THE IMPACT OF HEALTHCARE FUNDING AND LABOUR PRODUCTIVITY ON ECONOMIC GROWTH IN NIGERIA (1981-2018)

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JULY, 2021

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BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF ECONOMICS, FACULTY OF SOCIAL SCIENCES, UNIVERSITY OF BENIN, BENIN CITY, NIGERIA

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CERTIFICATION

This is to certify that this project titled "**INDUSTRIAL GROWTH AND FINANCIAL GROWTH NEXUS: A CASE OF THE NIGERIAN ECONOMY"** was carried out by **EDEKPOBI AKPOTOWERE SHADRACK** with matriculation number **SSC1609198**

. It has been read and recommended for acceptance in partial fulfilment of the requirement for the award of Bachelor of Science (B.Sc.) Degree in Economics.

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DEDICATION

This project is solely dedicated to almighty God for the grace, wisdom and courage he bestowed upon me throughout my years of academic pursuits in University of Benin.

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My in-depth gratitude goes to God Almighty for his blessings in my life. I am grateful for his endless love, protection, guidance, grace and showers of blessings upon my life.

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ABSTRACT

It is near impossible, for any country to witness significant growth in its economy without a well-developed and dynamic industrial sector. The mainstay on industrial development aspects of government spending in modern structures of economic development derives from the fact that industrial sector is the vehicle or channel for sustained growth in the long run due to the fact that industrial sector brings about a structural transformation of the economy. The overall objective of this study is to examine the role of the industrial sector in the development of the Nigerian economy. The variables considered are the ratio of private sector credit to GDP, a proxy for financial growth, as the dependent variable while real GDP per capita, a proxy for GDP, industrial output, a proxy for industrial growth and investment as the independent variables for the study. Augmented Dickey-fuller (ADF) test was used for the unit root test and the variables were found to be stationary at second difference. Then Johansen (1988) technique was used to establish if the stationary variables are co-integrated. Further, ECM is employed to correct any form of disequilibrium in the short run. The result of stationarity and normality test reveals that the model is fairly well specified and could be used for policy analysis. The analysis was based on data extracted from Central Bank of Nigeria (CBN) statistical bulletin and World Development Indicators (WDI). The result of the analysis shows that all the variables were statistically significant at 5%. The results reveal that there is, overall, a positive relationship between financial growth and industrial growth. The study therefore suggest that the government should adopt policies capable of stimulating industrial activities which will ensure sustainable financial growth.

CHAPTER ONE

INTRODUCTION

1.1.Background to the Study

The primary role of the industrial sector to the economy cannot be over emphasized when considering its contributions in the process of economic growth and development (Loto, 2012). It is near impossible, for any country to witness significant growth in its economy without a well-developed and dynamic industrial sector. The mainstay on industrial development aspects of government spending in modern structures of economic development derives from the fact that industrial sector is the vehicle or channel for sustained growth in the long run due to the fact that industrial sector brings about a structural transformation of the economy, provides the leverage for a competitive participation in foreign trade, expansion of domestic productive capacity and generation of quality employment opportunities. As the production of output of the economy increases as a result of mass production of goods and services with the use of better utilization of technologies, there is incidence of

capital formation which invariably increases the economic performance of the country and reduce the overdependence of a country on natural resources like crude oil.

The industry sector plays a very important and sensitive role in any nations' economic building. Industrialization leads to economic growth, creates goods and services, provides jobs and provides a healthy population through the structural transformation of the economy. The industrial sector is one of the sub-sectors of the real sector and it is one of the sectors of any economy that has the capacity of transforming an economy into a developed economy. In the development literature, industrial sector serves as the vehicle for the production of goods and services, the generation of employment and the enhancement of income (Olorunfem, Tomola, Adekunjo, &Ogundele, 2013).

In Nigeria, as in many other developing countries, the word industry is used synonymous for manufacturing. Manufacturing sector refers to those industries and activities which are involved in the manufacturing and processing of items and indulge in either the creation of new commodities or value addition (Adebayo, 2010). Indeed, Mbelede

(2012) opined that manufacturing sector is involved in the process of adding value to raw materials by turning them into products. Chete, Adeoti and Ogundele (2016) stated that the structure of Nigerian economy is such that it is highly driven by oil and gas sector accounting for about 95% of export earnings and 85% of government revenue between 2011 and 2012, with the industrial sector output consisting of mining, manufacturing and services accounting for only a proportion of about 10% of the economy. The decade of 1960-1969, the industrial share in output was 7.7% in 1960. The discovery of petroleum began to significantly raise this share in the second half of the decade. By 1969 industrial output accounted for 15.6%. Also the decade of 1970-1979 the contribution of the industrial sector to GDP rose from 13.76% in 1970 to 37.8% in 1979 due to the relative importance of crude oil to the economy (WDI, 1979). The decade of 1980-1989 according to Iyoha (2002) is regarded as "Africa's lost decade of development opportunities", this was particularly true for Nigeria where GDP per capital fell from $710 to $270. This was attributable to several factors which includes; the collapse of oil prices arising from the oil glut in the international market, the rise

in international interest rate and domestic macroeconomic policy mistake. The industrial output fell from 45.57% in 1980 to 26% in 1989 (WDI, 1989). The decade of 1990-1999, the relative share of industrial output has rose by several factors including favorable oil prices. The decade started with industrial output amounting to 41% of GDP, it rose steadily to high of 58.7% in 1993 but later fell to 46.9%. For the decade of 1990s, the relative share of industrial output in GDP has averaged a healthy 49.6%. (WDI, 1990). The decade of 2000 -2009, the industrial share in output was 23.04% in 2000. However, due to the Book Haram insurgency and vandalization of pipelines especially in Niger Delta region, the industrial output fell to 21.2% in 2009 (WDI, 2009). Also the period of 2010-2017, the contribution of the industrial sector to GDP was 25.3% in 2010 and has since fallen to 22.3% in 2017 (WDI, 2017).

Many Nigerians were made unemployed by the ongoing COVID-19 pandemic, combined with lower volumes of exports such as oil, Nigeria's economy has contracted by 6.1% year on year in the second quarter of the year 2020 (NEO, 2020). Economic data shows Nigeria’s government continues to fall far short of projections in its Economic

Recovery and Growth Plan, created in the aftermath of the 2016 recession to set out aggressive growth targets from 2017 to 2020. There's also little sign of a quick turnaround in Nigeria's economic woes as the World Bank predicted Africa's most populous country is set for its worst recession in four decades. This is evidenced as about 27% of Nigeria's labour force (over 21 million Nigerians) are unemployed, rising inflation (monetary policy problem), declining national income arising from the total lockdown in April 2020 which disrupted industrial sector's activities which led to rising prices of commodities in the local markets.

Developing economies are faced with challenges of rising unemployment rate, sustainable growth and price stability, aside from struggling to achieve structural transformation to suit the demands of contemporary economies. Despite the industrial sector policies adopted by the authority in Nigeria over the years, they have not been able to achieve stimulate the industrial base of the economy which would inevitably leads to a reduction in unemployment rate, price stability (which also entails exchange rate stability) and sustained growth. The economy still gets hurt by external shocks (dwindling foreign reserves

arising from volatility in crude oil prices), higher cost of importing industrial machineries, poor industrial policy implementation etc. The role of government activities in promoting the industrial sector is thus a significant aspect to be considered in the drive to promote sustainable growth in the sector.

1.2. Statement of the Research Problem

It is difficult for an economy to meet the economic and social needs and aspirations of the people, if the industrial sector is hampered. Therefore, Nigeria as a developing economy has accorded prominence to industrialization as an effective means of structural transformation which will stimulate the industrial base. In Nigeria, the industries have been the worse hit by various government economic policies (whether deregulation or regulation) and especially the ongoing COVID-19 pandemic. No wonder there has been an escalating rate of unemployment (which is about 27%) due to the total lockdown of the country in the second quarter of 2020. The pandemic has since led to closure of some infant industries, diminished living standard of the people and wide spread of poverty.

Over the years it can be deduced that contribution of the industrial sector to the Gross Domestic Product (GDP) which stands to measure the economic growth and development of a country remained relatively low. Nigeria can be classified as industrially underdeveloped Country. A lot of efforts have been put into the industrialization process. The industrial sector is known to be the strength of the value added process in many economies. A country is industrialized when at least one quarter of its gross domestic product (GDP) is produced in its industrial sector of which greater percentage of its output arises from the manufacturing sub-sector (Ayodele and Falokun, 2003).

The COVID-19 pandemic has created severe Economic consequences for all countries around the world especially Less Developed countries (LDCs). Nigeria has also been very badly hit. The lockdowns which was imposed in March 2020 led to a mess down in economic activities, culminating into massive job losses and disruptions in the supply network. It has also depressed the demand for crude oil and precipitated an unprecedented oil price crash. Nigeria's dependence on oil for revenue and foreign exchange makes it particularly vulnerable in

this situation. Consequently, many Nigerians were made unemployed by COVID-19, combined with lower volumes of exports such as oil, Nigeria's economy has contracted by 6.1% year on year in the second quarter of the year 2020. It is however important to note that economic data depicts that the government continues to lag behind of its potential targets in its Economic Recovery and Growth Plan, created in the aftermath of the 2016 recession to set out aggressive growth targets from 2017 to 2020. There's also little sign of a quick turnaround in Nigeria's economic woes as the World Bank predicted Africa's most populous country is set for its worst recession in four decades. This is evidenced as about 27% of Nigeria's labour force (over 21 million Nigerians) are unemployed, declining national income arising from the total lockdown in April 2020, rising prices of commodities in the local markets, fiscal problems etc.

The greatest obstacles to rapid industrial output in Nigeria is inadequate finance and poor industrial policy implementation. The failure of government capital expenditure to propel sustainable growth in this sector and in the economy at large is a misery in the economic cycle in

Nigeria. In addition, most government administration in Nigeria embarked on unproductive expenditures which do not aid industrial growth and economic development. Despite the fact that it has become clear to the developing countries of the world (including Nigeria), how important the industrial sector is to the development of any nation, the growth of the industrial sector and its contribution to the Nigeria's GDP have not been impressive.

1.3. Research Questions

Based on the above stated problems, the research questions which will guide this research work are as follows:

i. What is the impact of industrial output on economic growth in Nigeria?
ii. What is the impact of government capital expenditure on industrial performance in Nigeria?
iii. What is the effect of exchange rate on industrial performance in Nigeria?

1.4. Objective of the Study

The overall objective of this study is to examine the role of the industrial sector in the development of the Nigerian economy. Specifically, the study seeks to;

i. To examine the impact of industrial output on economic growth in Nigeria.
ii. To assess the impact of government capital expenditure on Industrial Performance in Nigeria.
iii. To examine the effect of exchange rate on industrial performance in Nigeria.

