EFFECTS OF TRADE ON ECONOMIC GROWTH IN NIGERIA

BY

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

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CERTIFICATION

This is to satisfy that the project titled "Effects of Trade on Economic Growth in Nigeria" was carried out by **Esther Ojochide AGI** with matriculation number of **SSC1707968** in the Department of Economics, Faculty of Social Science, University of Benin, Benin City.

Prof. E.I. Izilein **(Project Supervisor)**	**Date**
Dr. S.O. Igbinedion **(Project Coordinator)**	**Date**
Dr. S.O Igbinedion **(Head of Department)**	**Date**

DEDICATION

I dedicate this project to Almighty God for his grace upon me and to my parents Elder S.A. Agi and Mrs Mary Agi.

ACKNOWLEDGEMENTS

Dear God, thank you for the gift of this admission to study the course of my choice. I am grateful for your constant presence in my life, and for the comfort, peace, and financial that your love brings. I give you praise now and forever.

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TABLE OF CONTENTS

Trade plays a vital role in driving economic growth by facilitating the exchange of goods, services, and ideas between countries .Increased trade can lead to increased efficiency and productivity, as firms are able to access a wider range of inputs and market, which can drive economic growth. Trade can also lead to increased competitiveness and a more diversified economy, which can further contribute to economic growth.

However, it is important to note that the relationship between trade and economic growth is complex, and there are many other factors that can impact economic growth, such as infrastructure, education, and political stability. Trade can also have negative effects on economic growth, particularly if it leads to the displacement of domestic industries and job losses. Therefore, it is important to carefully consider the potential costs and benefits of trade policies and implement strategies to mitigate any negative impacts.

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

In economics international trade is an age-long phenomenon which has attracted different views theoretically and empirically in respect of economic growth. From theoretical point of view, some trade theorists such as Adam Smith, David Ricardo, Eli Fillip Heckscher and Bertil Gotthard Ohlin etc. believe that international trade spurs economic growth mainly when nations trade on area they have absolute, comparative cost and factor endowment advantage respectively (Appleyard & Field, 1998). International trade is simply known as the exchange of goods and services between nations of the world. At least two countries should be involved in the activities, that is, the aggregate of activities relating to trading between merchants across borders. Traders engage in economic activities for the purpose of the profit maximization engendered from differentials among international economic environment of nations (Adedeji, 2006).

Trade fosters the efficient production of goods and services via resources allocation to nations that have comparative advantage in their productions. Foreign trade has been described as a tool and catalyst of economic growth (Frankel and Romer, 1999). The predication for foreign trade depends on the veracity that nations of the globe are different in their natural resources endowment, scale of production, capacity for growth, preferences, technology, and sustainable development. Because of these major discrepancies, the involvement in international trade is vindicated for the creation of thorough fares for nations to exchange and consume goods and services they do not have

capacity for. Differences in resources present a case where nations can only consume what they are capable of producing, but trade invigorates them to consume what other nations are able to produce. Therefore, trade motivates nations to enjoy motley of goods and services in a bid to improve their people's wellbeing.

Theory of comparative advantage make us to understand that countries trade with each other in goods and services because of the concept of differentials in the natural resources, human capital, financial capital and technical capabilities endowment of nations. Some countries are more endowed in these resources than others, even, many countries that are adequately blessed with good resources may not have the ability to manage and channel them to their advantage, hence, denying them the opportunity of achieving the necessary growth, development and good standard of living for their citizenry. The importance of international trade stems from the fact that no country can produce all goods and services which people require for their consumption largely owing to resources differences and constraints. As a result, this trade relationship suggests that economies need to export goods and services in order to generate revenue to finance imported goods and services which cannot be produced domestically.

However, Nigerian economy has grossly underperformed relative to its economic endowment and her peer nations. With about 37 solid minerals types and a population estimate of over 160 million people, one of the largest gas and oil reserves in the world, the economic performance of the country is rather weak when compared to the emerging Asian countries such as Thailand, Malaysia, China, India and Indonesia and even Brazil. These countries had by far lagged behind Nigeria or at par with Nigeria in terms of GDP

per capital in 1970s, but later they were better able to transform their economies to emerge as major players on the global economic arena. In 1970, for instance, Nigeria had a GDP per capital of US$233.35 and was ranked 88th in the world, when China was ranked 114th with a GDP per capital of US$111.82 (Sanusi 2010). Today, China occupied an enviable position even as the second largest economy after the United State of America, largely owing to her self-esteemed trade position.

Ojoh (2005) and Sen (2010) assert that exports of the developed countries are necessary good that conduct high market prices, high consumption speed and cannot be easily substituted with synthetics, while exports of developing countries can be substituted easily with synthetics which make them conduct lower prices in international market and as well as attract low consumption speed. These factors according to Prebisch-Singer will finally lead to negative commodity terms of trade in developing countries, which in turn will lead to perpetual underdevelopment.

From the era of 1973 oil boom to 2017 more focus has been given to oil sector which now dominates international trade in Nigeria (Afolabi, 2017). Regardless, trade in other sectors and subsectors agriculture inclusive are still on going, from 1970 to 1980 non-oil import stood at N 45.41billion and non-oil export stood at N 5.02 billion. From 1981 to 1991 non-oil import stood at N 230.9 billion and non-oil export stood at N 17.9 billion. On the other hand, from 1970 to 1980 oil import stood at N 1.12 billion and oil export stood at N 57.05 billion. From 1981 to 1991 oil import stood at N 27.9 billion and oil export stood at N389.5 billion (CBN, 2017). The growth of the economy of Nigeria depends to a large extent on her trade with the rest of the world. In the pre-independence

decades, Nigeria was typically an agrarian economy. Also, in the decade of the 1960's, Nigeria's economy was largely dominated by peasant agriculture which accounted for about 71% of the country's total export and employing about 73% of total labour force of the country. Also in this decade, agriculture contributed about 64% to Gross Domestic Product (GDP). The major exportable commodities were Cotton, Palm oil, Rubber, Cocoa, and Groundnut while importing manufactured products from developed countries (Afolabi 2017).

In the decade of the 1970's, with the advent of crude oil as a major source of foreign exchange to the Nigerian economy, there was a shift of focus from agriculture-based to an oil-driven economy. This was as a result of the oil boom which was triggered by the quadrupling of crude oil prices in 1973-1974 (from the Arab-Israeli war) and also significant rise in 1978-1979 (Iraqi-Iranian war) which made the exploitation and exportation of crude oil a juicy venture. Increasing oil export in this decade led to the loss of Nigeria's position as an important producer and major exporter of cocoa, cotton, rubber, groundnut and palm oil (CBN annual report, 2006). However, from 1974, food import became prominent in Nigeria's foreign trade. Crude oil export guaranteed a favourable balance of trade, thus, the contribution of agriculture dropped to about 33% while the export of crude oil increase to about 58% of total export. The influence of Nigeria joining OPEC in 1971 led to an increase in oil export to about 74%.

1.2 STATEMENT OF THE PROBLEM

The growth performance of the Nigeria economy has been less satisfactory during the past three decades until recently when statistics shows steady growth in the nation's

economy. Apart from oil, Nigeria export mainly primary products and often rely almost exclusively on a limited number of commodities, such exports are characterized by lower prices than manufactured goods plus highly volatile markets. Thus, Nigeria is often on the wrong end of unbalanced trade environment that favours developed countries. Nigeria with the abundant human and natural resources is paradoxically being regarded as one of the poorest countries in the world. Hence, the need to answer some important questions in this research studies.

1.3 RESEARCH QUESTIONS

The research questions which will guide this research work are as follows:

i. Does trade significantly affect economic growth in Nigeria?
ii. To what extent does Gross Fixed Capital Formation influences growth process in Nigeria?
iii. Does exchange rate influences economic growth in Nigeria?

1.4 OBJECTIVES OF THE STUDY

The objective is to analyze the effect of trade on economic growth in Nigeria. The specific objectives are:

i. To identify and analyze the effect of trade on economic growth in Nigeria.
ii. To assess whether Gross Fixed Capital Formation influences economic growth in Nigeria.
iii. To assess whether exchange rate influences economic growth in Nigeria.

1.5 RESEARCH HYPOTHESES

The hypotheses of this study are stated as follows:

i. Trade does not have any significant effect on economic growth in Nigeria.

ii. Gross Fixed Capital formation does not significantly influence economic growth in Nigeria.

iii. Exchange rate does not significantly influence economic growth in Nigeria.

1.6 SIGNIFICANCE OF THE STUDY

The study will be will give light to policy makers to keep them abreast of the performance of trade on economic growth, and where necessary formulate and implement national policies to boost trade and to maximize the benefits that accrues to the nation from international trade. It can also assist the Nigerian government to know where the problem of trade lies so as to proffer solutions to such problems since trade is regarded as an engine of growth by classical and neoclassical economists. Furthermore, this research will also brighten the path of the above subject and give more insight to researchers on where to improve international trade in the country.

1.7 SCOPE OF THE STUDY

This study seeks to analyse the effect of trade on economic growth in Nigeria from the period of 1982-2018. This study adopted time series secondary data sourced from Central Bank of Nigeria Statistical Bulletin, National Bureau of Statistics (NBS) and the World Development Indicators (WDI). The dependent variable for this research work is real Gross Domestic Product (RGDP), while the independent variables includes total export, total import, real exchange rate, gross fixed capital formation and total government expenditure.

1.8 LIMITATIONS OF THE STUDY

The major limitation I am facing while carrying out my project work include lack of time available to carry out a detailed study, level of finance of the researcher, the availability of adequate and required data, and the number of independent variables adopted for the research work. Time constraint was a major constraint to the researcher.

CHAPTER TWO

LITERATURE REVIEW

2.1 CONCEPTUAL CLARIFICATIONS

For the purpose of the study, it is essential to review some topics related to the subject matter of this research that would provide us with adequate theoretical and empirical background for assessing the relevance and contributions of this research study. This study tries to ascertain the empirical relationship that exists between trade and economic growth making use of analytical and econometric research tools.

- **Meaning of Trade**

International trade is described as an exchange of goods and services between the residents of a given country and those of the rest of the world (Mannur, 1995). It is, therefore, a tool which links the nations of the world via service flows, commodity trade, and factor movements. As noted earlier, international trade is based on the reality that no country is self-reliant in the production of all goods and services, which are required by her citizens for survival owing to the constraint and differences of resources (Mannur, 1995). Therefore, Morgan and Katsikeas, (1997) cited Coutts and Godley, (1992) as well as McCombie and Thirlwall, (1992) who asserted that this trade relationship paves way for an avenue for nations to exchange their goods and services for the generation of revenue to finance the goods and services imported whose production are impossible domestically.

International trade can be referred to as the exchange of goods, services and capital across international borders or territories because there is a need or want of goods

or services. Such trade represents a significant share of gross domestic product(GDP) in most countries. International trade is more of a complex process when compared to that of domestic trade. When trade takes place between two or more nations factors which include government policies, currency, economy, laws, judicial system and market influences trade. International economic organizations were formed in order to smoothen and justify the process of trade between two or more countries. Example of this international trade organization is the World Trade Organization. These organizations are aimed at the growth of international trade.

The impact of international trade on economic growth has been a crucial and disputable subject for many decades. Using various approaches, a lot of studies have discovered growth to be heightened by liberalization or trade openness (Krueger, 1978; Balassa, 1978 and 1985; Feder, 1983; Ram, 1985 and 1987; Dollar, 1992; Edwards, 1998; Ben-David et al., 2000; to mention but a few). On the other hand, Singer (1950), Prehisch (1962), Kavoussi (1985), Sachs (1987 and 1989) Singer and Gray (1988), and Taylor (1991) argued that trade expansion or trade liberalization may not be expedient for the economic growth of all nations at all times. Frankel and Romer (1999) ascertained significant contribution of trade openness to level of per capita income. They posited that trade promote growth through stock of education, greater capital stock, and higher total factor productivity. They however, cautioned explicitly against concluding for trade policies as a result of their findings as it brings various factors into play. Cooper (2001) addressed the impact of foreign trade (US) Volume XVII Issue V Version I 30 (E) Global Journal of Human Social Science - Year 2017 International Trade and Economic Growth

in Nigeria and investment on growth via distribution of income and inequality in less developed nations. He debated that study of empirical evidence and theory are inconclusive.

Ishola (2013) International trade has risen relatively fast in recent years. Countries or groups of countries integrating into the World economy can be characterized through the growth of their export volume and changes in competitiveness. The importance of countries or particular groups of countries is changing world export.

2.2 BENEFITS OF INTERNATIONAL TRADE

According to Abraham John Onoja Nigeria is a developing economy basically characterized by a high degree of subsistence production with low application of modern technology. This has resulted into a higher volume of importation over export. Export trade is a sub-division of international trade where goods produced in one country are transported to another country for sale. Exportation is a crucial element of a country's economy as it stimulates economic growth. Some of the world's biggest exporting countries are China, United States, Germany, Japan, Netherlands etc. However, this export trade is something we take for granted in this country as we are largely dependent on importation for survival. Nigeria has small-scale industries which are insufficient for producing export goods as these industries also cannot meet with the local needs. Export trade facilitates economic expansion, promotes international cooperation, improves the balance of payments and boosts foreign currency earnings.

2.3 AN OVERVIEW OF TRADE POLICIES IN NIGERIA

Trade policies over the years in Nigeria were strictly directed at discouraging dumping, supporting import substitution, stemming adverse nature of our balance of trade and payment, conserving foreign exchange and generating revenue for the government (Bankole & Bankole, 2004 as cited in Adesuyi & Odeloye, 2013). During the decade of the 1960s which marked the independence decade, Nigeria embraced an import substitution strategy. This strategy involved the utilization of trade policies to provide effective protection to domestic manufacturing industries (especially infant industries) through the use of quotas (i.e. quantitative restrictions) and tariffs (import tariffs). In the early and middle years of the decade of the 1970s, trade policy took a less restrictive stance arising from demands necessitated by the post war reconstruction. Thus, only goods that were tagged non-essential consumer goods were restricted i.e. import tariffs were reduced and import quotas on spare parts, agricultural equipment and machinery were relaxed. Specifically, in 1973, the duties placed on export of items such as palm oil, groundnut, cocoa, rubber, cotton and palm kernel in the 1960s up to 1972 were relaxed as a result of the oil boom and as part of the export diversification strategy.

