

**EXTERNAL DEBT AND ITS IMPACT ON
ECONOMIC GROWTH (1981-2012)**

BY

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DEDICATION

This Project is dedicated to God Almighty for his infinite mercy, grace and guidance throughout this project. I would also like to dedicate this project to my parents MR & MRS OSATUYI for their financial support and encouragement.

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ABSTRACT

This study investigated external debt dynamics and its impact on economic growth in Nigeria for the period 1981-2012. Time series data on external debt stock and external debt service was used to capture external debt burden. The study set out to test for both long run and causal relationship between external debt and economic growth in Nigeria. An empirical investigation was conducted using time series data on Real Gross Domestic Product, External Debt Stock, Exchange Rate, Debt Service Payment and Government Expenditure from 1981-2012. The techniques of Estimation employed in the study include Augmented Dickey Fuller (ADF) test, Johansen Co-integration, Phillip Perron test, Regression Analysis and Granger Causality Test. The result shows that the variables experience a uni-directional causality running from RGDP to EDS and also a long run relationship between external debt stock and economic growth.

Keywords: External debt, economic growth, external debt stock and government expenditure.

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CHAPTER ONE INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Sustainable economic growth is a major concern for any sovereign nation most especially the Less Developed Countries (LDCs) which are characterized by low capital formation due to low levels of domestic savings and investment (Adepoju, Salau and Obayelu, 2007). It is expected that these LDC's when facing a scarcity of capital would resort to borrowing from external sources so as to supplement domestic saving (Aluko and Arowolo, 2010; Safdari and Mehrizi, 2011; Sulaiman and Azeez, 2011).

Soludo (2003) asserted that countries borrow for two broad reasons; macroeconomic reason that is to finance higher level of consumption and investment or to finance transitory balance of payment deficit and avoid budget constraint so as to boost economic growth and reduce poverty. The constant need for governments to borrow in order to finance budget deficit has led to the creation of external debt (Osinubi and Olaleru, 2006).

External debt is a major source of public receipts and financing capital accumulation in any economy (Adepoju et al, 2007). It is a medium used by countries to bridge their deficits and carry out economic projects that are able to increase the standard of living of the citizenry and promote sustainable growth and development. Hameed, Ashraf and Chaudary (2008) stated that external borrowing ought to accelerate economic growth especially when domestic financing is inadequate. External debt also improves total factor productivity through an increase in output which in turn enhances Gross Domestic product (GDP) growth of a nation. The importance of external debt cannot be overemphasized as it is an ardent booster of growth and thus improves living standards thereby alleviating poverty.

It is widely recognized in the international community that excessive foreign indebtedness in most developing countries is a major impediment to their economic growth and stability (Audu, 2004; Mutasa, 2003). Developing countries like Nigeria have often contracted large amount of external debts that has led to the mounting of trade debt arrears at highly concessional interest rates. Gohar and Butt (2012) opine that accumulated debt service payments create a lot of problems for countries especially the developing nations because such debt is serviced for more than the amount it was acquired and this slows down the growth process in such nations. The inability of the Nigerian economy to meet its debt service payments obligations has resulted in debt overhang or debt service burden that has militated against her growth and development (Audu, 2004). The genesis of Nigeria's debt service burden dates back to 1978 after a fall in world oil prices. Prior to this occurrence Nigeria had incurred some minor debts from World Bank in 1958 with a loan of US\$28million dollars for railway construction and the Paris Club debtor nations in 1964 from the Italian government with a loan of US\$13.1 million for the construction of the Niger dam. The first major borrowing of US\$1 billion known as the "Jumbo loan" was in 1978 from the International Capital Market (ICM) (Adesola, 2009).

External borrowing has a significant impact on the growth and investment of a nation up to a point where high levels of external debt servicing sets in and affects the growth as the focus moves from financing private investment to repayments of debts. Pattilo et al (2002) assert that at low levels debt has positive effects on growth but above particular points or thresholds accumulated debt begins to have a negative impact on growth. Similarly, Fosu (2009) observed that high debt service payments shifts spending away from health, educational and social sectors. This obscures the motive behind external borrowing which is to boost growth and development

rather than get drowned in a pool of debt service payments which eats up most of the nation's resources and hinders growth due to high interest payments on external debt.

Furthermore, OkonjoIweala (2011) asserts that the unabated increase in the level of external debt service payments has led to huge imbalances in fiscal deficits and budgetary constraints that have militated against the growth of the Nigerian economy. The resultant effect of the debt quagmire in Nigeria could create some unfavorable circumstances such as crowding out of private investment, poor GDP growth e.t.c.

Nigeria as a developing nation has adopted a number of policies such as the Structural Adjustment Programme (SAP) of 1986 to liberalize her economy and boost GDP growth. In a bid to ensure the implementation of these policies the government embarked upon massive borrowings from multilateral sources which resulted in a high external debt service burden and by 1992 Nigeria was classified among the heavily indebted poor countries (HIPC) by the World Bank. According to Omotoyeetal(2006) Nigeria is the largest debtor nation in sub Saharan Africa. When compared with other sub Saharan nations such as South Africa, Nigeria's external debt stock follows an upward pattern over the years while the former is relatively stabilized (Ayad and Ayadi, 2008). Nigeria's external debt stock rose from US\$28454.8 million in 1997 to US\$31041.6 and US\$37883.1 million in 2001 and 2004 with 80.3, 64.67 and 52.58 percentages of GDP respectively.

