AN EMPIRICAL ANALYSIS OF THE RELATIONSHIP BETWEEN

EXPORT AND ECONOMIC GROWTH IN NIGERIA

BY

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BEING A DISSERTATION SUBMITTED TO THE
DEPARTMENT OF ECONOMICS,
BAYERO UNIVERSITY, KANO
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD
OF MASTERS OF SCIENCE DEGREE IN ECONOMICS
(M.Sc. ECONOMICS)

September, 2016

DECLARATION PAGE

I IBRAHIM YARO (SPS/12/MEC/00011) do hereby declare that this Dissertation was carried out by me as part of the requirements for the award of Masters of Science (Msc.) Degree in Economics and that all texts consulted for this study were referenced.

……. ……..

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APPROVAL PAGE

This dissertation by IBRAHIM YARO (SPS/12/MEC/00011) has met all the requirements for the award of the Degree of Masters of Science (M.Sc.) in Economics of the Economics Department, Bayero University, Kano; Nigeria, and is hereby approved for its contribution to knowledge.

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DEDICATION

This Dissertation is Dedicated to my Late Mother HAJIYA ZAINAB YARO (Ajji) may her soul rest in peace amin.

A Mother who stooge assiduously for her children to succeed in life but could not wait to reap the fruits.

ACKNOWLEDGEMENT

In the name of ALLAH the most beneficent the most merciful, All thanks is due to ALLAH (SWA) that granted me the favor to show my appreciation and acknowledge the contribution of my distinguish lecturers, colleagues, friends and family for the success of my programme.

I would like to express my appreciation and gratitude to my supervisor in person of Dr. Hassan Hassan Suleiman who despite his tight schedules and personal commitments, yet he was able to go through the manuscript and made laudable observations and corrections as at when due. Dr I am deeply grateful for the support, guidance and suggestions that make this dissertation possible and real. Sir I am indeed grateful. This dissertation has been accomplished through the tireless effort, corrections and suggestion made by my co-supervisor Dr. Latifah Musa Pedro, thank you very much Ma.

I would also like to express my appreciation and thanks to all the Lecturers of Economics Department who were always there to guide and support the students in their academic carrier and even day to day hustling. This paragraph will not be over without mentioning Prof. Garba Ibrahim Sheka for his support and guidance, thank you sir.

I must express my heartfelt thanks to the entire family of Alh Yaro Shettimah Doho (Baba Dalan Doho) for their support, guidance and prayers for the success of my programme. On the same vein I am specifically grateful for the support of my dearest brother in person of Qs Abubakar Yaro (MNIQS) during the period of my study. I will also like to use this medium to express my appreciation to all my friends' ladies and gentle men. Specifically I will like to thank Mal Nasiru

Inuwa (Phd Fellow) and Mal Haruna Usman Modibbo for their support and encouragement. I thank you all.

Finally, I am blessed to have been part of the wonderful Msc Class (set 2012/2013 Academic session), a class that has always been ready to share their problems, experiences and carry everybody along. I sincerely thank you all for the support and courage given to me.

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Abstract

The study examined empirically the relationship between export and economic growth in Nigeria using annual time series data over the period 1970 to 2014 statistical year. Econometrics methodologies applied are the cointegration test, Vector Error Correction Estimation (VECM) and Granger causality Test to achieve the objectives of the study. The Johansen cointegration test confirmed that both economic growth and exports are cointegrated, thereby indicating the existence of long run equilibrium relationship between the two variables. The vector error correction model estimates gave evidence that in the short run also, both export and economic growth are mutually causal and the error correction term is negative and statistically significant at 5% level of significance. Finally, Granger causality test conducted confirmed the presence of Uni-directional causality which runs from economic growth to export; meaning that economic growth has a significant impact on export, such that economic growth promote export. Therefore the findings of the study led to the rejection of export led growth hypothesis for Nigeria over the period of the study.

CHAPTER ONE

GENERAL INTRODUCTION

1.1 Background of the Study

The study intends to examine the relationship between export and economic growth in Nigeria using annual time series data from 1970 to 2014. The subject relationship between exports and economic growth for long has received a considerable attention by researchers and economist in a number of countries, employing different time series techniques and models. In this era of open economy, achieving high, rapid and sustainable economic growth has been the main objective of every economy. Equally, it has been well recognized that economic growth itself is a function of many factors of which export is an integral part. Thus, increasing exports to facilitate economic growth is one of the most important objectives of any economy. The role of exports in promoting and sustaining rapid economic growth, especially in emerging economies, cannot be underestimated (Bbaale & Mutenyo 2011).

International Trade shapes our everyday lives and the world we live in. International trade is therefore the system by which countries exchange goods and services, (Simply International Trade comprises of export and import of goods and services). Countries trade with each other to obtain things that are of better quality, less expensive or simply different from what is produced domestically. International trade occurs because individuals, businesses and governments in one country want to buy goods and services produced in another country. Nearly every time we make a purchase or sale, we are participating in the global economy. Goods and services that a country buys from another country that is called imports while goods and services that are sold to other countries are the exports of that country. These are transactions that formed International Trade.

Most international trade consists of the purchase and sale of industrial equipment, consumer goods, oil products and agricultural products. Services such as banking, insurance, transportation, telecommunications, engineering and tourism among others account for a proportion of the world exports. The cost of international transportation and communication has fallen drastically, resulting in greater integration among the economies of the world. Because of this interdependence, economic trends and conditions in one country can strongly affect prices, wages, employment and production in other countries.

To explain some of the benefits and how International Trade works, for a country to become economically buoyant and wealthier, countries want to use their natural resources such as land, labor, capital and entrepreneurship in the most efficient manner. However, there are differences among countries in term of the quantity, quality and cost of these resources. The advantages that a country has may vary according to the following:

- Abundant mineral resources
- Climate suited to agriculture
- Well-trained labor force
- New innovative ideas
- Highly developed infrastructures like good roads, telecommunication systems, electricity etc. Instead of trying to produce everything by themselves. Countries often concentrate on producing things that they can produce most efficiently. They then trade those for other goods and services. In doing so, both the countries are engaged and the world becomes wealthier.

On the other hand Export which is part of International trade brings about gains that include access to outside markets, hence exploiting economies of scale, as industries expand and develop

their markets overseas in response to foreign demand. There are also gains that include efficiency advances as a result of knowledge and technological spillovers from exporting experience. Other advantages include efficiency in resource allocation, employment generation, and relaxing the foreign exchange constraints. This is why countries all over the world are taking deliberate and purposive efforts to promote exports activities. Similarly, in a world where globalization and economic integration is fast eroding, there are also distance and barriers which will not allow any country to be in an autarky position (a state of being self sufficient) if indeed it must achieve its desired objective of economic growth. Therefore for an economy to achieved growth it has to engage in international trade (especially export). Hence, export is a catalyst for the growth and development of an economy (Abou-Stait 2005).

For long, countries that relied on exports to drive growth have achieved considerable success in accelerating their economies. Several countries in the world like the United State, Japan China and the Asian tigers or the four Asian dragons Hong Kong, Singapore, South Korea and Taiwan have taken this route to promote economic growth. Their economic success stories have served as role models for many developing countries including Nigeria. The success of these export-oriented economies has also resulted in a plethora of empirical studies that examine the role of exports in generating economic growth (Tang et al. 2015). It is noted that the outcome of these studies are controversial. The contradictory findings of these studies conducted might be attributed to the arbitrariness in the choice of the order for lags in the various tests conducted. Also the inconclusive results may also be attributed to the estimation techniques and data spans employed.

However, economies which are overly dependent on exports for growth are very vulnerable (especially economies that rely on the exportation of raw materials) when there is a global

slowdown and fluctuations in the world market. Thus, the financial crisis of 2008–2009 in the world had a devastating impact on export-dependent economies and of course Nigeria is not an exception. During this period most of the affected economies adopted some policies and strategies to stimulate domestic demand to promote growth. Even though strategy of domestic demand led-growth alone is not enough to derive the growth needed, therefore should not replace or take over the export led-growth as a means of generating growth if indeed a relationship between exports and economic activity exists, export-orientation is still one of the best strategies to adopt for growth.

Looking at the objective and goal of all the countries in the world which is to promote and sustained growth, and that export is one of the important factors that generate such growth even though it has some shortcomings particularly for countries that export raw materials binded by the nature of the global finance and markets. These are some of the factors make this study imperative.

1.2 Statement of the Problem

For decades, several studies have been conducted to examine the relationship between exports and economic growth some of the studies were conducted on single country basis; some were cross country studies and at the same time some studies concentrated on the developing countries while some were on developed ones. The outcome and findings of some of these studies confirmed the existence of positive and significant relationship between export and economic growth, others revealed evidence supporting the fact that export growth precedes economic growth hence giving a stance to the export-led-growth (ELG) hypothesis. Other findings argue

that there is a feedback relationship between export growth and economic growth. The arguments presented along these lines are that exports may arise from the economies of scale effects of economic growth. At the same time, export expansion may propel further cost reductions leading to efficiency gains, and by extension leading to economic growth. Nevertheless some authors find no significant causal relationship between the two series. Some of the studies among others are Baharumshah & Rashid 1999;; Vohra 2001; Subasat 2002; Njikam 2003; Shirazi 2004; Herzer et al., 2004; Wörz 2005 Keong et al. 2005, Mah 2005; Tang 2006; Pazim 2009; and Bbaale & Mutenyo 2011, Mishra P.K (2011) Ray S. (2011), Ahdi et.al. (2013) Kumari & Malhotra(2014).

In Nigerian context Various researches has been carried out in this regard some were meant to examine the relationship between export and growth while others was conducted to examine the direction and to assess the significant impact of export on the economic growth of Nigeria using different econometric methodology over time. All these studies yielded different result and outcome. Chemeda 2001, Olayiwola & Okodua 2007; Chimobi 2010, Celina and Bethran (2012) Ewetan and Okodua 2013, Ugochukwu & Chinyere 2013 and Olaleye & Olasode 2013.

In view of the above therefore, it is noted that numerous studies have been conducted on this subject (export and economic growth) and has gained a considerable attention from a wide range of scholars and researchers over the years over but the results and findings of these studies was controversial and inconclusive. This shows that there is no consensus among the scholars; this might be due to either the scope of the study covered, the country been studied, the econometric methodology and models used in their studies. Secondly it is based on the important role of export in promoting economic growth, as the main target of any economy in the world for

development. Because as one of the factors of growth, Export cannot be replace or over taking by other factors for promoting growth, rather they should serve as supplement to export.

Lastly the recent of the studies reviewed are those that covered the period 2012 statistical year of investigation.

On this note, it is imperative for this study to bridge these important gaps in order to contribute to the Debate in this area of study Nigeria Nexus. These are some of the reasons that motivated this study. It is against this background that the study intends to re-examined and shed additional light on the relationship between export and economic growth in Nigeria, and observed the dimension of causality among the series in the study.

Therefore this study differs from previous studies in a number of ways some of which are; the scope of this study covers up to 2014 statistical year. Secondly this study employed the Vector Error Correction Model (VECM) as some of the previous studies used simple OLS and VAR models for analysis. Lastly this study used a multivariate model because some studies conducted used bivariate model, also this study may be different from others in terms of the variables used.

1.3 Research Questions

The following research questions are designed in order to achieve the objectives of the study:

I. What is the relationship between Export and Economic Growth in Nigeria for the period under study?
II. What is the direction of causality between Export and Economic Growth in Nigeria?