1.5. Research Hypotheses

The hypotheses (all in null form) that guide this study are stated below:

i. There is no significant relationship between industrial output and economic growth in Nigeria
ii. There is no significant relationship between government capital expenditure and industrial performance in Nigeria.
iii. Exchange rate does not significantly affect industrial performance in Nigeria.

1.6. Significance of the Study

This study, therefore aims at assessing the role of the industrial sector to the development of the Nigerian economy. The significance of this study lies in the fact that it will expose the extent to which the industrial sector has contributed to economic growth in Nigeria. The relevance of this work also lies in the fact that it adds to the already existing literature thereby constituting relevant literature for upcoming researchers as regards the subject matter.

For the government, it will help them to appreciate the need to evolve policies that will be aimed at increasing the level of industrialization for rapid economic development. It will also help the students to know to what extent the industrial sector has contributed to economic development in Nigeria.

1.7. Scope of the Study

This study seeks to empirically analyze the role of the industrial sector to the development of the Nigerian economy between the periods of 1985-2019. The justification for the scope is out of the desire to account for recent developments in Nigeria. This study adopted time series secondary data sourced from Central Bank of Nigeria (CBN) statistical bulletin.

1.8. Limitations of the Study

Time constraint was a major constraint to the researcher. Limited time serves as a constraint to adequate research of subject matter as the study was carried out alongside other academic work, as well as the issues with reliability of time-series secondary data.

1.9. Organization of the Study

This research work is subdivided into five chapters; Chapter one depicts the introductory aspect of the research which encompasses background to the study, statement of the problem, research questions, objectives of the study, research hypotheses, scope of the study, significance of the study as well as the limitation of the study. Chapter

two deals with the assessment and review of relevant literatures to the research work. It involves conceptual literature, theoretical literature and empirical review of literature. Chapter three which is the methodology consists of the theoretical framework of the study, model specification, justification of the model as well as the method of data analysis adopted for the research work. Chapter four deals with the presentation and analysis of results as well as policy implication of findings. Chapter five comprises summary of findings, recommendation and conclusion.

CHAPTER TWO

LITERATURE REVIEW

2.1. Conceptual Literature

This chapter shall review the relevant related literature on the role of the industrial sector to the development of the Nigerian economy which includes the conceptual, theoretical and the empirical aspect of it.

2.1.1. Meaning of Industrial Sector Output

Industrial output is the total output of all the facilities producing goods within a country. Also, industrial output is the aggregate output from crude petroleum, natural gas, solid minerals and manufacturing sub-sectors in a given year expressed as a ratio of the nation's GDP. The output of all factories in a country is a sub-set of industrial output. An industry connotes a number of firms producing similar goods and services. In light of the foregoing, industrialization can be referred to as the process of developing the capacity of a nation to master and locate within its borders, the overall industrial process involved in the production of raw materials, production for intermediate products for

further production, fabrications of machines and tools needed for the manufacture of the desired semi or finished products.

Developing/under developed nations strive to industrialize their economies for many reasons. One of the rationale is to increase national output, industry value added and hence the productive base of the economy to deliver higher and improved levels of wealth and welfare to the people; secure fuller employment, expand the market for local raw materials and improve the stability of foreign exchange position through import substitution and export promotion industries.

In light of the important role the industrial sector should play in the structural transformation of the economy, the Nigerian government regards genuine industrialization as a sine qua non in national efforts to achieve the degree of self-reliance and confidence without which a nation can neither have stability necessary for social harmony at home nor master the needed respect and the means required for meaningful involvement in international affairs and interaction. Hence, over the years, a number of fiscal, monetary, exchange rate and commercial measures,

among others have been implemented to encourage industrial development with the ambit of available resources.

2.1.2. Features of the Industrial Sector

Before Nigeria gained independence, only a negligible number of industries existed in the nation. The available industries were essentially concerned with processing of agricultural items for domestic and export markets. The low pace of industrialization was associated with the institutional logs inherent in British colonial economic system. These systems which dominated essentially by foreign trading companies (such as United African Company) were aimed at keeping and reducing Nigeria to a buyers' market for metropolitan manufactures and a potential market for her raw material supplies.

In the 1970s, the federal government encouraged by massive oil revenue earnings due to quadrupled prices, invested heavily in consumer goods industries. It also directed efforts towards the development of capital goods. As at the early 1980s, the government invested heavily in projects, which included salt, iron and steel, cement, sugar, pulp and paper and fertilizer. In the later parts of the 1980s and in 1990s the

government had invested heavily in products, which included pro-chemical and aluminum.

Nigeria's industrial sector has been characterized by high import content of industrial inputs, dwindling capacity utilization, high cost of production, low value added, declining output growth, low employment generation and poor backward and forward linkages with other activity sectors of the economy (Obioma and Ozughalu, 2005).

Additionally, the industrial sector in Nigeria is characterized by a number of features which include the following:

i. Industrial production is inward looking: This connotes that emphasis is placed on import substitution rather than export promotion unlike the case in the newly industrializing less developed nations, which have diversified into high technology industries.

ii. Although manufacturing occupies one of the front seats in the native fastest growing concerns, it contribution to the Gross Domestic Product is minimal. In 1950, for example, it accounted for 0.49 percent of GDP and in 1960, it contributed 4.8 percent of

GDP. In 1970 its share rose to 7.25 percent. By 1980, the share of manufacturing in GDP was 8.3 percent. In 1991 its share rose to 8.52 percent from where it maintained a continuous annual decline such that by 1995 it stood at 6.88 percent and it maintained a steady meagre rise in the two decades of the 21 century. This poor manufacturing performance has been attributed to high production costs as a result of high cost of foreign exchange, poor demand, incessant power disruption, insufficient raw materials supply, inadequate working capital and frequent machine breakdowns. All these occurrences snowballed into low capacity utilization.

iii. The industrial sector's contributions to self-sufficiency in industrial goods has not been particularly satisfactory. As at the inception of the fourth national development plan, there was no industrial product in which the nation was self-sufficient. The nation still depends on imports for the supply of a number of industrial goods. The worst areas were those related to the supply of industrial and agricultural machinery and equipment where the

degree of dependence was 98.7 percent and 93.8 percent respectively.

iv. One major feature of the Nigerian economy has been the dominant and pervasive role of multinational corporation (MNCs). The multinationals are concentrated in the high technology capital intensive sectors of the economy. One of these is the manufacturing sector. The three traditional enclaves of foreign monopoly capital were areas of quick profit such as mining and quarrying, trading and business services as well as manufacturing in that order. Between 1970 and 1977, this pattern seemed to have shifted in favour of mining and quarrying dominated by oil, manufacturing, trading and business services in that order. But thereafter, foreign capital becomes most dominant in the manufacturing sector followed by trading and business services.

2.1.3. The Rationale/Reasons for Increased Industrial Sector Output

Most developing countries see increased industrial output as a central objective of their economic policy. It is seen as an integral part of development and structural change. The government has always accorded

it as an important pace in its various development plans to ensure an increased level of self-reliance in supply of industrial product.

The following are the rationale for increased industrial output.

(i) To alleviate poverty/standard of Living:

With increased industrial outputs, employment will increase and this would inevitably increase income which in turn would increase the standard of living of the people.

(ii) To Reduce Unemployment Rate:

An increase in industrial output will reduce the number of people unemployed in the country. The increased output would strengthen the economic base of the country, and this transformation would bring about an increase in national income which in turn reduces unemployment. The increased income would lead to increased government capital expenditure which would inevitably reduce unemployment rate.

(iii) To Increase Export/Import Substitution:

With increased industrial output of the country, more goods will be exported leading to favorable balance of payment and reduction in overdependence on imported materials/goods. This leads to an increase in

foreign exchange earnings which helps to stabilize our currency in the foreign exchange market.

(iv) To industrialized the Economic Base:

With increased industrial output, most of the less developing countries of the world would generate enough earnings to import capital goods need to industrialized the economic base of the country. This would help in bringing the gap between developed countries and developing countries

2.1.4. Problems of Industrial Sector in Nigeria

The industrial sector has helped substantially in reshaping the economic structure of Nigeria. Over the years, the sector has been faced with several problems which are;

(i) **Lack of Adequate Capital/Finance**:

Industries in Nigeria are afflicted with difficulties with the chief among been lack of adequate capital or finance. Besides the fact that lack of adequate finance constrains all small scale industries from being competitive with its large scale counterpart, it also limits his ability to

engage in aggressive selling technologies. Inadequate finance is a major problem confronting industrialist at various stages of their business. It is also important to state that because of our depressed economy and our debt problems, industrialist are finds it difficult to obtain enough trade credit or source capital abroad to enable them expand their operations.

(ii) Lack of Technical Knowhow:

The technological knowhow and shortage of managerial manpower is another problem facing the Nigeria industrial sector. Many industrial entrepreneurs engage in industries where they do not have appreciable technological background or experience.

(iii) Weak Raw Material Based

Due to poor state of its agricultural sector, there has been weak production of raw materials and these resulted to excessive reliance on the external sector for capital equipment and raw materials. That is most of the beverage industries, cosmetics, cement, rubber and some other food industries depend on imported raw materials for their production.

(iv) Inadequate Basic Infrastructural Facilities:

Infrastructural facilities like road network, epileptic power supply, river transportation, airways, water facilities, irrigation, machinery and equipment has hampered the role of industrial sector in the development of Nigeria. These infrastructural deficits it has resulted to closing of some of the existing industries while some of the new ones are not coming up. Although some of the industries have resolve to the use of diesel engines to run their industries which has often times resulted to high cost of production.

2.1.5 Government Incentives/Policy Measures to Industrial Sector in Nigeria

Government since 1968 made conscious effort to reduce dependence on foreign manufacturers through supportive program aimed at making the local manufacturers meet local demand along the line of import substitution. In order to achieve the objective, the Nigerian government has drafted for the country an industrial policy to guide its achievement. According to the Bureau of Public Enterprise (2005), industrial policy can be defined as a systematic government involvement

through specifically designed policies in industrial affairs, arising from the adequacy of macroeconomic policies in regulating the growth of the industry. The industrial policy of Nigeria intends to achieve the following objectives:

i. To generate and raise the local production
ii. Increase export of locally manufactured goods.
iii. Create a wider geographical dispersal of industries among the 36 states and the FCT.
iv. To improve the technological skill and capabilities available in the country.
v. To increase local content of industrial output by looking inwards for the basic and intermediate inputs.
vi. To attract foreign direct investment into the country.

To achieve the above, the Nigerian government has put in place some policy measures, these policy measures are looked at from three perspectives. Funding industrial development, incentives to industries and institutional framework.

(A) Funding Industrial Development

Stimulating industrial value added in Nigeria requires adequate financial resources. The private sector is expected to play the leading role while government focuses on facilitator's role. To help the industrialist to obtain a cheap inventible fund, government adopt two major strategies.