The maiden Nigerian Annual Trade Policy Report was published in February 2017 as one of the several steps to implement the firm determination of the Federal Government of Nigeria (FGN) to diversify the economy and to ensure that trade, investment and digital economy policies functions more effectively as stimulators of the Nigerian economy. Arising from the recession that gulped Nigerian economy in 2016 which caused a mess down of economic activities. The essence of the report was to bring

about a reform that will stimulate structural transformation, to diversify and modernize our economy, accelerate economic progress, enhance economic welfare and increase job opportunities for Nigerians. The second Annual Trade Policy Report was published in February 2018. The report depicts that trade only accounts for 18% of GDP, second only to agriculture (which accounts for 29.1% of the GDP). The report identifies the key priorities in Nigeria's trade policy, which was the utilization of our trade policy as a veritable instrument for structural transformation which stimulate diversification, modernization, construction of regional and global value chains, enhancement of welfare and job creation. However, gradually working in close co-ordination with the industrial policy and the competitiveness Advisory council, the government hopes to phase out export of primary products devoid of value added.

Despite various trade policies adopted in Nigeria over the years, trade policy still suffers some limitations. Trade negotiations among nations are becoming increasingly complex and hence, even more challenging for the formation on trade policy (Adesuyi & Odeloye, 2013). There is also the challenge of institutional and human capacity. The Ministry of Industry, Trade and Investment which has the statutory responsibility for international trade relations lacks the requisite level of skills to effectively and efficiently engage in trade policy negotiation process.

The Ministry of Industry, trade and Investment which runs the affairs of trade policy is ill-equipped as result of inadequate infrastructure and unfriendly environment for effective operations. This is partly due to inadequate funding for the ministry. Finally, lack of co-ordination among government establishments and between state and non-state

actors has also impeded the effectiveness of trade policy adopted over the years in Nigeria.

- **Meaning of Economic Growth**

Historically, there seems to be a consensus among economic historians that in the nineteenth century trade acted as an engine of growth. Trade contributed to the optimal allocation of resources within countries and the transmission of growth from one part of the world to another. The gains were those gains that resulted from international specialization in line with the philosophy of comparative advantage (Ishola 2013). On the other hand, dynamic gains were those that accrued from the impact of trade on production possibilities at large. Examples of dynamic gains are international investment, transmission of technical knowledge and economies of scale. In fact, trade may provide a vent for surplus commodities resulting in employment of otherwise, unemployed resources. Models of the export led growth abound in development literature. Chenery and Stout (1966) remarked that there is almost no example of a country which has sustained a growth rate substantially higher than its growth of exports for long period. The Pearson Commission (1969) claimed that the growth rates of individual developing countries in 1950 correlated better with their export performance than with any other single economic indicator. In modern times countries such as Japan Hong Kong, Korea and Taiwan have achieved remarkable growth by the export of manufactures. The statistical evidence from present day developing countries has in general supported the hypothesis that the growth of exports plays a major part in the country's growth processes through the stimulation of demand; the encouragement of savings and capital goods.

A study by Fosu (1990) of sub-saharan Africa shows that economic growth is stimulated by exports. At the core of the Structural Adjustment programme being implemented by many African countries is the belief that exports enhance economic growth, Fajana (1979) used the two gap model to show that Nigeria's economic growth is positively responsive to exports. According to Ekpo and Egwaikhide (1994) using co-integration and error correction techniques showed a long-term relationship between exports and economic growth in Nigeria. On the strategy for export development, Robinson (1967) argues that firms and countries should concentrate their export drive on a few markets where maximum energy could be devoted. Balassa (1970), proposed that apart from exposing domestic products to world competition and the test of the world market, export oriented strategy also provides incentives for industry specialization and encourages specialization according to comparative advantage, with exports a country can be involved in the international division of labour and then provide needed goods and services from abroad at considerable savings in terms of inputs of productive resources, thereby helping into those sectors in which the country has comparative advantage. According to Cukor (1971), unless some extremely rapid structural changes take place, the industrial exports developing countries will be determined by the imports of advanced capitalist countries. He saw the pattern of industrial exports from developing countries as distinct from that of the developed countries, especially in the degree of processing. These structural differences depended to a large extent on the technical level of industry. Cukor (1971) then proposed the development of special industries on a high technical level and an increase marketing of exports among developing countries within the

framework of regional cooperation. On the export performance of developing countries (Thirlwaal 1978) argues that especially in manufacturing, exports have continued to lag behind that of developed industrialized countries. Developing countries share of world trade manufactures is relatively small. Exports of primary products and petroleum account for a large proportion of the export earning in some of these Countries. These ranges of traded manufacturing goods are not only narrow but also consist of goods, which are highly competitive in the world market unlike the nineteenth century. Most of the world's trade now takes place in industrial goods which developing countries are yet to produce in abundance. The demand for developing countries traditional exports is inelastic relative to the demand for industrial goods

- **The Nexus Between Trade and Economic Growth**

Free trade is considered by some economists as most relevant for economic development. According to Haberler (1961) ―free trade is economically advantageous because it maximizes the output of social products. However, a counter argument holds that although the derivable benefits of free trade are laudable, they are to some extent hypothetical, effective only under the conditions of full employment, full allocation of resources and free competition in the economy. For instance, Singh (1985) argued that "the applicability of free trade is limited in the case of a developing economy, where a vast segment of the productive resources are still unexploited, with acute problem of unemployment. A free trade regime will further compound these problems by weakening the domestic industries, especially those that lack sufficient competitive powers".

i. **Direct Benefits:** When a country specialises in the production of a few goods due to international trade and division of labour, it exports those commodities which it produces cheaper in exchange for what others can produce at a lower cost. It gains from trade and there is increase in national income which, in turn, raises the level of output and the growth rate of economy. Thus, the higher level of output through trade tends to break the vicious circle of poverty and promotes economic development. A Less developed country (LDC) is hampered by the small size of its domestic market which fails to absorb sufficient volume of output. This leads to low inducement to investment. The size of the market is also small because of low per capita income and of purchasing power. International trade widens the market and increases the inducement to invest income and savings through more efficient resource allocations. In Smith's "vent- for- surplus" theory to the LDCs for measuring the effects of gain from international trade, the introduction of foreign trade opens the possibility of a "vent- for- surplus" (or potential surplus) in the primary producing LDCs. Since land and labour are underutilised in the traditional subsistence sector in such a country, its opening up to foreign trade can produce a surplus of primary products in exchange for import of manufactured products which it cannot itself produce. Thus, it benefits from international trade (H. Myint 1958). Many under-developed countries specialise in the production of one or two staple commodities. If efforts are made to export them, they tend to widen the market. The existing resources are employed more productively and the resources allocation becomes more efficient with given production functions. As a result, unemployment

and under-employment are reduced; domestic savings and investment increase; there is a larger inflow of factor inputs into the expanding export sector; and greater backward and forward linkages with other sectors of the economy. This is known as the - staple theory of economic growth '(Watkins, 1963).

ii. **Indirect Benefits:** Besides, there are indirect dynamic benefits of a high order from foreign trade, as pointed out by Mill. By enlarging the size of the market and the scope of specialisation, international trade makes a greater use of machinery, encourages inventions and innovations, raises labour productivity, lowers costs and leads to economic development. It also leads to the importation of foreign capital and instills new ideas, technical know-how, skills, managerial talents and entrepreneurship. Lastly, it fosters healthy competition and checks inefficient monopolies. Let us study these indirect benefits of foreign trade to under-developed countries in detail.

2.4 THEORETICAL LITERATURE

The framework for foreign trade is based on the law of comparative costs, otherwise known as the theory of comparative cost. It is the classical theory of international trade formulated by David Ricardo, and later improved by John Stuart Mill, Cairnes and Bastable. Its best exposition is found in the works of Taussig, and Haberler (1988).

Theories of International Trade

- **Mercantilist Trade Theory:**

Mercantilist provided the earlier idea on foreign trade. According to the theory, the most important way for a nation to be become rich and powerful is to export more than its import. Some of the mercantilism are; Jean Baptiste Colbert and Thomas Hobbes. It was understood then, that, the most important way in which a country could be rich was by acquiring precious metals such as gold. This was achieved by ensuring that the volume of export was better than the volume of import. Trade has to be controlled, regulated and restricted. The country was expected to achieve favourable balance of payment. Tariffs, quotas and other commercial policies were proposed by the mercantilism to minimize imports in order to protect a nation's trade position. Mercantilism did not favour free trade. Mercantilism believed in a world of conflict in which the state of nature was a state of war. The need for regulation to maintain order in human affairs and economic affairs were taking for granted. To the mercantilist, the world wealth was fixed. A nation's gain from trade was at the expense of its trading partners that are, not all nationals could simultaneously benefit from trade.

Towards the end of 18th century, the economic policies of mercantilism came under strong attack. David Hume criticized the favourable trade balance as being short run phenomenon which could be eliminated automatically overtime. The other nation is likely to retaliate. Mercantilism was also attacked for their static view of the world economy. Adam Smith also criticized the nation that the world wealth is fixed with the advantages of specialization and division of labour. With specialization and division of

labour, the general level of productivity within a country will increase. Despite the criticism faced by the foundation of mercantilism, mercantilism is still alive today. New mercantilism now emphasized employment rather than holding some gold. They also postulate that exports are beneficial as job is provided domestically. Imports are considered bad as jobs are taken away and transferred to the foreign workers. To the new mercantilist, trade is a zero sum activity which a country must loose for the other to gain. And that there is no acknowledgment that trade can provide benefits to all countries (Adesuyi, 2013).

- **Absolute Advantage Trade Theory**

The theory of absolute cost advantage was propounded by Adam Smith in his famous book (Wealth of Nations in 1776). The theory emerges as a result of the criticism levied against mercantilism. He advocated free trade as the best policy for the nations of the world. Smith argued that with free trade each nation could specialize in the production of those commodities in which it could produce more efficiency than the other nations, and import those commodities in which it could produces less efficiently. This international specialization of factors in production would result in increase in world output, which would be shared by the trading nations. Thus, a nation need not gain at the expense of other nations, all nations could gain simultaneously. In other words, according to the theory, a nation should specialize in the production of export of commodities in which it has lower cost or absolute cost advantages over others. On the other hand, the same country should import a commodity in which it has higher cost or absolute cost disadvantage.

- **Comparative Cost Advantage Trade Theory**

Absolute advantage failed to analyse where a country has comparative advantage in the production of two goods, will trade still be necessary or beneficial to the country in question? David Ricardo tackled this question. Ricardo was the first to demonstrate that external trade arises not from difference in absolute advantage but from difference in comparative advantage. By "comparative advantage" is meant by "greater advantage". Thus in the context of two countries and two commodities, trade would still take place even if one country was more efficient in the production of both commodities, provided the degree of its superiority over the other country was not identical for both commodities. Ricardo assumed the existence of two countries, two commodities, and one factor of production, labour. He assumed that labour was fully employed and internationally immobile and that the product and factor of prices were perfectly competitive. There are no transport costs or any other impediments to trade. In context of a model of two countries, two commodities and one factor of production, Ricardo obtained the result that a country will tend to export the commodity in which it has a comparative disadvantage. Since comparative costs are the other side of comparative advantage, the theory could be expressed in terms of comparative costs. Specifically, the theory now states that a country will tend to export the commodity whose comparative cost is lower in production and comparative cost is higher in pre-trade isolation. The theory also assumed the level of technology to be fixed for both nations. Different nations may use different technology but all firms within each nation utilize a common production method for each commodity. It also assumed that trade is balanced and rolls out the flow of money between nations.

The distribution of income within a nation is not affected by trade. Most assumption of the Ricardian theory is unrealistic. The theory is based on labour theory of values which states that the price of the values of a commodity is equal to or can be inferred by the quality of labour time going into its production process. Labour theory of values is based on; labour is the only factor of production. Labour is used in the same fixed proportion in the production of all commodities. Labour is homogenous. This underline proposition is quite unrealistic, because as labour is categorized into skilled, semi-skilled and unskilled labour, there are other factors of production. Despite its shortcomings, the law of comparative advantage cannot be discarded off because it found application in study of economics. The law is valid and can be explained in terms of opportunity cost in the modern theory of trade.

- **Heckscher-Ohlin Trade Theory (H-O theorem)**

Eli Hecksher and Bertil Ohlin are two Swedish economists that postulated a theory that addressed two issues that the Ricardian theory could not explain; what factors determine the comparative advantaged and what effect does foreign trade have on the factors incomes in the trading nations. The Hecksher – Ohlin theory focuses on the differences in relative factors endowments and factors prices between nations as the most determinants of trade (On the assumption of equal or similar technology and tastes). Hecksher Ohlin maintained that the sources of the factors endowments determine a nation's comparative advantage. This arrangement is the basis of the theory to be referred to as factor endowment theory. The theory analysed the differences in factors endowment on international specialization. The model was based on two main prepositions; firstly, a

country with specialisation in the production and export of a commodity whose production requires intensive use of abundant resources. This implies that goods differ in factor requirement. Secondly, countries differ in factor endowment. Some countries have much capital per worker and some have less. Countries could be ranked by factor abundance. The Hecksher – Ohlin model identified difference in pre-trade product prices between nations as the immediate basis for trade. The price depends on production possibility curve (supply side) and then taste and preferences (demand side) in the trading nations. Production possibility curve depends on technology and resources endowment. According to the theory, a nation should produce and export a product for which the large amount of the relative abundance resources is used. Such country should import the commodity in which a great deal of its relative scarce and expensive factors is used. Where a resource is abundant, its cost is less than the cost in country where it is relatively scarce. This scenario facilitates comparative advantage. The effect of factor endowment on comparative advantage is seen as follows; differences in relative resource endowment leading to differences in relative resource prices and later to differences in relative resource prices.

Theories of Economic Growth

- **Neoclassical Growth Theory**

This was first propounded by Robert Solow over 40 years ago. The model believes that a sustained increase in capital investments increased the growth rate only temporarily, because the ratio of capital to labour goes up. The marginal product of additional units is assumed to decline and thus an economy eventually moves back to a

long term growth-path with the real GDP growing at the same rate as the growth of the workforce plus factor to reflect improving productivity. Neo-classical economists who subscribe to the Solow model believes that to raise an economy long term trend rate of growth requires an increase in labour supply and also a higher level of productivity of labour and capital. Differences in the rate of technological change between countries are said to explain much of the variation in growth rates. The neo-classical model treats productivity improvements as an exogenous variable which means that productivity improvements are assumed to be independent of the amount of capital investment

- **Endogenous Growth Theory**

Endogenous growth economists believed that improvements in productivity can be linked directly to a faster pace of innovation and extra investment in human capital. They stress the need for government and private sector institutions which successfully nurture innovation, and provide the right incentives for individuals and businesses to be inventive. There is also a central role for the accumulation of knowledge as a determinant of growth. Supporters of endogenous growth theory believed that there are positive externalities to be exploited from the development of a high value-added knowledge economy which is able to develop and maintain a competitive advantage in fast-growth industries within the global and maintain a competitive advantage in fastgrowth industries within the global economy. The main points of the endogenous growth theory are as follows: The rate of technological progress should not be taken as a constant in growth model, government policies can permanently raise a country's growth rate if they lead to more intense competition in markets and help to stimulate product and process

innovation. There are increase returns to scale from new capital investment. The assumption of the law of diminishing returns is questionable. Endogenous growth theorists are strong believers in the potential for economies of scale (or increasing returns to scale) to be experienced in nearly every industry and market. Private sector investment in research and development is a key source of technical progress. The protection of private property rights and patents is essential in providing appropriate and effective incentives for businesses and entrepreneurs to engage in research and development. Investment in human capital (including the quantity and quality of education and training made available to the workforce) is an essential ingredient of long-term growth. Government policy should encourage entrepreneurship as a means of creating new businesses and ultimately as an important source of new jobs, investment and innovation.

