dev.	8214.048	5370.734	13334.07	64910.11	1.238628	2.330138
Skewness	1.744921	1.966536	1.529160	1.293021	-0.466849	-1.079151
Kurtosis	4.837542	5.665098	4.576914	3.561808	1.894908	4.559358
Jarque-Bera	28.51852	41.38164	21.70663	12.83927	3.837201	12.99809
Probability	0.000001	0.000001	0.000019	0.001629	0.146812	0.001505
Sum	240740.2	150898.1	400309.9	2152454.	159.5989	301.8780
Sum Sq. Dev.	2.900000	1.240000	7.650000	1.8100000	65.97059	233.4703
Observations	44	44	44	44	44	44

Unit Root Test at Level

Null Hypothesis: LNMANC has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.247506	0.1935
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNMANC)
Method: Least Squares
Date: 10/31/25 Time: 01:53
Sample (adjusted): 1985 2024

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNMANC(-1)	-0.020080	0.008934	-2.247506	0.0310
D(LNMANC(-1))	0.404426	0.152892	2.645172	0.0121
D(LNMANC(-2))	0.085959	0.165412	0.519665	0.6066
D(LNMANC(-3))	-0.144688	0.153269	-0.944018	0.3516
C	0.111155	0.032583	3.411469	0.0016

R-squared	0.327655	Mean dependent var	0.073544
Adjusted R-squared	0.250815	S.D. dependent var	0.056642
S.E. of regression	0.049027	Akaike info criterion	-3.076433
Sum squared resid	0.084127	Schwarz criterion	-2.865323
Log likelihood	66.52865	Hannan-Quinn criter.	-3.000102
F-statistic	4.264144	Durbin-Watson stat	1.755723
Prob(F-statistic)	0.006473		

Null Hypothesis: LNFGPD has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.591585	0.4780
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNFGPD)
Method: Least Squares
Date: 10/31/25 Time: 01:55
Sample (adjusted): 1983 2024
Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNFGPD(-1)	-0.052643	0.033076	-1.591585	0.1196
D(LNFGPD(-1))	0.260013	0.138871	1.872335	0.0687
C	0.209332	0.103897	2.014806	0.0509

R-squared	0.159490	Mean dependent var	0.079201
Adjusted R-squared	0.116387	S.D. dependent var	0.190589

S.E. of regression	0.179155	Akaike info criterion	-0.532377
Sum squared resid	1.251770	Schwarz criterion	-0.408258
Log likelihood	14.17992	Hannan-Quinn criter.	-0.486882
F-statistic	3.700202	Durbin-Watson stat	1.807215
Prob(F-statistic)	0.033774		

Null Hypothesis: LNPSL has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.351889	0.5967
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNPSL)
Method: Least Squares
Date: 10/31/25 Time: 01:56
Sample (adjusted): 1982 2024
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNPSL(-1)	-0.013094	0.009686	-1.351889	0.1838
C	0.123296	0.030707	4.015243	0.0002

R-squared	0.042674	Mean dependent var	0.085075
Adjusted R-squared	0.019324	S.D. dependent var	0.079344
S.E. of regression	0.078574	Akaike info criterion	-2.204159
Sum squared resid	0.253128	Schwarz criterion	-2.122243
Log likelihood	49.38942	Hannan-Quinn criter.	-2.173951
F-statistic	1.827605	Durbin-Watson stat	1.479065
Prob(F-statistic)	0.183822		

Null Hypothesis: LNGDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.048836	0.2658
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNGDP)
Method: Least Squares
Date: 10/31/25 Time: 01:56
Sample (adjusted): 1982 2024
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP(-1)	-0.016015	0.007817	-2.048836	0.0469
C	0.134444	0.031540	4.262598	0.0001

R-squared	0.092875	Mean dependent var	0.072133
Adjusted R-squared	0.070750	S.D. dependent var	0.056855
S.E. of regression	0.054807	Akaike info criterion	-2.924617
Sum squared resid	0.123154	Schwarz criterion	-2.842701
Log likelihood	64.87927	Hannan-Quinn criter.	-2.894409
F-statistic	4.197728	Durbin-Watson stat	0.999120
Prob(F-statistic)	0.046915		

Null Hypothesis: LNCONEX has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.638607	0.0089
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNCONEX)
Method: Least Squares
Date: 10/31/25 Time: 01:57
Sample (adjusted): 1982 2024
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCONEX(-1)	-0.037747	0.010374	-3.638607	0.0008
C	0.225406	0.039391	5.722214	0.0000