The debt crisis reached its maximum in 2003 when US\$2.3 billion was transferred to service Nigeria's external debt. In the year 2005 the Paris Club group of creditor nations forgave 60% (US\$18 billion) of US\$30.85 billion debt owed by Nigeria. Despite the debt relief of US\$18 billion received by Nigeria from the Paris club in 2005 the situation remains the same (Bakare,

2010).As at 2012, the percentage of total external debt in Nigeria was last measured at 471.87 according to the World Bank.

Therefore, the persistence of development on Nigeria's external debt raised concerns regarding its impact on economic growth and fears are being expressed about the debt sustainability. The high level of debt service payment prevented the country from embarking on larger volume of domestic investment, which would have enhanced economic growth. For instance, the vice president-elect YemiOsinbajo on Wednesday said Nigeria's local and foreign debts for 2015 now stand at \$60 billion,Our Debt servicing bill for 2015 is N953.6 billion, 21 per cent of our Budget. However, given the number of years since Nigeria had been independent and the substantial debt she had incurred, coupled with the existing weak institutions, one can claim that the entire spectrum of the economy has not been sufficiently active, especially when compared with the economy of similar or lesser aged developing countries.

1.2 STATEMENT OF THE PROBLEM

"Huge external debt does not necessarily imply a slow economic growth; because debt encourages tilting by allowing a more equitable manner in which a country can exploit investment with long gestation periods, secondly, by smoothing a more efficient procedure for conducting counter-cyclical policies or meeting emergency spending needs are achieved. Adjusting taxes frequently may lead to efficiency losses and economic uncertainty. Third is the stability advantage of debt over taxation and seignorage. It is rather a nation's inability to meet its debt service payments fueled by inadequate knowledge on the nature, structure and magnitude of the debt in question" (Were, 2011).It is no understatement that this is the major challenge faced by the Nigerian economy. The inability of the Nigerian economy to effectively meet its

H1: External debt does impact on economic growth of Nigeria.

Ho: External debt has no causal relationship with economic growth in Nigeria.

H1: External debt has causal relationship with economic growth in Nigeria.

1.6 SIGNIFICANCE OF THE STUDY

External debt is an important subject in the management of a country's economy, due to the fact that debt is usually contracted by most countries as means of raising funds to increase their available resources in order to fully finance public expenditures for growth and development purposes.

This research will provide useful information to governments in the area of debt management, regarding the best concessionary terms under which borrowing should be undertaken as regards interest and maturity of loans.

The study will help government to see the need to invest borrowed funds efficiently in the economy and the importance of appropriate debt servicing and rescheduling.

This study seeks to investigate the direct impact of external debt on economic growth in Nigeria by finding a long run and causal relationship between external debt and economic growth. This study is significant as its findings will provide a basis which will aid policy makers in proffering policies aimed at managing the debt crisis situation in Nigeria.

1.7 SCOPE OF THE STUDY

The study seeks to analyze Nigeria's external debt and its impact on her economic growth. In order to fully capture its effect on the economy, a thorough empirical investigation will be

conducted with data covering a period of 31 years i.e. 1981-2012. This period was chosen to cover the period after the oil collapse and also the post debt-relief era.

1.8 ORGANISATION OF THE STUDY

This study is presented in five (5) chapters. The first chapter which is the introduction includes the background of the study, statement of the problem, objectives of the study, research question, significance of the study, scope of the study, organization of the study and definition of terms. Chapter two which is the literature review includes introduction, conceptual issues, theoretical framework and empirical evidence. Chapter three is the research methodology and it includes research design, sources and methods of data collection, model specification, and estimation techniques/methods of data analysis. Chapter four is the data presentation and analysis, empirical results, and discussion of findings. Chapter 5 is the summary, conclusion and recommendation.

1.9 DEFINITION OF TERMS

1.9.1 External Debt

Likita (2000) in Umaru et al (2013) defined debt as a contractual obligation of owing or accumulated borrowing with a promise to payback at a future date. Internal (domestic) debt is that part of a nation's debt owed to lenders within the country. External debt on the other hand refers to that part of a nation's debt owed to creditors outside a country. The debtors can be the government, corporations or citizens of the country. The debt can include: money owed to private commercial banks, other governments, or international financial institutions such as the international monetary fund (IMF) and the World Bank. Nigeria has incurred both domestic and external debt in pursuit of better economic growth.

Sustainable Debt refers to the level of debt which allows a debtor country to meet its current and future debt service obligation in full without recourse to further debt relief or rescheduling, avoiding accumulating debt arrears, while allowing an acceptable level of economic growth. It can be said that Nigeria's debt is still sustainable given the fact that her debt is still below the IMF level of 250% of Government revenue and the improved debt management practice by the Debt management of Office of Nigeria.

1.9.2 Economic Growth

According to (Todaro, 1977) economic growth is simply the increase overtime of an economy's capacity to produce those goods and services needed to improve the well-being of the citizens in increasing numbers and diversity. It is the steady process by which the productive capacity of the economy is increased overtime to bring about rising levels of national income.

1.9.3 External Debt Stock is the amount at which the debt was contracted and it is used as a proxy for capturing external debt burden.

1.9.4 Exchange rate is the price of a nation's currency in terms of another currency. It is included in the model because it is a macroeconomic indicator and it is also a monetary aggregate in the open economy.

1.9.5 Real Gross Domestic Product is a measure that reflects the value of goods and services produced in a given year.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

In this section, the researcher gave an overview of some conceptual issues, theoretical framework and empirical evidences. The conceptual framework will shed light on some conceptual issues about external debt. The theoretical framework will explain what various theories say about external debt and economic growth and empirical research on the topic and other related issues.