- **Harrod-Domar Growth Theory (H-O Model)**

This is referred to the economic mechanism by which more investment leads to more growth. It is often referred to as the AK model because it is based on the linear production function with output given by the capital stock K times a constant, often labelled A. In order to grow, new investments representing net additions to the capital stock are necessary. In this theory, investment is considered fundamental in the process of economic growth. Investment according to the theory creates income as well as augments the productive capacity of the economy by increasing the capital stock. In as much as there is net investment real income and output will continue to expand. For full employment equilibrium level of income and output to be maintained, both real income and output should expand at the same rate with the productive capacity of the capital

stock. According to the theory, for the economy to maintain a full employment, in the long run, net investment must increase continuously as well as growth in the real income at a rate sufficient enough to ensure full capacity use of a growing stock of capital. It follows that any net addition to the capital stock in the form of new investment will bring about corresponding increase in the flow of national output. Suppose that this relationship, known in economics as the capital-output ration, is roughly 3 to 1. If we define the capital-out put ratio as K and assume further that the national net savings ratio, S is a fixed proportion of national output and that total new investment is determined by the level of total savings, economic growth model could be constructed, net savings (S) is some proportion, S, of national income

(Y), such that we have;

$S = sY$ 2.1

Net investment is defined as the change in the change in the capital stock, K and can be represented by

$\Delta K; I = \Delta K$ 2.2

But because the total capital stock, K, bear a direct relationship to total national income, Y, as expressed by the capital output ratio, k, it follows that

$K = k$

OR

$\Delta K = k$

$Y \Delta K$

OR

$$\Delta K = k \Delta Y \quad 2.3$$

Because net national savings, S, must equal net investment, I, we can write this equality as;

$$S = I \quad 2.4$$

But from equation 2.4 we know that S = sY, and from equation 2.2 and 2.3;

$$I = \Delta K = k\Delta Y$$

The identity of saving equaling investment in 2.4 could be written as

$$S = sY = k\Delta Y = \Delta K = I \quad 2.5$$

Or simply as

$$SY = k \Delta Y \quad 2.6$$

Dividing both sides of equation 2.6 first by Y and the by k,

$$\Delta Y / Y = s/k \quad 2.7$$

$\Delta Y/Y$ represents rate of growth of GDP. Equation 2.7, states simply that the rate of growth of GDP is determined jointly by the net national saving ratio, s, and the national capital-output, k. In the absence of government, the growth rate of national income will be positively related to the savings ratio, that is, the more an economy is able to save and invest out of a given GDP, the greater the growth of that GDP will be, and negatively related to the economy's capital output ratio, the lower the rate of GDP growth. To grow, the economy must save and invest a certain proportion of their GDP.

2.5 EMPIRICAL LITERATURE

We will be focusing on succinctly review and assess works done on the empirical analysis of the effect of trade on economic growth in the advanced countries. Secondly,

we will consider the case of less advanced countries. And finally, we will look at the case of Nigeria.

- **Evidence from Developed Countries**

Maizel (1963) investigated the impact of international trade on economic growth using a rank correlation analysis among developed countries. The results of the study depicted a positive relationship between international trade and economic growth. Balassa (1978) in his study of eleven countries that have an established industrial base discovers that the positive correlation between export growth and the growth in GDP will provide a clue of the total effect of exports on economic growth.

Lin and Li (2002) studied the contribution of foreign trade to China's economic growth and found out the previous studies of exports on domestic consumption, investment, import and government expenditures. They utilized new estimation method and found out that a 10% increase in exports resulted in a 1% increase in GDP in the 1990s in China when both direct and indirect contributions are considered. Balaguer (2002) examined the hypothesis of export-led growth from the Spanish trade liberalization process initiated about four decades ago, from 1960-2000. Both the export expansion and progression from traditional export to export based on manufacturing were considered. It was revealed that the structural transformation in export composition has become a key factor for Spain's economic development along with the nexus between export and real output.

The Organisation for Economic Cooperation (OECD 2013) carried out a study on the impact of international trade on the average income per population. The result

revealed that the elasticity of international trade was 0.2 which was statistically significant. Tang (2006) in his study depicted that there is no long-run relationship among exports, imports and real Gross Domestic Product (GDP). The research further depicts no long-run and short-run causality between export expansion and economic growth in China on the platform of Granger Causality which economic growth does granger-cause imports in the short-run. Akanni (2007) examined the nexus between exports and economic growth in Indonesia employing Vector autoregressive (VAR) model. The results of the study depicted the significance of both exports and economic growth to the economy of Indonesia as indicated in GIRF analysis. It was concluded that export and economic growth exhibited a bi-directional cause and effect structure, which is growth led export in the short-run and export led growth in the long-run.

Hassan (2007) adopted Vector Auto-regressive (VAR), Impulse Response Function (IRF) and Granger Causality test to ascertain the long-term relationships between exports and economic growth in Saudi Arabia over the period 1970-2005. The study found that the export sector had a significant impact on economic growth and a direct influence on other economic activities in the long run. Chen and San (2010) carried out a study on the nexus between foreign trade and GDP growth of East China over the period 1981-2008. Adopting the unit root test, co-integration analysis and the Error Correction Model (ECM), they found out that foreign trade is the short-term and long-term basis for GDP growth, but no evidence proved that there exists long-term stationary causality between import trade and GDP. Mustafa (2011) carried out a study to analyse the nexus between foreign trade and economic growth in Turkey using VAR and Vector

Error Correction Model (VECM), and employed quarterly data of GDP, export and import over the period 1987-2007. The study found that in the short-run, GDP growth did not significantly depend on the export growth.

Rahmaddi and Ichihashi (2011) studied the relationship between exports and economic growth in Indonesia over the period 1971-2008. Using VAR model, they found that export and economic growth exhibits a bi-directional causal structure. They however concluded that both exports and economic growth are significant to the economy of Indonesia. Muhammad et.al (2012) carried out a study on the relationship between international trade, financial development and economic growth in Australia over the period 1965-2010. Utilizing the Auto-Regressive Distributed Lag (ARDL) bounds testing approach, their empirical result confirmed the long-run relationship among the variables. The results of the study further depicted that international trade, financial development and capital are the stimulators of economic growth both in the short-run and in the long-run. Also, the feedback effect exists between international trade and economic growth. Given the co-integration among the variables; exports, imports and trade openness have a direct impact on economic growth in Australia.

- **Evidence from Nigeria**

Obadan (1983) carried out a study on the impact of export instability on the economic development of Nigeria over the period 1960-1977. The study seeks to examine whether or not fluctuations in Nigeria's export earnings have adverse effect on her economy. Adopting Multivariate analysis as the framework, the study confirms the hypothesis that export instability is an important obstacle to Nigeria's quest for economic

development. In particular, export instability was found to be highly detrimental to the rate of growth of investment as well as meagre proportion of national income being invested. Thus, the study concluded that the economic growth of Nigeria is export-led.

Ogbokor (2001) examined the macroeconomic impact of oil exports on the Nigerian economy. Adopting OLS technique, he observed that economic growth reacted in an unanticipated manner to changes in the variables used in the study. He found that a 10% increase in oil exports would lead to 5.2% increase in economic growth. He concluded that export-oriented strategies should be given a more practical support.

Oviemuno (2007) studied foreign trade as an engine of growth in developing countries using Nigeria as a case study over the period 1960-2003. Adopting four important variables which were exports, imports, inflation rate and exchange rate. He found that Nigeria's export value does not act as an engine of growth in Nigeria. Also, Nigeria's import value and inflation rate does not act as an engine of growth in her economy. Obadan (2008) drawing on the works of Mwaba (1999), re-emphasized the view that trade exhibits great potentials in stimulating economic growth and poverty reduction among nations especially the less developed ones like Nigeria. Omoke & Ugwuanyi (2010) adopted Granger Causality and co-integration tests to investigate the relationship between export, domestic demand and economic growth in Nigeria. The Trace and Maximum Eigen value test results depicted that the variables do not exhibit long-run relationship, but the par-wise Granger Causality test depicted that economic growth granger cause both exports and domestic demand, while a bi-lateral causality exists between exports and domestic demand.

Emeka et.al (2012) analysed the macroeconomic impact of trade on Nigeria's economic growth over the periods of 1970-2008. Adopting a combination of bi-variate and multi-variate models, their findings revealed that export and foreign direct investment inflows have direct and significant impact on economic growth in the Nigerian economy. They recommended that there should be harmonization of export and fiscal policies towards a greater shift of non-oil exports by the Nigerian government in order to attain a desired growth prospect of international trade. Omoju & Adesanya (2012) analysed the impact of trade on economic growth in Nigeria adopting data over the periods of 1980-2010. Using OLS technique, the study depicted that trade, exchange rate, government expenditure and foreign direct investment have a direct and significant impact on economic growth in Nigeria. Saibu (2012) carried out a study on the direct and interactive effects of capital inflows, trade openness and economic growth in Nigeria using data over the periods 1960-2011. The study adopted Composite Indicators gotten from Principal Component Analysis (PCA) in the Autoregressive-Distributed Lag (ARDL) bound testing model. It was found that the effect of capital and trade on economic growth was statistically significant. The study also provided new facts in support of the modernization hypothesis that capital inflow and trade policy are function of each other and increasing growth in developing economies like Nigeria. And that trade liberalization policies tend to enhance effectiveness of capital inflow and together they stimulate higher economic growth in Nigeria.

Olaifa et.al (2013) empirically analysed the effect of trade liberalization on economic growth in Nigeria over the period 1970-2012. With a view of examining the

possibility of the existence of a long-run relationship between the two variables and also account for the structural changes that may have occurred with the implementation of a free trade regime in 1986. Adopting the OLS method in estimating the relationship, it was found that there is a long-run relationship between trade liberalization and economic growth in Nigeria. Strong evidence was found to support structural changes that occurred in 1986 with the use of free trade policy. Adenuga & Dipo (2013) carried out a study on the performance of non-oil exports in the economic growth of Nigeria over the period 1981-2010. Their finding revealed that non-oil exports have performed poorly; thus proffering reason to doubt the efficacy of the export promotion strategies that have been adopted and since implemented in Nigeria. Edoumiekumo & Opukin (2013) empirically examined the contributions of international trade (proxy with export and import values) to economic growth in Nigeria (proxy by real GDP). The time-series data used for the study was for a period of 27years and also used Augmented Dickey-Fuller (ADF) tests, Ordinary Least Square (OLS), Johansen co-integration test and Granger Causality test. The findings of the study depict there is a direct relationship between the variables and also co-integration exists among the variables. In addition, the Granger causality test revealed a one directional relationship showing that RGDP Granger cause export and also import Granger cause RGDP and export.

Arodoye & Iyoha (2014) carried out a study on the nexus between international trade and economic growth in Nigeria adopting quarterly time-series data over the period 1981- 2010. The empirical result depicts that there is a stable, long-run relationship between international trade and economic growth. And they therefore concluded that

trade policies which favours export expansion should be encouraged because exports are engine of economic growth. Furthermore, an exchange rate which is in tandem to export expansion and consistent with Nigeria's status as a small open economy should be advocated for. However, from the above empirical review of literature it can be deduced that the empirics reviewed above has not comprehensively and empirically analysed the effect of trade on economic growth in Nigeria. This may be due to differences in methodology applied, approach, and the composition of data. Hence, this study is aimed at improving the previous works done by scholars as well as contributes to the literature on the empirical analysis of the effect of trade on economic growth in Nigeria. Furthermore, in the view of expanding the scope of this study to capture the appropriate long-run trends among the variables adopted for this study, the Error Correction mechanism (ECM) were adopted to examine the short-run (changes) and long-run (levels) dynamics among the variables in this study.

2.6 TREND FACTS ABOUT THE ECONOMY OF NIGERIA

Nigeria is one of the sub-Saharan Africa's largest economy with a GDP of US $581.6b and a GDP per capita of US $2885 as at 2018. It accounts for about 20% of Africa's total GDP and about 75% of West Africa total GDP thus, becoming the backbone of Africa's economy. The structure of the Nigerian economy has depicted in 2108 that the Service sector contributed more than half of the GDP i.e. about 52.5% of GDP (Nigeria Economic Outlook, 2018). The real GDP growth rate was about 1.82%, and there was a trade surplus of about 3.7% and the manufacturing sector contributed about 33.57% to GDP in 2018. Education contributed about 8.4% to GDP and the debt to

GDP ratio was about 17.1%. The debt as at 2017 was about US $71b which reduced to about US $25.3b in 2018. The agricultural sector contributed about 18% to GDP given the problem of flooding in the North central and herdsmen crisis in the North East. There was a slight growth in the oil sector which was about 1.14% in 2018 due to relative calmness in the Niger Delta region. It is important to note that Nigeria is operating on a double digit inflation. Inflation as at 2018 was about 11.3% and as at the 2nd quarter of 2019, it was 11.4% (CBN, 2019). Also, unemployment was about 23.1%, underemployment was about 20.21% and youth unemployment was about 55.4%.

However, the growth rate of Nigeria has been random due to heavy dependence on natural resources i.e. high reliance on the petroleum sector as a source of foreign exchange earnings. The strong resource endowment of Nigeria, which generate gigantic revenues to the government has not over the years stimulate GDP per capita beyond that of its smaller and resource-poor neighbours (Atoyebi et.al., 2012). The composition of the Nigerian economy depicts heavy reliance on the oil and gas sector. It accounts for over 75% of our total export value and about 80% of our budgetary revenues to the government. Nigeria's exports to the rest of African countries were estimated at about 12.7% and only 3.7% of total trade is within the geographical spheres of ECOWAS. Currently, it is key to note that Nigeria is yet to ratify the Continental Free Trade Agreement, pending the outcome of the comprehensive consultations with captains of industry and other stakeholders in Nigeria.

Factors Affecting international trade in Nigeria

There are several factors that can affect international trade in Nigeria, including:

i. Economic policies:

The government's economic policies can have a significant impact on international trade, including taxes, tariffs, and regulations.

ii. Political instability:

Political instability can take many forms, such as civil unrest, military coups, and ethnic or religious conflicts. When a country is politically unstable, it can be difficult to predict the actions of its government and the direction of its policies. This can make it difficult for companies to plan for the future and can discourage foreign investment. In extreme cases, political instability can lead to the collapse of a country's economy and a complete disruption of international trade.

iii. Reliance on oil exports:

Nigeria is a major oil producer, and the country's economy is heavily reliant on oil exports. However, the global demand for oil can fluctuate significantly, which can impact Nigeria's trade. In addition, the country's infrastructure is often inadequate to support the transportation of oil, which can also hinder trade.

iv. Corruption:

Corruption is a pervasive problem in Nigeria, and it can impact trade in number of ways. For example, corrupt officials may demand bribes in exchange for granting import or export licenses, or may unfairly favour certain companies or countries in trade deals. Corruption can also discourage foreign investments and deter companies from doing business in the country.