1.4 Objectives of the Study

The main objective of this study is to examine the relationship between export and economic growth in Nigeria. The specific objectives include the following:

I. To examine the long run relationship between Export and Economic Growth in Nigeria.

II. To examine the direction of causality between Export and Economic Growth in Nigeria

1.5 Significance of the Study

This study was set to examine empirically the relationship between export and economic growth and the direction of causality between the series in Nigeria from 1970 – 2014. As usual all the necessary econometric methodology has been followed in order to achieved the stated objective of the study. This study employs the Vector error correction model (VECM) to establish and to test the dynamic relationship between export and economic growth. As pointed out by Riezman (1996), that the relationship between exports and economic growth is essentially a dynamic one. Secondly, in order to have a clear picture and nature of the export –growth relationship, the study used a multivariate model because the bivariate causality test may not provide a consistent finding on the export-growth relation.

Considering the fact that previous Governments and administration of Nigeria has put in place many different policies and programmes with the aim of achieving desirable rate of growth of which export expansion is an important one among them. However Nigeria is endowed with enormous human and natural resources but still faces a lot of growth related challenges, and one of them is associated with the nature of the Nigerian export composition which of course is

predominantly export of raw materials. This is why the study investigates empirically the relationship between export and economic growth in Nigeria for the stated period.

Therefore the emanating results and findings of this study are intended not to only provide an insight that could be used by policy makers in the formulation and implementation of policies, but also to show that interventions that promote Export promotions can no longer be seen as a cost that needs to be curtailed but rather, as a means towards achieving a desired objective of economic growth of the country.

Never the less, the study will add to the growing body of literature in the area of development economics, as well the study would identify the area for further researches in academics and Non academic purposes. Lastly the study is updated as it covers the period 2014 statistical year.

1.6 Scope of the Study

The study used annual/time series data ranging from 1970 to 2014, as to examine the relationship between export and economic growth, and also to examine the dimension of the relationship between the variables export and economic growth in Nigeria. The time frame is chosen to cover the eras of economic policies and programmes adopted in Nigeria with the aim of boosting the economy of the country, especially policies and programmes aimed at promoting the export sector. The study period also take care of when the institutions that take care of all the necessary inputs for analysis are in place, to ensure data availability and reliability.

1.7 Limitations of the Study

Even though Nigeria has been in foreign trade transaction especially export for long time, but this research looked at the period when the data for the variable used is available, this meant that Nigeria has been in export transaction for long, infact since when there was no government in place. Thus this means that the availability of data and statistical information to be discussed may has limit.

Every study no matter how well it is conducted and constructed it must have some constraints, either in terms of the availability of the data, validity and reliability of data or the method and technique used; this is why it is always possible that future research may have doubt on the validity of any hypothesis or conclusion of a study.

The study scope is also hindered by other personal and environment induced challenges (such as social, economic problems among others).

1.8 Plan of the Study

In order to have a clear picture of the study, the study is divided in to five (5) broad chapters. Chapter one of the study provides a general introduction of the study which includes the following: background of the study, statement of the problem, research questions, objectives of the study, significance of the study, scope and limitations of the study as well as the study plan. The remaining part of the study is divided into four parts. Chapter two discusses the conceptual frame work, the theoretical framework and reviewed some related literatures concerning export-growth relationship. Chapter three of the study discusses the methodology used in conducting the

research, the chapter dealt with the issues like sources of data, method of data analysis, variables used in the study and model specification. While chapter four presents the analysis of data, interpretations of the result and discusses the results obtained. Then lastly chapter five concludes the study with a summary, conclusion and Recommendations offered.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the related literature on the issue of export and economic growth categorized as follows; the conceptual frame work, review of the theoretical literatures and lastly the discussion of the empirical literatures.

2.2 Conceptual Frame Work

Economic growth simply refers to increase in Output. It is the steady process by which the productivity capacity of an economy is increased overtime to bring about rising levels of national output and income while, foreign trade is a trade between different countries of the world(Patrick, Emanuel & Edmond 2013). Lipsey (1986) defined economic growth as the positive trend in the nations' total output over a long period of time. Jhingan (1997) quotes Kuznets (1966) in defining economic growth as a long term rise in capacity to supply increasingly diverse economic goods to its population, with the growing capacity based on advancing technology and institutional and ideological adjustments that it demands. Todaro and Smith opined that it is the steady process by which the productive capacity of the economy is increased overtime to bring about rising levels of national output and income. It is this sustained growth that leads to economic development.

According to Patel (2013), foreign trade is the process of focusing on resources of the globe and objectives of the organizations or global business opportunities and threats in order to produce, buy, sell or exchange of goods and services world – wide. Put differently, foreign trade is all commercial transactions (private and governmental, sales, investments, logistics, and transport) that take place between two or more regions, countries and nations on their political boundary. It is also called international trade, external trade or interregional trade. It consists of imports, exports and Entrepot.

Import trade refers to purchase of goods by one country from another country or inflow of goods and services from foreign country to home country. Export trade refers to the sale of goods by one country to another country or outflow of goods from home country to foreign country. The term export is derived from the conceptual meaning as to ship the goods and services out of the port of a country. Export is a function of international trade whereby goods produced in one country are shipped to another country for future sale or trade (Investopedia). The sale of such goods adds to the producing nations gross output. Generally, it can be argued that export is an engine of growth, a potent strategy for mutual inter-dependence among world nations and an instrument for technological and industrial emancipation.

Entrepot trade is also called re-export. It refers to the purchase of goods from one country and then selling them to another country after some processing operations. Foreign trade is therefore influenced as a result of many factors some of which includes differences in natural factor endowments, preferences, technologies, exchange rate, distance and gross domestic product (GDP) (Andrew, 2004).

Balance of payments (BOP) - is an accounting record summarizing international transactions between a country and foreign territories over a period of time. The balance of payments has three major components, a current account, capital account and the financial account. The BOP can either have a surplus balance of payment (which occurs when a country sells more to foreign countries than it buys from them or a deficit balance of payment (when a country buys more from a foreign country than it sells to foreign nations.

Balance of trade- is the difference in monetary value of a country's exports and its imports. Current account- is the sum of the balance of trade (value of exports minus imports), cross border interest and dividends payments, and gifts from both individuals and governments from other countries such as foreign aid. It measures trade in goods and services as well as income and current transfers. Capital account- reflects the change in ownership of fixed assets and the acquisitions or disposal of non-financial assets.

Terms of Trade a country's terms of trade represents the relationship between the price it pays for imported goods and the price it receives for its exported goods. If the prices received for exports exceeds what it pays for imports, a country's terms of trade is said to be favorable as it means fewer exports have to be sacrificed to obtain a given amount of imports. If the prices received for exports are lower than that paid for the imports, then the terms of trade is not favorable and more exports have to be sold to purchase a given amount of imports.

2.3 Review of Theoretical Literatures/Framework

International trade issues generally pose three types of questions for economists. The first is based on explanations of trade flows between at least two nations. The second refers to the nature and extent of gains or losses to an economy. Finally, the third issue concerns the effects of trade policies on an economy. Most theories of international trade are dedicated to the first question, and attention will now turn to theoretical responses to such an issue in form of: the classical trade theory (the theory of comparative advantage); export led Growth theory; factor proportion theory; and product life cycle theory.

The discussion concerning the role of exports as one of the major determinant factor of economic growth is not new. It goes back to the classical economic theories by Adam Smith and David Ricardo, According to classical foreign trade theory, trade presents each country with a comparative advantage by providing specialization in production. However, the "Classical Foreign Trade Theory" has been criticized by many economists. According to these economists, the theory is not appropriate for real, dynamic conditions, especially in terms of poor countries that want to develop. These countries are export dealers of primitive substance (Serin, 1981: 29). This means that the hypothesis of foreign trade as growth's engine is not relevant to developing countries. As Nurkse (1959) asserts, foreign trade undertook the role of growth's engine in such countries as Canada, the United States and Australia in the 19th century. According to Kravis (1970), the real reason for growth through foreign trade in these countries was their rich natural resources. Cairncross(1961) states that developing countries use their natural resources only to meet their domestic demands, and they can allot only an insignificant portion of the resources for export.

The theory of comparative advantage was demonstrated by David Ricardo (1772 –1823). In his book the Principles of Political Economy and Taxation, According to Ricardo a country should specialize in producing and exporting only those goods and services which it can produce more efficiently, that is at lower opportunity cost than other goods and services which it should import. Comparative advantage results from different endowments of the factors of production, that is, capital, land, labor, entrepreneurial skill, power, resources, and technology. It therefore follows that free trade is beneficial to all countries, because each can gain if it specializes according to the comparative advantage. Alternatively, the principle states that trade is beneficial even if a country does not have an absolute advantage in the production of a good, but does have a cost benefit of producing the good relative to its trading partner. This principle explains why countries specialize in producing and exporting products based on their endowment of resources. The concept is especially important in international trade, suggesting that countries should specialize in areas in which they have a comparative advantage. Differently argued, in the domain of international trade, each nation takes to the production of only those products in the manufacturer of which, she is at an advantage in terms of skill, equipment, machinery or tradition, as compared to the other nations. Thus, with international specialization that has become order of the day, each nation concentrates on the making of only such products in which it has the maximum comparative advantage and the least comparative cost (Ray, 2011). Therefore, classical trade theory effectively describes the scenario where a country generates goods and services in which it has an advantage, for consumption indigenously, and subsequently exports the surplus. Consequently, it is sensible for countries to import those goods and services in which they have an economic disadvantage. Economic advantages/disadvantages may arise from country differences in factors such as resource endowments, labour, capital,

technology or entrepreneurship. Thus, classical trade theory contends that the basis for international trade can be sourced to differences in production characteristics and resource endowments which are founded on domestic differences in natural and acquired economic advantages. However, over and above such a general insight into international trade, classical trade theory is unable to offer any explanation as to what causes differences in relative advantages.

Internal Growth Theories, the basis of which dates back to Adam Smith, also emphasize the growth-increasing effect of foreign trade. Among the supporters of Internal Growth Models, Grossman and Helpman (1990) discuss the internal growth of countries that are engaged in foreign trade along with international information overflow. In their study, it is assumed that information overflows occur automatically, and the growth performance of a small country which can obtain scientific and technological information flow from foreign countries, gauged by its foreign trade, is analyzed. In addition, it is asserted that some policies that are incentives for foreign trade accelerate growth by decreasing the harmful effects caused by innovation externality and promote national prosperity. Moreover, the study reveals that without external technological improvement and constant returns in manufacturing, information overflows can promote long-term economic growth.

The export led growth hypothesis generally reflects the relationship between exports and economic growth. The proponents of such hypothesis argue that export promotion through policies such as export subsidies or exchange rate depreciation will increase economic growth. The substance of the neo-classical arguments underlying the export-led growth hypothesis is that competition in international markets promotes economies of scale and increases efficiency by concentrating resources in sectors in which the country has a comparative advantage. In

theoretical growth model, exports are considered as an umpire for growth, Firstly, Export being a component of GDP, an increase of export directly increases GDP. An increase in export means increase in employment of the export sector industries which in turn increases income and GDP. Secondly, export supports foreign exchange earnings which also assist in importing capital goods, imports of capital goods and intermediate goods which stimulate domestic growth (Awokuse, 2005). Thus, export growth is one of the key determinants of economic growth. It holds that the overall growth of a country can be generated not only by increasing the amounts of labor and capital within the economy but also by expanding exports such that exports can perform as an engine of growth. Export and economic growth association is often attributed to the possible positive externalities beneficial to the domestic economy arising from world market participation.