R-squared	0.244093	Mean dependent var	0.089684
Adjusted R-squared	0.225656	S.D. dependent var	0.094365
S.E. of regression	0.083038	Akaike info criterion	-2.093637
Sum squared resid	0.282709	Schwarz criterion	-2.011721
Log likelihood	47.01319	Hannan-Quinn criter.	-2.063429
F-statistic	13.23946	Durbin-Watson stat	1.730541
Prob(F-statistic)	0.000760		

Null Hypothesis: INT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.192840	0.0273
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INT)
Method: Least Squares
Date: 10/31/25 Time: 01:57
Sample (adjusted): 1982 2024
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INT(-1)	-0.391927	0.122752	-3.192840	0.0027
C	2.735198	0.888271	3.079237	0.0037

R-squared	0.199128	Mean dependent var	0.050030
Adjusted R-squared	0.179595	S.D. dependent var	2.069974
S.E. of regression	1.874904	Akaike info criterion	4.140387
Sum squared resid	144.1259	Schwarz criterion	4.222304
Log likelihood	-87.01833	Hannan-Quinn criter.	4.170595
F-statistic	10.19423	Durbin-Watson stat	1.726859
Prob(F-statistic)	0.002706		

Unit Root Test at First Difference

Null Hypothesis: D(LNMANC) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.276806	0.0228
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNMANC,2)
Method: Least Squares
Date: 10/31/25 Time: 01:59
Sample (adjusted): 1985 2024
Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNMANC(-1))	-0.634662	0.193683	-3.276806	0.0023
D(LNMANC(-1),2)	0.081674	0.187608	0.435341	0.6659
D(LNMANC(-2),2)	0.169559	0.161241	1.051587	0.3000
C	0.046859	0.016450	2.848565	0.0072

R-squared	0.303419	Mean dependent var	0.000319
Adjusted R-squared	0.245370	S.D. dependent var	0.059528
S.E. of regression	0.051712	Akaike info criterion	-2.991620
Sum squared resid	0.096268	Schwarz criterion	-2.822732
Log likelihood	63.83240	Hannan-Quinn criter.	-2.930555
F-statistic	5.226995	Durbin-Watson stat	1.656629
Prob(F-statistic)	0.004244		

Null Hypothesis: D(LNFGPD) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.026720	0.0002
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNFGPD,2)
Method: Least Squares
Date: 10/31/25 Time: 02:01
Sample (adjusted): 1983 2024
Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNFGPD(-1))	-0.698951	0.139047	-5.026720	0.0000
C	0.051216	0.030993	1.652491	0.1063

R-squared	0.387141	Mean dependent var	-0.013759
Adjusted R-squared	0.371820	S.D. dependent var	0.230333
S.E. of regression	0.182557	Akaike info criterion	-0.517066
Sum squared resid	1.333075	Schwarz criterion	-0.434320
Log likelihood	12.85838	Hannan-Quinn criter.	-0.486736
F-statistic	25.26791	Durbin-Watson stat	1.862540
Prob(F-statistic)	0.000011		

Null Hypothesis: D(LNPSL) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.466623	0.0009
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNPSL,2)
Method: Least Squares
Date: 10/31/25 Time: 02:02
Sample (adjusted): 1983 2024
Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNPSL(-1))	-0.762860	0.170791	-4.466623	0.0001
C	0.063435	0.019689	3.221820	0.0025

R-squared	0.332785	Mean dependent var	-0.005411
Adjusted R-squared	0.316105	S.D. dependent var	0.096008
S.E. of regression	0.079397	Akaike info criterion	-2.182264
Sum squared resid	0.252155	Schwarz criterion	-2.099518
Log likelihood	47.82755	Hannan-Quinn criter.	-2.151935
F-statistic	19.95072	Durbin-Watson stat	1.754948
Prob(F-statistic)	0.000064		

Null Hypothesis: D(LNGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.725388	0.0782
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNGDP,2)
Method: Least Squares
Date: 10/31/25 Time: 02:02
Sample (adjusted): 1983 2024
Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDP(-1))	-0.449457	0.164915	-2.725388	0.0095
C	0.030864	0.014926	2.067817	0.0452