2.2 CONCEPTUAL FRAMEWORK

The act of borrowing creates debts and this debt may be domestic or external. The focus of this study is on external debt which refers to that part of a nation's debt that is owed to creditors outside the nation. Arnone et al (2005) defines external debt as that portion of a country's debt that is acquired from foreign sources such as foreign corporations, government or financial institutions. According to (Ogbeifin, 2007), external debt arises as a result of the gap between domestic savings and investment. As the gap widens, debt accumulates and this makes the country to continually borrow increasing amounts in order to stay afloat. He further defined Nigeria's external debt as the debt owed by the public and private sectors of the Nigerian economy to non-residents and citizens that is payable in foreign currency, goods and services.

Debt crisis occurs when a country has accumulated a huge amount of debt such that it can no longer effectively manage the debt which leads to several mishaps in the domestic political economy (Adejuwon et al). Mimiko (1997) defined debt crisis as a situation whereby a nation is severely indebted to external sources and is unable to repay the principal of the debt.

Eaton (1993) made simple distinction with the various stock and flows associated with debt. Regarding stocks, a major distinction is made between disbursed and undisbursed debt. Whereas undisbursed debt is composed for mere commitment made by lenders and are, therefore, not accumulating interest, disbursed debt consists of commitment made by the lender that have been drawn on and have accumulated unpaid interest. Put differently, unpaid interest obligations are part of the disbursed debt. Thus, debt essentially refers to disbursed debt. When a government borrows, the debt is a public debt (internal or external). It is debt incurred by the government through borrowing in the domestic and international market so as to finance domestic investment. Debt is classified into two which are; reproductive debt and dead weight debt. When a loan is obtained to enable the state or nation to purchase some sort of assets, the debt is said to be productive e.g. money borrowed for acquiring factories, electricity, and refineries etc. however, debt undertaken to finance war and expenses on current expenditure are dead weight debt.

When a country obtains loan from abroad, it means that the country can import from abroad goods and services to the value of the loan without sometime having to export anything for exchange. When capital and interest have to be repaid, the same country will have to get the burden of exporting goods and services. These two types of debt however require that the borrower's future saving must cover the interest and principal payment (Debt Servicing). Therefore, debt finance investment need to be productive and well manage enough to earn a rate of return higher than the cost of debt servicing. For the past two decades, Nigeria has borrowed large amount, often at highly concessional interest rates with the hope to put them on a faster route for development through higher investment, faster growth and poverty improvement but on the constant economic growth and poverty situation are staggering at the door admit excess debts even though that was the initial intention.

According to the World Bank total external debt may be defined as debt owed to non-resident repayable in terms of foreign currency, goods or services. External debt is the composition of long term debt (public and publicly guaranteed debt plus private nonguaranteed debt), short term commercial debt and International Monetary Fund (IMF) loans. Prior to early 1970s the external debt of developing countries was primarily small and official phenomenon, the majority of creditors being foreign governments and international financial institutions offer loan for development project (Todaro, 1988). External debt only helps to exploit the potentials of a country, it does not enhance it. Therefore, the only guideline is that the rate of return on spending should exceed the marginal cost of borrowing on the assumption that debt is paid (Indermit and Brian 2005).

2.3 THEORETICAL FRAMEWORK

External debt is widely believed to enhance economic growth and development (Osinubi&Olaleru, 2006; Hirschman, 1958). That is the basic reason why the debt is usually borrowed in the first place. Both developed and developing nations seek for external debt to boost their economic performance (Kletzer& Wright, 1999; Eaton &Gersovitz, 1981). Available statistics have shown that the United States of America is the biggest debtor country in the world but yet the country enjoyed significant economic growth and development taking the global financial meltdown aside (Blakely & Leigh, 2009). Nigeria has been utilizing the external debt to the extent that the debt becomes so huge to water down substantial part of the country's revenue. Despite the increasing nature of the debt stock, until the recent decline due to debt cancellation and relief, the economic development of Nigeria is not encouraging especially looking at the economic development in terms of its basic components such as employment creation and poverty reduction (Ayadi, 2008).

Studies on the impact of external debt on economic growth find one or more debt variables are to be significantly and negatively associated with investment or growth depending on the focus of the study. Anyanwu (1994) was of the opinion that a whole scale of some white elephant development project (gigantic projects) in the country is the cause of our external debt problem. He says "instead of emphasis being placed on small-scale rural development projects so as to reverse the chaotic trend of urbanization and lessen the opportunity for corruption, Nigeria government started embarking on many false projects of which many are not productive".

Sanusi (1988) believe that the Nigeria's debt problem was caused by the inappropriate monetary and fiscal policies of the government. These policies had a contrary effect on the domestic economy leading to domestic inflation, capital flight, encouragement of import, and discouragement of production for export, distortion in relative price and other depressant effects. He was of the opinion that the rigid exchange rates and pricing was one reason that caused external debt problem. A study by IMF in 1989 on investment behaviour found investment to be lower in heavily indebted countries, and after analyzing the different explanations for the decline in investment concluded that poor performance of investment in countries with debt servicing of sub-Saharan African countries, debt serving in the face of inadequate foreign earning leads to severe import strangulation. Import strangulation hold back export growth thus perpetuating import shortages. The debt overhangs created by the debt situation further depress investment. Problems are generally consistent with the presence of debt overhang.