The factor proportion theory, in contrast to classical trade theory, is able to provide an explanation for the differences in advantage exhibited by trading countries. According to this theory, countries will tend to generate and export goods and services that harness large amounts of abundant production factors that they possess, while they will import goods and services that require large amounts of production factors which may be relatively scarce (Hecksher and Ohlin, 1933). Therefore, this theory extends the concept of economic advantage by considering the endowment and costs of factors of production. Both of these theories have been shown to be deficient in explaining more recent patterns of international trade. For example, the 1960s witnessed significant technological progress and the rise of the multinational enterprise, which resulted in a call for new theories of international trade to reflect changing commercial realities (Leontief, 1966). At that time, the product life cycle theory of international trade was found to be a useful framework for explaining and predicting international trade patterns as well as

multinational enterprise expansion. This theory suggested that a trade cycle emerges where a product is produced by a parent firm, then by its foreign subsidiaries and finally anywhere in the world where costs are at their lowest possible (Vernon, 1966, 1971; Wells, 1968, 1969). Furthermore, it explains how a product may emerge as a country's export and work through the life cycle to ultimately become an import. The essence of the international product life cycle is that technological innovation and market expansion are critical issues in explaining patterns of international trade. That is, technology is a key factor in creating and developing new products, while market size and structure are influential in determining the extent and type of international trade. While these theories are insightful, a number of modern international trade theories have emerged recently which take account of other important considerations such as government involvement and regulation. However, it remains that these theories make several assumptions which detract from their potential significances and contribution to international business. For instance, they assume that: factors of production are immobile between countries; perfect information for international trade opportunities exists; and, traditional importing and exporting are the only mechanisms for transferring goods and services across national boundaries (Bradley, 1991).

2.4 Review of Related Empirical Literatures

Several empirical studies have been conducted over decades to examine the causal relationship between export and economic growth in both developing and developed countries; never the less this study reviewed some of the related literatures concerning export-growth relationship for specific countries and cross countries studies for different sample period from different parts of the world. Some of these reviewed studies are as follows;

Ekanayeke (1999) has applied cointegration and error-correction models to analyze the causal relationship between export expansion and economic growth in eight Asian developing countries using annual data from 1960 to 1997. The empirical results show the existence of bi-directional causality between export growth and economic growth in some of the countries while others revealed a unidirectional causality. Erfani (1999), has examined the causal relationship between economic performance and exports over the period of 1965 to 1995 for several developing countries in Asia and Latin America. The result showed the significant positive relationship between export and economic growth. This study has also provided the evidence on the hypothesis that exports leads to higher output.

Vohra (2001), showed the relationship between export and economic growth in India, Pakistan, the Philippines, Malaysia, and Thailand for 1973 to 1993. All of the above empirical results indicated that when a country achieved some level of economic development, then exports have contributed significantly on the economic growth of that country. This study also showed the importance of liberal market policies by pursuing export expansion strategies and by attracting foreign investments.

Lee & Huang (2002) in their study on the relationship between export growth and output growth is explored using a multivariate threshold model with regimes defined by the export-import ratio. By contrast, the methodology used in this study is based on the Multivariate threshold autoregressive (MTAR) model introduced by Tsay (1998). The causal relationship between export growth and economic growth is explored using the MTAR model with two regimes defined by the threshold variable. The results show that, for some outward-oriented countries, the conventional approach, which allows for just one regime, is not able to determine the existence of an exports-lead-growth relationship. In the cases of five countries that are recognized as being outward-oriented, the study find out that, except for Hong Kong, the relationship whereby exports lead output prevails in at least one regime for each of four of the countries being studied.

Subasat (2002) his study investigated the empirical linkages between exports and economic growth. The analysis suggested that more export oriented countries like middle-income countries grow faster than the relatively less export oriented countries .The study also showed that export promotion does not have any significant impact on economic growth for low and high income countries.

Lazslo (2004) his paper investigates the possibility of export-led growth and growth-driven export hypothesis by testing for Granger causality between exports and economic growth in twenty-five OECD countries from 1960 to 1998. The result in some countries indicated that there is no causality, some revealed one way causality while some reveal the two way causality between export and economic growth.

Pazim (2009) he tested the validity of export-led growth hypothesis in three countries using panel data analysis. It is concluded that there is no significant relationship between the size on

national income and amount of export for these countries on the basis of one-way random effect model. The panel unit root test shows that the process for both GDP and Export at first difference is not stationary while the panel co integration test indicates that there is no co integration relationship between the export and economic growth for these countries.

Tang, et al. (2014) their study re-investigates the export led-growth hypothesis for Asia's Four Little Dragons using cointegration and rolling causality analyses. Employing both bivariate (exports and GDP) and trivariate (exports, GDP and exchange rate) models, the study find that exports and GDP are cointegrated for all the four economies, implying that there is a long run relationship between the variables. However, the rolling regression-based MWALD test shows that export led growth in each of the four economies is not stable over their respective period of analysis. Instead of export, policy makers should start to search for alternative catalyst of growth to continuously as well as effectively promote long-term economic growth in the Four Little Dragon economies

Baharumshah & Rashid (1999) their paper examines the relationship between export growth and income growth using the Johansen cointegration (1988) procedure and vector-error correction model (VECM) for Malaysia from 1970 to 1994. The result of the cointegration indicate a long run relationship between export and economic growth, the estimated VEC model suggest economic growth is driven by exports. Thus supporting the Export led Growth hypothesis over the sample period. Also at the same time, test results confirm that there is feedback relationship between the series.

Chemeda (2001) his study applies the Cobb-Douglas function model to analyze the effects of exports on economic growth in context of Ethiopian economy. To achieved the objectives of the

study econometrics techniques of analysis (co-integration system) by using the RATS software package for the time series data from 1950 to 1986 have been used. The results of the findings support the idea that the rate of growth of real export has a positive effect on the rate of economic growth in context of the Ethiopian economy. Even strong positive relationship exists between real export and real growth domestic product per capita in long run rather than in short run. Thus, the contribution of real exports to economic growth in context of Ethiopian economy is greater in long run than in short run.

Balaguer (2002) has examined the hypothesis of export-led growth from the Spanish trade liberalization process initiated four decades ago from 1961 to 2000. Both the export expansion and the progression from "traditional" exports to manufacture and semi manufactured export are considered for this purpose. It is proved that the structural transformation in export composition has become a key factor for Spain's economic development along with the relationship between export and real output.

Njikam (2003) has paper determined the role of exports in economic growth by analyzing Namibia's data from 1968 to 1992. Results explained the general importance of exports, but find no discernible sign of accelerated growth because of exports. Similarly, Lin (2003) stated that ten percent increase in exports cause one percent increase in GDP in the 1990s in China on the basis of new proposed estimation method, when both direct and indirect contributions are considered.

Shirazi (2004) he studied the short run and long run relationship among real export, real import and economic growth on the basis of co integration and multivariate Granger causality developed by Toda and Yamamoto (1995) for the period 1960 to 2003.This study showed a long-run

relationship among import, export and economic growth and found unidirectional causality from export to output but did not find any significant causality between import and export.

Abou-Stait (2005) has examined the export-led growth (ELG) paradigm for Egypt, using historical data from 1977 to 2003. The paper employs a variety of analytical tools, including cointegration analysis, Granger causality tests, and unit root tests, coupled with vector auto regression (VAR) and impulse response function (IRF) analyses. The result revealed that the series are cointegrated.

Keong,et al. (2005) their paper tested the validity of the export led growth hypothesis of Malaysia for the period 1960 to 2001 using the autoregressive distributed lag model (ARDL) or bounds testing approach. Moreover, a cointegrated relationship between exports and economic growth was detected in both the long and short runs. Further analysis showed that exports Granger-cause economic growth in the period of the study. Thus, this study provides further evidence to support the export-led growth hypothesis in the Malaysian economy.

Tang (2006) his paper tries to examine the relationship between export economic growth and import in China. The outcome of the study stated that there is no long run relationship among export, real Gross Domestic product and imports. This study further shows no long-run and short-run causality between export expansion and economic growth in China on the basis of Granger causality while economic growth does Granger-cause imports in the short run.

Olayiwola & Okodua (2007) their paper study and examine the applicability of the export-led growth (ELG) hypothesis using empirical evidence from Nigeria. Empirical evidence from available data failed to support the export-led growth hypothesis in Nigeria. Besides, the

dynamic interaction among FDI, non-oil exports, and growth of the Nigerian economy was also investigated using the concept of variance decomposition and impulse response analysis.

Jordaan (2007) he analyzed the causality between exports and GDP of Namibia for the period 1970 to 2005. The hypothesis of growth led by export is tested through Granger causality and cointegration. It tests whether there is unidirectional or bi-direction causality between export and GDP. The results revealed that exports Granger cause GDP and GDP per capita and suggested that the export-led growth strategy through various incentives has a positive influence on growth.

Elbeydi et. al (2010) Their study investigates the relationships between export and economic growth in Libya. An econometric model has been developed and estimated in order to determine the direction of causality in both, short and long run. The annual time series used for the estimation cover the time period 1980 – 2007. The findings indicate that the income, exports and relative prices are cointegrated. The long run bidirectional causality between the exports and income growth has been also proved. The study result indicates that the export promotion policy contributes to the economic growth in Libya. Thus the study recommends that government intervention through policies and programmes would on the other promote growth of the economy among other things.

Chimobi (2010) his paper attempts to estimate the relationship between economic growth, investments and export in Nigeria from 1970 to 2005. The cointegration tests showed no long run relationship between the variables. However, the empirical result of the Granger causality test shows a bidirectional relationship between Investment (Inv) and Economic growth (Y) and also a bidirectional relationship between Investment and Export (Ex); but the result of the causation between Investment and growth was statistically insignificant. Mah (2005) studied the

long-run causality between export and growth with the help of significance of error correction term, ECt-1. This study also indicated that export expansion is insufficient to explain the patterns of real economic growth.

Mishra P. K (2011) this paper attempts to reinvestigate the dynamics of the relationship between exports and economic growth for India over the period 1970 to 2009. The paper applied popular time series econometric techniques of cointegration and vector error correction estimation in order to achieve the objective of the study. The empirical result of the study provides the evidence of stationarity of time series variables, existence of long-run equilibrium relation between them, and finally the rejection of export led growth hypothesis for India by the Granger causality test based on vector error correction model estimation.

S. Ray (2011) this paper was conducted to test for the direction of the causality, and whether there exists a long run relationship between GDP and Export in India. The study employed the Johansen cointegration test the result confirmed that economic growth and exports are co integrated indicating the existence of long run equilibrium relationship between the two series. The Granger causality test finally confirmed the presence of bi-directional causality which runs from economic growth to export and vice-versa over the period of the study.

Abbas, (2012) this study investigates causal relationship between GDP and exports for Pakistan from the period of 1975 to 2010. Johansen test for Cointegration and Granger Causality are employed to determine both the short run and long run causality. The result of Cointegration reveals existence of one positive cointegrating equation. The result of Causality test shows that short run and long run causality run from GDP to exports. The result concludes that both in short and long run only growth in production cause exports growth.

Celina and Bethran (2012) their study Export and Nigeria's Economic growth aimed at examining the long run relationship between export and economic growth in Nigeria, and to evaluate the significant impact of export on economic growth. On the application of Johansen cointegration test and vector error correction mechanism the following output surfaced: - There existed a long-run relationship with economic growth and export in Nigeria. The short-run dynamics adjusts to the long-run equilibrium at the rate of 0.866% per annum, confirmed by the error correction estimates.

Christopher and Oguntona, (2012) this study sets out to examine if there exist a causal and long-run relationship between export and economic growth in Nigeria. The study employed annual time series data from 1970 to 2010 using the following variables: Gross domestic product, export, exchange rate, imports, gross capital formation and labor force population. Using econometric procedures in testing for causality with the use of granger causality test and autoregressive distributed lag (ARDL) to ascertain if there exists a long run relationship. The results obtained indicated that there exist a uni directional relationship between export and economic growth; while the results of the ARDL showed a co-integration (i.e. long-run relationship) between export and economic growth in Nigeria for the period.

Ugochukwu & Chinyere, (2013) The paper employed OLS to determine the impact of oil and non-oil export on economic growth in Nigeria from 1986 to 2011, Correlation analysis was also deployed to determine the degree of relationship between the variables and the result showed that all the variables are highly correlated, granger causality test was employed to determine the direction of causality between the variables under consideration. The result shows that the overall regression was statistically significant, and The Export Led-Growth Hypothesis is valid for Nigeria. Thus the study reject the null hypothesis that export does not granger cause growth.