R-squared	0.156612	Mean dependent var	-0.003659
Adjusted R-squared	0.135527	S.D. dependent var	0.055030
S.E. of regression	0.051165	Akaike info criterion	-3.061073
Sum squared resid	0.104714	Schwarz criterion	-2.978326
Log likelihood	66.28253	Hannan-Quinn criter.	-3.030743
F-statistic	7.427738	Durbin-Watson stat	1.778551
Prob(F-statistic)	0.009482		

Null Hypothesis: D(LNCONEX) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.264448	0.0016
Test critical values:	1% level	-3.596616	
	5% level	-2.933158	
	10% level	-2.604867	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNCONEX,2)
Method: Least Squares
Date: 10/31/25 Time: 02:03
Sample (adjusted): 1983 2024
Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNCONEX(-1))	-0.714183	0.167474	-4.264448	0.0001
C	0.061421	0.021525	2.853469	0.0068

R-squared	0.312544	Mean dependent var	-0.006899
Adjusted R-squared	0.295357	S.D. dependent var	0.110986
S.E. of regression	0.093165	Akaike info criterion	-1.862450
Sum squared resid	0.347186	Schwarz criterion	-1.779703
Log likelihood	41.11144	Hannan-Quinn criter.	-1.832120
F-statistic	18.18552	Durbin-Watson stat	1.828989
Prob(F-statistic)	0.000119		

Null Hypothesis: D(INT) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.599476	0.0001
Test critical values:	1% level	-3.600987	
	5% level	-2.935001	
	10% level	-2.605836	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INT,2)
Method: Least Squares
Date: 10/31/25 Time: 02:03
Sample (adjusted): 1984 2024
Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INT(-1))	-1.407907	0.213336	-6.599476	0.0000
D(INT(-1),2)	0.362695	0.148861	2.436473	0.0196
C	-0.015970	0.311187	-0.051319	0.9593

R-squared	0.587171	Mean dependent var	-0.041260
Adjusted R-squared	0.565443	S.D. dependent var	3.022278
S.E. of regression	1.992313	Akaike info criterion	4.286825
Sum squared resid	150.8339	Schwarz criterion	4.412209
Log likelihood	-84.87992	Hannan-Quinn criter.	4.332483
F-statistic	27.02392	Durbin-Watson stat	2.146892
Prob(F-statistic)	0.000000		

Test for Co-integration

Date: 10/31/25 Time: 02:18
Sample (adjusted): 1983 2024
Included observations: 42 after adjustments
Trend assumption: Linear deterministic trend
Series: LNMANC LNFGPD LNPSL LNGDP LNCONEX INT
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.689170	135.5146	95.75366	0.0000
At most 1 *	0.663666	86.43730	69.81889	0.0014
At most 2	0.330785	40.67195	47.85613	0.1993
At most 3	0.277617	23.80263	29.79707	0.2089
At most 4	0.168447	10.14422	15.49471	0.2698
At most 5	0.055472	2.396916	3.841466	0.1216

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.689170	49.07735	40.07757	0.0038
At most 1 *	0.663666	45.76534	33.87687	0.0012
At most 2	0.330785	16.86932	27.58434	0.5912
At most 3	0.277617	13.65841	21.13162	0.3937
At most 4	0.168447	7.747307	14.26460	0.4050
At most 5	0.055472	2.396916	3.841466	0.1216

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

LNMANC	LNFGPD	LNPSL	LNGDP	LNCONEX	INT
2.160412	0.411359	10.37599	-17.62607	2.110341	0.544483
1.700772	-0.850630	-1.091975	10.96479	-9.623490	0.004803
-10.25578	1.950167	-4.933244	14.60182	-1.690684	0.167866
9.633919	-2.441611	-6.191749	-6.815300	5.976665	0.161724
-1.191315	0.022608	1.054522	-0.859184	0.137023	-0.322712

5.346679	1.730723	1.457756	-3.872014	-3.310954	-0.111064	

Unrestricted Adjustment Coefficients (alpha):

D(LNMANC)	0.014776	-0.013006	0.014895	-0.011819	-3.96E-05	-0.005857
D(LNFGPD)	0.062582	-0.027102	-0.034311	0.042427	0.033010	-0.012827
D(LNPSL)	-0.031649	0.001517	0.020446	0.015225	0.007203	-0.008495
D(LNGDP)	0.002271	-0.015964	0.021045	-0.001819	0.008695	0.000986
D(LNCONEX)	0.025998	0.038827	0.032796	-0.004985	0.013811	-0.001036
D(INT)	-0.703892	0.030237	-0.450232	-0.311156	0.527567	0.099055