Borenztein (1990) however found that debt overhang had an adverse effect on private investment in Philippines. The effect was strong when private debt rather than total debt was used as a measure of debt overhang. Cohen (1993) argued that the results on the correlation between the less developing country (LDC) debt and the investment in 1980s showed that the level of stock

of debt does not appear to have much power to explain the slowdown of investment in developing countries during the 1980s. It is the actual flow of net transfers that matter. He found that the actual service of debt crowded out investment. Fajana (1993) sees nothing wrong with external or foreign borrowing but that the debt crises arise due to the mismanagement of such funds. In fact he believes that borrowing is desirable and also unavoidable because external borrowing is the first order condition for bridging the domestic gap, the second order condition is that such funds be invested in viable projects whose rate of return is higher than that of the interest rate on the loan. He summed this up by saying that for external debt to serve as an engine of growth it has to be well managed and the resources it make available need to be prudently and efficiently utilized.

Iyoha (1997a) supported the argument made by Ajayi when he said that the two issues; debt and lack of growth are clearly inter-related. Indeed, excessive stock of external debt retard growth and hamper the socio economic development of sub-Saharan African countries. The large debt stock and crushing debt service burden have now introduced a new vicious cycle to the analysis of the development problem.

Obadan (2001) opined that for a country aspiring to achieve a particular target rate of growth, such growth may be limited by lack of domestic savings or foreign exchange. Growth as he argued is limited by the domestic resource gap of the foreign exchange or external sector gap and foreign borrowing is required to meet the larger gap. If foreign exchange is the dominant constraint, dual gap analysis stressed that additional role of foreign borrowing in supplementing foreign exchange without which a fraction of domestic savings might be unutilized because actual growth would be constrained by the inability to import necessary input.

2.3.1 THEORIES OF EXTERNAL DEBT

The **dual gap analysis** explained that economic growth is a function of investment and that such investment which require domestic savings, is not sufficient to ensure that development take place. There must be the possibility of obtaining from abroad the amount that can be invested in any country is identical with the amount that is saved. Furthermore, if the domestic resources are to be supplemented from abroad, such as excess of import over export (i.e. $M > E$).

$$I - S$$

$$M - E$$

$$\text{Hence, } I - S = M - E$$

In national income accounting, an excess of investment over domestic saving is equivalent to excess surplus of import over export.

$$\text{Income} = \text{consumption} + \text{import} + \text{savings}$$

$$\text{Output} = \text{consumption} + \text{export} + \text{investment}$$

$$\text{Income} = \text{output}$$

$$\text{Then Investment} - \text{Saving} = \text{Import} - \text{Export}$$

This is the basis of dual gap analysis; it assures that there is a country that requires saving and investment good import to achieve a particular rate of growth. If the available domestic saving fall short of the level necessary to achieve the target rate of growth, a savings investment gap is said to exist on a similar note, if the maximum import requirement needed to achieve the growth target is greater than the maximum possible level of export, then there is an export-import of origin exchange gap.

Debt overhang theory: This theory states that when the accumulated debt amount crosses the starting point level of a country's repayment capacity, the expected default may cause the

domestic and foreign investors to draw back their money; and these will negatively affect the economic growth of the country. This also means that whether the stock of debt is too large, the expected interest payments are a positive function of output. Thus, investments decrease, because their return will be taxed away by foreign creditors and the pace of economic growth will slow down. (Krugman, 1988 and Sachs, 1989).

The debt – cum – growth model

Given the need for larger capital stock and the inadequacy of domestic saving to finance investment that would make this possible, it is necessary that domestic savings should be supplemented by foreign sources; this shifted the issue from whether external funds are useful to developing countries but how much is sufficient to help realize her growth potential. However, the general case for borrowing abroad is to add to financial resources not just to acquire specific resources (Solis et al 1985); first is can increase resources available for investment by supplementing export earnings.

According to national income accounting, excess investment expenditure over domestic savings equivalent to surplus of imports over exports. At equilibrium, the following identities hold;

$$I - S = m - x \dots \dots \dots (1)$$

$$S - M = x - m \dots \dots \dots (2)$$

Where:

I = Investment

S = Savings

M = Import

X = Export

The above equations implies that the domestic resources gap ($S - I$) is identified to foreign investment or external gap ($x - m$), an excess of import over export necessarily implies an excess of resources used by an economy over resources generated by it or an excess of investment in resources generated by it or an excess of investment in relation to domestic savings, this means that need for foreign borrowing overtime is determined by the rate of investment in relation to domestic savings. However, foreign borrowing is not only the difference between domestic investment and savings but includes the different between export and import.

$$id - s = m - x \dots \dots \dots (3)$$

$$id + x = s + m \dots \dots \dots (4)$$

The condition for the national income to be is that domestic investment plus export must equal import plus domestic savings for the balance of payment to be in equilibrium with no foreign borrowing, export must be equal import and domestic investment i.e. unaccompanied by an equal shift in the savings schedule must be financed in part by borrowing from abroad.

This is because part of increased income will spill over into import (assuming a positive marginal propensity to import). The only condition for investment to increase without adversely affecting the balance of payment is if exports expand simultaneously in the correct proportion or the savings schedule shift upwards or the import schedule shift downward.

However, the gaps in the equation (3) and (4) above may not be equal, factor proportion may be slow to adjust and substitutability between foreign and domestic resources may be a long drawn out process than the possibility that exist for the shortage of foreign exchange and domestic savings at particular points time as well as overtime.

The Dependency theory

This theory which emerged in 1949 from the separate writings of authors; Hans Singer and Paul

Prebisch, is built on the premise that poor countries provide natural resources, primary materials, and cheap markets for developed nations without which the latter could not have the standard of living they enjoy, on the other hand Wealthy nations actively perpetuate a state of dependency by various means. The phenomenon associated with the theory is that poor states are impoverished while rich ones continue to be enriched by the way in which the poor countries are integrated in the world system (Todaro, 2003).