Ewetan & Okodua, (2013) This paper also examines the applicability of the Export-Led Growth hypothesis for Nigeria using annual secondary time series data from 1970-2010. Econometrics methodology employed was unit root test, cointegration test and granger causality test. The estimation results obtained from the Johansen cointegration test confirmed the existence of long run relationship among the variables, while the Granger Causality result depicts a unidirectional causality running from economic growth to export. Thus the overall finding of the study did not support the Export-Led Growth hypothesis for Nigeria

Olaleye & Olasode, (2013) this study used a thirty (30) years dataset of Oil, manufacturing and agricultural share of total exports of Nigeria as independent variables and per capital Income as the dependent variable. Johansen co-integration test confirm the existence of a long run relationship between the variables. It is also noted that the granger casualty test indicated that there is a uni-directional relationship between the variables under consideration.

Enu et.al. (2013) the study examined the effect of foreign trade on economic growth in Ghana over the period 1980 to 2012, using the Johansen cointegration analysis. The results of Johansen cointegration test indicated that there exist a long run and short run relationship among real gross domestic product, foreign direct investment, exports, imports and foreign direct investment in Ghana. The study found out that in the long run, exports had a positive effect on real gross domestic product and as a result, an increase in exports leads to an improvement in real gross domestic product. Imports and foreign direct investment had a negative effect on real gross domestic product, respectively. The speed of adjustment was 4.57% taking place at each year towards the long run periods.

Ahdi et.al. (2013) This paper investigates the dynamic causal link between exports and economic growth for south Africa over the period 1911 to 2011 using both linear and nonlinear Granger causality tests. The linear Granger causality result shows no evidence of significant causality between exports and GDP. The relevant VAR is unstable, which undermines our confidence in the causality result identified by linear Granger causality tests. Accordingly the study turns to the nonlinear methods to evaluate Granger causality between exports and GDP. The study use both Hiemstra and Jones (1994) and Diks and Panchenko (2005) nonlinear Granger causality tests. For the Hiemstra and Jones (1994) test, the result finds a unidirectional causality from GDP to exports. However, using the Diks and Panchenko (2005) test, we find evidence of significant bi-directional causality.

Kumari and Malhotra (2014) the paper title Export led growth in India – a cointegration and causality analysis. This paper explores the causal relationship between exports and economic growth by employing Johansen cointegration and Granger causality approach. Annual time series data on India for the variables exports and GDP per capita stemming from 1980 to 2012 have been used in analysis. The tests on the long run and short run relationship between exports and economic growth are conducted. Based on the findings of cointegration approach this paper concludes that there does not exist long run equilibrium relationship between exports and GDP per capita. Granger causality test exhibits bidirectional causality running from exports to GDP per capita and GDP Per Capita to Exports.

Szkorupová (2014) the paper aims to analyze the relation between foreign direct investment, economic growth and export in Slovakia. Estimation of effects on economic growth was performed for Slovakia in the period 2001-2010. The co-integration method and vector error correction model were applied on quarterly data. The results confirm the existence of long-term

causal links between variables studied in Slovakia. We reveal a positive impact of foreign direct investment and positive impact of export on gross domestic product.

Dritsaki & Stiakakisb, (2014) the objective of this paper is to study the relationship between foreign direct investments, exports, and economic growth in Croatia using annual time series data for the period 1994-2012. Several econometric models are applied including the bounds testing (ARDL) approach and the ECM-ARDL model. The results confirm a bidirectional long run and short run causal relationship between exports and growth. These results offer new perspectives and insight for a new policy in Croatia for a sustainable economic growth. The study therefore concludes that long run equilibrium relationship does not exist among the variables of the study

Sahoo, et al. (2014) this paper investigates the relationship among mining export, industrial production, and economic growth in India using annual time series data from 1981 to 2010. It is based on the secondary sources of data extracted from Reserve Bank of India database. The multivariate cointegration technique has been employed to see the long run equilibrium relationship among variables. Further, Granger causality based on vector error correction model (VECM) has been adopted to see both short run and long run causality among the variables. The cointegration results confirm that mineral exports, industrial production and economic growth are cointegrated, indicating an existence of long run equilibrium relationship among variables. Similarly, the VECM Granger causality result holds that there is a long-run relationship running from economic growth and industrial production to the mineral export of India.

From the above reviewed literatures, it is confirmed that series of studies have been conducted yielding different outcome at different time for individual country and cross country studies.

Some of the studies contain explanation that export expansion is the key factor promoting economic growth. These arguments lead to hypothesize that exports contribute positively to economic progress. In contrast to the export-led growth hypothesis, it can also be argued that causality runs from the growth of output to the growth of exports, on the other hand called Growth-led export hypothesis. Nevertheless some of the outcome revealed the absence of cointegration among the variables.

Although previous empirical work has been concentrated on a number of both developed and developing countries, the economies of the African countries have rarely been studied particularly in the 1970's and 80's. The literature on this subject has neglected these countries owing to the non-availability of consistent data, lack of quarterly data or else the sample period for these countries not being long enough.

This is why this study, used the data from the period when all the necessary authorities responsible for making the data available are in place, and that the period of this study covers the year 2014.

Going by the main objective of the study and other studies conducted especially Nigerian Nexus, it is confirmed that there exist a long run equilibrium relationship between export and economic growth; some studies confirmed that export has a positive and significant impact on growth. However many questions need to be answered or further explored one of which is that Is Growth-Led Export valid for Nigeria**?**

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter present and discusses the methodology employed in the study. The chapter consists of method of data collection, Research variables, method of data analysis and model specification.

3.2Method Of Data Collection

This study used secondary data. Specifically the study used annual time series data from 1970 - 2014. The data was obtained from secondary sources such as Central Bank of Nigeria (CBN) statistical Bulletin, World Development Indicators (WDI) and United Nation Conference on Trade and Development (UNCTAD).

3.3 Research Variables

This study examined the relationship between export and economic growth in Nigeria. The variables measured in the study include gross domestic product (GDP) as the dependent variable, While Export (EPT) and Import (IMP) served as independent variables.

Gross Domestic Product (GDP) is used as a proxy for economic growth following the works of Keong, et al. (2005) and Abou-Stait (2005). Real Gross domestic product is expressed in market price.

Exports (EPT) is used to measure the total exports of all goods and other market services provided to the rest of the world as done by Enu, et al. (2013). Export represents the total value of all goods and services send to abroad.

Imports (IMP) will be used to measure the imports of all goods and other market services received from the rest of the world as done by Enu, et al. (2013). Import is calculated as the sum total of all goods and services received from the rest of the world.

3.4 Method of Data Analysis

To achieve the objective of this study, the data collected for this research is analyzed in the following steps. Firstly, the data was subjected to a unit root test in order to test the properties of the variables using Augmented Dickey Fuller (ADF) and Phillips Perron (PP) unit root tests. Secondly, the optimal lag selection was carried out to know the maximum number of lags to be included in the model and then followed by Johansen test for cointegration. After the cointegration test was conducted, it has been discovered that there is one cointegrating equation among the variables export (EPT) and economic growth (GDP), never the less cointegration test indicates only the existence of long run relationship among the series but did not tell anything about causality. Engel and Granger (1969) suggest that if co-integration exists between two or more Variables, then proper statistical inference is obtained only by analyzing causality based on error correction model (ECM). Therefore the need to apply the Vector error correction model (VECM) arises, as to examine both the short run and long run equilibrium between the variables. Finally, post analysis tests were carried out to test for the properties of the models used.

3.5 Model Specification

In order to meet the obligations of this study, this research is built on existing models of Vector autoregressive frame work as done by Baharumshah & Rashid (1999) and Olayiwola & Okodua (2007). The study specify the model used in those studies in form of vector autoregressive model of p^{th} order within the vector error correction model (VECM) framework: Given the vector of p variables,

$$y_t = y_{1t} \dots \dots y_{pt} \qquad \dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

This is generated by the p-order vector autoregressive process with Gaussian errors: the model is stated as follows

$$y_t = \beta_0 + \beta_1 y_{t-1} + \dots + \beta_p y_{t-p} + u_t \quad \dots\dots\dots\dots\dots\dots\dots\dots (2)$$

Where y_t is an n x 1 vector of variables and u_t is the error term, The model above describe a system in which each variable is a function of its own lag, and the lag of the other variable in the system.

But if the time series are not stationary then the VAR framework needs to be modified inform of the vector error correction model (VECM) to allow for consistent estimation of the relationships among the series. The vector error correction (VEC) model is just a special case of the VAR for variables that are stationary in their differences i.e I(1). The VEC model can also take into account any cointegrating relationships among the variables. In other word the VECM has cointegration relations built into the specification so that it restricts the long-run behavior of the endogenous variables to converge on their cointegrating relationship while allowing for short-run

adjustment dynamics. The cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. The dynamic specification of the VECM allows the deletion of the insignificant variables, while the error correction term is retained. The size of the error correction term indicates the speed of adjustment of any disequilibrium towards a long-run equilibrium state.

In this study the error correction model as suggested by Hendry (1995) has been adopted. The general form of the VECM is as follows:

$$\Delta X_t = \alpha_0 + \lambda_1 EC^1_{t-1} + \sum \alpha_i \Delta X_{t-i} + \sum \alpha_p \Delta Y_{t-p} + \varepsilon 1t \quad \text{.....(3)}$$

$$\Delta Y_t = \beta_0 + \lambda_1 EC^2_{t-1} + \sum \beta_i \Delta Y_{t-i} + \sum \beta_p \Delta X_{t-p} + \varepsilon 2t \quad \text{.....(4)}$$

Where Δ is the first difference operator; EC^1_{t-1} is the error correction term lagged one Period, λ is the short-run coefficient of the error correction term ($-1 < \lambda < 0$) and ε is the white noise. The error correction coefficient (λ) is very important in this error correction estimation as the greater coefficient indicates higher speed of adjustment of the model from the short-run to the long-run.

The error correction term represents the long-run relationship. A negative and significant coefficient of the error correction term indicates the presence of long-run causal relationship. If both the coefficients of error correction terms in both the equations are significant, this suggests the existence of a bi-directional causality. If only λ_1 is negative and significant, this suggests a unidirectional causality running from Y to X, implying that Y drives X towards long-run equilibrium, but not the other way round. Similarly, if λ_2 is negative and significant, this also

suggests a unidirectional causality from X to Y exist, implying that X drives Y towards long-run equilibrium but not the other way round. On the other hand, the lagged terms of ΔX_t and ΔYt appeared as explanatory variables, indicating a short-run cause and effect relationship between the two variables. Thus, if the lagged coefficients of ΔXt appear to be significant in the regression of ΔY_t, this means that X causes Y. Similarly, if the lagged coefficients of ΔYt appear to be significant in the regression of ΔXt , this means that Y causes X.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS OF RESULTS

4.1 Introduction

This chapter analyses the data, interpret the result and present the findings obtained from the study. The study employs the use of E-Views Econometrics software for computation and analysis. As mentioned earlier the estimation procedure consists of three steps in the study, first Unit Root test, Cointegration test, Vector Error Correction Estimate and then Granger causality test. The table gives the summary statistics of the data such as the Variables names, Number of Observations, the Mean, standard deviation, Maximum and the Minimum values in the series as follows:

Table 1: Summary of the Data

Variable	Obsv.	Mean	Median	Std. Dev	Maximum	Minimum
LnGDP	45	27.25922	27.04304	2.948219	32.12015	22.91620
LnEPT	45	12.05589	12.23374	3.175665	16.54088	6.786040
LnIMP	45	11.70009	11.87166	3.121265	16.21303	6.628570

Source: Author's Estimation using EViews 7.