- The provision of credit facilities on concessionary economic development banks.
- Provision of equity funds and long term loans by the banking sector for the promotion of small and medium scale enterprises.

The bank (BoI)is expected to facilitate the production of primary industrial inputs by providing medium and long term loan for agriculture and agro-allied industries. The bank emerged from the merging of people bank, Nigerian agricultural and corporation bank and Family Economic Advancement Programme (FEAP).

To make funds available to small and medium scale enterprises (SMEs) which help Nigeria government to achieve its objectives of self-reliance enhances poverty reduction etc. Government through the Central Bank has encourage banks to set aside 10 percent of their annual profit as equity funds and long term loans for promotion of small and medium

scale enterprises. To attract foreign capital, the government has put in place structures that will encourage capital inflow to the economy. These measures include deregulation of the economic policy stability, reduction in number of regulatory agencies and establishing the Nigeria investment promotion commission (NIPC).

(B) Incentives to Industry

To achieve the industrial output growth of the nation and promote a dynamic efficient and sustainable manufacturing sector, government has set up package incentives. The incentive packages is aimed at stimulating the private sector to play a major role, increase industrial output and domestic resources utilization, promote geographical dispersal of industries and industrial linkages (backward and forward). The incentives are divided into fiscal measure and export promotion.

(i) Fiscal Measure

i. Tax Holiday: This is exemption of some industries especially the infant ones from the payment of tax for the period of at least 5 years to enable them grow.

ii. Tariff Protection: This is imposition of a heavy import duty on foreign goods so as to protect local industries from unhealthy international competition.

iii. Import Duty Relief: This is the granting of import duty relief to the importation of capital equipment by the government. This helps the newly established firm to be able to procure capital equipment cheaply, thereby increasing their productivity.

iv. Reduction of Excise Duty: This simply means reduction in the amount paid as taxes for goods and services produced in the country. This tax on locally produced goods help to reduce business cost of production.

(ii) Export Promotion

The Export incentive packages was introduced in the 1980s with the adoption of the Structural Adjustment Programme (SAP) through the promulgation of the export decree No. 17 of 1986. It includes:

(i) Export Development Fund: The government set up this scheme to assist financially the private sector exporting companies to cover part of their export promotion activities. These include

advertising and publicity, export research, training, seminars, etc.

(ii) Export Expansion Grant: The scheme provided inducement to exporters who have exported N500,000 worth of processed product. It is administered by the Nigeria export promotion council. Other policy measures include; duty draws scheme, depreciation allowance, currency retention scheme etc.

(C) Institutional Framework

The institution plays advisory facilitator roles in the industrialization process of the country. They make the business environment conducive for successful take off. The institution includes Individual Training Fund (ITF) for man power development, Standard Organization of Nigeria (SON) to ensure quality of products, National Automatic Council (NAC) to execute the automotive policy of government. Others includes; Small and Medium Scale Enterprises Development Association (SMEDAN), Raw Material Research and Development Council (RMRDC), National Agency for Food and Drug Administration and Control (NAFDAC) etc.

2.2. Meaning of Economic Growth

Economic growth can be seen as the increase in the final market value of goods and services produced in an economy overtime. It is conventionally measured as the percentage rate of increase in real gross domestic product. Economic growth also means an increase in the average rate of output produce per person usually measured on a per annum basis. It can be deduced that whenever there is increase in real GDP of a country, it will boost up the overall output and we called it economic growth. Todaro and Smith (2006) defined economic growth as the steady process by which the productive capacity of an economy is increased to bring about rising levels of national income. Economic growth is measured by the increase in a country's total output or real Gross Domestic Product (GDP) or Gross National Product (GNP). The Gross Domestic Product (GDP) of a country is the total value of all final goods and services produced within a country over a period of time. Therefore, an increase in GDP is the increase in a country's production or national income.

2.2.1. Importance/Need of Economic Growth

Sustainable economic growth is one of the most key parameter of a healthy and developing economy. One of the biggest impacts of long-term growth of a country is that it has a positive impact on national income and the level of employment, which increases the standard of living. An increase in GDP increases the wealth of the country thereby improving the standard of living of the populace. In addition, as the population of a country grows, it requires the growth to keep up its standard of living and wealth.

2.2.2. Factors Limiting Economic Growth

The development of the economy is the primal aim of the Nigerian government over the years. Some of the major factors limiting the development of the Nigerian economy are examined below;

(i) Poor Health and Low Levels of Education

People who don't have access to quality healthcare or education have lower levels of productivity. This lack of access means the labour force is not as productive as it could be and this tend to hinder the growth of the economy.

(ii) Lack of Necessary Infrastructure

Developing nations often surfer from inadequate infrastructures such as durable roads, adequate schools, and hospitals. This lack of infrastructure makes transportation more expensive, yields half-baked graduates and hinders the overall productivity of the country.

(iii) Flight of Capital

If the country is not delivering the returns expected from investors, then investors will pull out their money. Money often flows out of the country (capital flight) to seek higher rates of returns in other countries.

(iv) Political Instability/Insecurity

Political instability in the government scares investors and hinders investment. For example, the Boko Haram terrorists and the Fulani herdsmen has brought insecurity and political instability in the country. This instability and insecurity often scare off many potential investors who then invest in other countries that is relatively more stable.

2.3. Theoretical Review

This section provides a comprehensive review of literature on the theories of industrial output, capital expenditure and also theories of economic growth.

(i) The Keynesian Theory

In the Keynesian macroeconomics, increase in government expenditure has an expansionary effect on income and employment through the multiplier effects on aggregate demand. On the other side, government expenditure crowds out private investment as a result of increase in the rate of interest and this slows down economic growth and reduces the rate of capital accumulation in the long run (Keynes, 1936). Government expenditure is regarded as an exogenous variable that contributes positively to economic growth. To this end, an increase in government expenditure would likely lead to increase in employment, profitability and output through the multiplier effects on aggregate demand. The government expenditure has direct and positive impact on the GDP. An increase in government expenditure will boost aggregate demand, resulting in higher level of national income.

(ii) Musgrave's Theory of Public Expenditure Growth

The Musgrave's theory of public expenditure and growth explained that, at low level of per capital income, the demand for public services tend to be low, arguing that such income is devoted to satisfying primary needs and it is only when the per capital income starts to rise above these level of low income that the demand for services provided by the public sector such as education, health and transports starts to rise, thereby forcing government to increase expenditure on them. The theory observed that with high per capital income typical in the developed nations, the rate of public spending falls as most basic wants are being satisfied. Therefore, the theory suggested in connection to Wagner that as progressive nations become more industrialized, the share of public sector in the national economy grows continually.

(iii) The Theory of Infant Industry Promotion

The infant-industry theory is states that emerging domestic industries and firm need protection against foreign countries competition until they become mature and stable. An infant industry is one that is new and in its early stages of development, and still fragile to competition of

established industries. However, infant-industry theory is more of a protectionist trade policy.

This theory was later improved by John Stuart Mill, he added that infant industries should be protected if only they can mature and can continue without protection. The cumulative net benefits provided by the protected industry must exceed the cumulative costs of protecting the industry. In the theory of infant industry promoting the lack of productive capabilities is seen as the main cause of underdevelopment, and the development of productive capabilities is the essence of economic development. Alexander Hamilton, opined that the government of less developed countries should protect and develops its infant industry through policy measures in order to ensure their growth and be able to compete with superior producers.

Although protection, subsidies another helps the government create space in which the firms can grow up, a more sophisticated version of the infant industry argues that this government aids are not enough. These governmental aids and assistance only create the space in which the firms can grow up. The growing up process require that, having been given the

space, the infant industries need to invest in enhancing their productive capabilities, through investments in equipment, training, management skills, research and development etc.

(iv) Endogenous Growth Theory

Endogenous growth holds that economic growth is primarily as a result of endogenous factors and not external factors of the exogenous growth theory. Endogenous growth theory holds that investment in human capital, innovation and knowledge are significant contributors to economic growth. The theory also focuses on positive externalities and spillover effects of a knowledge based economy which leads to economic development. The theory primarily holds that long run growth rate of an economy depends on policy measures such as subsidies for research and development or education increases the growth rate in some endogenous growth rate by increasing the incentives for innovation.

In the endogenous growth theory, it has been argued that financial development can affect growth in three ways; raising the efficiency of financial intermediation, increasing the social marginal product of capital and labour as well as influencing the private savings rate. This means that

a well-functioning market is important and should be at the core of endogenous technical progress because a well-functioning financial system increases the efficiency of human capital as well as the physical capital. Moreover, productive financial services improve and expand the scope of innovative activities in an economy. Our simple endogenous growth model is based on the aggregate production function:

$$Y=AK$$

Where Y is the aggregate output and K is the aggregate capital stock. The parameter A is a positive constant. According to the production function, each additional unit of capital increases output by units regardless of how many units of capital are in production. Given that the marginal product of capital (A) is not a function of the size of capital stock (K), the production function does not imply diminishing marginal productivity of capital.

2.4. Empirical Literature

2.4.1. Evidence from Developed Countries

Melissa and Dean (2013) investigated the effect of government outflow on productivity industrial sector in the USA covering the period of 1985-2013, engaging the simple Cobb-Douglas production model. Findings confirm a strong positive and statistically bond between private capital and labor productivity. The recommendation of the study holds that government should encourage massive investment through direct funding and Public-Private-Partnership (PPP) model, since it would reduce the cost of doing business as well as raise the profitability of firms, hence contributing to overall national output and economic prosperity.

Nekarda and Ramey (2010) in USA, investigated industry level effects of government purchases in order to shed light on the transmission mechanism for government spending on the aggregate economy. They began by highlighting the different theoretical predictions concerning the effects of government spending on industry labor market equilibrium and thereafter create a panel data set that matches output and labor variable to shifts in industry – specific

government demand. The empirical results indicated that increases in government demand raise output and hours, but lower real product wages and productivity. Mark ups do not change as a result of government demand increases. The results were consistent with the neoclassical model of government spending, but they are not consistent with the New Keynesian model of the effects of government spending.

2.4.2 Evidence from Developing Countries

Ndiaya and Kangjuan (2018) carried out a study on the impact of industrialization on economic growth by analyzing the Senegalese manufacturing firms and covered the period between 1960 and 2017. It will employ the Ordinary Least Square (OLS) techniques in estimating the relationship between industrial output, inflation rate, FDI, Foreign Exchange Rate and economic growth, after which ADF unit root test was conducted using Breusch-Godfrey serial correlation LM test and Breusch-Pagan-Godfrey heteroscedasticity test. The econometric analysis revealed that the increase of industrial output will increase economic growth in Senegal. Therefore, there is significant relationship between industrial development and Senegalese economy growth. However, the

result revealed that industrialization will go a long way in stimulating economic growth.