According to the Bourgeoisie scholars the state of underdevelopment and the constant dependence of less developed countries on developed nations are as a result of their domestic mishaps. They believe this issue can be explained by their lack of close integration, diffusion of capital, low level technology, poor institutional framework, bad leadership, corruption, and mismanagement (Momoh and Hundeyin, 1999). They see the underdevelopment and dependency of the less developed nations (LDCs) as being internally inflicted rather than externally afflicted. This school of thought argues that the way out of the problem is for the LDCs to seek external assistance in form of Aid, loans, Technological transfer, Investment, and allow undisrupted operations of the Multinational Corporations (MNCs).

The crowding out effect

The crowding out effect refers to the relationship between the amount of debt repayment and the size of the debt. When the effect is so strong, the debtor is said to be on the wrong side of the Laffer curve, the idea of the Laffer curve also implies that there is a limit to which debt incurred can stimulate growth (Elbadawi et al, 1996). When the debt exceeds that limit the debt becomes a burden as the cost of servicing the debt brings strain to the amount of resources available for productive investments thereby crowding out investment which ultimately slows growth.

THEORIES OF ECONOMIC GROWTH

The Solow Growth model In the case of the Solow growth model, the key variable is labor productivity: output per worker, how much the average worker in the economy is able to produce. We calculate output per worker by simply taking the economy's level of real GDP or output Y , and dividing it by the economy's labor force L . This quantity, output per worker, Y/L , is our best simple proxy for the standard of living and level of prosperity of the economy.

In every economic model—and the Solow growth model is no exception—economists analyze the model by looking for equilibrium: a point of balance, a condition of rest, a state of the system toward which the model will converge over time. Economists look for equilibrium for a simple reason: either an economy is at its (or one of its) equilibrium position or it is moving—and probably moving rapidly—to an equilibrium position. Once you have found the equilibrium position toward which the economy tends to move, you can use it to understand how the model will behave. If you have built the right model, it will tell you in broad strokes how the economy will behave. In economic growth, the equilibrium economists look for is an equilibrium in which economy's capital stock per worker, its level of real GDP per worker, and its efficiency of labor are all three growing at the exact same proportional rate. The equilibrium economists look for in the case of the Solow growth model is balanced-growth equilibrium.

The Classical View

The classical economists are of the view that public debt will always impact negatively on the economy, this view is of course not surprising to me given their laissez-faire stance. David Humen was quoted in Churchman (2001) to have argued in 1752 that “either the nation destroys public debt or public debt destroyed the nation”. He stated that public debt if not checked mate will have social and political consequences. Adam Smith further asserted the classical view on

public debt based on this quote from his (1776, Book Five, Chapter III entitled "Of Public Debts.") "The progress of the enormous debts which at present oppress, and will in the long-run probably ruin, all the great nations of Europe, has been pretty uniform." (Holtfrerich, 2012).

The Ricardian Equivalence

David Ricardo an English economist had in early part of the 19th century, proposed his theory on public expenditure known as the Ricardian equivalence. Where he stated that, increasing government expenditures by borrowing with the hope of stimulating aggregate demand as a means of boosting economic activities will not have any impact on consumers spending especially when they are forward looking. This because todays borrowing begets tomorrows higher taxes which the citizens will have to bear. Thus taken cognizance of this fact, when the public sector borrows money to invest in the economy as a means of stimulating economic activities for growth, the private sector increases savings almost equal to the amount of debt incurred by the government (perhaps preparing for future debt servicing). As a result the impact of the borrowed funds will not be felt in the economy; hence we say that the debt financed public expenditure has a neutral effect on the economy (Hudson, 2011).

2.3.2 WHY COUNTRIES BORROW

Generally the need for public borrowing arises from the recognized role of capital in the developmental process of any nation as capital accumulation improves productivity which in turn enhances economic growth. There is abundant proof in the existing body of literature to indicate that foreign borrowing aids the growth and development of a nation. Soludo (2003) was of the opinion that countries borrow for two major reasons. The first is of macroeconomic intent that is to bring about increased investment and human capital development while the other is to reduce budget constraint by financing fiscal and balance of payment deficits. Furthermore (Obadan and

Uga, 2007) stressed the fact that countries especially the less developed countries borrow to raise capital formation and investment which has been previously hampered by low level of domestic savings. Ultimately the reasons why countries borrow boils down to two major reasons which are to bridge the “savings-investment” gap and the “foreign exchange gap”. Chenery (1966) pointed out that the main reason why countries borrow is to supplement the lack of savings and investment in that country. The dual-gap analysis justifies the need for external borrowing as an attempt in trying to bridge the savings-investment gap in a nation. For development to take place it requires a level of investment which is a function of domestic savings and the level of domestic savings is not sufficient enough to ensure that development take place (Oloyede, 2002). The second reason for borrowing from overseas is also to fill the foreign exchange (imports-exports) gap. For many developing countries like Nigeria the constant balance of payment deficit have not allowed for capital inflow which will bring about growth and development. Since the foreign exchange earnings required to finance this investment is insufficient external borrowing may be the only means of gaining access to the resources needed to achieve rapid economic growth.