4.2 Unit Root Test

It is confirmed that when dealing with time series data, a number of econometric issues can influence the output of the estimates obtained using ordinary least square (OLS) and other methods. Regressing a time series model using the OLS estimation can obtain a high R^2, even if there is no meaningful relationship between the time series variables. This situation reflects the problem of spurious regression between unrelated variables generated by a non-stationary process. By this we get to know that time series data are divided into stationary and non stationary series. A stochastic process that is said to be stationary simply implies that the mean [(E(Yt)] and the variance [Var(Yt)] of Y remain constant over time for all t, and the covariance [covar(Yt, Ys)]. Since standard regression analysis requires that data series must be stationary.

Therefore, prior to any test, econometric methodology needs to examine the stationarity state for individual time series, because most macro economic data are non stationary, i.e. they tend to exhibit a deterministic and/or stochastic trend. Therefore, it is recommended that a stationarity (unit root) test be carried out to test for the order of integration.

The study first examines the stationarity properties of the series, and determine the order of integration for each of the variables under consideration. This study uses Augmented Dickey-Fuller (ADF) unit root test and Phillips Perron (PP) Unit root test to examine the stationarity of the series. The result in Table 2 & 3 below indicates that all the variables are non stationary at level, thus validate the rejection of null hypothesis that the series has unit root for all of the variables at their first differences, because both the Augmented Dickey-Fuller (ADF) and Phillips Perron unit root test statistics values are less than the critical values at 1, 5 and 10 percent levels of significances. This means that the variables are stationary after first difference and are

integrated of the same order, i.e. I (1). The tables give the highlight of the result of the unit root test

Table 2: Result of the ADF Unit Root Test

Augmented Dickey Fuller Unit Root Tests

Variable (s)	Augmented Dickey Fuller Unit Root Test					Hypothesis
	@ Level	@5% C. VALUE	1ST DIFF.	@5% C. VALUE	P - Value	DECISION
LnGDP	0.515415	-2.929734	-6.136628	-2.931404	0.0000	REJECT H_0
LnEPT	-0.981638	-2.929734	-7.152549	-2.931404	0.0000	REJECT H_0
LnIMP	-0.784118	-2.929734	-7.398011	-2.931404	0.0000	REJECT H_0

Source: Author's Estimation Using EViews7

Table 3: Result of the PP Unit Root Test
Phillips Perron Unit Root Tests

Variable (s)	Phillips Perron Unit Root Test					Hypothesis
	@ Level	@5% C. VALUE	1ST DIFF.	@5% C. VALUE	P - Value	DECISION
LnGDP	0.515415	-2.929734	-6.136628	-2.931404	0.0000	REJECT H_0
LnEPT	-1.011906	-2.929734	-7.205845	-2.931404	0.0000	REJECT H_0
LnIMP	-0.784118	-2.929734	-7.387682	-2.931404	0.0000	REJECT H_0

Source: Author's Estimation Using EViews7

4.3 Cointegration Test

Cointegration is a precondition for the existence of a long run or equilibrium economic relationship between two or more variables having unit roots (i.e. Integrated of order one). The Johansen approach can determine the number of co-integrated vectors for any given number of non-stationary variables of the same order. Two or more random variables are said to be cointegrated if each of the series are themselves non – stationary. This test may be regarded as a long run equilibrium relationship among the variables. The purpose of the Cointegration tests is to determine whether a group of non – stationary series is cointegrated or not. Cointegration in a nut shell explain the existence of a long run equilibrium relationship or otherwise between the series.

Having concluded from the unit root test outcome that each variable of interest is non-stationary at level, i.e. it is integrated of order one I(1), I proceed to the second step, which requires that the two time series be co-integrated. This study used johansen cointegration test to examine the existence of the long run equilibrium relationship, the two tests used for analysis in this regard are; Trace test and Maximum Eigen value test as identified by Johansen and Julius (1991). The Johansen approach can determine the number of cointegrated vectors for any given number of non-stationary variables of the same order. The objective of this study is to determine whether or not export (EPT) and economic growth (GDP) variables have a long-run relationship. This study tested the null hypothesis of no cointegration between Export, Import and Real gross domestic product against alternative hypothesis of the existence of cointegration between the variables. The Result of cointegration among these variables is presented in the table below.

Table 4: Result of Johansen cointegration test

Trace Test Statistic

Hypothesized No. of CE (s)	Eigenvalue	Trace statistic	Critical Values @5%	P- Value
None *	0.604235	48.65264	29.79707	0.0001
At most 1	0.183288	8.794475	15.49471	0.3847

Source: Author's Estimation using EViews7

Table 5: Result of Johansen cointegration test

Maximum Eigenvalue Test Statistic

Hypothesized No. of CE (s)	Eigenvalue	Max- Eigen statistic	Critical Values @5%	P – Value
None *	0.604235	39.85817	21.13162	0.0001
At most 1	0.183288	8.706155	14.26460	0.3114

Source: Author's Estimation using EViews7

The results in tables 4 & 5 revealed that there is one (1) cointegrating equation as shown by the trace statistics and the max-eigen value statistics. The calculated Trace test statistic values exceed the critical values at 5% level of significance and on the other hand the calculated Maximum Eigenvalue test statistic values also exceed the critical values at 5% level of significance, thus confirming the trace statistics outcome, thereby rejecting the null hypothesis of no cointegration, hence confirming the existence of a long run equilibrium relationship among the variables. Thus outcome of the cointegration test validate the rejection of the Null hypothesis of the study that there is no long run relationship between Export and Economic growth in Nigeria.

But Johansen and Julius cointegration test only indicates existence of the Long run relationship among the variables; the test did not provide any explanation about short run and or causality. Though (Granger, 1988) states that the existence of Cointegration between series implies the existence of causality at least in one direction.

Table 6: Normalized Long Run Cointegrating Coefficients

Dependent variable: LnGDP

Variable (s)	Coefficient	Standard error
C	-16.21	-
LnGDP	1.0000	-
LnEPT	-4.889946	0.58822
LnIMP	4.074260	0.60042

Source: Author's Estimation using EViews7

The table presents the result of the long run Cointegrating coefficients between Export (EPT), Import (IMP) and Economic Growth (GDP), the coefficients are the values that indicate the strength and the direction of the relationship between the explanatory variables and the dependent variable. The value of the constant C indicates that the average level in the Gross Domestic Product (GDP) in Nigeria is approximately -16.21 units when other variables are zero. The sign of the constant value is negative which means that the proportion of the Gross Domestic Product (GDP) in Nigeria tends to decrease, keeping other variables constant in the long-run. It is found that a unit increase in Exports (EPT) on the average will lead to a decrease by 4.89 units in the Gross Domestic Product (GDP) respectively. However, it is found that a unit increase in Imports (IMP) will lead to increase by 4.07 units in GDP on the average. Further more the result indicates the existence of a negative long run equilibrium relationship with Economic Growth. Meaning that $\Pi = \alpha\beta'$, thus LnEPT (+ve) ,Also Import coefficient is found to be positively related with GDP, indicating the existence of a positive long run equilibrium relationship

between Import and Economic Growth in Nigeria such that LnIMP (-ve). This contradicts the work of Celina & Bethran (2012), Christopher and Oguntona, (2012) Ray S. (2011), Celina & Bethran (2012) and Abbas (2012). Looking at the results, the normalized cointegrating equation reveals that in the long-run, export affects economic growth negatively while Import affects economic growth positively in the long run in Nigeria.

Abbas (2012) suggest that if cointegration exists between Variables, then proper statistical inference is obtained only by analyzing causality based on error correction mechanism (ECM). This study therefore employs the Vector error correction model (VECM), as to examine the short run dynamics and to confirm the long run equilibrium relationship between the variables.

4.4 Vector Error Correction Model (VECM)

Once cointegration is confirm between variables, then the next step entails the construction of error correction mechanism to model dynamic relationship. The purpose of the error correction model is to indicate the speed of adjustment from the short run equilibrium to the long-run equilibrium state. The vector error correction (VEC) model is a special case of the Vector Autoregressive (VAR) Model for variables that are cointegrated, meaning that the variables are stationary in their differences (i.e., I(1)). The vector error correction can also take into account any cointegrating relationships among the variables. The Error Correction Term contains information about how the past values affect the current values of the variables. It also explains the speed of adjustment of the system from short run towards achieving equilibrium in the long run. So, error correction mechanism is a measure to reconcile the short-run and long-run

behavior of the series. Therefore Vector Error Correction Model (VECM) is used in this study to generate such short-run dynamics.

The cointegration test conducted in the study confirmed the existence of long-run equilibrium relationship between among the variables. But in the short-run there may be deviations from this equilibrium, thus there is need to confirm with the use of Error correction mechanism whether such disequilibrium converges on the long-run or not. Error correction mechanism (ECM) provides a means whereby a proportion of the disequilibrium is corrected in the next period.

Table 7: Short run Coefficient (VECM RESULT)
Dependent variable: ΔLnGDP

Variable (s)	Coefficient	Standard error	T-statistics	P-Value
ECM_{t-1}	-0.052936	0.052810	-1.002394	0.0323
ΔLnGDP	0.069634	0.256668	0.271302	0.7878
ΔLnEPT	-0.143271	0.168837	-0.848576	0.4021
ΔLnIMP	0.038656	0.120463	0.320892	0.7503

Source: Author's Estimation using EViews7

The table depicts the outcome of the Vector Error Correction Estimate, including the lagged Error Correction Term i.e (ECM_{t-1}) and all the variables under study. However, the Error correction term is found to be negative and statistically significant at 5% level of significance, this reveals that any deviation from long run equilibrium relationship between the series i.e. economic growth, Export, and Import can be corrected by 5.3% every year until such equilibrium is achieved. The negative and significant error correction term also confirmed the

existence of the long term relationship between the series of the study in Nigeria. The coefficients of the independent variables explained the proportion of the disequilibrium in the long run between the dependent and the independent variables in the model.

4.5 Granger Causality Test

Causality is a statistical concept that is use to explain feedback relationships among variables, it is widely used in econometrics for building of forecasting models. Granger (1969) and Sim (1972) were the ones who formalized the application of causality in economics. Granger causality test is a technique for determining whether one time series is significant in forecasting another (Granger. 1969). The standard Granger causality test (Granger, 1988) seeks to determine whether past values of a variable helps to predict changes in another variable. The definition states that in the conditional distribution, lagged values of Y_t add no information to explanation of movements of X_t beyond that provided by lagged values of X_t itself (Green, 2003). One should take note of the fact that the Granger causality technique measures the information given by one variable in explaining the latest value of another variable. In addition, it also says that variable Y is Granger caused by variable X if variable X assists in predicting the value of variable Y. If this is the case, it means that the lagged values of variable X are statistically significant in explaining variable Y.

The objective of this section is to determine the direction of causality between export and GDP in Nigeria for the period 1970 to 2014, to achieve this objective Pair wise granger causality test was carried out to test the following hypothesis. The null hypotheses tested are, firstly that Economic growth (GDP) does not Granger cause Export (EPT). Secondly, the null hypothesis is that Export (EPT) does not Granger cause Economic Growth (GDP). Then third null hypothesis

is that export (EPT) does not Granger cause import (IMP). The Pair-wise Granger Causality test results are reported in the Table below.