- **International Trade Operations in Nigeria vs. Rest of the World**

Nigeria- US: Nigeria is one of the united states largest trading partner as it is the country with largest export and import records each year, from research Nigeria export goods worth 19 billion USD which consist of oil, cassava, cashew, coffee and cocoa, whereas it was record that Nigeria imported goods worth more than the price they export as of 2009, imported material includes car, farming tools, technology, automobiles, vehicles and so many others, during the 2011 cooperate meeting from both parties to solidified the relationship share in trading the meeting held in Abuja it was said that the relationship between US and Nigeria trade is facing challenges of corruptions, it is easy to export product from Nigeria to the United State but it's a lot of customs crisis when importing goods from the United states, as of 2011, good ceased by the Nigeria custom is worth 1.1billion USD, upon meeting the requirement of export duties and the custom policy.(Coperate.Nigeria.2011).

Nigeria – France: Europe is now second in international trade with Nigeria, in 2010 the export from Nigeria is worth 11.6 billion united state dollars and import is worth about USD10.8 billion. Nigeria and France has recorded trade success seem the most in Africa, Nigeria France trade hit 5.5billion Euros as at 2011, making it the most success record trade so far in Africa to European nations. (Gramer, R. 2017).

Nigeria – UK: according to UK trade and investment Nigeria is the 32nd largest UK international market. As at 2008 UK exported services worth 100 million euros to Nigeria, also the double bilateral trade agreement between the UK and Nigeria worth along 8 billion euros, Nigeria is one of the oil exporting countries, they refined their oil by

sending it as crude in the Uk and import it back as fuel, gas and kerosene for consumption.(Schumacher, I. 2013) this relationship has been in and up even after the independent, Nigeria was colonized by the British, it was stipulated that the trade relationship between Nigeria and united Kingdom has been untouched even after their independent, the oil rich was dependent in the refinery across Uk, they export crude oil to refinery in the United nation and import as finished goods for consumption back in Nigeria(Anyadike.N.O.2012).

Nigeria – China: Nigeria and China bilateral trade connection is one of the strongest international trade relationships today with both countries, almost 95% of all the technological material used in Nigeria are all imported from china (Goodluck 2015). China has imported so many products from Nigeria, like crude oil, coffee, rubber and many others, export from china to Nigeria's approximately at 400% increase while from Nigeria to china export increase to 200% in 2014. China is one of the biggest country in Asia that exports to African countries and mostly Nigeria has recorded much trade connections and service in the recent years. (Al Jazeera 2017). Nigeria – Brazil: the relationship between Brazil and Nigeria from the 18th Century, this both countries have and are currently enjoying warm cultural and trade relationship. Nigeria's the second largest trade partner of Brazil in sub-Saharan Africa and 11th in the world. Brazil happens to be the third largest importer of crude oil from Nigeria after India and United States. Nigeria balance of trade with Brazil is favourable to both parties and the relationship has been there for centuries now, as one of the leading economy in Latin America, it's the key industries include; chemicals, cements, agriculture, vehicles, and so

many others, and some export products like; aircraft, coffee, soybeans, sugar, iron and so many others, which Nigeria as its trade partner benefits from. During the Nigeria chamber of commerce and industry (NBCN) anniversary the chairman of the committee made it known that the long ties and the international trade operation between the two parties and the economic advantages they shared makes the two super beneficiary to each other, the increase in the economy as of 2011 was at about USD9.6 billion, driven only from the ties and international trade between Brazil and Nigeria, as part of continue advantage Nigeria has seek bilateral agreements between brazil, in other to increase the supply of electricity, agricultural vehicle, education and aviation with the help of international trade with the Brazil(CBN 2015).

CHAPTER THREE

RESEARCH METHODOLOGY

This section focuses on the theoretical framework, model specification and the methodology to be used for this study.

3.1 THEORETICAL FRAMEWORK

The theoretical framework for this study is based on the basic Solow (exogenous) growth model adopted by Iyoha and Okim (2017) which gives the growth rate of output (income) as a function of the rate of growth of technical change, labour (population) and capital stock (Solow, 1956 as cited in Iyoha & Okim, 2017 p.35).

Consider the standard Neoclassical production function:

$Y=F(A, K, L)$ ……. (1)

Where A is the technology level, K is the stock of capital while L is the quantity of labour and Y is output (income).

Assume that the production function is twice differentiable and subject to constant returns to scale, and that technical change is Hicks-Neutral (Iyoha, 2017). Differentiating equation (1) above with respect to time, dividing by Y and rearranging terms yields:

$\dot{Y}/Y = \dot{A}/A + (F_K K/Y) \cdot (\dot{K}/K) + (F_L L/Y) \cdot (\dot{L}/L)$ ……. (2)

Where $\dot{Y}/Y$ is the continuous time rate of output growth, $\dot{K}/K$ is the growth rate of capital stock and $\dot{L}/L$ is the growth rate of labour force. F_K and F_L are the social marginal products of capital and labour respectively, and finally $\dot{A}/A$ is the Hicks-neutral rate of change of technological progress.

Hence, the basic Solow growth model gives the rate of growth of output (income) as a function of the growth rate of technical change, labour (population) and stock of capital. In empirical applications, this basic Solow growth model has been modified to obtain the augmented Solow growth model, where the growth rate of output is not only a function of technical change, capital and labour but also on policy variables like real exchange rate and gross fixed capital formation (Barro, 1991; Mankiw et.al., 1992; Easterly & Levine, 2001; and Ologu, 2003 as cited in Iyoha & Okim, 2017 p.36).

However, the Solow growth model depicts that to increase an economy long term trend of growth rate requires an increase in the supply of labour and also a higher level of productivity of capital and labour. Thus, variations in the rate of technological change between countries are said to explain much of the differences in growth rates. The Neoclassical model takes improvement in productivity as an exogenous variable which depicts that productivity improvement are assumed to be independent of capital investment in a given time period.

3.2 MODEL SPECIFICATION

Koutusoyiannis (1997) opined that the specification of an appropriate econometric model centres around on the prevailing economic circumstance(s) and the availability of economic data relating to the variable(s) being examined. Therefore, following the Augmented Solow growth model stated in the above equation, an appropriate model will be specified in this study to examine the strength and direction of the effect of trade on economic growth in Nigeria.

In this study, the list of policy variables is expanded to include total exports, total import, gross fixed capital formation and total government expenditure. Hence, the Augmented Solow model of economic growth as adopted by Iyoha and Okim (2017 p.35) in their study of the "Impact of Trade on Economic Growth: a case study of ECOWAS" yields the following specification for the determinants of economic growth in Nigeria:

RGDP = f (EXPT, IMPT, REXR, GEXP, GFCF) ……. (3)

The econometric form of the model above is stated as:

$RGDP_t = \beta_0 + \beta_1 EXPT_t + \beta_2 IMPT_t + \beta_3 REXR_t + \beta_4 GEXP_t + Ut$ …. (4)

Where;

RGDP= gross domestic product at constant prices (As a proxy for output)

EXPT = Total exports

IMPT = Total imports

REXR = Real Exchange Rate

GEXP = Total government Expenditures

U_t = stochastic error term

β_0 = constant intercept

β_1 - β_6 = co-efficient of the associated variables

However, the dependent and all of the independent variables including exchange rates and interest rate are in million naira; hence, they were logged so as to bring the data to the same level. Thus, the above equation (4) can be re-specified as;

$LNRGDP_t = \beta_0 + \beta_1 LNEXPT_t + \beta_2 LNIMPT_t + \beta_3 LNREXR_t + \beta_4 LNGEXP_t + Ut$ …… (5)

Where;

LNRGDP= natural log of gross domestic product at constant prices

LNEXPT = natural log of value of export

LNIMPT = natural log of value of import

LNREXR = natural log of real Exchange Rate

LNGEXP = natural log of Total Government Expenditures

U_t = stochastic error term

Finally, the major estimation technique for this study is the error correction mechanism. Hence, the ECM model for this study can be specified as;

$$\Delta GDP_t = \beta_0 + \beta_1 LNEXPt_{t-i} + \beta_2 LNIMPT_{t-i} + \beta_3 lnREXR_{t-I} + \beta_4 GEXP_{t-i} + \varepsilon ECM_{t-I} + Ut \ldots \ (6)$$

The coefficient of error correction term is expected to be negative ($\varepsilon<0$) and significant as this is necessary condition to ensuring the existence of long run relationship and adjusted disequilibrium in the model (Narayan, 2005). Similarly, the ECM_{t-1} depicts one period lagged error correction term. The value of its coefficient measures the speed of adjustment to equilibrium from the short run disequilibrium in the model.

In simple terms, the ECM involves using lagged residual to correct deviations of actual values from the long-run equilibrium values. The error correction methodology is appealing because of its ability to induce flexibility by combining the short-run dynamics and long-run equilibrium model in a unified system while at the same time ensuring theoretic rigour and data coherence, and consistency (Iyoha, 2004).

- **Determining the Reliability of Estimated Results**

In a view of evaluating whether the estimates of the parameters are theoretically meaningful and statistically satisfactory, this study will adopt three criterions which are economic or a priori criteria (determined by economic theory), statistical criteria (determined by statistical theory), and econometric criteria (determined by econometric theory).

- **Economic or A priori Criterion**

This criterion is based on economic theory and it is aimed at determining whether the signs and sizes of the empirical results conform or are in tandem with economic theory postulates. Put differently, it is concerned with determining the consistency of our parameter estimates with the signs and magnitude. Therefore, given the variables under consideration, their parameters and respective a priori signs can be expressed as follows:

$\beta_1>0, \beta_2<0, \beta_3<0, \beta_4>0, \beta_5>0$

Where;

β_1 = coefficient of total export

β_2 = coefficient of total import

β_3 = coefficient of Real Exchange Rate

β_4 = coefficient of Total Government Expenditure

- **Statistical Criterion (First Order Test):**

This test is based on statistical theory used in evaluating the reliability of the parameter estimates of a given model. According to Guajarati (2004), a test of

significance is a procedure by which sample result is used to verify the truth or falsity of a null hypothesis. It encompasses the following tests:

i. **Standard Error Test**: This test is of high relevance arising from the fact that sampling errors tend to characterized parameter estimates of a given model. It is therefore essential to measure the size of the sampling error and subsequently determine the degree of confidence in the validity of the obtained estimates. The test helps us to know if our estimates are statistically significant or not, and also whether the sample from which we made estimates might have come from a population whose true parameter value are zero (Koutsoyiannis, 1977 p.80).

ii. **The T-Test:** This test is carried out to ascertain the statistical significance of the individual parameters in an econometric model. It is used in testing the statistical significance of each regression coefficient at a given level of significance (say 1%, 5%, or 10%) with N–K degree of freedom. The table or critical value is given as; $t_{\alpha/2\,(N-K).}$ Where; t = t –critical, α = level of significance N = Sample size K = total number of estimated parameters. Decision Rule If $/t_{cal/} < t_{\alpha/2\ (N-K)}$ at a given level of significance, we accept H_0 and reject H_1 but if $/t_{cal/} > t_{\alpha/2\ (N-K)}$ we reject H_0 and accept H_1. In the former, we therefore conclude that the parameter estimate is not statistically significant at a given level of significance while for the latter; we conclude that the parameter estimate is not statistically significant at a given level of significance.

iii. **F – Test:** This test is used to test overall significance of the regression model. Simply put, it is used to test for the statistical significance of the coefficient of

determination (R^2). The decision is that, if the computed F – test i.e. $Fc_{al} > F_{\alpha}$ (k-1), (N-K), then we say the overall model is statistically significant at a given significance level. If $Fc_{al} < F_{\alpha}$ (k-1), (N-K), then we conclude that the overall model is not statistically significant at a given significance level.

iv. **R^2 and adjusted R^2 test**: the coefficient of determination (R^2) depicts the percentage variations in the dependent variable that is accounted for by the variations in the independent variables in a given single regression model. It is also known as the measure of the Goodness of Fit of a regression line. The adjusted R^2 depicts the variations in the dependent variable that is accounted for by the changes in the explanatory variables of a given model taking account of the degree of freedom associated with the sum of squares. The adjusted R^2 is used in a multiple regression model.

- **Econometrics Criterion (Second Order Test)**

This criterion is based on the theory of econometrics and aimed at investigating whether the assumptions of econometric method employed are satisfied or not. Examples of tests under this criterion are heteroskedasticity test, Multi-collinearity test, autocorrelation test, Normality test, Stability test etc. for the purpose of this study, we will focus on autocorrelation test, normality test and stability test.

i. **Autocorrelation Test:** the test is used to investigate if the error term of different observations is correlated or not. That is, testing for the randomness of the error term. Hence, the Durbin-Watson method was adopted for this test.

ii. **Stability Test:** this test is carried out to ascertain whether the variables adopted for this study were stable over the period under review (usually at 5% level). The CUSUM Test is adopted for this study.

iii. **Normality Test:** this test is carried out to ascertain whether the stochastic error term is normally distributed with a mean of zero and constant variance. This is expressed symbolically as;

$\mu = N(0, \sigma_i^2)$

3.3 METHODOLOGY

The study adopts a multiple regression analysis with Ordinary Least Square (OLS) econometric technique. In a view of avoiding the difficulties that may spring up while carrying out regression analysis with clearly non-stationary series which thus leads to spurious results. However, this study however 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. However, the techniques adopted for this study are further elaborated below;

- **Unit Root Test**

This test is the first step and involves testing the stationarity of the variables, and then the order of integration of the individual series under consideration. Researchers have developed several procedures for the test of order of integration. The most popular among them is the Augmented Dickey-Fuller (ADF) test due to Dickey (1979) and Fuller

(1981). Augmented Dickey-Fuller test relies on rejecting a null hypothesis of unit root (the series are non-stationary) in favour of the alternative hypotheses of no unit root (the series are stationary). The tests are conducted with or without a deterministic trend (t) for each of the series. A stochastic process y(t) is known as a unit root if its first difference, y(t) – y(t-1) is non-stationary. Basically, a series is said to be integrated of order I(1), if it needs to be differenced once to become stationary. The same holds for an I(2) series which need to be differenced twice to become stationary. If I(0) then no differencing is necessary.