1 Cointegrating Equation(s): Log likelihood 207.4007

Normalized cointegrating coefficients (standard error in parentheses)

LNMANC	LNFGPD	LNPSL	LNGDP	LNCONEX	INT
1.000000	0.190408	4.802783	-8.158659	0.976823	0.252027
	(0.15539)	(0.70198)	(1.10715)	(0.62612)	(0.03633)

Adjustment coefficients (standard error in parentheses)

D(LNMANC)	0.031923
	(0.01716)
D(LNFGPD)	0.135202
	(0.05539)
D(LNPSL)	-0.068376
	(0.02391)
D(LNGDP)	0.004907
	(0.01739)
D(LNCONEX)	0.056167
	(0.03115)
D(INT)	-1.520696
	(0.64340)

2 Cointegrating Equation(s): Log likelihood 230.2834

Normalized cointegrating coefficients (standard error in parentheses)

LNMANC	LNFGPD	LNPSL	LNGDP	LNCONEX	INT
1.000000	0.000000	3.301464	-4.131411	-0.852702	0.183314
		(0.51993)	(0.86969)	(0.49595)	(0.02955)
0.000000	1.000000	7.884756	-21.15064	9.608452	0.360876
		(1.55158)	(2.59532)	(1.48001)	(0.08819)

Adjustment coefficients (standard error in parentheses)

D(LNMANC)	0.009803	0.017142
	(0.02096)	(0.00720)
D(LNFGPD)	0.089109	0.048797
	(0.06933)	(0.02382)
D(LNPSL)	-0.065795	-0.014310
	(0.03042)	(0.01045)

D(LNGDP)	-0.022244	0.014514
	(0.02082)	(0.00715)
D(LNCONEX)	0.122203	-0.022333
	(0.03517)	(0.01208)
D(INT)	-1.469270	-0.315273
	(0.81873)	(0.28136)

3 Cointegrating Equation(s): Log likelihood 238.7180

Normalized cointegrating coefficients (standard error in parentheses)

LNMANC	LNFGPD	LNPSL	LNGDP	LNCONEX	INT
1.000000	0.000000	0.000000	-7.415587	6.255930	-0.144201
			(1.32221)	(1.15298)	(0.06369)
0.000000	1.000000	0.000000	-28.99411	26.58571	-0.421314
			(4.89216)	(4.26599)	(0.23564)
0.000000	0.000000	1.000000	0.994763	-2.153175	0.099203
			(0.51440)	(0.44856)	(0.02478)

Adjustment coefficients (standard error in parentheses)

D(LNMANC)	-0.142960	0.046190	0.094040
	(0.07628)	(0.01557)	(0.08291)
D(LNFGPD)	0.440993	-0.018115	0.848205
	(0.26034)	(0.05313)	(0.28296)
D(LNPSL)	-0.275487	0.025563	-0.430918
	(0.11140)	(0.02274)	(0.12108)
D(LNGDP)	-0.238073	0.055554	-0.062820
	(0.07066)	(0.01442)	(0.07680)
D(LNCONEX)	-0.214151	0.041626	0.065568
	(0.12197)	(0.02489)	(0.13257)
D(INT)	3.148206	-1.193300	-5.115488
	(3.05356)	(0.62320)	(3.31897)

4 Cointegrating Equation(s): Log likelihood 245.5472

Normalized cointegrating coefficients (standard error in parentheses)

LNMANC	LNFGPD	LNPSL	LNGDP	LNCONEX	INT
1.000000	0.000000	0.000000	0.000000	2822.354	-1180.087
				(603.594)	(297.364)
0.000000	1.000000	0.000000	0.000000	11037.21	-4613.864
				(2359.91)	(1162.62)
0.000000	0.000000	1.000000	0.000000	-379.9185	158.3826
				(80.9895)	(39.8999)
0.000000	0.000000	0.000000	1.000000	379.7540	-159.1166
				(81.3841)	(40.0944)

Adjustment coefficients (standard error in parentheses)

D(LNMANC)	-0.256826	0.075048	0.167222	-0.105010
	(0.09881)	(0.02250)	(0.09027)	(0.18112)
D(LNFGPD)	0.849732	-0.121705	0.585507	-2.190387