Table 8: Granger Causality Result
Pairwise Granger Causality Outcome

Null hypothesis	F - Statistics	P-value	Causality
LnGDP does not granger cause LnEPT	3.53745	0.0280*	*Causality runs from*
LnEPT does not granger cause LnGDP	0.20922	0.8121	*GDP to EPT*
LnGDP does not granger cause LnIMP	2.50825	0.0948**	*Causality runs from*
LnIMP does not granger cause LnGDP	0.35304	0.7048	*GDP to IMP*
LnEPT does not granger cause LnIMP	9.11698	0.0006*	*Causality runs from*
LnIMP does not granger cause LnEPT	0.11089	0.8953	*EPT to IMP*

Source: Author's Estimation using EViews7

The table revealed the result of the Pairwise Granger causality test, the causal relationship between economic growth and export is found to be Unidirectional running from economic growth (GDP) to Export (EPT). The result rejects the null hypothesis that economic growth does not granger cause export in Nigeria at 5% level of significance. Similarly, the result indicates the existence of a unidirectional causality running from economic growth to Import, thus rejecting the null hypothesis that economic growth does not granger cause import but at 10% level of significance. Lastly, the table revealed that a unidirectional causality runs from Export (EPT) to

Import (IMP). Thereby rejecting the null hypothesis that export does not granger cause import at 5% level of significance. The findings above form the basis for answering the research question of the study of what is the Causality between Export and Economic Growth in Nigeria.

Table 9: Residual Diagnostic Tests Result

Test Type	Statistics	P – Value
Breusch-Godfrey Serial Correlation LM Test	0.315938	0.8539
Breusch-Pagan-Godfrey Heteroskedasticity Test	6.655075	0.6730
Jarque-Bera Normality Test	23.13316	0.0000

Source: Authors Estimation using EViews7

The final stage of the study is the post analysis check. Serial correlation test, Heteroskedasticity test and Normality test were carried out to test the econometrics properties of the model used. The probability value 0.8539 obtained from Breusch-Godfrey Serial Correlation LM Test validates the acceptance of the null hypothesis that there is No serial correlation in the model. Also the Breusch-Pagan-Godfrey Heteroskedasticity Test probability value obtained is 0.6730 explains that the model is Homoskedastic at 5% level. This is further supported by the normality test, given the Jarque-Bera value at 23.1332 and the P – value is 0.0000 which explains that the residual term is normally distributed. Finally the overall adequacy of the model is satisfactory as explained by the value of the R square 0.5929 that is about 60%, and finally the F statistic is

significant because the p – value (F-stat) is 0.0006 this means that all the independent variable can jointly influence the dependent variable.

4.6 Discussion of Result

The study was embarked upon to empirically examine the relationship between export and economic growth in Nigeria using modern econometrics techniques with EViews software. The result of the unit root test revealed that all the variables under study were non stationary at level but found to be cointegrated after first difference i.e. I (1), thereby rejecting the null hypothesis that the series has unit root, this indicates that the variables are integrated of the same order.

Johansen cointegration test was employed to examine the long run equilibrium relationship between the variables, the result confirmed the existence of a long run equilibrium relationship by revealing that there is one cointegrating equation which led to the rejection of the null hypothesis that there is no cointegration among the variable. Precisely, the coefficients of the long run cointegrating equations revealed that export has a negative long run effect on economic growth in Nigeria. This is contrary to the theoretical arguments which states that exports promotes growth. It also contradicted the previous studies of Iyoha and Arodoye (2014), Szkorupova (2014), Okodua and Ewetan (2013), Chinyere and Ugochukwu (2013), Abbas (2012), Daniel and Ehinomen (2012), Ray (2011), Abou-stait (2005), Chemeda (2001) and Jaquet & Abdulai (2000). All these studies found a positive relationship between export and economic growth. However the result is not surprising in case of Nigeria, because Nigerian Export is dominated by crude oil product which is a raw material and such economies are characterized as vulnerable. The long run negative effect of export on economic growth in

Nigeria is likely to be the consequences of world market price fluctuations (specifically the fall in the price of oil) couple with corruption in the country.

On the other hand, the long run coefficient of Import revealed a positive long run relationship between import and economic growth in Nigeria for the period under study. This result conforms to the a priori expectation in the case of Nigeria.

The short run dynamics in this study between export, import and economic growth in Nigeria is captured with the use of coefficients of the lagged error correction term (EC_{t-1}) which is found to be negative and statistically significant at 5% level. Specifically, the result shows that about 5.3% of the deviations from the long run equilibrium relationship between the variables is corrected each year until they converges back to equilibrium. Also the negative coefficient of the error correction term further supports the existence of long run relationship between export and economic growth, the level of the speed of adjustment of the error correction term towards equilibrium is satisfactory looking at the number of the observations.

The result of granger causality test as revealed by table 8 above indicate that a unidirectional causal relationship exist among the variables running from Economic growth to export for the period under consideration. The result also shows that a unidirectional causality runs from Growth to Import. Lastly a Unidirectional causality also exists running from export to import.

The overall findings of the study thus, rejects the export-led growth hypothesis for Nigeria, the hypothesis which explain that export promote growth, therefore this study corroborates the studies of Mishra (2011), Abbas (2012), Christopher & Oguntona (2012) and Ewetan & Okudua (2013) . Moreover the outcome of the study finds the opposite result of Keong et. al (2005),

Jordan (2007) and Olayiwola & Okodua (2007); that it is exports that have promoted growth in Nigeria for the period 1970 to 2012, not the reverse. There by leaving the issue unsettled.

4.7 Summary of the Findings

In order to achieve the objectives of this study for the variables of interest in the study that is Economic growth, Export and Import. Econometrics techniques with the use of EViews software were used; the major findings and results obtained from the study are summarized as follows;

4.7.1 Unit Root Test: The result of the unit root test revealed that all the variables under study were non stationary at level but became stationary after first difference, the variables were tested using Augmented Dickey Fuller (ADF) unit root test and the result was confirmed by the Phillips Perron unit root test. This indicates that the variables are integrated of the same order, meaning that the variables under study are all I (1).

4.7.2 Cointegration Test: Johansen test for cointegration was used for the study, Trace test statistics plus the Maximum Eigen value statistics results confirmed that the variables export, import and economic growth are cointegrated. Thus the result indicates the existence of a long run equilibrium relationship among the variables, this mean that the variables move together in the long run.

4.7.3 Vector Error Correction Model: The result of the vector error correction model estimation reveals a negative error correction term and statistically significant of about 5.3% rate of adjustment towards equilibrium in the long run. The negative and significant error correction term also confirmed the existence of a long run equilibrium relationship between the series in Nigeria over the study period.

4.7.4 Granger Causality Test: Finally, the Granger causality outcome confirmed the existence of unidirectional causality running from Growth to Export; this is not surprising because of the nature of Nigerian export. Also a unidirectional causality runs from growth to import, the result also confirm a unidirectional causality running from export to import.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMENDATIONS

5.1 Introduction

This study has been able to examine the relationship between export and economic growth in Nigeria from the year 1970 – 2014. This chapter gives the brief overview of the whole study. It contains the Summary of the study, it also contains the conclusion reached based on the outcome and findings of the study, lastly recommendations were made based on the findings of the study.

5.2 Summary of the Study

The Study investigates and assesses empirically the relationship between export (EPT), import (IMP) and economic growth (GDP) in Nigeria using annual time series data for the period of 1970 – 2014. The data was obtained from the Central Bank of Nigeria (CBN) statistical Bulletin and The World Development Indicators (WDI) annual data.

Following the culture of time series analysis, the data undergoes all the necessary econometric steps in order to achieve the goal of the study. Firstly unit root test was conducted to check the stationarity properties of each series under consideration, the variables used was export (EPT), import (IMP) and Economic growth proxied by (GDP), all the variables were found to be integrated of the same order i.e. I (1), meaning that the variables were non stationary at level but became stationary after first difference. Johansen cointegration test was conducted; the test confirmed that all the variables were cointegrated thus explained that a long run equilibrium relationship exists among the variables for the period under study. The model adopted in order to

achieve the objectives of the study was the Vector Error Correction Model along with granger causality test. The estimated coefficient of error-correction term is statistically significant and has a negative sign, which confirm that there is not only any problem in the long-run equilibrium relation between the independent and dependent variables at 5 per cent level of significance, but the relative value (-0.0529) for Nigeria shows the rate of convergence to the equilibrium state per annum. To be Precise, the speed of adjustment of any disequilibrium towards a long-run equilibrium is 5.3% of the disequilibrium in exports is corrected each year. Furthermore, the negative and statistically significant value of error correction coefficient indicates the existence of a long-run causality between the variables of the study. And, the granger causality test is confirmed to be unidirectional in our model, being running from the real GDP to exports. In other words, the changes in exports can be explained by real GDP, as confirmed by the Granger causality test.

Lastly, the overall result revealed the existence of a long run equilibrium relationship between economic growth and export in Nigeria, Also, the finding reveals that the direction of causality is found to be unidirectional running from economic growth to export over the period of the study. Thus the outcome of the study answered the research questions. Thus the study rejects the null hypothesis that there is no long run relationship between export and economic growth over the period of the study, and at the same time rejecting the null hypothesis that there is no causality between export and growth.

5.3 Conclusion

This study empirically examined the relationship between export, import and economic growth in Nigeria for the period 1970 to 2014. Econometrics methodology adopted were the unit root test followed by Johansen cointegration test, vector error correction mechanism and granger causality test was conducted. The findings and outcome of the study revealed that there exist a long run equilibrium relationship between export and economic growth in Nigeria over the study period. Also a Unidirectional causality emerge running from economic growth to export as confirmed by the granger causality test over the sample period. The error correction term was found to be negative and statistically significant at 5% level of significance, thereby explaining the rate of convergence from short run to long run for a period. Thus the outcome of the study answered the study question and the study objectives achieved.

In view of the above outcome, the results of the empirical analysis lead to the conclusion that both exports, import and economic growth in Nigeria for the period under review are related to their past deviations (i.e. error correction terms), this means that all the variables export, import and economic growth in this study are connected such that increase or decrease in one variable would affect the other variable in the long run. This also shows that any increase in economic growth (GDP) would have a positive impact on the growth of exports in the long-run. It implies that all the variables have a tendency to revert back to their equilibrium over time. In other words, the study provides the evidence of growth-driven exports in Nigeria over the sampled period, there by supporting the Growth led export hypothesis and thus corroborates the studies of Mishra (2011), Celina & Bethran (2012), Christopher and Oguntona, (2012). Moreover the study find the opposite results and findings compared to the studies of Iyoha & Arodoye (2014),

Szkorupova (2014), Okodua and Ewetan (2013); that it is exports that have promoted growth not the reverse. Thus leaving the issue unsettle and inconclusive.

The conclusion of the study as evidence from the results and outcome of this study suggested that government of Nigeria through its policy-planning agencies, parastatals and export promotion bodies should devise prudential means and policies to make the macro-economic fundamentals of the country strong enough to absorb external shocks, invest more in the export sector, diversify the export base of the economy from its over dependence on export of crude oil, facilitate proper machineries and provide institutions to support and motivate export activities in the country (especially export of manufactured products), which by multiplier effect would promote growth of the economy.

5.4 Policy Implication

The main objective of this research is to investigate the relationship between export and economic growth in Nigeria from 1970-2014, this was based on the evidences gathered from existing literatures for countries around the globe which suggests that economic growth and export are mutual, and that one can be achieved by engaging more of the other. For example economic growth can be achieved by engaging more in exports, or the other way round.

The findings of the study reveal that there exist a positive long run equilibrium relationship between economic growth, export and import. The policy implication as evidence from the results of this study is that government of Nigeria and other policy-planning agencies should devise prudential means and policies to make the macro-economic fundamentals of the country strong enough to absorb external shocks, invest more in the export sector, diversify the export base of the economy from its over dependence on export of crude oil, facilitate proper machineries and provide institutions to support and motivate export activities in the country (especially export of manufactured products). Thus therefore promoting both domestic and foreign investment in key areas of the economy, ensuring price stability, interest rate and political stabilities in the long run would by multiplier effect lead to growth.

5.5 Recommendations

In the light of the research findings and outcome conclusion is drawn and a number of policy recommendations were made with the hope that they would help to promote both Economic Growth and the Export sector of the economy. The recommendations made are as follows;

I. Government through its ministries and agencies should promote policies and programmes to be geared toward the export sector with the aim of promoting level of export in Nigeria as means of achieving economic growth.