- **Phillip- Peron's Test**

Given that the sample size adopted for this study is large, there is need to further test for stationarity i.e., unit root. The Phillip-Peron's test (PP) is an extension of the Augmented-Dickey Fuller test (having the merit of being nonparametric) adopted for testing for unit root taking into account of the structural breaks that may characterize our time series data utilized for this study. The PP test corrects the test statistic to conduct for autocorrelations and heteroskedasticity in the disturbance process of the test equation.

- **The Co-Integration Test**

The second step is the testing of the presence of co-integration between the series of the same order of integration. The analysis of and testing for unit roots naturally lead to the theory of co-integration. The test deals with the methodology of modeling non-stationary time series variables. According to Maddala (1992) as cited in Iyoha (2004, p.86), "the theory of co-integration explains how to study the interrelationships between the long run trend in the variables that are differenced away in the Box-Jenkins method".

The basic idea behind co-integration is that, if in the long run two or more variables move closely together, even though the series themselves are trended, the difference between them is constant. Simply put, variables are said to be co-integrated if there exist a long-run relationship among them. A lack of co-integration suggests that such variables have no long-run relationship: they can wander arbitrarily far away from each other (Dickey et.al., 1991). In this study, we employ the maximum-likelihood test procedure established by Johansen and Juselius (1990) and Johansen (1991). To determine the number of co-integration vectors, the Trace statistic can be used. The statistic test null hypothesis that the number of distinct co-integrating vectors is less than or equal to q.

- **The Error Correction Model**

Given that the existence of Co-integration is established amongst the series, then an Error Correction Mechanism (ECM) first adopted by Sargan (1964) and later popularized by Engel and Granger (1969) is carried out to correct for any dis-equibrium in the short run. In this model, the dynamics of both short-run (changes) and long-run (levels) adjustment processes are modelled simultaneously, thereby providing information about both the short-run and long-run relationship.

3.4 NATURE AND SOURCES OF DATA

The Data used in this research are secondary data, sourced from World Development Indicators (WDI, 2017) form the period (1981-2017). Secondary data was used because it is appropriate for this research work.

3.5 TECHNIQUES OF DATA ANALYSIS

This research work will make use of regression tools of analysis in analysing the data collected and the estimation procedure here would be that of Ordinary Least Squares (OLS). The emphasis would be to know whether the variables adopted in this study are well behaved or not. We aim to ascertain their respective level of statistical significant or not.

Table 1.0. Variables Description, Measurement, A priori Sign Expectation and Data Source

Variables	Measurement	A priori Sign Expectation	Data source
Real Gross Domestic Product (RGDP)	GDP (CONSTANT LCU). It is a proxy for economic growth		WDI
Total Export (EXPT)	Total value of goods and services traded to other countries. Proxy for trade.	Positive	WDI
Total Import (IMPT)	Total value of goods and services traded from other countries. Proxy for trade.	Negative	WDI
Real Exchange Rate (REXR)	Official exchange rate (constant LCU). Proxy for trade	Negative	WDI
Total Government Expenditure (GEXP)	The sum of government capital and recurrent expenditures. Proxy for trade	Positive	WDI

WDI =World Development Indicators

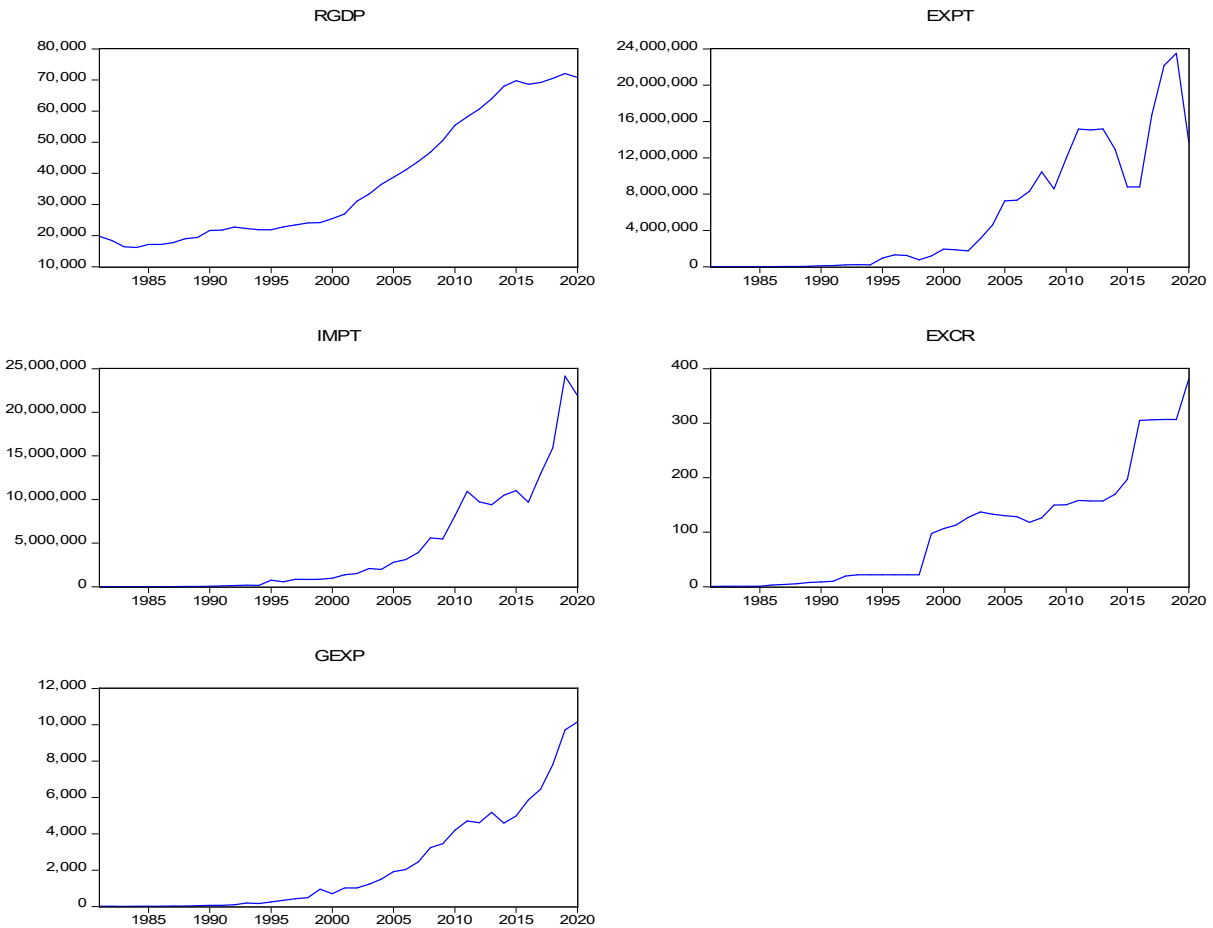
CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 TREND ANALYSIS

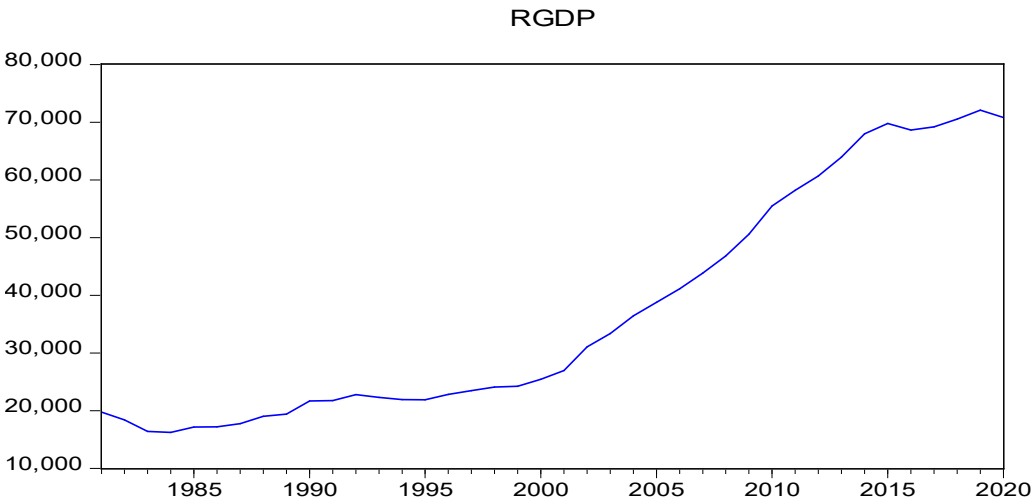
In this section, we look at and evaluate the trend behaviour of all the study's variables. The main goal is to determine if the variables have shown stability, volatility, or stagnation during the time period under consideration.

Fig. 4.0. Categorical trend of the variables (1981-2020)



Source: Author's Computation Using E-views, 2022

Fig. 4.1 Trend of RGDP

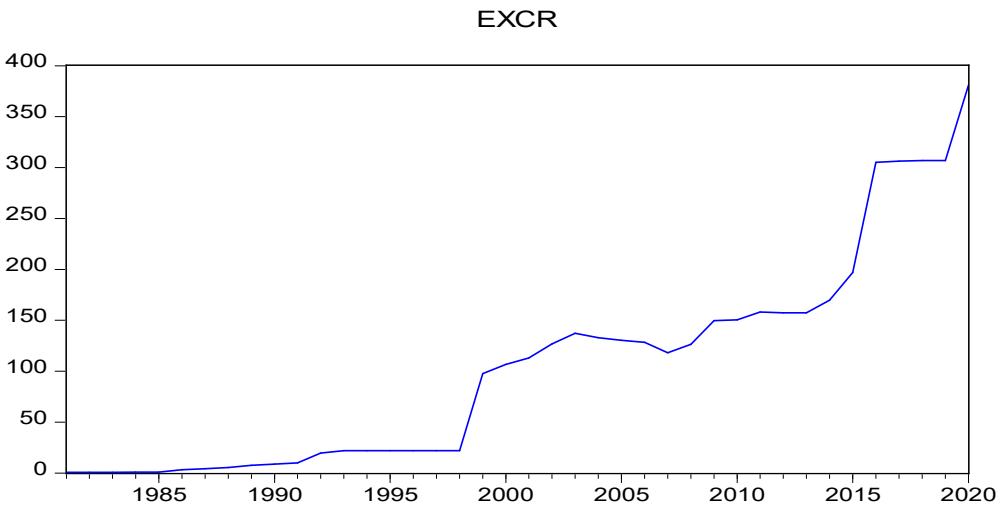


Source: Author's Computation, 2022

From the figure 4.1, it is depicted that the trend in Real Gross Domestic Product (RGDP) has witnessed a steady rise for the period of observation. A slight decline can be observed from 1981 to 1984. This may be due to the oil glut in the 1980s which brought about decreased export earnings and higher domestic and foreign debt contraction. From 1984, it rose but was galloping over the period up to 2001. From 2001, it rose significantly till the year 2015. In 2016 RGDP experienced a negative growth rate (downward trend) as a result of the economic recession (mess down in economic activities) that characterized the Nigerian economy. The RGDP reached its peak in the year 2019 during the time of observation. The real level of output fell in 2020 and this may be adduced to the negative economic effect of the COVID-19 pandemic on the Nigerian economy. The total and/or partial lockdown of the country reduced significantly the level of economic activities,

hence, negative economic performance of the Nigerian economy. To this end, RGDP has experienced a relatively stable growth within the period under consideration.

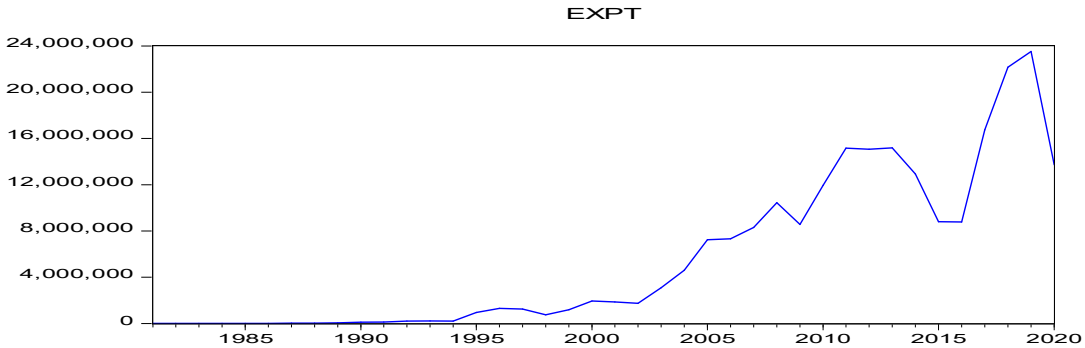
Fig. 4.2 Trend of EXCR



Source: Author's Computation, 2022

The exchange rate showed a consistent pattern between the years 1981 and 1985. It increased between the years 1985 and 1998 (this might be attributed to the liberalisation strategy implemented by SAP in 1986), and it increased once again between the years 1998 and 2004. Nevertheless, between 2004 and 2008, it fell. However, it increased extremely slowly between the years 2008 and 2014, whereas it considerably increased between 2014 and 2020, indicating a devaluation of the naira versus the dollar on the foreign currency market. Generally speaking, the EXCR trend is upward with a steep slope.

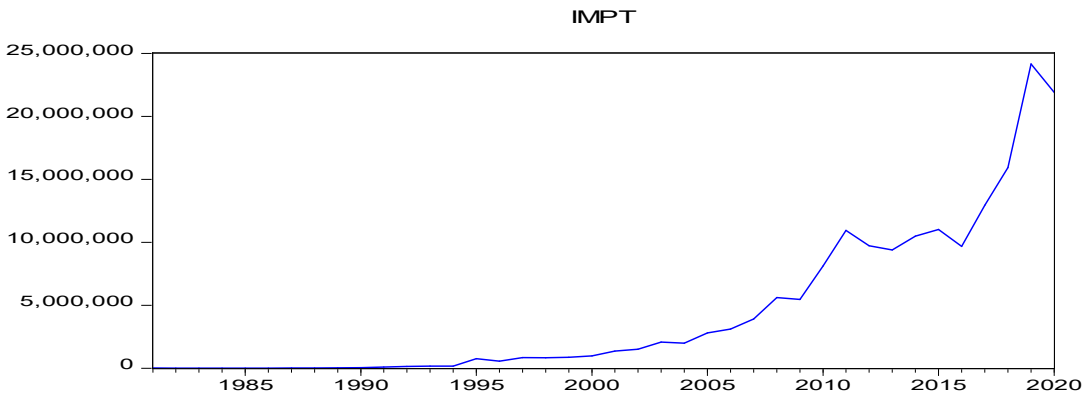
Fig. 4.3. Trend of EXPT



Source: Author's Computation, 2022

The graph shows that EXPT has increased in Nigeria during the course of the studied periods. From 1981 to 1994, EXPT remained constant; however from 1994 to 2015, it drastically increased. EXPT saw a sharp decline in 2016, which may have been a result of the year's economic downturn. EXPT increased from 2016 to 2019 while seeing a sharp decline in 2020. This may be attributed to the COVID-19 pandemic, which had an impact on global trade and supply systems. EXPT's basic trend is upward with significant steepness over time.