A study by Isiksal and Chimezie (2016) indicated that no country particularly the developing ones has attained a level of economic growth without sub-sector linkage. They evaluated the Impact of Industrialization in Nigeria from 1997-2012 using the Johansen co-integration testing approach which demonstrated a significant long-run relationship between the three variables used. The results reveal that agriculture, industry and services have a significant positive relationship with economic growth measure by GDP in Nigeria.

Falade and Olagbaju (2015) ascertained the relationship between total government expenditure and industrial sector output in Nigeria. Total government expenditure was disaggregated into capital and recurrent with a view to analyze the relative effect of these categories of government expenditure with emphasis on the capital component. The study employed time series data from 1970 to 2013. Data on industrial sector output, capital and recurrent expenditure, nominal and real Gross Domestic Product (GDP) exchange rate and interest rate were collected

from statistical bulletin and Annual Report and statement of Accounts published by the Central Bank of Nigeria (CBN). the econometric results revealed stationarity of the variable of interest at the first difference while the Johansen co-integration approach also confirms the existence of one co-integrating relationship. The error correction estimates revealed that while government capital expenditure has positive relationship with industrial sector output in Nigeria, recurrent expenditure exerts negative effect on industrial sector output. The findings of the result showed that recurrent expenditure negatively affect industrial output which in turn leads to under-utilization of resources. The study recommends that the government should allocate more to capital expenditure to enhance economic development in Nigeria.

Njoku (2014) studied the effect of government expenditure on economic growth in Nigeria between the period of 1961 to 2013 and concluded that there is significant relationship between federal government expenditure and economic growth in Nigeria. Their study recommended that government should continuously increase expenditures that accelerate growth. On the basis of their empirical

results, Egbetunde and Fasanya (2013) suggested that public spending does not stimulate economic growth for Nigeria. They attributed the reason for this to be as a result of expenditure fungibility (that is spending more on recurrent expenses than capital expenses).

Samson (2013) examine administrative outflow and economic progression proxy by GDP to industrial sector in Nigeria between the period of 1980-2015, by means of vector error correction model and Granger causality model. The findings, therefore shows the manifestation of a negative and significant affiliation between government outflow and the industrial sector in Nigeria. The recommendation of the study holds that for government outflow to impact positively there ought to be effective and efficient channeling of funds to the industrial sector.

Iweriebor (2013) assessed the effect of public spending on the industrial sector in Nigeria using data covering the period 1980 to 2013. It was found in the study that public spending has no significant effect on industrial production in the short run. Moreover, government spending has a relatively weak effect on industrial production even in the long run, suggesting a disconnection between public spending and the real sector

of the economy. The findings, therefore shows the manifestation of a negative and significant affiliation between government outflow and the industrial sector in Nigeria. The recommendation emanating from statistical result established that the most effective and efficient way to boost development is sufficient outflow via capital outflow and decrease recurrent outflow in all the sectors in the economy.

WimNaudé and Adam Szirmai (2012) have examined the arguments about the engine of growth hypothesis for some Asian and Latin American developing countries. Focusing on capital intensity and growth of output, he finds support for the engine of growth hypothesis, but for some periods capital intensity in services and industry turns out to be higher than in manufacturing. He concludes that in advanced economies productivity growth in agriculture is more rapid than in manufacturing.

Eze and Ogiji, (2012) explore the impact of fiscal policy on the industrial output in Nigeria between the period of 1970-2014, by means of co-integration, VECM and OLS method. Findings bare that government outflow significantly affect the manufacturing sector output

and there is a long-run correlation between fiscal policy and manufacturing sector output in Nigeria. The recommendation suggest that government should encourage massive investment directly and through public-private-partnership in human capital sector of the national economy-education and health sectors through increased funding especially the funds for capital projects and maintenance, as well as ensure strict due diligence and implementation of Public-Private-Partnership (PPP) guidelines and processes for the development of education and health services.

Muritala and Taiwo (2011) examined the trends and effects of government expenditure on the growth of real GDP in Nigeria between 1970 and 2008 using ordinary least square techniques. The finding shows that there is a positive relationship between the real GDP and government capital and recurrent expenditure. The recommendation holds that there is positive correlation between economic growth and capital expenditure spent despite the low percentage of capital expenditure in the overall public expenditure programmed, government should strive towards

increasing the percentage of capital expenditure and productive capacity and accelerate economic growth.

2.5. Summary of Empirical Literature

From the review of empirical literature in investigating the role of the industrial sector in the development of the Nigerian economy, the findings are divided along two line of thought. One is that government capital expenditure on industrial output have positive impact on economic growth, while other stated government capital expenditure on industrial output have negative impact on economic growth. From the reviewed empirical literature, there is need to further determine the role of the industrial sector to the development of Nigeria using key policy variables.

CHAPTER THREE

THEORETICAL FRAMEWORK AND MODEL SPECIFICATION

3.2Theoretical Framework

In the preceding section under the theoretical literature, the theory that link industrial sector, government capital expenditure and economic growth is the endogenous growth theory/model. Hence, the endogenous growth theory will form the theoretical framework of this study. The endogenous growth theory places emphasis on technological progress which is determined by the rate of investment, size of capital stock as well as human capital as the determinants of economic growth in the long run. According to Rebelo (1991), he provided a simplest version of the endogenous growth model, the AK-model. It is characterized by the following production function:

$Y = AK$ ……... (1)

Where;

Y = aggregate output,

A = constant that ensures proportionality of income to capital.

K= capital stock.

This model belongs to the first generation of the endogenous growth models and explains cross country differences in the growth rates of income through the differences in the saving rates which in turn can be influenced by the economic policy conducted by the government (Rebelo, 1991). An endogenous character of the model is based on a result that government economic policy has long run implications on the saving patterns of the households and, thus, on the growth rate of a country.

The main feature of the AK model is constant returns to scale exhibited by the production function and in particular the constant return to the accumulated factor of production, capital. Rebelo (1991) explains the presence of constant returns to scale through the absence of such finite resources as land in the process of capital stock production. Based on these assumptions, the production function becomes proportional and linear in capital with the share of income paid to capital. The capital stock is accumulated through the process of savings and this can be expressed by the following equation:

$K = sAY - \partial K$ ……. (2)

From the equation of the capital accumulation, it is seen that savings and depreciation can be represented by straight lines (Jones, 2002). Therefore, the capital stock is always growing, which leads to an unlimited growth in the level of income. If we divide both sides of the capital accumulation equation (2) by *K*, the growth of capital equation will be derived:

$K/K = sA - \partial$ ……. (3)

Recalling the production function (1), it is seen that the growth rate of output is equal to the growth rate of capital:

$Y/Y = K/k = sA - \partial$ …… (4)

The income growth equation (4) shows that the linearity implied by the assumptions of the AK model leads to the infinite growth in income. Thus, the economic policy orientated on an increase in investments through savings will have long run effects on the development of an economy (Rebelo, 1991). This is the core conclusion of the AK-model.

3.2 Model Specification

The specification of appropriate econometric model boarders on the prevailing economic circumstances and the availability of economic data relating to the variables being examined (Koutusoyiannis, 1997). Therefore, following the modified endogenous growth model being stated above, a suitable model is specified to harness the degree and direction of the role of industrial sector in the development of the economy of Nigeria. Thus, the model for this study can be specified mathematically as;

RGDP = f (INDQ, CEXP, NEXR, INTR) …… (5)

The econometric form of the model above is stated as;

$RGDP_t = \beta_0 + \beta_1 INDQ_t + \beta_2 CEXP_t + \beta_3 NEXRt + \beta_4 INTR_t + Ut$ …… (6)

Where;

RGDP= Real Gross Domestic Product

INDQ= Industrial Output

CEXP = Capital Expenditure

NEXR = Nominal Exchange Rate

INTR = Interest Rate

Ut = stochastic term

t= time period

All variables are in their natural log form

***A Priori* Expectation**:

$\beta_1>0$, $\beta_2>0$, $\beta_3>0$, $\beta_4<0$

Where;

β_0 = constant term

β_1 = coefficient of industrial output

β_2 = coefficient of capital expenditure

β_3 = coefficient of real exchange rate

β_4 = coefficient of interest rate

3.3 Methodology

The study adopts a multiple regression analysis with Ordinary Least Square (OLS) econometric technique. In a view to avoiding the difficulties that may spring up while carrying out regression analysis with clearly non-stationary series which thus leads to spurious result, this study adopted Augmented Dickey Fuller (ADF) test for our unit root to

ascertain whether the data series has a unit root in order attain stationary. The study also employed the use of Johansen co-integration test so as to ascertain the long run relationship between variables employed for this study. Further, ECM is employed to correct any form of dis-equilibrium in the short run.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF RESULTS

4.4 Pre-Estimation Tests

4.4.1 Descriptive Statistics

Table 4.1. Descriptive Statistics of the Variables

	RGDP	INDQ	CEXP	NEXR	INTR
Mean	37001.83	11257.67	527.524	104.952	12.14977
Median	28957.71	10192.3	351.25	118.5669	10.0925
Maximum	71387.83	16742.15	2288.996	306.9206	28.02
Minimum	14953.91	6516.763	5.4647	0.89375	5.46
Std. Dev.	20101.98	3250.299	532.1273	92.14589	5.226087
Skewness	0.539957	0.198215	1.314816	0.694193	1.225207
Kurtosis	1.70741	1.653283	4.808814	2.752391	4.071999
Jarque-Bera	4.1373	2.87409	14.85572	2.900516	10.4325
Probability	0.126356	0.237629	0.000594	0.23451	0.005428
Sum	1295064	394018.3	18463.34	3673.321	425.2418
Sum Sq. Dev.	1.37E+10	3.59E+08	9627422	288689.4	928.6075
Observations	35	35	35	35	35

Source: Author's Computation using E-views 10

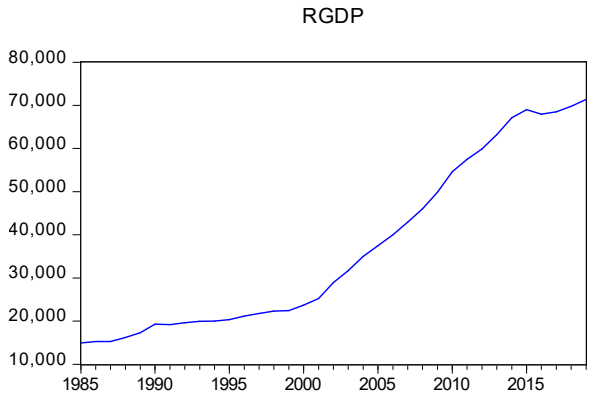
The descriptive statistics above shows that the average or mean of RGDP is about ₦37,001.8Billion and that of INDQ is about ₦11257.7Billion. The average value of CEXP is about ₦527.5Billion, while that of NEXR and INTR are about ₦105 per dollar and 12.15% respectively. The table show that the series are in high level of consistency as all the mean and median values of the respective variables are within the max and min values of the series. The standard deviation of RGDP is about 20,101.98 and that of INDQ is about 3250.3. The standard deviation of CEXP is about 532, while that of REXR and INTR are about 92 and 5.2 respectively. Furthermore, the relatively low standard deviation of all the data shows that the deviations of the actual data from their respective mean values are meagre.