II. Secondly Nigerian export base and composition should be diversified from it's over dependence on crude oil and some few number of raw materials exports. It is well known that Nigerian export mainly primary products and often rely almost exclusively on only a limited number of commodities. Such exports are characterized by lower prices than manufactured products and there markets are highly volatile.

III. It is also recommended that government at all levels should device means of enhancing domestically mode of promoting growth to supplement the export sector of the economy at large, as it is known that every part of the country is blessed with abundant human and natural resource which are the base for development.

IV. Finally, while Government policies towards private sector investment and promotion of exports of non-traditional goods are important to stimulate exports, it is equally important to ensure that the produced goods are able to compete internationally in terms of quality and prices. This would on the other hand stimulate domestic demand which will in turn promote growth.

To be precise, it is noted that Government is the key player in promoting growth of an economy at all levels and at all cost. It is thus therefore the sole responsibility of the government to devise means through all the agencies to ensure a steady and sustainable growth, especially through export as one of the means of promoting growth. Lastly Government at all levels should supplement export domestically and otherwise to promote growth of the country.

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APPENDICES

Appendix 1: Descriptive Statistics

	GDP	EPT	IMP
Mean	27.25922	12.05589	11.70009
Median	27.04304	12.23374	11.87166
Maximum	32.12015	16.54088	16.21303
Minimum	22.91620	6.786040	6.628570
Std. Dev.	2.948219	3.175665	3.121265
Skewness	0.161500	-0.002338	-0.008139
Kurtosis	1.631406	1.527503	1.554455
Jarque-Bera	3.707582	4.065507	3.918497
Probability	0.156642	0.130974	0.140964
Sum	1226.665	542.5149	526.5042
Sum Sq. Dev.	382.4479	443.7333	428.6611
Observations	45	45	45

Appendix 2: Unit Root Test

- ✓ **Augmented Dickey Fuller Unit Root Test**

RGDP I 0

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.515415	0.9854
Test critical values:	1% level	-3.588509	
	5% level	-2.929734	
	10% level	-2.603064	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 10/25/15 Time: 20:48
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.004896	0.009500	0.515415	0.6090
C	0.076252	0.259327	0.294037	0.7702

R-squared	0.006285	Mean dependent var	0.209181
Adjusted R-squared	-0.017375	S.D. dependent var	0.178273
S.E. of regression	0.179815	Akaike info criterion	-0.549392
Sum squared resid	1.357999	Schwarz criterion	-0.468292
Log likelihood	14.08661	Hannan-Quinn criter.	-0.519316
F-statistic	0.265653	Durbin-Watson stat	1.931598
Prob(F-statistic)	0.608965		

I 1

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.136628	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 10/25/15 Time: 20:49
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-0.960985	0.156598	-6.136628	0.0000
C	0.202373	0.043270	4.677018	0.0000

R-squared	0.478757	Mean dependent var	-0.001208
Adjusted R-squared	0.466044	S.D. dependent var	0.249291
S.E. of regression	0.182162	Akaike info criterion	-0.522442
Sum squared resid	1.360508	Schwarz criterion	-0.440525
Log likelihood	13.23249	Hannan-Quinn criter.	-0.492233
F-statistic	37.65820	Durbin-Watson stat	1.988596
Prob(F-statistic)	0.000000		

EPT I 0

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.981638	0.7517
Test critical values:	1% level	-3.588509	

5% level	-2.929734	
10% level	-2.603064	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EPT)
Method: Least Squares
Date: 10/25/15 Time: 20:50
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EPT(-1)	-0.019008	0.019363	-0.981638	0.3319
C	0.445275	0.239227	1.861310	0.0697

R-squared	0.022429	Mean dependent var	0.217986
Adjusted R-squared	-0.000847	S.D. dependent var	0.398844
S.E. of regression	0.399013	Akaike info criterion	1.044743
Sum squared resid	6.686875	Schwarz criterion	1.125843
Log likelihood	-20.98435	Hannan-Quinn criter.	1.074819
F-statistic	0.963614	Durbin-Watson stat	2.216645
Prob(F-statistic)	0.331899		

I 1

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.152549	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(EPT,2)
Method: Least Squares
Date: 10/25/15 Time: 20:50
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EPT(-1))	-1.119302	0.156490	-7.152549	0.0000
C	0.241306	0.071212	3.388556	0.0016

R-squared	0.555116	Mean dependent var	-0.012615

Adjusted R-squared	0.544266	S.D. dependent var	0.599638
S.E. of regression	0.404804	Akaike info criterion	1.074569
Sum squared resid	6.718529	Schwarz criterion	1.156486
Log likelihood	-21.10324	Hannan-Quinn criter.	1.104778
F-statistic	51.15896	Durbin-Watson stat	2.006400
Prob(F-statistic)	0.000000		

IMP I 0

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.784118	0.8137
Test critical values:	1% level	-3.588509	
	5% level	-2.929734	
	10% level	-2.603064	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IMP)
Method: Least Squares
Date: 10/25/15 Time: 20:52
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IMP(-1)	-0.013502	0.017219	-0.784118	0.4374
C	0.373468	0.206492	1.808628	0.0777

R-squared	0.014428	Mean dependent var	0.216864
Adjusted R-squared	-0.009038	S.D. dependent var	0.346350
S.E. of regression	0.347911	Akaike info criterion	0.770651
Sum squared resid	5.083775	Schwarz criterion	0.851750
Log likelihood	-14.95431	Hannan-Quinn criter.	0.800726
F-statistic	0.614841	Durbin-Watson stat	2.280996
Prob(F-statistic)	0.437371		

I 1

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.398011	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	

	10% level	-2.603944

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(IMP,2)
Method: Least Squares
Date: 10/25/15 Time: 20:52
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IMP(-1))	-1.142653	0.154454	-7.398011	0.0000
C	0.244938	0.063269	3.871352	0.0004

R-squared	0.571715	Mean dependent var	-0.005689
Adjusted R-squared	0.561269	S.D. dependent var	0.529007
S.E. of regression	0.350397	Akaike info criterion	0.785896
Sum squared resid	5.033902	Schwarz criterion	0.867812
Log likelihood	-14.89676	Hannan-Quinn criter.	0.816104
F-statistic	54.73057	Durbin-Watson stat	1.932424
Prob(F-statistic)	0.000000		

- ✓ **Phillips Perron Unit Root Test**

GDP I 0

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		0.515415	0.9854
Test critical values:	1% level	-3.588509	
	5% level	-2.929734	
	10% level	-2.603064	

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

Residual variance (no correction)	0.030864
HAC corrected variance (Bartlett kernel)	0.030864

Phillips-Perron Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 10/25/15 Time: 21:00
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	0.004896	0.009500	0.515415	0.6090
C	0.076252	0.259327	0.294037	0.7702

R-squared	0.006285	Mean dependent var	0.209181
Adjusted R-squared	-0.017375	S.D. dependent var	0.178273
S.E. of regression	0.179815	Akaike info criterion	-0.549392
Sum squared resid	1.357999	Schwarz criterion	-0.468292
Log likelihood	14.08661	Hannan-Quinn criter.	-0.519316
F-statistic	0.265653	Durbin-Watson stat	1.931598
Prob(F-statistic)	0.608965		

I 1

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-6.136628	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

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

Residual variance (no correction)	0.031640
HAC corrected variance (Bartlett kernel)	0.031640

Phillips-Perron Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 10/25/15 Time: 21:01
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-0.960985	0.156598	-6.136628	0.0000
C	0.202373	0.043270	4.677018	0.0000

R-squared	0.478757	Mean dependent var	-0.001208
Adjusted R-squared	0.466044	S.D. dependent var	0.249291
S.E. of regression	0.182162	Akaike info criterion	-0.522442
Sum squared resid	1.360508	Schwarz criterion	-0.440525
Log likelihood	13.23249	Hannan-Quinn criter.	-0.492233
F-statistic	37.65820	Durbin-Watson stat	1.988596
Prob(F-statistic)	0.000000		

EPT I 0

Null Hypothesis: EPT has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.011906	0.7409
Test critical values:	1% level	-3.588509	
	5% level	-2.929734	
	10% level	-2.603064	

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

Residual variance (no correction)	0.151974
HAC corrected variance (Bartlett kernel)	0.115123

Phillips-Perron Test Equation
Dependent Variable: D(EPT)
Method: Least Squares
Date: 10/25/15 Time: 21:02
Sample (adjusted): 1971 2014
Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EPT(-1)	-0.019008	0.019363	-0.981638	0.3319
C	0.445275	0.239227	1.861310	0.0697

R-squared	0.022429	Mean dependent var	0.217986
Adjusted R-squared	-0.000847	S.D. dependent var	0.398844
S.E. of regression	0.399013	Akaike info criterion	1.044743
Sum squared resid	6.686875	Schwarz criterion	1.125843
Log likelihood	-20.98435	Hannan-Quinn criter.	1.074819
F-statistic	0.963614	Durbin-Watson stat	2.216645
Prob(F-statistic)	0.331899		

I 1

Null Hypothesis: D(EPT) has a unit root
Exogenous: Constant
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.205845	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	

	10% level	-2.603944

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

Residual variance (no correction)	0.156245
HAC corrected variance (Bartlett kernel)	0.137110

Phillips-Perron Test Equation
Dependent Variable: D(EPT,2)
Method: Least Squares
Date: 10/25/15 Time: 21:02
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EPT(-1))	-1.119302	0.156490	-7.152549	0.0000
C	0.241306	0.071212	3.388556	0.0016

R-squared	0.555116	Mean dependent var	-0.012615
Adjusted R-squared	0.544266	S.D. dependent var	0.599638
S.E. of regression	0.404804	Akaike info criterion	1.074569
Sum squared resid	6.718529	Schwarz criterion	1.156486
Log likelihood	-21.10324	Hannan-Quinn criter.	1.104778
F-statistic	51.15896	Durbin-Watson stat	2.006400
Prob(F-statistic)	0.000000		

IMP I 0

Null Hypothesis: IMP has a unit root
Exogenous: Constant
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.784118	0.8137
Test critical values:	1% level	-3.588509	
	5% level	-2.929734	
	10% level	-2.603064	

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

Residual variance (no correction)	0.115540
HAC corrected variance (Bartlett kernel)	0.115540

Phillips-Perron Test Equation
Dependent Variable: D(IMP)
Method: Least Squares
Date: 10/25/15 Time: 21:03
Sample (adjusted): 1971 2014

Included observations: 44 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
IMP(-1)	-0.013502	0.017219	-0.784118	0.4374
C	0.373468	0.206492	1.808628	0.0777

R-squared	0.014428	Mean dependent var	0.216864
Adjusted R-squared	-0.009038	S.D. dependent var	0.346350
S.E. of regression	0.347911	Akaike info criterion	0.770651
Sum squared resid	5.083775	Schwarz criterion	0.851750
Log likelihood	-14.95431	Hannan-Quinn criter.	0.800726
F-statistic	0.614841	Durbin-Watson stat	2.280996
Prob(F-statistic)	0.437371		

I 1

Null Hypothesis: D(IMP) has a unit root
Exogenous: Constant
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.387682	0.0000
Test critical values:	1% level	-3.592462	
	5% level	-2.931404	
	10% level	-2.603944	

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

Residual variance (no correction)	0.117067
HAC corrected variance (Bartlett kernel)	0.119884

Phillips-Perron Test Equation
Dependent Variable: D(IMP,2)
Method: Least Squares
Date: 10/25/15 Time: 21:04
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(IMP(-1))	-1.142653	0.154454	-7.398011	0.0000
C	0.244938	0.063269	3.871352	0.0004