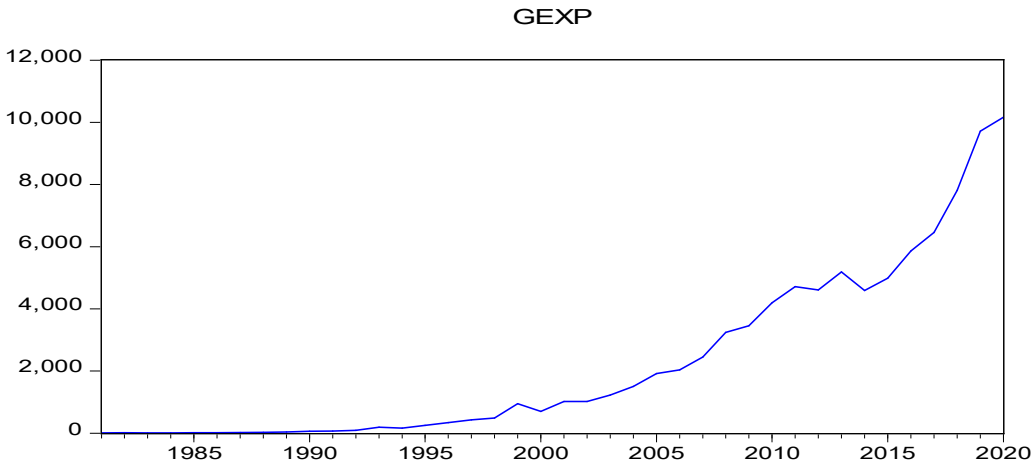
Fig. 4.4 Trend of IMPT



Source: Author's Computation, 2022

The data shows that IMPT has increased in Nigeria during the course of the studied periods. From 1981 to 1994, IMPT remained constant, however from 1994 to 2015, it drastically increased. The 2016 economic slowdown may have contributed to the IMPT's small decline in that year. IMPT increased from 2016 to 2019, however it significantly decreased in 2020. This may be attributed to the COVID-19 pandemic, which had an impact on global trade and supply systems. In general, the IMPT trend is rising over time.

Fig. 4.5 Trend of GEXP



Source: Author's Computation, 2022

From the trend above, GEXP exhibited a relatively constant trend from 1981 to 1985. From 1992 to 2021, GEXP rose significantly with an absolute growth. Hence, the trend of GEXP is positive with time within the period under consideration.

4.2 DESCRIPTIVE STATISTICS

	RGDP	EXPT	IMPT	EXCR	GEXP
Mean	37243.45	5,641,582	4,442,620	103.933	2,250.882
Median	26182.87	1806066	1171601	109.85	982.8433
Maximum	72094.09	23516824	24153674	381	10164.56
Minimum	16211.49	7502.5	5983.6	0.64	9.6365
Std. Dev.	20015.68	6788913	6200045	104.864	2819.831
Skewness	0.631029	1.036056	1.611824	0.93121	1.290899
Kurtosis	1.791312	2.997731	4.990078	3.08203	3.786526
Jarque-Bera	5.089529	7.156084	23.92053	5.79217	12.14051
Probability	0.078492	0.02793	0.000006	0.05524	0.002311
Sum	1489738	2.26E+08	1.78E+08	4157.3	90035.27
Sum Sq. Dev.	1.56E+10	1.80E+15	1.50E+15	428863	3.10E+08
Observations	40	40	40	40	40

Source: Author (2022)

The descriptive statistics above shows that the average or mean of real gross domestic product is about ₦37,243.5 while that of export is about ₦5,641,582 and that of import is about ₦4,442,620. The average value of real exchange rate is about ₦104/$. While that of gross fixed capital formation is about 36% and that of total government expenditure is about ₦2,251. 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 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 5%, the

null hypothesis of the regression is rejected. From the table above, only RGDP and EXCR are normally distributed since their p-values are higher than 5%. While EXPT, IMPT, GEXP and GFCF are non-normally distributed.

4.3 ORDINARY LEAST SQUARE RESULTS

Table 4.2: OLS Results

Dependent variable: LNRGDP

Variables	Coefficients	St. Error	t-Statistics	Prob.
C	9.705178	0.640649	15.14898	0.0000
LNEXPT	-0.143993	0.087992	-1.636441	0.1107
LNIMPT	-1.19E-05	0.120781	-9.89E-05	0.9999
LN**EXCR**	-0.202593	0.065005	-3.116597	0.0036
LNGEXP	0.546463	0.141293	3.867575	0.0005
R^2 = 0.907992			**R^{-2} =** 0.897477	
F-stat = 86.35060			**DW stat =** 0.417380	
Prob(F-stat) = 0.000000				

Source: Author (2022)

From the regression result above, the coefficient of determination (R^2) which depicts the goodness of fit i.e. the predictive power of the model, indicates that about 91% of the systematic variations in the real gross domestic product were explained or captured by the explanatory variables which include export, import, real exchange rate, and government expenditure while the remaining 9% is due to chance. Similarly, the adjusted R^{-2} shows that about 90% of the growth in the LNRGDP can be attributed to the explanatory variables adopted for the study taking into account the degrees of freedom and the remaining 10% is due to randomness.

The F-test which measures the overall goodness of fit of the model depicts that the overall model is significant, since the Prob (F-stat) which is 0.000000 is less than 1%

(i.e. 0.01), we reject the null hypothesis and accept the alternate hypothesis that the overall test is significant at 1% significance level. Similarly, the t-test depicts that the coefficients of LNREXR and LNGEXP were statistically significant since their p-values were less than 5% (i.e. 0.05) while LNEXPT and LNIMPT was statistically insignificant since its p-value is higher than 5% and even 10%.

The Durbin-Watson value of 0.417380 indicates the presence of positive serial correlation and as such, the OLS cannot be said to be the Best Linear Unbiased Estimator (BLUE), that is, possessing the BLUE property, hence, the model is grossly unreliable if our aim is not for forecasting and prediction. Also, the coefficient of GEXP and that of IMPT conformed to a priori expectations, while that of EXPT and EXCR did not conform to a priori expectations.

In order to correct this problem of possible spurious regression, there is need to adopt more sophisticated techniques of analysis. In other words, this study however adopted Augmented Dickey Fuller (ADF) test for unit root in order to attain stationary and thereafter, the study employ the use of Johansen co-integration test so as to ascertain the long run equilibrium relationship between variables employed for this study. Also, ECM is employed to correct for any form of dis-equilibrium in the short run. Finally, residual and stability diagnostics were also carried out.

4.4 UNIT ROOT TEST FOR STATIONARITY

Table 4.3 Unit Root Test (at levels)

VARIABLES	ADF TEST STATISTICS	ADF CRITICAL VALUE			ORDER OF INTEGRATION	REMARKS
		1% Level	5% level	10% level		
LNRGDP	-1.041159	-3.621023	-2.943427	-2.610263	I(0)	NOT STATIONARY
LNEXPT	-1.423827	-3.615588	-2.941145	-2.609066	I(0)	NOT STATIONARY
LNIMPT	-0.966425	-3.615588	-2.941145	-2.609066	I(0)	NOT STATIONARY
LNEXCR	-2.005550	-3.615588	-2.941145	-2.609066	I(0)	NOT STATIONARY
LNGEXP	-1.553788	-3.615588	-2.941145	-2.609066	I(0)	NOT STATIONARY

Source: Author (2022)

Table 4.4 Unit Root Test (At First Difference)

VARIABLES	ADF TEST STATISTICS	ADF CRITICAL VALUE			ORDER OF INTEGRATION	REMARKS
		1% Level	5% level	10% level		
D(LNRGDP)	-3.783083	-3.615588	-2.941145	-2.609066	I(1)	STATIONARY
D(LNEXPT)	-6.120283	-3.615588	-2.941145	-2.609066	I(1)	STATIONARY
D(LNIMPT)	-7.194091	-3.615588	-2.941145	-2.609066	I(1)	STATIONARY
D(LNEXCR)	-5.786098	-3.615588	-2.941145	-2.609066	I(1)	STATIONARY
D(LNGEXP)	-7.568131	-3.615588	-2.941145	-2.609066	I(1)	STATIONARY

Source: Author (2022)

Table 4.2a and 4.2b above shows the results of unit root test for ADF. It shows that in the process of comparing the test statistic value against the Mackinnon critical value at 1%, 5% and 10% level of significance, it was observed that none of the variables were stationary at level, while all the variables were found to be stationary at their first difference. Hence, having tested for the stationarity of the variables using the Augmented Dickey-Fuller (ADF) test, we proceed to test for the long run equilibrium relationship of the variables which give us the co-integration result depicted in table 4.3 below

4.5 CO-INTEGRATION ANALYSIS

Johansen Co-Integration Test

Table 4.5: Unrestricted Co-integration Rank Test (Trace value)

Hypothesized No of CE(S)	Eigen Value	Trace statistic	0.05 critical value	Prob**
None *	0.740732	113.7402	69.81889	0.0000
At most 1 *	0.578852	63.79420	47.85613	0.0008
At most 2 *	0.383126	31.79765	29.79707	0.0290
At most 3	0.243130	13.92328	15.49471	0.0851
At most 4	0.093116	3.616396	3.841466	0.0572

Trace value test indicates 3 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

Table 4.6: Unrestricted Co-integration Rank Test (Maximum Eigenvalue)

Hypothesized No of CE(S)	Eigen Value	Max-Eigen statistic	0.05 critical value	Prob**
None *	None *	0.740732	49.94605	33.87687
At most 1 *	At most 1 *	0.578852	31.99654	27.58434
At most 2	At most 2	0.383126	17.87438	21.13162
At most 3	At most 3	0.243130	10.30688	14.26460
At most 4	At most 4	0.093116	3.616396	3.841466

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

Source: Author (2022)

Table 4.3a and Table 4.3b above depicts the results of Johansen Co-integration test. It shows the estimated result of the long run relationship between the variables that is DLNRGDP, DLNEXPT, DLNIMPT, DLNEXCR, and DLNGEXP using the Johansen co-integration test. It was observed that the trace statistic in table 4.3a indicated 3 co-integrating equations at the 5% level of significance. While, the maximum Eigen value statistic in table 4.3b indicates 2 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 4.4.

4.6 PARSIMONIOUS ERROR CORRECTION MODEL

Table 4.7 Error Correction Model Estimates (1981-2020)

Dependent Variable: DLNRGDP

Variables	*Coefficients*	*St. Error*	*t-Statistics*	*Prob.*
C	0.032465	0.008438	3.847240	0.0006
DLNEXPT	0.021947	0.024151	0.908735	0.3707
DLNIMPT	-0.037424	0.021403	-1.748564	0.0906
DLNEXCR	-0.069835	0.013398	-5.212507	0.0000
DLNGEXP	0.088081	0.030295	2.907476	0.0068
ECM(-1)	-0.209846	0.098411	-2.132352	0.0413
AR(1)	0.861324	0.206682	4.167384	0.0002
MA(3)	-0.999999	2320.877	-0.000431	0.9997
R^2 = 0.574443			**R^{-2}** = 0.460961	
F-stat = 5.061983			**DW stat** = 2.082530	
Prob(F-stat) = 0.000484				

Source: Author (2022)

Table 4.7 above shows that the output of a parsimonious error correction model (ECM). It shows that about 21% of the discrepancy between the actual and the long run (equilibrium) value of real GDP is corrected or eliminated each year. Put differently, it tells us that about 21% of disequilibrium in the previous year is corrected in the current year. Notice that the coefficient of the ECM has a negative sign as expected and is significant at 5% as expected. Thus, this justify our earlier position that the variables under study are indeed co-integrated. The coefficient of determination (R^2) is 0.574443 which depicts that about 57% variations in the DLNRGDP were explained by the independent variables in the model. Also, its adjusted counterpart is 0.460961 which shows that about 46% growth in the DLNRGDP in Nigeria can be attributed to the explanatory variables taking into account the degrees of freedom.

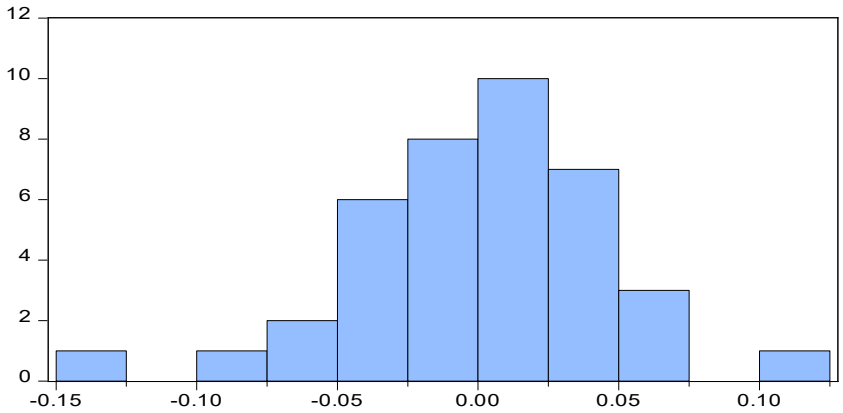
The elasticity coefficient of export is 0.021947 and it depicts that a 1percent increase in the DLNEXPT will result to about 0.02percent increases in the DLNRGDP. The elasticity coefficient of import is -0.037424 and it shows that a 1percent increase in the DLNIMPT will result to about 0.04percent decreases in the DLNRGDP. The elasticity coefficient of EXCR is -0.069835 and it shows that a 1percent increase in the exchange rate (depreciation of the naira) will result to about 0.07percent decreases in the DLNRGDP. The elasticity coefficient of DLNGEXP is 0.088081 which depicts that a 1% increase in DLNGEXP will results to about 0.09% increase in DLNRGDP. Similarly, the probability values of the t-test for the export, import, exchange rate, and government expenditure were 0.3707, 0.0906, 0.0000, and 0.0068 respectively. By implication, the P-values indicates that only GEXP and EXCR significantly influences the RGDP at 5

percent level of significance. While IMPT was found to be significant at 10% level. Total exports (EXPT) was found to be statistically insignificant even at 10%.

Similarly, the P-value of the F-test is 0.000484 which is less than 5%, hence, the overall test is significant. Thus, it therefore depicts that the explanatory variables are simultaneously significant in forecasting economic growth in Nigeria. Also, the Durbin-Watson statistics value of 2.082530 which is approximately 2 indicates that there is no autocorrelation in the model.

4.7 POST-ESTIMATION TESTS

- **Normality Test**



Source: Author (2022)

H_0: The sample data are not significantly different than a normal population

H_1: The sample data are significantly different than a normal population.

Probabilities > 0.05 accept the null hypothesis

Probabilities < 0.05 reject the null hypothesis

From the result, the probability is 0.162266 and this is greater than 0.05 at 5% significant level and therefore, the null hypothesis is accepted. This implies that the residuals are normally distributed.