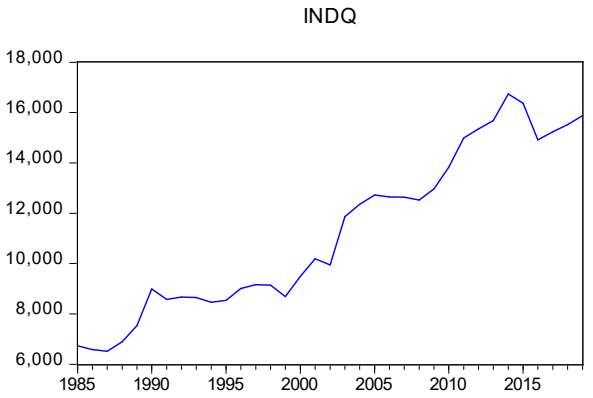
The skewness and Kurtosis statistics provide pivotal information regarding the symmetry of the probability of the data and the thickness of the distribution respectively. Normality test uses the null hypothesis of normality against the alternative hypothesis of non-normality. If the probability value of the Jacque-Berra chi-square is less than 0.05 at 5% level of significance, the null hypothesis of the regression is rejected.

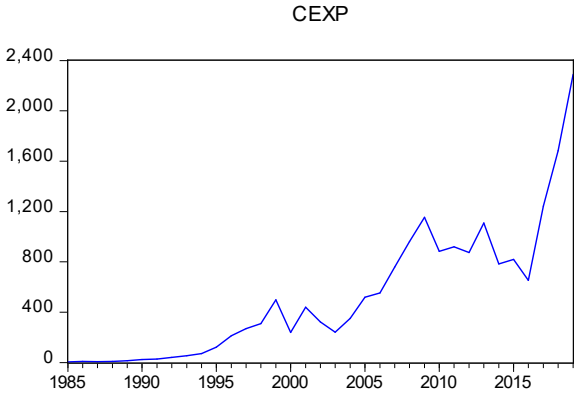
From the table above, the probability values of all the variables except CEXP and INTR exceed 5% (that is, 0.05), hence, they are normally distributed.

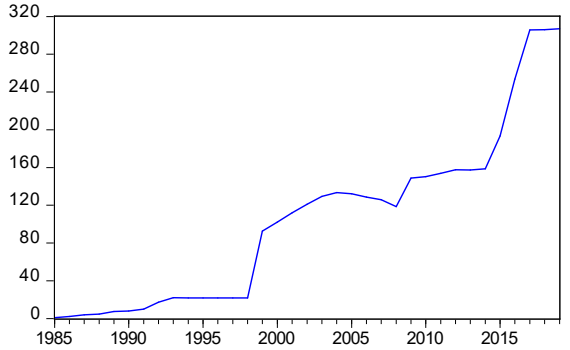
4.4.2 Trend Analyses

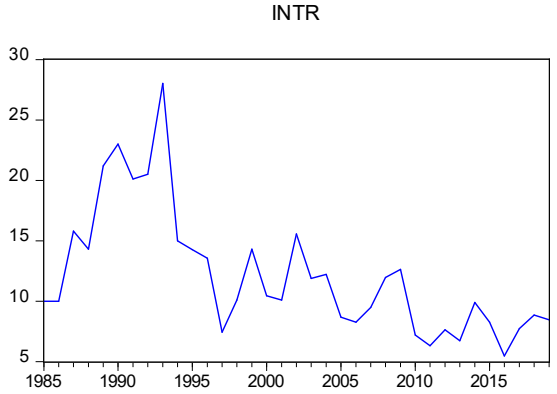
Under this section, we examine and analyze the trend behavior of all the variables employed in the study. The key aim is to ascertain whether the variables have experienced stability, fluctuations (volatility) or stagnation over the period under review.











Source: Author's Computation using E-views 10

Fig.4.1 Graphical Trend of the Regression Variables (1985-2019)

From the figure above, it is depicted that the trend in real gross domestic product has witnessed a steady rise for the period of observation. A slight decline can be observed between 1985 to 1987. This may be due to the oil glut in the 1980s which brought about decreased export earnings and higher domestic and foreign debts contraction. In 1987 onwards, it rose significantly and from then has been on the increase. The rationale adduced for this was the introduction of the Structural Adjustment Programme in 1986 which ushered in an era of laissez-faire policies, economic liberalization and price deregulation in virtually all aspects of economic life in Nigeria. Also, the oil price was favourable in the international market. The gross domestic product reached its peak during the time of observation in the year 2015. The real level of output fell from 2015 to 2017 and this may be adduced to the negative growth (i.e. recession) witnessed by the Nigerian economy. It however exhibited an upward trend from 2017 to 2019.

INDQ in Nigeria has over the years exhibited a trend characterized upward and downward patterns. From 1981 to 1983, INDQ exhibited a

steady downward trend. While from 1983 to 2015, INGDP exhibited an upward trend similar to a stepwise pattern. In 2016, INDQ fell and this may be due to the economic recession that characterized Nigerian economy in 2016. From 2016 to 2019, INDQ exhibited an upward trend.

From the figure above, it is depicted that the trend in CEXP has witnessed a steady and significant rise for the period of observation. The level of CEXP has risen over the years except for being relatively stagnant from 1985 to 1992. this may be due to the oil glut in the 1980s which brought about decreased export earnings and higher domestic and foreign debts contraction which in turn lead to deterioration in economic activities. From 1992 onwards, it picked up and from then has been on the increase though with meagre fluctuations. The upward trend of government expenditure is in tandem with the theories of public expenditures.

Between the period 1985 to 1987, the exchange rate exhibited a constant trend. It witnessed a rise from 1987 to 1998 (this maybe adduced to the liberalization policy introduced by SAP in 1986) and it rose again between the periods 1998 to 2004. It however experienced

decline from 2004 to 2008. However, between the periods 2008 to 2014, it has been growing at a very slow pace and it rose sharply from 2014 to 2019.

The trend of interest rate exhibited high level of fluctuations which entail volatility clustering since interest rate is a high frequency data. From 1985 to 1996, the trend witnessed an upward and later a downward pattern, that is, period of high volatility occurring sequentially. While from 1996 to 2019, the trend exhibited upward swings, that is, period of high volatility occurring sequentially.

4.4.3 Unit Root Test for Stationarity

Augmented Dickey-Fuller Unit Root Test Results

TABLE 4.1.3a. Unit Root Test(At Levels)

VARIABLES	ADF TEST STATISTICS	ADF CRITICAL VALUE			REMARKS
		1% Level	5% level	10% level	
LNRGDP	-0.526629	-3.646342	-2.954021	-2.615817	NOT STATIONARY
LNINDQ	-0.956870	-3.639407	-2.951125	-2.614300	NOT STATIONARY
LNCEXP	-1.849000	-3.639407	-2.951125	-2.614300	NOT STATIONARY
LNREXR	-3.473570	-3.639407	-2.951125	-2.614300	NOT STATIONARY
LNINTR	-2.221416	-3.639407	-2.951125	-2.614300	NOT STATIONARY

TABLE 4.1.3b. UNIT ROOT TEST(AT FIRST DIFFERENCE)

VARIABLES	ADF TEST STATISTICS	ADF CRITICAL VALUE			REMARKS
		1% Level	5% Level	10% level	
D(LNRGDP)	-3.032118	-3.646342	-2.954021	-2.615817	STATIONARY
D(LNINDQ)	-5.380604	-3.646342	-2.954021	-2.615817	STATIONARY
D(LNCEXP)	-6.429535	-3.646342	-2.954021	-2.615817	STATIONARY
D(LNREXR)	-5.271194	-3.646342	-2.954021	-2.615817	STATIONARY
D(LNINTR)	-6.042063	-3.653730	-2.957110	-2.617434	STATIONARY

Source: Author's Computation using E-views 10

Table 4.1.3a and 4.1.3b which show the results of the ADF unit root test at levels and first difference respectively. However, the test suggests that all the variables were stationary at their first difference using 5% critical values.

4.5 Estimation Result

4.5.1 Johansen Co-Integration Result

Table 4.2.1: Unrestricted Co-Integration Rank Test (Trace value)

Hypothesized No of CE(S)	Eigen Value	Trace statistic	0.05critical value	Prob**
None *	0.532563	79.06583	69.81889	0.0076
At most 1 *	0.465844	53.96966	47.85613	0.0120
At most 2 *	0.370930	33.27646	29.79707	0.0191
At most 3 *	0.282369	17.98056	15.49471	0.0207
At most 4 *	0.191897	7.031164	3.841466	0.0080

Trace value test indicates 5 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's Computations Using E-views 10, 2021

Table 4.2.1 above depicts the results of Johansen Co-integration test. It shows the estimated result of the long run relationship between the variables. It can be observed that the trace statistic in table 4.2.1a indicates that there are 5 co-integrating equations at the 5% level of significance. These results depict that there is co-integration or long–run

equilibrium relationship among the variables employed in the study. Thus, we further proceed to conduct an error correction mechanism, given the one-year time lag used to show the speed of adjustment (λ) of the dependent variable to the changes in the independent variables in the short run and the result is presented in table 4.2.2 below.

4.2.2. Error Correction Model

Table 4.2.2: Parsimonious Error Correction Result

Dependent Variable: DLNRGDP

Variables	Coefficients	St. Error	t-Statistics	Prob.
C	0.039963	0.025812	1.548201	0.1347
DLNINDQ	0.272563	0.070097	3.888369	0.0007
DLNCEXP	-0.024526	0.015956	-1.537139	0.1373
DLNNEXR	-0.019617	0.022307	-0.879422	0.3879
DLNINTR	0.019717	0.016017	1.230973	0.2303
ECM(-1)	-0.594644	0.276763	-2.148570	0.0420
AR(1)	0.813665	0.296899	2.740548	0.0114
MA(2)	-0.134896	0.457921	-0.294584	0.7708
R^2 = 0.602830			R^{-2}= 0.470440	
F-stat = 4.553445			DW stat = 1.998507	
Prob(F-stat) = 0.001792				

Source: Author

Table 4.2.2.above shows that the output of a parsimonious error correction model (ECM). It shows that about 59.5% of the discrepancy

between the actual and the long run (equilibrium) value of DLNRGDP is corrected or eliminated each year. Put differently, it tells us that about 59.5% of disequilibrium in the previous year is corrected in the current year. Notice that the coefficient of the ECM has a negative sign and is statistically significant at 5% (as shown by its p-value) level as expected. Thus, this justify our earlier position that the variables under study are indeed co-integrated. The coefficient of determination (R^2) is 0.602830 which depicts that about 60.3% variations in the DLNRGDP were explained by the independent variables in the model. Also, its adjusted counterpart is 0.470440 which shows that about 47% growth in the DLNRGDP in Nigeria can be attributed to the explanatory variables taking into account the degrees of freedom in the model.