R-squared	0.571715	Mean dependent var	-0.005689
Adjusted R-squared	0.561269	S.D. dependent var	0.529007
S.E. of regression	0.350397	Akaike info criterion	0.785896
Sum squared resid	5.033902	Schwarz criterion	0.867812
Log likelihood	-14.89676	Hannan-Quinn criter.	0.816104
F-statistic	54.73057	Durbin-Watson stat	1.932424
Prob(F-statistic)	0.000000		

Appendix 3: Johansen Cointegration Test

Date: 10/25/15 Time: 21:08
Sample (adjusted): 1972 2014
Included observations: 43 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP EPT IMP
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 *	0.604235	48.65264	29.79707	0.0001
At most 1	0.183288	8.794475	15.49471	0.3847
At most 2	0.002052	0.088320	3.841466	0.7663

Trace test indicates 1 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 *	0.604235	39.85817	21.13162	0.0001
At most 1	0.183288	8.706155	14.26460	0.3114
At most 2	0.002052	0.088320	3.841466	0.7663

Max-eigenvalue test indicates 1 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):

GDP	EPT	IMP
1.002293	-4.901161	4.083604
-1.921011	0.938388	1.149553
3.546112	-0.840207	-2.300642

Unrestricted Adjustment Coefficients (alpha):

D(GDP)	-0.018124	0.010088	0.007802
D(EPT)	0.027111	-0.094300	0.014424
D(IMP)	-0.196196	-0.052213	0.007940

1 Cointegrating Equation(s): Log likelihood 25.82879

Normalized cointegrating coefficients (standard error in parentheses)

GDP	EPT	IMP
1.000000	-4.889946	4.074260
	(0.58822)	(0.60042)

Adjustment coefficients (standard error in parentheses)

D(GDP)	-0.018165
	(0.02837)
D(EPT)	0.027173
	(0.06305)
D(IMP)	-0.196646
	(0.04327)

2 Cointegrating Equation(s): Log likelihood 30.18187

Normalized cointegrating coefficients (standard error in parentheses)

GDP	EPT	IMP
1.000000	0.000000	-1.116996
		(0.06929)
0.000000	1.000000	-1.061618
		(0.01754)

Adjustment coefficients (standard error in parentheses)

D(GDP)	-0.037546	0.098295
	(0.06122)	(0.14099)
D(EPT)	0.208325	-0.221365
	(0.13222)	(0.30451)
D(IMP)	-0.096345	0.912592
	(0.09171)	(0.21122)

Appendix 4: Vector Error Correction Estimate

Vector Error Correction Estimates
Date: 10/25/15 Time: 21:36
Sample (adjusted): 1973 2014
Included observations: 42 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
GDP(-1)	1.000000
EPT(-1)	-4.403379
	(0.66930)
	[-6.57906]
IMP(-1)	3.599042
	(0.68583)
	[5.24769]
C	-16.21276

Error Correction:	D(GDP)	D(EPT)	D(IMP)

CointEq1	-0.052936	-0.080541	-0.325760
	(0.05281)	(0.11670)	(0.07791)
	[-1.00239]	[-0.69015]	[-4.18118]
D(GDP(-1))	0.072905	0.519685	0.976506
	(0.25693)	(0.56778)	(0.37906)
	[0.28375]	[0.91529]	[2.57613]
D(GDP(-2))	0.069634	0.029598	0.211476
	(0.25667)	(0.56720)	(0.37867)
	[0.27130]	[0.05218]	[0.55847]
D(EPT(-1))	-0.223493	-0.456591	-0.981193
	(0.19431)	(0.42940)	(0.28667)
	[-1.15019]	[-1.06333]	[-3.42272]
D(EPT(-2))	-0.143271	-0.411802	-0.388400
	(0.16884)	(0.37310)	(0.24909)
	[-0.84858]	[-1.10372]	[-1.55928]
D(IMP(-1))	0.165261	0.002806	0.046755
	(0.12468)	(0.27552)	(0.18394)
	[1.32551]	[0.01018]	[0.25419]
D(IMP(-2))	0.038656	0.202709	0.021005
	(0.12046)	(0.26620)	(0.17772)
	[0.32089]	[0.76148]	[0.11819]
C	0.222421	0.250837	0.261409
	(0.06168)	(0.13631)	(0.09100)
	[3.60585]	[1.84019]	[2.87254]
R-squared	0.059294	0.095015	0.456423
Adj. R-squared	-0.134381	-0.091305	0.344510
Sum sq. resids	1.260385	6.154958	2.743313
S.E. equation	0.192536	0.425474	0.284052
F-statistic	0.306151	0.509957	4.078369
Log likelihood	14.03588	-19.26677	-2.296853
Akaike AIC	-0.287423	1.298418	0.490326
Schwarz SC	0.043562	1.629402	0.821311
Mean dependent	0.214187	0.216882	0.220780
S.D. dependent	0.180773	0.407287	0.350845
Determinant resid covariance (dof adj.)		0.000105	
Determinant resid covariance		5.55E-05	
Log likelihood		26.97759	
Akaike information criterion		0.001067	
Schwarz criterion		1.118141	

OLS Version of ECM Estimate

Dependent Variable: D(GDP)
Method: Least Squares
Date: 10/25/15 Time: 21:39
Sample (adjusted): 1973 2014
Included observations: 42 after adjustments
D(GDP) = C(1)*(GDP(-1) - 4.40337938749*EPT(-1) + 3.59904163687*IMP(-1) - 16.2127598054) + C(2)*D(GDP(-1)) + C(3)*D(GDP(-2)) + C(4)*D(EPT(-1)) + C(5)*D(EPT(-2)) + C(6)*D(IMP(-1)) + C(7)*D(IMP(-2)) + C(8)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.052936	0.052810	-1.002394	0.0323
C(2)	0.072905	0.256934	0.283748	0.7783
C(3)	0.069634	0.256668	0.271302	0.7878
C(4)	-0.223493	0.194311	-1.150186	0.2581
C(5)	-0.143271	0.168837	-0.848576	0.4021
C(6)	0.165261	0.124677	1.325512	0.1938
C(7)	0.038656	0.120463	0.320892	0.7503
C(8)	0.222421	0.061683	3.605854	0.0010

R-squared	0.592940	Mean dependent var	0.214187
Adjusted R-squared	0.438113	S.D. dependent var	0.180773
S.E. of regression	0.192536	Akaike info criterion	-0.287423
Sum squared resid	1.260385	Schwarz criterion	0.043562
Log likelihood	14.03588	Hannan-Quinn criter.	-0.166104
F-statistic	9.306151	Durbin-Watson stat	2.013952
Prob(F-statistic)	0.000620		

Appendix 5: Residual Diagnostic Test

✓ Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.121270	Prob. F(2,32)	0.8862
Obs*R-squared	0.315938	Prob. Chi-Square(2)	0.8539

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 10/25/15 Time: 21:42
Sample: 1973 2014
Included observations: 42
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.

C(1)	-0.001306	0.057427	-0.022743	0.9820
C(2)	0.202129	0.990092	0.204151	0.8395
C(3)	0.215262	0.733648	0.293413	0.7711
C(4)	0.002854	0.212265	0.013446	0.9894
C(5)	0.022321	0.199709	0.111770	0.9117
C(6)	-0.011323	0.149156	-0.075913	0.9400
C(7)	-0.030308	0.165988	-0.182592	0.8563
C(8)	-0.084519	0.196168	-0.430850	0.6695
RESID(-1)	-0.213721	0.978739	-0.218364	0.8285
RESID(-2)	-0.242965	0.726287	-0.334531	0.7402

R-squared	0.007522	Mean dependent var	-2.55E-16
Adjusted R-squared	-0.271612	S.D. dependent var	0.175331
S.E. of regression	0.197714	Akaike info criterion	-0.199735
Sum squared resid	1.250904	Schwarz criterion	0.213995
Log likelihood	14.19444	Hannan-Quinn criter.	-0.048087
F-statistic	0.026949	Durbin-Watson stat	1.999735
Prob(F-statistic)	0.999998		

✓ Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.669473	Prob. F(9,32)	0.7299
Obs*R-squared	6.655075	Prob. Chi-Square(9)	0.6730
Scaled explained SS	9.300453	Prob. Chi-Square(9)	0.4100

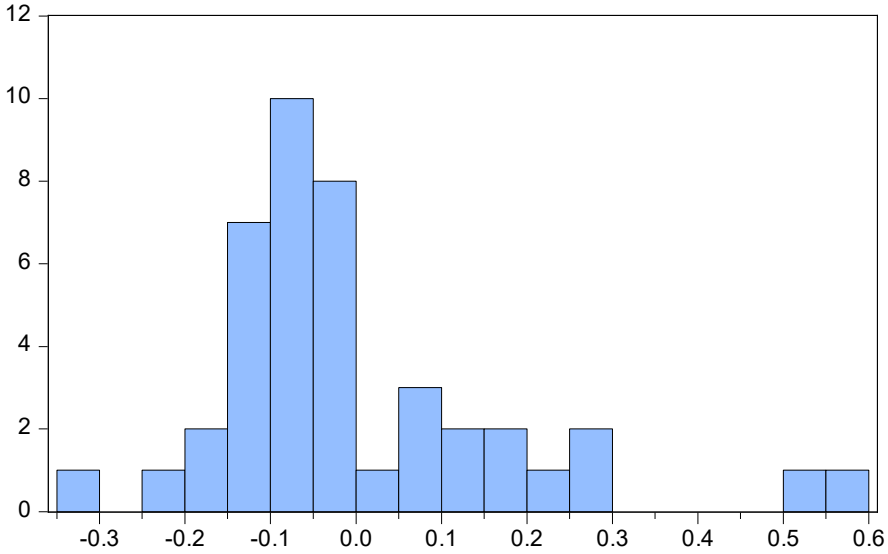
Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 10/25/15 Time: 21:43
Sample: 1973 2014
Included observations: 42

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.943237	0.806108	1.170112	0.2506
GDP(-1)	0.007304	0.090818	0.080420	0.9364
EPT(-1)	-0.003970	0.049503	-0.080189	0.9366
IMP(-1)	-0.054453	0.060347	-0.902335	0.3736
GDP(-2)	-0.025571	0.109080	-0.234420	0.8162
GDP(-3)	-0.038737	0.092632	-0.418174	0.6786
EPT(-2)	0.087593	0.052576	1.666037	0.1055
EPT(-3)	0.029091	0.057218	0.508419	0.6146
IMP(-2)	-0.048258	0.049092	-0.983003	0.3330
IMP(-3)	0.042703	0.045097	0.946915	0.3508

R-squared	0.158454	Mean dependent var	0.030009
Adjusted R-squared	-0.078231	S.D. dependent var	0.062726
S.E. of regression	0.065133	Akaike info criterion	-2.420503
Sum squared resid	0.135755	Schwarz criterion	-2.006772
Log likelihood	60.83056	Hannan-Quinn criter.	-2.268854
F-statistic	0.669473	Durbin-Watson stat	1.973972

Prob(F-statistic)	0.729874

✓ **Normality Test**



Series: Residuals	
Sample 1973 2014	
Observations 42	
Mean	-2.55e-16
Median	-0.048818
Maximum	0.555869
Minimum	-0.311503
Std. Dev.	0.175331
Skewness	1.422023
Kurtosis	5.265028
Jarque-Bera	23.13316
Probability	0.000009

Appendix 6: Granger Causality Test

Pairwise Granger Causality Tests
Date: 10/25/15 Time: 22:18
Sample: 1970 2014
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
EPT does not Granger Cause GDP	43	0.20922	0.8121
GDP does not Granger Cause EPT		3.53745	0.0280
IMP does not Granger Cause GDP	43	0.35304	0.7048
GDP does not Granger Cause IMP		2.50825	0.0948
IMP does not Granger Cause EPT	43	0.11089	0.8953
EPT does not Granger Cause IMP		9.11698	0.0006