4.8 HETEROSKEDASTICITY TEST

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.612355	Prob. F(4,34)	0.6566
Obs*R-squared	2.620819	Prob. Chi-Square(4)	0.6231
Scaled explained SS	3.162436	Prob. Chi-Square(4)	0.5310

Source: Author (2022)

H_0: The residuals are homoskedastic

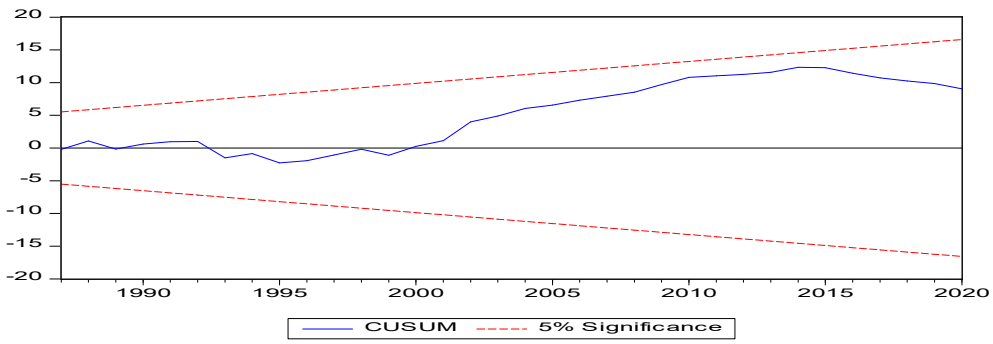
H_1: The residuals are not homoskedastic

Probabilities > 0.05 accept the null hypothesis

Probabilities < 0.05 reject the null hypothesis

From the result, the probability of Chi-Square (4) is 0.5310 and this is greater than 0.05 at 5% significant level and therefore, the null hypothesis is accepted. This implies and therefore confirms the absence of heteroskedasticity in the model. That is the error terms are homoskedastic i.e., they have constant variance in repeated sampling.

Stability Test



Source: Author (2022)

From the figure above, the blue lines are within the 5% boundary using the CUSUM test for stability, hence, the parameters in the model are stable within the period under review.

4.9 POLICY IMPLICATION OF FINDINGS

From the regression results above, there exist a positive relationship between export and real GDP. This implies that the country should promotes exportation through improving on the export incentives. This will not only stimulate domestic production but also it will boost economic growth in the country through increased export earnings. Similarly, since export was found to be insignificant variable in explaining the level of economic growth in Nigeria, this signal that export does not significantly influence real economic growth in Nigeria.

There is a negative and significant relationship between total imports and economic growth in Nigeria. This depicts that import has a way of constraining economic growth in the country. Hence, there is need for the country to impose trade restriction measures such as import tariff, quotas, bans and other commercial policies that will discourage importations of goods especially goods that are consumptive in nature, while restrictions on capital goods which are productive should be reduced in the country. However, import was found to be statistically significant to economic growth in Nigeria.

Also, a negative and significant relationship exists between real exchange rate and economic growth. This stems from the fact that exchange rate here means the value of naira in terms to dollar and a unit increase depicts depreciation or devaluation of the naira

and this will be favourable to exporters. Hence, increasing exchange rate has had a significant negative impact on the economy of Nigeria

Finally, there exist a positive and significant relationship between government expenditure and economic growth in Nigeria. This further re-emphasized the rationale for government intervention in stimulating the level of economic activities. Increasing government expenditures would have a significant positive impact on the economy of Nigeria.

CHAPTER FIVE

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.1 SUMMARY OF FINDINGS

This research has provided evidence on analysis of the impact of trade on economic growth by empirically investigating the relationship between economic growth and trade in Nigeria using annual time series data from 1981 to 2020. Some statistical tools were adopted to discover the relationship between these variables. A trend analysis which helped to reveal the pattern of movement in real GDP, export, import, real exchange rate, gross fixed capital formation, and government expenditure were examined by plotting their values against the years in a time series form. A descriptive statistic was also carried out to show the average, standard deviation, probability value, Jacque Berra and Chi-square of the variables. A correlation matrix was also performed to show the relationship between the variables. A unit root test (ADF and PP) were conducted and it was discovered that all the variables adopted were not stationary at levels while they all became stationary after first differencing. A Johansen co-integration test was performed to show the long-run equilibrium relationship between real gross domestic product and export, import, real exchange rate, gross fixed capital formation and government expenditure: the result showed that they were co-integrated and this led to the adoption of the parsimonious error correction model using the ordinary least squares technique to show the short-run dynamics between real gross domestic product and export, import, real exchange rate, gross fixed capital formation and government expenditure which revealed the R-square, adjusted R-square, F-statistic, Durbin-Watson statistic and the

probability(f-statistic). Estimation was facilitated with the use of a statistical software programme (Econometric-views 10) in order to analyse the impact of trade on the growth of the Nigerian economy. Evaluation of parameter estimates and test of research hypothesis was based on relevant statistics from error correction model.

5.2 RECOMMENDATIONS

Having identified and studied the impact of trade on economic growth in Nigeria, all things being equal, having taking into account factors such as export, import, real exchange rate, gross fixed capital formation and government expenditure and how they influence economic growth, based on the empirical findings, the following recommendations are provided:

i. Attempts should be made to stimulate and increase the export base. The over-dependence of the Nigeria economy on oil as its major export earnings is fatalistic. There is the urgent need to diversify the productive base of the economy to include the production and exportation of other goods and services, if this happens Nigeria will reap the gains from trade and this would translate to economic growth and development.

ii. Nigerians should reframe from excessive consumption of foreign goods and services. Intense surveillance, managerial efforts and trade restrictions should be increased to check dumping activities of some foreigners. The role of law enforcement agencies such as NAFDAC, Nigeria Custom Service and others should be sustained and it should be more effective and efficient in reducing unnecessary importation.

iii. There should be adequate provision of infrastructures especially the supply of power. Epileptic power supply which is the recurring trend in Nigeria poses a serious threat to manufacturing industries. Government and policy makers should therefore take decisive actions to curb this menace as this will help in increased domestic production vis-à-vis stimulate exportation;

iv. Manufacturing industries should improve on their production so that their output would be competitive in the global market i.e. there should be value added to locally made goods, also excise duties should be lowered so as to encourage local industries to export their goods and services.

v. Foreigners investing in Nigeria should be made to engage in developmental projects through corporate social responsibility to boost economic growth. Government should encourage foreigners to invest in Nigeria by providing a conducive and secured environment for them to effectively and efficiently carry out their business activities.

5.3 CONCLUSION

This study examined empirically the effect of trade on economic growth in Nigeria by employing the use of OLS, unit root test, Co-integration test and error correction model as its tools of analysis. Based on the findings of this study, it was discovered that export, import and government expenditure does significantly influence economic growth in Nigeria. Also real exchange rate and gross fixed capital formation was found not to significantly influence economic growth in Nigeria in the period under review. In light of the above findings, there are several that Nigeria can take to maximize the positive effects of trade on economic growth and minimize any negative impacts. These may include:

i. **Implementing sound trade policies**:

Nigeria can benefit from trade by adopting policies that promote openness and competitiveness. This may include reducing tariffs, simplifying customs procedures, and improving the business environment.

ii. **Diversifying exports:**

Nigeria can reduce its reliance on a few exports by expanding the range of goods and services it exports. This can help to reduce the impact of fluctuations in demand for any particular product.

iii. **Strengthening regional integration:**

The nation can benefit from regional integration by increasing trade with neighbouring countries. This can help to create larger markets and increase the flow of goods and services.

iv. **Promoting competitiveness:**

The nation can improve the competitiveness of its domestic industries by investing in education and training, infrastructure, and research development. This can help to create an environment that is more attractive to domestic and foreign investors.

v. **Providing support to disadvantaged groups:**

To ensure that the benefits of trade are shared widely, Nigeria can provide support to disadvantaged groups, such as small and medium-sized enterprises, through targeted policies and programs. Overall, by adopting a strategic approach to trade and economic policy, Nigeria can maximize the benefits of trade and promote sustainable economic growth.

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APPENDIX

SECONDARY DATA EMPLOYED IN THE STUDY

YEAR	RGDP	EXPT	IMPT	EXCR	GEXP
1981	19,748.53	11,023.30	12,839.60	0.64	11.4
1982	18,404.96	8,206.40	10,770.50	0.67	11.9
1983	16,394.39	7,502.50	8,903.70	0.75	9.60
1984	16,211.49	9,088.00	7,178.30	0.81	9.90
1985	17,170.08	11,720.80	7,062.60	0.96	13.0
1986	17,180.55	8,920.60	5,983.60	3.18	16.2
1987	17,730.34	30,360.60	17,861.70	4.17	22.0
1988	19,030.69	31,192.80	21,445.70	5.35	27.7
1989	19,395.96	57,971.20	30,860.20	7.62	41.0
1990	21,680.20	109,886.10	45,717.90	8.71	60.3
1991	21,757.90	121,535.40	89,488.20	9.87	66.6
1992	22,765.55	205,611.70	143,151.20	19.66	92.8
1993	22,302.24	218,770.10	165,629.40	21.89	191.2
1994	21,897.47	206,059.20	162,788.80	21.89	160.9
1995	21,881.56	950,661.40	755,127.70	21.89	248.8
1996	22,799.69	1,309,543.40	562,626.60	21.89	337.2
1997	23,469.34	1,241,662.70	845,716.60	21.89	428.2
1998	24,075.15	751,856.70	837,418.70	21.89	487.1
1999	24,215.78	1,188,969.80	862,515.70	97.6	947.7
2000	25,430.42	1,945,723.30	985,022.39	106.71	701.1
2001	26,935.32	1,867,953.85	1,358,180.33	112.99	1,018.0
2002	31,064.27	1,744,177.68	1,512,695.33	126.88	1,018.2
2003	33,346.62	3,087,886.39	2,080,235.27	137.22	1,226.0
2004	36,431.37	4,602,781.54	1,987,045.27	132.86	1,504.2
2005	38,777.01	7,246,534.80	2,800,856.33	130.29	1,919.7
2006	41,126.68	7,324,680.63	3,108,519.32	128.29	2,038.0
2007	43,837.39	8,309,758.32	3,911,952.63	118.21	2,450.9
2008	46,802.76	10,441,487.81	5,605,232.11	126.48	3,240.8
2009	50,564.26	8,567,597.23	5,465,224.09	149.69	3,453.0
2010	55,469.35	11,950,728.78	8,123,586.34	150.48	4,194.6

2011	58,180.35	15,164,174.20	10,943,106.15	158.21	4,712.1
2012	60,670.05	15,063,885.88	9,718,635.46	157.32	4,605.3
2013	63,942.85	15,186,644.35	9,392,828.46	157.27	5,185.3
2014	67,977.46	12,924,989.08	10,491,555.47	169.68	4,587.4
2015	69,780.69	8,801,427.15	11,020,975.63	196.99	4,988.9
2016	68,652.43	8,783,295.43	9,678,528.17	305.22	5,858.6
2017	69,205.69	16,750,073.75	12,938,561.19	306.31	6,456.7
2018	70,536.35	22,165,039.19	15,929,796.86	306.92	7,813.7
2019	72,094.09	23,516,823.92	24,153,673.89	306.95	9,714.6
2020	70,800.54	13,737,083.62	21,905,499.46	381	10,164.6

Source: CBN (2020) &WDI (2020)

OLS RESULT

Dependent Variable: LNRGDP
Method: Least Squares
Date: 12/05/22 Time: 01:19
Sample: 1981 2020
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.705178	0.640649	15.14898	0.0000
LNEXPT	-0.143993	0.087992	-1.636441	0.1107
LNIMPT	-1.19E-05	0.120781	-9.89E-05	0.9999
LNEXCR	-0.202593	0.065005	-3.116597	0.0036
LNGEXP	0.546463	0.141293	3.867575	0.0005
R-squared	0.907992	Mean dependent var		10.38826
Adjusted R-squared	0.897477	S.D. dependent var		0.525254
S.E. of regression	0.168182	Akaike info criterion		-0.611068
Sum squared resid	0.989985	Schwarz criterion		-0.399958
Log likelihood	17.22136	Hannan-Quinn criter.		-0.534737
F-statistic	86.35060	Durbin-Watson stat		0.417380
Prob(F-statistic)	0.000000			

Unit Root Test

Null Hypothesis: LNRGDP has a unit root				
Exogenous: Constant				
Lag Length: 2 (Automatic - based on AIC, maxlag=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-1.041159	0.7282
Test critical values:	1% level		-3.621023	
	5% level		-2.943427	
	10% level		-2.610263	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(LNRGDP)				
Method: Least Squares				
Date: 03/07/22 Time: 18:39				
Sample (adjusted): 1984 2020				
Included observations: 37 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNRGDP(-1)	-0.012635	0.012135	-1.041159	0.3054
D(LNRGDP(-1))	0.245884	0.151708	1.620774	0.1146
D(LNRGDP(-2))	0.231600	0.146430	1.581639	0.1233
C	0.153847	0.124557	1.235152	0.2255
R-squared	0.226611	Mean dependent var		0.039539
Adjusted R-squared	0.156303	S.D. dependent var		0.038097
S.E. of regression	0.034994	Akaike info criterion		-3.765496
Sum squared resid	0.040410	Schwarz criterion		-3.591342
Log likelihood	73.66167	Hannan-Quinn criter.		-3.704098
F-statistic	3.223110	Durbin-Watson stat		1.932445
Prob(F-statistic)	0.035043			

Null Hypothesis: D(LNRGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.783083	0.0065
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNRGDP,2)
Method: Least Squares
Date: 03/07/22 Time: 18:40
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNRGDP(-1))	-0.514428	0.135981	-3.783083	0.0006
C	0.018907	0.007896	2.394701	0.0220

R-squared	0.284461	Mean dependent var	0.001378
Adjusted R-squared	0.264585	S.D. dependent var	0.045953
S.E. of regression	0.039408	Akaike info criterion	-3.578500
Sum squared resid	0.055908	Schwarz criterion	-3.492312
Log likelihood	69.99151	Hannan-Quinn criter.	-3.547835
F-statistic	14.31172	Durbin-Watson stat	2.260555
Prob(F-statistic)	0.000565		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.423827	0.5608
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNEXPT)
Method: Least Squares
Date: 03/07/22 Time: 18:41
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNEXPT(-1)	-0.035148	0.024686	-1.423827	0.1629
C	0.663978	0.344363	1.928133	0.0615