The constant term is 0.039963 and this implies that DLNRGDP will rise by about 0.04percent when the independent variables in the model are assumed to be zero i.e. held constant. The elasticity coefficient of DLNINDQ is 0.272563 and it depicts that a 1percent increase in LNINDQ will result to about 0.3percent increases in real national income (RGDP) in Nigeria. The elasticity coefficient of DLNCEXP is-0.024526

and it shows that a 1percent increase in the LNCEXP will result to about 0.025percentdecrease in the real national income (DLNRGDP) in Nigeria. The elasticity coefficient of DLNNEXR is -0.019617 and it shows that a 1percent increase in LNNEXR will result to about 0.02percent decreases in RGDP in Nigeria. The elasticity coefficient of DLNINTR is 0.019717 and it shows that a 1percent increase in LNINTR will result to about 0.02percent increases in the RGDP in Nigeria.

Similarly, the probability of the T-test (test for individual significance of the parameters in the model) for the for the DLNINDQ, DLNCEXP, DLNNEXR, and DLNINTR were 0.0007, 0.1373, 0.3879 and 0.2303 respectively. By implication, the T-test indicates that only DLNINDQ (our explanatory variable of interest) significantly influences DLNRGDP at 5% percent level of significance. While DLNCEXP, DLNNEXR and DLNINTR were found to be statistically insignificant even at 10% significance level. However, all the coefficients of the variables except that of INDQ did not conformed to a priori expectation.

Similarly, the P-value of the F-test is 0.001792 which is less than 5%, hence, the overall test is significant. Thus, the explanatory variables

are simultaneously significant in forecasting growth in national output in Nigeria. Also, the Durbin-Watson statistics value of 1.998507 which is approximately 2 indicates that there is no autocorrelation in the model.

4.6 Policy Implications of Findings

From the regression result above, there is a positive and significant relationship between Industrial Output (INDQ) and Real Gross Domestic Product (RGDP) in Nigeria. The policy implication of this finding would be that economic performance would improve if industrial output is stimulated.

There exists a negative and insignificant relationship between capital expenditures (CEXP) and real GDP in Nigeria. The implication of this is that CEXP does not significantly impact on economic performance in Nigeria.

There exists a negative and insignificant relationship between Nominal Exchange Rate (NEXR) and real GDP in Nigeria. This implies that NEXR does not significantly affect economic growth in Nigeria.

Finally, a positive and insignificant relationship exists between Interest Rate (INTR) and real GDP in Nigeria. This implies that INTR could impact on the GDP but not significantly with the result of this present study.

CHAPTER FIVE

RECOMMENDATIONS AND CONCLUSION

5.1. Summary of Findings

This research has provided empirical evidence on the empirical analysis of the role of the industrial sector in developing the Nigerian economy using annual time series data sourced from CBN statistical bulletin from 1985 to 2019. Given the ECM result, we found out that industrial output has a positive and significant relationship with real GDP in Nigeria. Capital expenditures over the period under consideration has a negative and insignificant relationship with real GDP in Nigeria. Also, nominal exchange rate has a negative and insignificant relationship with real GDP in Nigeria. Finally, interest rate has a positive and insignificant relationship with real GDP in Nigeria.

5.2. Policy Recommendation

From the findings of this study, the following can be recommended.

1. There is an urgent need for the adoption of Public Expenditure Tracking Survey (PETS) at all tiers of government. This would engender allocative efficiency, accountability, and transparency in

public sector activities which would stimulate economic activities in general.

2. There is need for the country to ensure diversification of the economy as this will help to reduce the overdependence in the oil sector in the economy. Government should focus on the other productive sectors of the economy such as agricultural and manufacturing sector, as this will also boost industrial output in the country.
3. Manufacturing industries should be improved upon so as to achieve boost in production. Also excise duties should be lowered so as to encourage local investors, as this has a way of ensuring that the manufactured outputs are competitive in the international market.
4. There is need for the government of the country to ensure that an enabling environment so as to attract the foreign investors in the country as this has a way of raising employment level, level of income as well improvement in the standard of the living of the citizen in the country.
5. This study also recommends the need to strengthen government agencies such as Economic and Financial Crimes Commission (EFCC)

and the Independent Corrupt Practice Commission (ICPC), with the powers to tackle corruption and also to arrest and penalize those who divert and embezzle public funds.

6. Lastly, the study recommends that despite the low percentage of capital expenditure in the overall public expenditure programme, government should strive towards increasing the percentage of capital expenditure and properly managed in a manner that will raise the level of economic activities, hence improving productive capacity and accelerate economic growth in the country.

5.3. Conclusion

The role of industrial sector in stimulating the level of economic activities vis-à-vis real level of income cannot be overemphasized. This study examined empirically the role of the industrial sector in the development of the Nigerian economy employing the Error correction model as its tool of data analysis. Based on the findings of this study, it was discovered that only industrial value added significantly influences economic growth in Nigeria. While capital expenditures, nominal exchange rate, and interest rate does not significantly affect economic

growth in the period under consideration. In light of the above findings, there is need for the country to ensure diversification of the economy as this will help to reduce the overdependence in the oil sector in the economy. Government should focus on the other productive sectors of the economy such as agricultural and manufacturing sector, as this will also boost industrial output in the country.

REFERENCES

Adebayo, R.I. (2010). Zakat and poverty alleviation: a lesson for the fiscal policy makers in Nigeria. *Journal of Islamic Economic, Banking and Finance*, 7(4), 26-41.

Akpan (2005). Government expenditure and economic growth in Nigeria: A disaggregated approach. *CBN Economic and Financial Review*, 43(1).

Ayodele, A.I., & Falokun, G. (2003). The Nigerian economy: Structure and pattern of development.

Bose (2003). Public expenditure and economic growth: Disaggregated analysis for developing countries.

Chete, L.N., Adeoti, J.O., & Ogundele, O. (2016). Industrial development and growth in Nigeria: lessons and challenges. *Learning to Compete Working Paper,* No.2

Devarajan, S., Swaroop, Vinaya&Zou, H. (1996).“The composition of public expenditure and economic growth”. *Journal of Monetary Economics*, 37, 313-344.

Devarajan, S., Vinaya, S., &Heng-Fu, Z. (1996).The composition of public expenditures and economic growth. *Journal of Monetary Economics*, 37, 313-344.

Eze, O.R., &Ogiji, F.O. (2013). Impact of fiscal policy on the manufacturing sector output in Nigeria: An error correction analysis. *International Journal of Business and Management Review (IJBMR)*, 1(3), 35-55.

Haque, A. (2007). Rethinking Industrial Policy. *UNCTAD Discussion Papers*, No. 187, April.

https://oxford.universitypressscholarship.com/view/10.1093/acprof:oso/9780198776987.001.0001/acprof-9780198776987-chapter-6.

Isiksal, A.Z. and himezie, O.J. (2016) Impact of Industrialization in Nigeria. *European Scientific Journal.*

Iweriebor, S., Egharevba, M.I., &Adegboye, A.C. (2015). Government spending and industrial development in Nigeria: A dynamic investigation. *Annals of the University of Petrosani, Economics*, 15(1), 179-190.

Kaldor, N. (1967) Strategic Factors in Economic Development. Cornell University Press, Ithaca, NY.

Loto, M.A. (2012). Global economic downturn and industrial sector performance in the Nigerian economy. *Journal of Emerging Trends in Economics and Management Sciences*, 3(1), 38-45.

Mbelede, C. (2012). Cost engineering in the manufacturing sector of the economy of Nigeria. *Paper presented at the 3rd annual technical conference of institute of appraiser and cost engineering, Abuja, Nigeria.*

Melissa, Y., & Dean, S. (2013). Is public expenditure productive? Evidence from the manufacturing sector in US cities. *Cato Journal*, 33, 1-28.

Melissa, Y., & Dean, S. (2013). Is public expenditure productive? Evidence from the manufacturing sector in US cities. *Cato Journal*, 33, 1-28.

Muritala &Taiwo, A. (2011). Government expenditure and economic development: Empirical evidence from Nigeria. *European Journal of Business and Management*, 3(9), 18-29.

Musa, Y., &Sanusi, J.A. (2013). Industrial output response to inflation and exchange rate in Nigeria: An empirical analysis. *Journal of Economics and Sustainable Development*, 4(20), 74-81.

Naudé, W. and Szirmai, A. (2012) The Importance of Manufacturing in Economic Development: Past, Present and Future Perspectives.

Ndiaya, C. and Lv, K.J. (2018) Role of Industrialization on Economic Growth: The Experience of Senegal (1960-2017). *American Journal of Industrial and Business Management , 8*, 2072-2085.

Nekarda, C.J., & Ramey, V.A. (2010). Industry evidence on the effects of government series division of research and statistics and monetary affairs federal reserve board, Washington D.C.

Nigeria Economic Outlook, 2020.

Nigerian Economic Sustainability Plan, 2020.

Niloy (2003). Public expenditure and economic growth: A disaggregated analysis for developing countries. Centre for Growth Business Cycle. *Research School of Economics Studies, University of Manchester, M13, 9PL, USA*.

Nwanne, T.F.I. (2015). Implications of government capital expenditure on the manufacturing sector in Nigeria. *European Journal of Accounting, Auditing and Finance Research,* 3(10), 19-33.

Obioma, E. C. and Ozugahalu, U. M. (2005). Industrialization and Economic Development: A Review of Major Conceptual and Theoretical Issues. In: The Challenges of Industrialization: A Pathway to Nigeria becoming a Highly Industrialized Country in the Year 2015, *Nigerian Economic Society, Ibandan* , pp.63-97.

Okeke, D.C. (1991). “The imperative of employment for a stable Nigeria”. *Daily Star*, 21.

Olorunfemi, S., Tomola, M.O., Adekunjo, F.O., &Ogundele, E.O. (2013). Manufacturing performance in Nigeria: implication for sustainable development. *Asian Economic and Financial Review*, 3(9), 1195-1213.

Onakoya, A.B., &Somoye, R.O.C. (2013). The impact of public capital – expenditure and economic growth in Nigeria. *Global Journal of Economics and Finance*, 2, 1-11.

Rebelo, S. (1991) “*Long-run policy Analysis and Long-run Growth*” Journal of Political Economy, P.99.

Samson, A.A. (2013). Government spending and economic growth in Nigeria. *Munich Personal Re PEC Archive (MPRA)*, 2, 1-23.