2.3.3 ORIGIN OF NIGERIA’S EXTERNAL DEBT

Nigeria’s external indebtedness can be traced back to the pre-independence period when in 1958 a loan of US\$28 million dollars was contracted from the World Bank for railway construction. This debt did not pose a serious burden reason being that it was acquired on soft terms i.e. with no interest or below market rate of interest. After this period, the need for external aid was relatively low until in 1977/1978 when there was a fall in world oil prices which in turn reduced the nation’s oil receipts. Before this period Nigeria was experiencing abundance in oil receipts especially with the oil boom of 1973-1976. After crude oil was first discovered in 1956, it

became a major source of foreign exchange earnings as there was a gradual drift from agriculture which had been the dominant provider of export earnings, employment e.t.c to near total dependence on oil as the mainstay of the economy. Following the fall in oil prices, it became necessary for the government to correct balance of payment difficulties and finance projects. This led to the first major borrowing of US\$1 billion which is referred to as the JUMBOLOAN in 1978 from the international capital market (ICM). Although this loan was used to finance various medium and long term infrastructural projects, the returns obtained from these projects were not enough to amortize the nation's debts as many of the projects as included in the Fourth National Development Plans (1981-1985) involved mainly the use of imported materials. In 1979, there was a recovery in the oil market and oil was sold in Nigeria at US\$39.00 per barrel which led to the belief that the economy was bouncing back. But due to the fact that there was excessive importation, it resulted in over-invoicing of imports and under-invoicing of exports and in 1982 when there was another collapse in world oil prices it caused severe strains and stresses on the economy. Foreign exchange was declining rapidly and there were large amount of deficits in government financing. In the face of drastic oildownturn and dwindling oil reserves, the rate of borrowings increased from the international capital market (ICM).

At this point the nation's debt profile had begun rising astronomically due to the increasing external debt service payments. In 1980 external debt stood at US\$8.65 billion and by 1985 it nearly reached US\$19 billion showing an increase of about 45.02%. The increase in debt service payments interests resulted in mounting of trade debts arrears. By 1997 the nation's debt stock stood at US\$27.0878 billion; US\$18.9804 billion Paris Club debt; US\$4.3727 billion Multilateral debt; \$1.6125 billion Promissory notes and US\$0.7919 billion Non Paris Bilateral debt (Ministry of Finance, 1997). Due to the rise in external debt there was a corresponding

increase in external debt servicing ratios; debt/GDP and debt/export earnings. As at December 31st 2001, the external debt stock stood at US\$28.35 billion which was about 59.4% of GDP and 153.9% of export earnings. The total external debt outstanding as at 31st December 2004 stood at US\$35.94 billion as against US\$32.92 billion in December 2003, indicating an increase of US\$3.03 billion or 9.20 percent (Debt management office, 2010).

2.3.4 THE NATURE AND CAUSES OF NIGERIA'S EXTERNAL DEBT

Nigeria, during the earlier years of its existence as an independent nation, was not classified as a debtor nation. Nigeria, in comparative terms, was rich. She had no reason to go a-borrowing. Indeed, she later successfully prosecuted her 30-month civil war from 1967 to January 1970 without taking a foreign loan. General Yakubu Gowon (1966-1975), Nigeria's military head of state, at the time, once said during the early 70s that Nigeria didn't have cash problems. Her problem rather was how to use the money in her vault.

However, surprisingly, the nation's vault soon began to dry up. She then discovered that to keep afloat she had to take foreign loans. Its entry into the league of debtors started in 1981, in spite of the paradox of being an oil-exporting country. The fact of its being awash with petro-dollar following the OPEC oil price windfall of 1973 made borrowing by Nigerian government unnecessary up till 1978. Until this period, government pegged external borrowing at a manageable N1.0 billion. Nigeria's rendezvous in the company of debtors nations began with the decision of the then military head of state Olusegun Obasanjo to raise the ceiling on external debt from N1.0 billion to N5.9 billion in 1978 (Babawale, 2007). In no time, she was subsequently caught up in a crippling foreign debt crisis that compromised its economic progress, political stability, social dignity and cultural integrity. Accompanying this debt crisis was poverty. It took

an upward swing. For instance, from 28% in 1980 Poverty took a frog leap to 66% in 1996 and finally settled at about 70% in 2000. Put simply, the UNDP estimate, about 65 million Nigerians were living on less than one dollar a day. The wealth of the nation was therefore concentrated in the hands of a select few while an average of 3million Nigerians enter the nonperforming job market, annually (AFRODAD, 2007).

The picture of debt crisis in Nigeria was painted by New Age Editorial (November, 3 2004)thus;

... a country that borrowed \$11 billion and has so far paid back \$32 billion is still owing \$34 billion? That means every dollar borrowed has been repaid almost three times over, yet about three times the initial amount borrowed is still being owed. Creditors are having their cake and eating it in a vicious arrangement designed by IMF and its allies, the effect of which stifles growth and development in developing countries

According to Sogo-Temi, (1999), the explanation for the growing debt burden of developing economies is of two-fold. Firstly, developing countries have become much dependent on external funding than they used to even previously. Secondly, difficulties are experienced by most countries in servicing external debt burden. These two factors according to him, account for Nigeria's indebtedness. Any assessment of the present dependency nature of Nigerian economy must take into cognizance the political economy of country during the colonial era.

Ahmed (1984) reflected the causes of debt problem as related to both the nature of the economy and the economic policies put in place by the government. He articulated that the developing economies are characterized by heavy dependence on one or few agricultural and mineral commodities and export trade is highly concentrated on the other. The manufacturing sector is mostly at the infant stage and relies heavily on imported inputs. To him, they are dependent on

the developed countries for supply of other input and finance needed for economic development, which made them vulnerable to external shocks.

The grand cause of the debt crisis is that, in most cases, the loan is not used for development purposes. The loan process is done in and shrouded with secrecy. The loan is, abinitio, obtained for the personal interest and parochial purposes. It is usually tied to party politics, patronage and elevation of primordial interest rather than the promotion of national interest and overall socioeconomic development (Aluko and Arowolo, 2010).