R-squared	0.051945	Mean dependent var	0.182765
Adjusted R-squared	0.026322	S.D. dependent var	0.417956
S.E. of regression	0.412419	Akaike info criterion	1.116364
Sum squared resid	6.293294	Schwarz criterion	1.201675
Log likelihood	-19.76910	Hannan-Quinn criter.	1.146973
F-statistic	2.027283	Durbin-Watson stat	2.002549
Prob(F-statistic)	0.162876		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.120283	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNEXPT,2)
Method: Least Squares
Date: 03/07/22 Time: 18:42
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNEXPT(-1))	-1.043712	0.170533	-6.120283	0.0000
C	0.204158	0.076524	2.667888	0.0114

R-squared	0.509923	Mean dependent var	-0.006382
Adjusted R-squared	0.496310	S.D. dependent var	0.593729
S.E. of regression	0.421376	Akaike info criterion	1.160615
Sum squared resid	6.392085	Schwarz criterion	1.246803
Log likelihood	-20.05168	Hannan-Quinn criter.	1.191280
F-statistic	37.45786	Durbin-Watson stat	1.958003
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.966425	0.7553
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNIMPT)
Method: Least Squares
Date: 03/07/22 Time: 18:42
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNIMPT(-1)	-0.021266	0.022004	-0.966425	0.3405
D(LNIMPT(-1))	-0.166909	0.163469	-1.021043	0.3142
C	0.519317	0.301432	1.722830	0.0937

R-squared	0.055755	Mean dependent var	0.200465
Adjusted R-squared	0.001798	S.D. dependent var	0.350744
S.E. of regression	0.350428	Akaike info criterion	0.816336
Sum squared resid	4.298000	Schwarz criterion	0.945619
Log likelihood	-12.51037	Hannan-Quinn criter.	0.862333
F-statistic	1.033326	Durbin-Watson stat	1.983244
Prob(F-statistic)	0.366422		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.194091	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNIMPT,2)
Method: Least Squares
Date: 03/07/22 Time: 18:42
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNIMPT(-1))	-1.173809	0.163163	-7.194091	0.0000
C	0.234951	0.065374	3.593981	0.0010

R-squared	0.589767	Mean dependent var	0.002053
Adjusted R-squared	0.578371	S.D. dependent var	0.539182
S.E. of regression	0.350107	Akaike info criterion	0.790039
Sum squared resid	4.412693	Schwarz criterion	0.876228
Log likelihood	-13.01074	Hannan-Quinn criter.	0.820704
F-statistic	51.75495	Durbin-Watson stat	1.958191
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.005550	0.2834
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNEXCR)
Method: Least Squares
Date: 03/07/22 Time: 18:43
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNEXCR(-1)	-0.050531	0.025196	-2.005550	0.0523
C	0.341775	0.101214	3.376756	0.0017

R-squared	0.098050	Mean dependent var	0.163823
Adjusted R-squared	0.073673	S.D. dependent var	0.315967
S.E. of regression	0.304105	Akaike info criterion	0.507033
Sum squared resid	3.421753	Schwarz criterion	0.592343
Log likelihood	-7.887134	Hannan-Quinn criter.	0.537641
F-statistic	4.022232	Durbin-Watson stat	2.025541
Prob(F-statistic)	0.052259		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.786098	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNEXCR,2)
Method: Least Squares
Date: 03/07/22 Time: 18:43
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNEXCR(-1))	-0.962197	0.166295	-5.786098	0.0000
C	0.160787	0.059064	2.722263	0.0099

R-squared	0.481857	Mean dependent var	0.004482
Adjusted R-squared	0.467464	S.D. dependent var	0.443687
S.E. of regression	0.323781	Akaike info criterion	0.633694
Sum squared resid	3.774017	Schwarz criterion	0.719883
Log likelihood	-10.04019	Hannan-Quinn criter.	0.664359
F-statistic	33.47892	Durbin-Watson stat	1.998100
Prob(F-statistic)	0.000001		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.553788	0.4959
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNGEXP)
Method: Least Squares
Date: 03/07/22 Time: 18:43
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGEXP(-1)	-0.022978	0.014788	-1.553788	0.1292
D(LNGEXP(-1))	-0.248449	0.159704	-1.555685	0.1288
C	0.364698	0.103738	3.515563	0.0012

R-squared	0.113157	Mean dependent var	0.177584
Adjusted R-squared	0.062480	S.D. dependent var	0.206909
S.E. of regression	0.200341	Akaike info criterion	-0.301935
Sum squared resid	1.404778	Schwarz criterion	-0.172652
Log likelihood	8.736763	Hannan-Quinn criter.	-0.255937
F-statistic	2.232910	Durbin-Watson stat	1.895512
Prob(F-statistic)	0.122270		

Null Hypothesis: D(LNGEXP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.568131	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNGEXP,2)
Method: Least Squares
Date: 03/07/22 Time: 18:44
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGEXP(-1))	-1.227968	0.162255	-7.568131	0.0000
C	0.218057	0.043904	4.966684	0.0000

R-squared	0.614051	Mean dependent var	4.21E-05
Adjusted R-squared	0.603330	S.D. dependent var	0.324282
S.E. of regression	0.204238	Akaike info criterion	-0.287863
Sum squared resid	1.501678	Schwarz criterion	-0.201674
Log likelihood	7.469391	Hannan-Quinn criter.	-0.257197
F-statistic	57.27660	Durbin-Watson stat	1.864784
Prob(F-statistic)	0.000000		

Johansen Co-Integration Test

Date: 12/05/22 Time: 01:41
Sample (adjusted): 1984 2020
Included observations: 37 after adjustments
Trend assumption: Linear deterministic trend
Series: DLNRGDP DLNEXPT DLNIMPT DLNEXCR DLNGEXP
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 *	0.740732	113.7402	69.81889	0.0000
At most 1 *	0.578852	63.79420	47.85613	0.0008
At most 2 *	0.383126	31.79765	29.79707	0.0290
At most 3	0.243130	13.92328	15.49471	0.0851
At most 4	0.093116	3.616396	3.841466	0.0572

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.740732	49.94605	33.87687	0.0003
At most 1 *	0.578852	31.99654	27.58434	0.0127
At most 2	0.383126	17.87438	21.13162	0.1346
At most 3	0.243130	10.30688	14.26460	0.1925
At most 4	0.093116	3.616396	3.841466	0.0572

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

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

DLNRGDP	DLNEXPT	DLNIMPT	DLNEXCR	DLNGEXP
3.347315	1.347130	-5.417016	-1.172210	7.903108
7.504999	-5.098570	2.979631	-1.119400	5.206870
-15.60434	-1.677003	-1.050135	-2.698497	1.170728
-1.817348	-2.058225	0.299006	4.464341	-2.293003
20.58832	0.904067	-2.633129	0.040623	-4.744217

Unrestricted Adjustment Coefficients (alpha):

D(DLNRGDP)	-0.002181	-0.018896	0.013389	0.006780	-0.004399
D(DLNEXPT)	-0.007385	0.112585	0.123439	0.145640	0.031312
D(DLNIMPT)	0.173254	-0.038508	0.045899	0.099594	0.040566
D(DLNEXCR)	-0.072309	0.104135	0.148254	-0.092974	0.032100
D(DLNGEXP)	-0.145721	-0.024203	0.043645	0.006320	0.037513

1 Cointegrating Equation(s):	Log likelihood	73.95906

Normalized cointegrating coefficients (standard error in parentheses)

DLNRGDP	DLNEXPT	DLNIMPT	DLNEXCR	DLNGEXP
1.000000	0.402451	-1.618317	-0.350194	2.361029
	(0.19194)	(0.21591)	(0.17424)	(0.34726)

Adjustment coefficients (standard error in parentheses)

D(DLNRGDP)	-0.007302
	(0.02354)
D(DLNEXPT)	-0.024721
	(0.24404)
D(DLNIMPT)	0.579936
	(0.16962)
D(DLNEXCR)	-0.242042
	(0.21568)
D(DLNGEXP)	-0.487772
	(0.10352)

2 Cointegrating Equation(s):	Log likelihood	89.95733

Normalized cointegrating coefficients (standard error in parentheses)

DLNRGDP	DLNEXPT	DLNIMPT	DLNEXCR	DLNGEXP
1.000000	0.000000	-0.868577	-0.275404	1.740786
		(0.11830)	(0.11704)	(0.22547)
0.000000	1.000000	-1.862934	-0.185837	1.541163
		(0.19348)	(0.19140)	(0.36873)

Adjustment coefficients (standard error in parentheses)

D(DLNRGDP)	-0.149117	0.093405
	(0.05035)	(0.03231)
D(DLNEXPT)	0.820230	-0.583972
	(0.57481)	(0.36887)
D(DLNIMPT)	0.290933	0.429732
	(0.41240)	(0.26465)
D(DLNEXCR)	0.539492	-0.628350
	(0.50592)	(0.32466)
D(DLNGEXP)	-0.669413	-0.072906
	(0.25153)	(0.16142)

3 Cointegrating Equation(s):	Log likelihood	98.89452

Normalized cointegrating coefficients (standard error in parentheses)

DLNRGDP	DLNEXPT	DLNIMPT	DLNEXCR	DLNGEXP
1.000000	0.000000	0.000000	0.082634	0.225904
			(0.06301)	(0.10706)
0.000000	1.000000	0.000000	0.582087	-1.707973
			(0.20062)	(0.34089)
0.000000	0.000000	1.000000	0.412212	-1.744096
			(0.13020)	(0.22124)

Adjustment coefficients (standard error in parentheses)

D(DLNRGDP)	-0.358038	0.070952	-0.058547
	(0.09908)	(0.03109)	(0.03523)
D(DLNEXPT)	-1.105952	-0.790979	0.245840
	(1.16781)	(0.36643)	(0.41525)
D(DLNIMPT)	-0.425288	0.352760	-1.101460
	(0.87262)	(0.27381)	(0.31029)
D(DLNEXCR)	-1.773907	-0.876972	0.546299
	(0.97519)	(0.30599)	(0.34676)
D(DLNGEXP)	-1.350462	-0.146098	0.671423
	(0.52120)	(0.16354)	(0.18533)

4 Cointegrating Equation(s):		Log likelihood	104.0480	

Normalized cointegrating coefficients (standard error in parentheses)

DLNRGDP	DLNEXPT	DLNIMPT	DLNEXCR	DLNGEXP
1.000000	0.000000	0.000000	0.000000	0.296731
				(0.09851)
0.000000	1.000000	0.000000	0.000000	-1.209063
				(0.35624)
0.000000	0.000000	1.000000	0.000000	-1.390787
				(0.25455)
0.000000	0.000000	0.000000	1.000000	-0.857105
				(0.46673)

Adjustment coefficients (standard error in parentheses)

D(DLNRGDP)	-0.370359	0.056998	-0.056520	0.017848
	(0.09716)	(0.03236)	(0.03441)	(0.02994)
D(DLNEXPT)	-1.370629	-1.090738	0.289388	0.199715
	(1.07519)	(0.35806)	(0.38073)	(0.33128)
D(DLNIMPT)	-0.606285	0.147772	-1.071681	0.160780
	(0.81586)	(0.27169)	(0.28890)	(0.25137)
D(DLNEXCR)	-1.604941	-0.685611	0.518499	-0.846936
	(0.93302)	(0.31071)	(0.33039)	(0.28747)
D(DLNGEXP)	-1.361947	-0.159106	0.673312	0.108345
	(0.52356)	(0.17436)	(0.18540)	(0.16131)

Error Correction Model

Dependent Variable: DLNRGDP
Method: ARMA Maximum Likelihood (OPG - BHHH)
Date: 12/05/22 Time: 01:53
Sample: 1982 2020
Included observations: 39
Failure to improve objective (non-zero gradients) after 23 iterations
Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.032465	0.008438	3.847240	0.0006
DLNEXPT	0.021947	0.024151	0.908735	0.3707
DLNIMPT	-0.037424	0.021403	-1.748564	0.0906
DLNEXCR	-0.069835	0.013398	-5.212507	0.0000
DLNGEXP	0.088081	0.030295	2.907476	0.0068
ECM(-1)	-0.209846	0.098411	-2.132352	0.0413
AR(1)	0.861324	0.206682	4.167384	0.0002
MA(3)	-0.999999	2320.877	-0.000431	0.9997
SIGMASQ	0.000945	1.101855	0.000858	0.9993

R-squared	0.574443	Mean dependent var	0.032738
Adjusted R-squared	0.460961	S.D. dependent var	0.047749
S.E. of regression	0.035057	Akaike info criterion	-3.473505
Sum squared resid	0.036870	Schwarz criterion	-3.089607
Log likelihood	76.73335	Hannan-Quinn criter.	-3.335766
F-statistic	5.061983	Durbin-Watson stat	2.082530
Prob(F-statistic)	0.000484		

Inverted AR Roots	.86		
Inverted MA Roots	1.00	-.50+.87i	-.50-.87i

Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

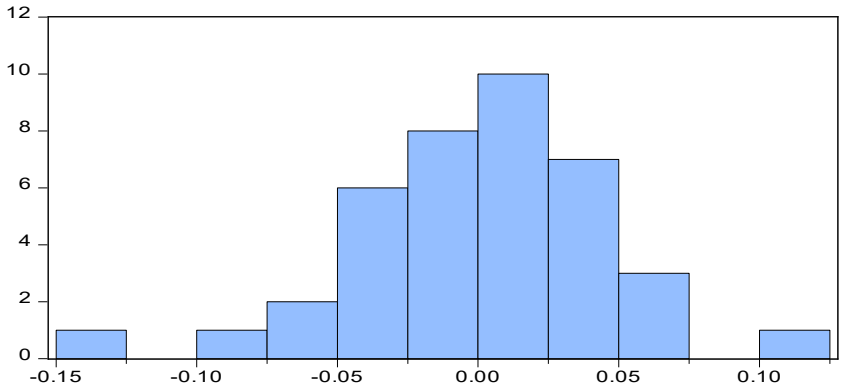
F-statistic	0.612355	Prob. F(4,34)	0.6566
Obs*R-squared	2.620819	Prob. Chi-Square(4)	0.6231
Scaled explained SS	3.162436	Prob. Chi-Square(4)	0.5310

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 12/05/22 Time: 02:06
Sample: 1982 2020
Included observations: 39

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.002949	0.000842	3.504338	0.0013
DLNEXPT	0.000236	0.002212	0.106821	0.9156
DLNIMPT	-0.000794	0.002672	-0.297217	0.7681
DLNEXCR	-0.000503	0.002197	-0.229092	0.8202
DLNGEXP	-0.003993	0.003637	-1.097868	0.2800

R-squared	0.067200	Mean dependent var	0.002063
Adjusted R-squared	-0.042541	S.D. dependent var	0.003724
S.E. of regression	0.003803	Akaike info criterion	-8.186980
Sum squared resid	0.000492	Schwarz criterion	-7.973703
Log likelihood	164.6461	Hannan-Quinn criter.	-8.110458
F-statistic	0.612355	Durbin-Watson stat	1.651391
Prob(F-statistic)	0.656604		

Normality test



Stability test