Solow R.M. (1956). “A Contribution to the Theory of Economic Growth”. *Quarterly Journal of Economics.*

Todaro, M.P., & Smith, S.C. (2009). Economic Development.

World Development Indicators, 1979.

World Development Indicators, 1989.

World Development Indicators, 2009.

World Development Indicators, 2017.

World Development Indicators, WDI 1990.

APPENDIX I
SECONDARY DATA OF THE VARIABLES EMPLOYED IN

THE STUDY

YEAR	RGDP	INDQ	CEXP	NEXR	INTR
1985	14,953.91	6,731.37	5.46	0.8938	10.00
1986	15,237.99	6,583.69	8.53	2.0206	10.00
1987	15,263.93	6,516.76	6.37	4.0179	15.80
1988	16,215.37	6,895.26	8.34	4.5367	14.30
1989	17,294.68	7,539.23	15.03	7.3916	21.20
1990	19,305.63	8,993.23	24.05	8.0378	23.00
1991	19,199.06	8,574.51	28.34	9.9095	20.10
1992	19,620.19	8,669.83	39.76	17.2984	20.50
1993	19,927.99	8,646.60	54.50	22.0511	28.02
1994	19,979.12	8,457.85	70.92	21.8861	15.00
1995	20,353.20	8,539.99	121.14	21.8861	14.27
1996	21,177.92	9,011.44	212.93	21.8861	13.55
1997	21,789.10	9,157.62	269.65	21.8861	7.43
1998	22,332.87	9,145.49	309.02	21.8861	10.09
1999	22,449.41	8,685.22	498.03	92.6934	14.30
2000	23,688.28	9,487.86	239.45	102.1052	10.44
2001	25,267.54	10,192.30	438.70	111.9433	10.09
2002	28,957.71	9,947.84	321.38	120.9702	15.57
2003	31,709.45	11,866.08	241.69	129.3565	11.88
2004	35,020.55	12,357.10	351.25	133.5004	12.21
2005	37,474.95	12,718.55	519.47	132.1470	8.68
2006	39,995.50	12,648.21	552.39	128.6516	8.26
2007	42,922.41	12,637.15	759.28	125.8331	9.49
2008	46,012.52	12,527.11	960.89	118.5669	11.95
2009	49,856.10	12,971.06	1,152.80	148.8802	12.63
2010	54,612.26	13,826.43	883.87	150.2980	7.19
2011	57,511.04	14,986.62	918.55	153.8616	6.30

2012	59,929.89	15,350.45	874.70	157.4994	7.63
2013	63,218.72	15,682.46	1,108.39	157.3112	6.72
2014	67,152.79	16,742.15	783.12	158.5526	9.89
2015	69,023.93	16,366.66	818.35	193.2792	8.26
2016	67,931.24	14,918.15	653.61	253.4923	5.46
2017	68,490.98	15,238.28	1,242.30	305.7901	7.73
2018	69,799.94	15,523.43	1,682.10	306.0802	8.85
2019	71,387.83	15,882.35	2,289.00	306.9206	8.46

SOURCE: CBN SB (2019)

APPENDIX II
SECONDARY DATA OF THE VARIABLES EMPLOYED IN THE STUDY IN NATURAL LOG FORM

YEAR	LNRGDP	LNINDQ	LNCEXP	LNNEXR	LNINTR
1985	9.61272829	8.8145337	1.69830923	-0.1123292	2.3025851
1986	9.63154675	8.79235028	2.14321414	0.70338212	2.3025851
1987	9.63324775	8.78213306	1.85199186	1.39076975	2.7600099
1988	9.69371489	8.83859011	2.12107521	1.51220722	2.6602595
1989	9.75815398	8.92787535	2.71032095	2.00033858	3.0540012
1990	9.86815221	9.10422681	3.18007678	2.08415645	3.1354942
1991	9.86261662	9.05654887	3.34430599	2.29349305	3.0007198
1992	9.88431443	9.06760459	3.68294438	2.85061546	3.0204249
1993	9.89988072	9.0649211	3.99823373	3.0933606	3.3329185
1994	9.90244318	9.04285057	4.26152851	3.08585173	2.7080502
1995	9.92099354	9.05251519	4.79693287	3.08585173	2.6581594
1996	9.96071445	9.10624984	5.3609461	3.08585173	2.606202
1997	9.98916502	9.12234154	5.59713113	3.08585173	2.0051893
1998	10.0138147	9.12101654	5.73339176	3.08585173	2.3117926
1999	10.0190196	9.06937805	6.2106555	4.52929673	2.6602595
2000	10.0727357	9.15776786	5.47834839	4.62600374	2.3456446
2001	10.1372759	9.22938765	6.08380783	4.71799272	2.3117926
2002	10.2735918	9.2051103	5.77261831	4.79554396	2.745346
2003	10.3643699	9.38143894	5.48764888	4.86257242	2.4748563
2004	10.4636903	9.42198645	5.86149822	4.89410447	2.5022553
2005	10.531428	9.45081711	6.25280906	4.88391494	2.1610215
2006	10.5965223	9.44527105	6.31424672	4.85710798	2.1114246
2007	10.6671493	9.44439594	6.63237221	4.83495643	2.2497116
2008	10.7366687	9.43565047	6.86786004	4.7754775	2.4809413
2009	10.8168961	9.47047634	7.04994601	5.00314178	2.535943
2010	10.9080138	9.53433754	6.78431508	5.01262016	1.97301
2011	10.9597322	9.61491322	6.82279514	5.03605355	1.8409963
2012	11.0009307	9.63890019	6.77388097	5.05942183	2.0314681
2013	11.0543558	9.66029846	7.01066054	5.05822613	1.9043754
2014	11.1147257	9.72568498	6.66328516	5.06608668	2.2915241

2015	11.1422085	9.70300143	6.70729313	5.2641356	2.1119373
2016	11.1262512	9.61033364	6.48250931	5.53533326	1.6974488
2017	11.1344573	9.63156597	7.12471656	5.72289895	2.0451089
2018	11.1533885	9.65010562	7.4277977	5.72384703	2.1799781
2019	11.1758826	9.67296348	7.73586857	5.72658893	2.1353492

APPENDIX III

ADF UNIT RROT TEST

AT LEVELS

Null Hypothesis: LNRGDP has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.526629	0.8734
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNRGDP)
Method: Least Squares
Date: 07/07/21 Time: 16:31
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNRGDP(-1)	-0.005511	0.010464	-0.526629	0.6023
D(LNRGDP(-1))	0.554459	0.152994	3.624062	0.0011
C	0.078071	0.108052	0.722530	0.4756

R-squared	0.304633	Mean dependent var	0.046798
Adjusted R-squared	0.258275	S.D. dependent var	0.036095

		Akaike info	-
S.E. of regression	0.031087	criterion	4.017578
Sum squared			-
resid	0.028991	Schwarz criterion	3.881532
		Hannan-Quinn	-
Log likelihood	69.29004	criter.	3.971803
		Durbin-Watson	
F-statistic	6.571346	stat	2.152185
Prob(F-statistic)	0.004297		

Null Hypothesis: LNINDQ has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.956870	0.7572
Test critical			
values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNINDQ)
Method: Least Squares
Date: 07/07/21 Time: 16:33
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.

LNINDQ(-1)	-0.032133	0.033581	-0.956870	0.3458
C	0.323306	0.311643	1.037425	0.3073

R-squared	0.027817	Mean dependent var	0.025248
Adjusted R-squared	-0.002564	S.D. dependent var	0.056326
S.E. of regression	0.056398	Akaike info criterion	-2.855727
Sum squared resid	0.101785	Schwarz criterion	-2.765941
Log likelihood	50.54736	Hannan-Quinn criter.	-2.825108
F-statistic	0.915600	Durbin-Watson stat	1.880600
Prob(F-statistic)	0.345807		

Null Hypothesis: LNCEXP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.849000	0.3514
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNCEXP)
Method: Least Squares
Date: 07/07/21 Time: 16:34
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNCEXP(-1)	-0.058479	0.031627	-1.849000	0.0737
C	0.487665	0.176249	2.766904	0.0093

R-squared	0.096525	Mean dependent var	0.177575
Adjusted R-squared	0.068291	S.D. dependent var	0.327451
S.E. of regression	0.316072	Akaike info criterion	0.591331
Sum squared resid	3.196856	Schwarz criterion	0.681117
Log likelihood	-8.052632	Hannan-Quinn criter.	0.621951
F-statistic	3.418802	Durbin-Watson stat	2.340255
Prob(F-statistic)	0.073715		

Null Hypothesis: LNNEXR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.473570	0.0150
Test critical values:	1% level	-3.639407	
	5% level	-2.951125	
	10% level	-2.614300	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNNEXR)
Method: Least Squares
Date: 07/07/21 Time: 16:35
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNNEXR(-1)	-0.103688	0.029851	-3.473570	0.0015
C	0.572773	0.124165	4.612990	0.0001

R-squared	0.273811	Mean dependent var	0.171733
Adjusted R-squared	0.251118	S.D. dependent var	0.307833
S.E. of regression	0.266393	Akaike info criterion	0.249332
Sum squared resid	2.270883	Schwarz criterion	0.339118
Log likelihood	-2.238652	Hannan-Quinn criter.	0.279952
F-statistic	12.06569	Durbin-Watson stat	1.982189
Prob(F-statistic)	0.001496		

Null Hypothesis: LNINTR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.221416	0.2027

Test critical values:	1% level	-3.639407
	5% level	-2.951125
	10% level	-2.614300

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNINTR)
Method: Least Squares
Date: 07/07/21 Time: 16:36
Sample (adjusted): 1986 2019
Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNINTR(-1)	-0.273681	0.123201	-2.221416	0.0335
C	0.659269	0.302839	2.176961	0.0370

R-squared	0.133606	Mean dependent var	-0.004919
Adjusted R-squared	0.106531	S.D. dependent var	0.296791
S.E. of regression	0.280538	Akaike info criterion	0.352805
Sum squared resid	2.518444	Schwarz criterion	0.442591
Log likelihood	-3.997680	Hannan-Quinn criter.	0.383424
F-statistic	4.934690	Durbin-Watson stat	2.117601
Prob(F-statistic)	0.033520		

AT FIRST DIFFERENCE

Null Hypothesis: D(LNRGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.032118	0.0422
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNRGDP,2)
Method: Least Squares
Date: 07/07/21 Time: 16:43
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNRGDP(-1))	-0.455170	0.150116	-3.032118	0.0049
C	0.021362	0.008816	2.423107	0.0214

R-squared	0.228736	Mean dependent var	0.000111
Adjusted R-squared	0.203856	S.D. dependent var	0.034431
S.E. of regression	0.030722	Akaike info criterion	-4.068982
Sum squared resid	0.029259	Schwarz criterion	-3.978285