The causes of Nigeria's external debt burden could be grouped into six areas and these according to Aluko and Arowolo (2010) are: Inefficient trade and exchange rate policies, adverse exchange rate movements, adverse interest rate movements, poor lending and inefficient loan utilization, poor debt management practices, and accumulation of arrears and penalties

Inappropriate monetary policy also contributed to the problem of Nigerian external indebtedness. For instance, until recently little or no conscious effort was made to achieve financial discipline which was made necessary for effective and efficient mobilization of domestic savings. The negative real rates of interest which prevail for long had the effect, if representing the financial market, increase the dependence of Nigeria on external loans, and encouraging capital flight.

2.3.5 EXTERNAL DEBT MANAGEMENT STRATEGIES

Right from the 1980s, the management of the external debt became major responsibility of the central Bank of Nigeria due to its increasing proportion (CBN). This necessitated the establishing of a special department in collaboration with Federal Ministry of finance to the management of external debt. Although, the debt management strategies and measures varied from time to time

since the 1980s when the external debt became pronounced, the Government uses the following measures as guidelines to external borrowing:

- ✓ Economic sector should have positive internal Rate of Return (IRR) as high as the cost of borrowing i.e. interest
- ✓ External loans for private and public sector projects with the shortest rate of return should be sourced from the international capital market while loans for social services or infrastructure could be sourced from concessional financial institutions.
- ✓ State government, Parastatal, Private sectors borrowing must receive adequate approval from the Federal Government so as to ensure that the borrowing conforms to the national objectives.
- ✓ Projects to be financed with external loan should be supported with feasibility studies which include loan acquisition, deployment and retirement schedule.
- ✓ State Government and other agencies with borrowed funds should service their debts through foreign exchange market and duly inform the Federal Ministry of Finance for record purposes.
- ✓ Private sector, industries that are export earning while others should utilize the foreign exchange market facilities for debt servicing.

The government over the years adopted the under listed strategies and measures to deal with the debt problem. These include:

- i. Embargo on new Loans and Directives to state Government to restrict external borrowing to the barest minimum. The embargo was to check the escalation of total debt stock and minimize

additional debt burden. However, these have not been particularly effective because of indiscriminate quest for external loans.

ii. Limit on debt service payments: This requires setting aside portion of export earnings to allow for internal development.

iii. Debt Restructuring: - This involve the reduction in the burden of an existing debt through refinancing, rescheduling bring back, issuance of collaterized bond and the provision of new money.

2.3.6 THE DEBT RELIEF FOR NIGERIA

With progress made from the reduction of resources directed to debt servicing in 2004, the implementation of a home-grown economic reform programme, the National Economic Empowerment and Development Strategy (NEEDS), coupled with improvements in economic governance and the anti-corruption drive of the Obasanjo administration, added incentives to the quest for debt relief for Nigeria among creditor nations. Also, it was argued that a debt relief was necessary if Nigeria was to achieve the objectives under NEEDS, as well as meet the Millennium Development Goals (MDGs) by 2015. Consequently, on June 27 2005, the country secured a major breakthrough in her quest for debt relief, with the Paris club agreement to grant Nigeria an International Development Assistance (IDA) which was supportive of the debt relief struggle. To give a practical effect to this, a delegation from the country met with the Paris club creditors on October 20, 2005 and a final agreement was reached to cancel 60% (US\$ 18 billion) of Nigeria's debt with Paris club. The breakdown of the debt owed to Paris club was; Principal balance – US\$ 25,199,180.0, Arrears -US\$5,684,634.53, Total - US\$30,883,814.53.

The agreement involved a debt reduction under the Naples terms, on eligible debt after reduction. This was to be implemented in two phases, conditional on the implementation of a comprehensive economic reform programme under the Policy Support Instrument (PSI) as approved by the executive board of the International Monetary Fund (IMF) on October 17, 2005. The Naples terms are a more generous debt relief package reserved only for lower income countries of good performance on their reform programme.

In the first phase, Nigeria undertook to pay arrears of US\$6.3 billion due on all categories of debts, while the Paris club creditors would grant a 33.0%. The second phase would become due after the approval of the first review of the PSI by the Executive Board of the International Monetary Fund during the first half of 2006. Then, Nigeria would pay US\$ 6.1 billion, the amount due under the post cutoff date debt. The Paris club creditors granted a further cancellation of 34.0% on eligible debts and then buyback the remaining eligible debts. The execution of the fifth bilateral agreement with the Paris club creditors would facilitate the resumption of normal bilateral economic relationship with the member countries. The total amount to be paid under the debt relief to complete the exit strategy from Paris club debt overhand amounted to US\$ 12.4 billion. According to Debt Management Office (DMO), Nigeria's total debt as at June ending 2006 stood at \$16.9 billion.

With the completion of the Paris club debt, the DMO stated that the priorities of the government would be to review and update earlier projections of the first workshop; ensure regular conduct of the DSA and build national capacity for Debt Strategy Analysis. Nigeria's debt stock was reduced to a low percent of the country's GDP; achievable when the Paris club of creditor nation granted the country debt relief, after rigorous technical negotiation and tremendous level of diplomatic initiative geared towards gathering the support of the international community.

2.3.7 CAUSATIVE FACTORS OF NIGERIA'S EXTERNAL DEBT

According to (Sogo-Temi, 1999), the explanation for the growing debt burden of developing economies is of two-fold. Firstly, developing countries have become over-dependent on external borrowing. Secondly, the difficulties they experience in servicing external debt due to huge debt service payments. Ahmed (1984) asserted that the causes of debt problem relate to both the nature of the economy and the economic policies put in place by the government. He articulated that the developing economies are characterized by heavy dependence on one or few agricultural and mineral commodities and export trade is highly concentrated on the other. The manufacturing sector is mostly at the infant stage and relies heavily on imported inputs. He stated that they are dependent on the developed countries for supply of other input and finance needed for economic development which makes them vulnerable to external shocks.