	(0.33569)	(0.07644)	(0.30665)	(0.61528)	
D(LNPSL)	-0.128813	-0.011609	-0.525186	0.769286	
	(0.14569)	(0.03317)	(0.13308)	(0.26703)	
D(LNGDP)	-0.255596	0.059995	-0.051558	0.104613	
	(0.09530)	(0.02170)	(0.08706)	(0.17468)	
D(LNCONEX)	-0.262173	0.053797	0.096432	0.480338	
	(0.16423)	(0.03740)	(0.15002)	(0.30102)	
D(INT)	0.150546	-0.433576	-3.188885	8.284803	
	(4.05154)	(0.92254)	(3.70106)	(7.42610)	

5 Cointegrating Equation(s): Log likelihood 249.4209

Normalized cointegrating coefficients (standard error in parentheses)

LNMANC	LNFGPD	LNPSL	LNGDP	LNCONEX	INT
1.000000	0.000000	0.000000	0.000000	0.000000	0.058765
					(0.14820)
0.000000	1.000000	0.000000	0.000000	0.000000	1.261118
					(0.55534)
0.000000	0.000000	1.000000	0.000000	0.000000	-0.477452
					(0.10421)
0.000000	0.000000	0.000000	1.000000	0.000000	-0.325383
					(0.07870)
0.000000	0.000000	0.000000	0.000000	1.000000	-0.418142
					(0.08864)

Adjustment coefficients (standard error in parentheses)

D(LNMANC)	-0.256778	0.075047	0.167180	-0.104976	0.060520
	(0.09915)	(0.02250)	(0.09056)	(0.18121)	(0.08028)
D(LNFGPD)	0.810407	-0.120959	0.620317	-2.218748	0.708985
	(0.32685)	(0.07417)	(0.29851)	(0.59735)	(0.26462)
D(LNPSL)	-0.137394	-0.011447	-0.517590	0.763097	-0.023982
	(0.14510)	(0.03293)	(0.13252)	(0.26519)	(0.11748)
D(LNGDP)	-0.265953	0.060192	-0.042390	0.097142	0.113162
	(0.09320)	(0.02115)	(0.08512)	(0.17032)	(0.07545)
D(LNCONEX)	-0.278625	0.054109	0.110996	0.468471	-0.402131
	(0.16124)	(0.03659)	(0.14726)	(0.29467)	(0.13054)
D(INT)	-0.477948	-0.421650	-2.632555	7.831522	-2.802624
	(3.85149)	(0.87400)	(3.51758)	(7.03895)	(3.11820)

Long Run Regression Result

Dependent Variable: LNMANC
Method: Least Squares
Date: 10/31/25 Time: 02:23
Sample: 1981 2024
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.549170	0.202392	-2.713401	0.0100
LNFGPD	0.138908	0.027945	4.970819	0.0000
LNPSL	0.029582	0.113356	0.260962	0.7955
LNGDP	1.019647	0.187478	5.438743	0.0000
LNCONEX	-0.236716	0.108193	-2.187897	0.0349
INT	-0.004859	0.006260	-0.776232	0.4424

R-squared	0.994064	Mean dependent var	3.048196
Adjusted R-squared	0.993283	S.D. dependent var	0.967036
S.E. of regression	0.079254	Akaike info criterion	-2.106182
Sum squared resid	0.238688	Schwarz criterion	-1.862883
Log likelihood	52.33600	Hannan-Quinn criter.	-2.015955
F-statistic	1272.772	Durbin-Watson stat	1.512114
Prob(F-statistic)	0.000000		

Short Run Regression Result

Dependent Variable: D(LNMANC)
Method: Least Squares
Date: 10/31/25 Time: 02:26
Sample (adjusted): 1982 2024
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.019293	0.012087	1.596211	0.1192
D(LNFGPD)	0.014263	0.033995	0.419566	0.6773
D(LNPSL)	-0.070845	0.091224	-0.776604	0.4425
D(LNGDP)	0.738672	0.144438	5.114101	0.0000
D(LNCONEX)	0.011288	0.081373	0.138725	0.8904
D(INT)	-0.006509	0.003205	-2.030623	0.0497
ECM(-1)	-0.130971	0.094882	-1.380364	0.0760

R-squared	0.556888	Mean dependent var	0.068829
Adjusted R-squared	0.483036	S.D. dependent var	0.058509
S.E. of regression	0.042068	Akaike info criterion	-3.351160
Sum squared resid	0.063710	Schwarz criterion	-3.064453
Log likelihood	79.04995	Hannan-Quinn criter.	-3.245432
F-statistic	7.540604	Durbin-Watson stat	1.526367
Prob(F-statistic)	0.000028		