		Hannan-Quinn	-
Log likelihood	69.13820	criter.	4.038465
		Durbin-Watson	
F-statistic	9.193740	stat	2.121630
Prob(F-statistic)	0.004874		

Null Hypothesis: D(LNINDQ) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.380604	0.0001
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNINDQ,2)
Method: Least Squares
Date: 07/07/21 Time: 16:42
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNINDQ(-1))	-0.954649	0.177424	-5.380604	0.0000
C	0.025537	0.010957	2.330714	0.0264

R-squared	0.482910	Mean dependent	0.001365

		var	
Adjusted R-squared	0.466230	S.D. dependent var	0.078576
S.E. of regression	0.057408	Akaike info criterion	-2.818592
Sum squared resid	0.102164	Schwarz criterion	-2.727894
Log likelihood	48.50676	Hannan-Quinn criter.	-2.788075
F-statistic	28.95090	Durbin-Watson stat	2.012252
Prob(F-statistic)	0.000007		

Null Hypothesis: D(LNCEXP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.429535	0.0000
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNCEXP,2)
Method: Least Squares
Date: 07/07/21 Time: 16:43
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNCEXP(-1))	-1.134902	0.176514	-6.429535	0.0000
C	0.192896	0.065295	2.954224	0.0059

R-squared	0.571462	Mean dependent var	-0.004146
Adjusted R-squared	0.557638	S.D. dependent var	0.497982
S.E. of regression	0.331210	Akaike info criterion	0.686561
Sum squared resid	3.400694	Schwarz criterion	0.777259
Log likelihood	-9.328261	Hannan-Quinn criter.	0.717078
F-statistic	41.33892	Durbin-Watson stat	1.831172
Prob(F-statistic)	0.000000		

Null Hypothesis: D(LNNEXR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.271194	0.0001
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNNEXR,2)
Method: Least Squares
Date: 07/07/21 Time: 16:45
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNNEXR(-1))	-0.876021	0.166190	-5.271194	0.0000
C	0.130292	0.058792	2.216168	0.0342

R-squared	0.472659	Mean dependent var	-0.024635
Adjusted R-squared	0.455648	S.D. dependent var	0.396447
S.E. of regression	0.292500	Akaike info criterion	0.437985
Sum squared resid	2.652236	Schwarz criterion	0.528682
Log likelihood	-5.226750	Hannan-Quinn criter.	0.468502
F-statistic	27.78548	Durbin-Watson stat	2.142849
Prob(F-statistic)	0.000010		

Null Hypothesis: D(LNINTR) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.042063	0.0000

Test critical values:	1% level	-3.653730
	5% level	-2.957110
	10% level	-2.617434

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNINTR,2)
Method: Least Squares
Date: 07/07/21 Time: 16:47
Sample (adjusted): 1988 2019
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNINTR(-1))	-1.587958	0.262817	-6.042063	0.0000
D(LNINTR(-1),2)	0.310495	0.169199	1.835083	0.0768
C	-0.023082	0.049696	-0.464469	0.6458

		Mean dependent var	-0.015689
R-squared	0.664564		
Adjusted R-squared	0.641430	S.D. dependent var	0.469216
S.E. of regression	0.280970	Akaike info criterion	0.387922
Sum squared resid	2.289379	Schwarz criterion	0.525335
Log likelihood	-3.206748	Hannan-Quinn criter.	0.433470
F-statistic	28.72729	Durbin-Watson stat	1.918041
Prob(F-statistic)	0.000000		

APPENDIX III

JOHANSEN CO-INTEGRATION TEST

Date: 07/07/21 Time: 16:54
Sample (adjusted): 1987 2019
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: LNRGDP LNINDQ LNCEXP LNNEXR LNINTR
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 *	0.532563	79.06583	69.81889	0.0076
At most 1 *	0.465844	53.96966	47.85613	0.0120
At most 2 *	0.370930	33.27646	29.79707	0.0191
At most 3 *	0.282369	17.98056	15.49471	0.0207
At most 4 *	0.191897	7.031164	3.841466	0.0080

Trace test indicates 5 cointegratingeqn(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	0.532563	25.09618	33.87687	0.3785
At most 1	0.465844	20.69320	27.58434	0.2952
At most 2	0.370930	15.29590	21.13162	0.2687

At most 3	0.282369	10.94940	14.26460	0.1568
At most 4 *	0.191897	7.031164	3.841466	0.0080

Max-eigenvalue test indicates no cointegration 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):

LNRGDP	LNINDQ	LNCEXP	LNNEXR	LNINTR
4.012431	-13.74754	-1.385136	2.335205	-0.766872
-4.261882	6.991099	-0.970294	0.389290	-4.661543
-3.092129	5.478772	-0.916242	1.680178	-0.442579
8.497203	-19.54258	1.186174	-0.263479	0.001596
7.854027	-7.962537	-0.729093	-0.092455	1.186771

Unrestricted Adjustment Coefficients (alpha):

D(LNRGDP)	0.013216	0.002750	0.006463	0.007483	-0.006224
D(LNINDQ)	0.024450	-0.006501	-0.005042	0.015963	0.005457
D(LNCEXP)	0.146318	-0.017668	-0.048230	-0.069475	0.012798
D(LNNEXR)	-0.043586	0.058349	-0.136530	-0.028628	-0.044824
D(LNINTR)	0.047014	0.184723	-0.034930	0.012373	0.001112

1 Cointegrating Equation(s):	Log likelihood	139.9686

Normalized cointegrating coefficients (standard error in parentheses)

LNRGDP	LNINDQ	LNCEXP	LNNEXR	LNINTR
1.000000	-3.426237	-0.345211	0.581993	-0.191124
	(0.45466)	(0.10691)	(0.13354)	(0.20308)

Adjustment coefficients (standard error in parentheses)

D(LNRGDP)	0.053029
	(0.02056)
D(LNINDQ)	0.098105
	(0.03284)
D(LNCEXP)	0.587091
	(0.16446)
D(LNNEXR)	-0.174886
	(0.21203)
D(LNINTR)	0.188639
	(0.22121)

2 Cointegrating Equation(s): Log likelihood 150.3152

Normalized cointegrating coefficients (standard error in parentheses)

LNRGDP	LNINDQ	LNCEXP	LNNEXR	LNINTR
1.000000	0.000000	0.753879	-0.709826	2.274005
		(0.24151)	(0.25729)	(0.42254)
0.000000	1.000000	0.320787	-0.377037	0.719486
		(0.08792)	(0.09366)	(0.15382)

Adjustment coefficients (standard error in parentheses)

D(LNRGDP)	0.041308	-0.162463
	(0.02982)	(0.07857)
D(LNINDQ)	0.125810	-0.381577
	(0.04732)	(0.12468)
D(LNCEXP)	0.662390	-2.135032
	(0.23906)	(0.62989)
D(LNNEXR)	-0.423562	1.007124
	(0.30198)	(0.79566)
D(LNINTR)	-0.598629	0.645095

	(0.24326)	(0.64096)		

3 Cointegrating Equation(s):		Log likelihood	157.9632	

Normalized cointegrating coefficients (standard error in parentheses)

LNRGDP	LNINDQ	LNCEXP	LNNEXR	LNINTR
1.000000	0.000000	0.000000	2.702456	8.097613
			(0.70691)	(2.54968)
0.000000	1.000000	0.000000	1.074938	3.197515
			(0.29378)	(1.05961)
0.000000	0.000000	1.000000	-4.526297	-7.724854
			(0.86930)	(3.13539)

Adjustment coefficients (standard error in parentheses)

D(LNRGDP)	0.021325	-0.127056	-0.026896
	(0.03266)	(0.08076)	(0.00949)
D(LNINDQ)	0.141400	-0.409200	-0.022940
	(0.05312)	(0.13132)	(0.01543)
D(LNCEXP)	0.811524	-2.399272	-0.141337
	(0.26302)	(0.65028)	(0.07642)
D(LNNEXR)	-0.001393	0.259106	0.128852
	(0.29192)	(0.72174)	(0.08482)
D(LNINTR)	-0.490621	0.453722	-0.212352
	(0.27135)	(0.67089)	(0.07884)

4 Cointegrating Equation(s):		Log likelihood	163.4379	

Normalized cointegrating coefficients (standard error in parentheses)

LNRGDP	LNINDQ	LNCEXP	LNNEXR	LNINTR

1.000000	0.000000	0.000000	0.000000	5.656023
				(1.16625)
0.000000	1.000000	0.000000	0.000000	2.226340
				(0.44651)
0.000000	0.000000	1.000000	0.000000	-3.635476
				(1.88173)
0.000000	0.000000	0.000000	1.000000	0.903471
				(0.80740)

Adjustment coefficients (standard error in parentheses)

D(LNRGDP)	0.084912	-0.273298	-0.018019	0.040820
	(0.05074)	(0.12009)	(0.01065)	(0.01373)
D(LNINDQ)	0.277037	-0.721151	-0.004006	0.041889
	(0.07958)	(0.18832)	(0.01669)	(0.02154)
D(LNCEXP)	0.221182	-1.041555	-0.223746	0.272075
	(0.40201)	(0.95136)	(0.08434)	(0.10879)
D(LNNEXR)	-0.244654	0.818577	0.094894	-0.300920
	(0.47112)	(1.11492)	(0.09884)	(0.12749)
D(LNINTR)	-0.385486	0.211923	-0.197676	0.119749
	(0.44075)	(1.04305)	(0.09247)	(0.11928)

APPENDIX IV

ERROR CORRECTION MODEL

Dependent Variable: DLNRGDP
Method: ARMA Maximum Likelihood (OPG - BHHH)
Date: 07/07/21 Time: 17:06
Sample: 1987 2019
Included observations: 33
Convergence achieved after 28 iterations
Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.039963	0.025812	1.548201	0.1347
DLNINDQ	0.272563	0.070097	3.888369	0.0007
DLNCEXP	-0.024526	0.015956	-1.537139	0.1373
DLNNEXR	-0.019617	0.022307	-0.879422	0.3879
DLNINTR	0.019717	0.016017	1.230973	0.2303
ECM(-1)	-0.594644	0.276763	-2.148570	0.0420
AR(1)	0.813665	0.296899	2.740548	0.0114
MA(2)	-0.134896	0.457921	-0.294584	0.7708
SIGMASQ	0.000502	0.000209	2.399436	0.0245

R-squared	0.602830	Mean dependent var	0.046798
Adjusted R-squared	0.470440	S.D. dependent var	0.036095
S.E. of regression	0.026267	Akaike info criterion	-4.185700
Sum squared resid	0.016559	Schwarz criterion	-3.777561
Log likelihood	78.06404	Hannan-Quinn criter.	-4.048374
F-statistic	4.553445	Durbin-Watson stat	1.998507

Prob(F-statistic)	0.001792	
Inverted AR Roots	.81	
Inverted MA Roots	.37	-.37