Aluko and Arowolo (2010) pointed out that the major cause of the debt crisis situation in Nigeria is the fact that these foreign loans are not being used for developmental purposes instead of being ventured into capital projects that will better the economy, they are shrouded in secrecy. According to (Debt Management Office of Nigeria, 2012), the factors that led to Nigeria's external debt burden can be grouped into six areas;

- ✓ Inefficient trade and exchange rate policies

Both the trade and exchange rate (monetary) policies were not quick enough to respond to show the external value of the naira at a time when there was a downturn in the oil market which led to a reduction in the flow of resources into the economy. This led to embarking upon foreign borrowing and in turn the accumulation of external debt.

- ✓ Adverse exchange rate movements

Due to the inefficient exchange rate policies, Nigeria's exchange rate system was not flexible enough to adjust to fluctuations (upward and downwards movements) in the foreign exchange market which led to continuous external borrowing.

- ✓ Adverse interest rate movements.

Also the debt quagmire in Nigeria can be attributed to external borrowing at higher interest rates. This will in turn lead to high interest payments of external debt and as such rapid debt accumulation.

- ✓ Poor lending and inefficient loan utilization.

Also the government of Nigeria rather than invest into capital projects that will lead to the development of the economy and also amortize the nation's debts poorly utilized the foreign loans and as such led to continuous borrowing.

- ✓ Poor debt management practices.

In terms of debt sustainability and debt management, Nigeria has performed poorly. The lack of understanding of the nature, structure and magnitude of external debt has not allowed for the Nigerian economy to effectively meet her debt service obligations and manage the debt stock appropriately.

- ✓ Accumulation of arrears and penalties.

Also accumulation of trade arrears and penalties with foreign nations due to high interest payments on external debt has led to the astronomical rise in Nigeria's external debt profile.

2.3.8 SOURCES OF NIGERIA'S EXTERNAL DEBT

Paris Club

Is a cartel of creditor countries that came into existence in 1956? It does have a fixed number of members. Current members of the Paris club are United Kingdom, Germany, France, Italy, Netherland, Spain, Switzerland, Japan, United States American, Australia, Belgium, Denmark, Finland, Ireland, Australia, Canada, Norway, and Russia.

The London Club of Creditors

These creditors mainly grant uninsured and unguaranteed loans. Members of the club were crowned in 1976. They hold meetings concerning issues or problems of repayment.

Multilateral Creditors

They are International Institutions. They include:

ADB-African Development Bank

IBRD-International bank for Reconstruction and Development

IFC-International Finance Corporation

IDA-International Development Association

ECC-European Economic Community

Bilateral and Private Sector Creditors

These creditors usually grant loans for development purposes. Members are ECC (now European Union), The United States of America, The East European countries and Japan. White private sector creditors issue short-term loans and they are extended by commercial banks and individual foreign suppliers.

Promissory Note Creditors

These creditors grant uninsured trade loans, resulting mainly from trade arrears. In 1982 and 1983, Nigeria had trade arrears, these arrears were financed by promissory notes.

2.3.9 NIGERIA EXTERNAL DEBT SERVICING

The major challenges faced by the Debt Management office (DMO) is ensuring that a reasonable level of resources are earmarked for debt servicing to avoid the risk of default and to maintain conducive relations for debt relief negotiations with the creditors. Debt service payment to the World Bank is due every 15 days while ADB (African Development Bank) service payments occur frequently. The debts are not subject to debt relief or rescheduling and in case of default, they carry stiff consequences with sanctions coming 30 days after due date. The implications for default include:-

- i. Prohibition of borrower/guarantor from signing new loan or guarantee agreement with the bank ground.
- ii. Suspension of disbursement in respect of all Bank group loans granted to the borrower/guarantor.
- iii. Suspension of the granting of any new loans by the Bank Group to the borrower/guarantor.

The impositions of the above sanction adversely affect the credit worthiness of a country as well as access to further foreign credits and loans. It is therefore to be avoided by all means

A Paris Club: - Failure of debt service obligation will undermine Nigeria's effort to obtain substantive debt relief over the medium term coupled with the inability to benefit from normal credit facilities as Export credit agencies in Paris Club creditor countries seeking to import goods

and service are required to pay full 100% upfront, even against deliveries that will take several months and at times years.

B Bilateral: - Defaulters in this category incur penalty charges in the form of late interest, which are usually about 1-3% above the normal interest charged.

C London Club: - The consequences of defaulting are stiff as the instrument carry legal obligations e.g. if par bonds on promissory note payment is not received as at when due, creditor could acquire the assets of the Central Bank of Nigeria (CBN) and Nigerian National Petroleum Corporation (NNPC) anywhere in the world.

In order to facilitate the implement of a new debts service arrangement, the DMO has agreed with the debtors on the nation's external debt stock and debt service obligation so that levels of government and their agencies that contracted the loans would know their respective stock of debt and the required amount for servicing.

2.3.10 NIGERIA EXTERNAL DEBT RESCHEDULING AND RESTRUCTURING

Debt Rescheduling involves the postponement, extension and reordering of the repayment of the existing debt. An agreement between creditors (government authorities and the commercial banks acting as a group and the debtor to roll over payment due to the former from the later over a certain period and under new terms and conditions falls under either debt rescheduling or refinancing. This involves the provision of new money to replace maturing debt. The four element of restructuring are:

- ✓ Rescheduling of the principle of a part or all of an existing loan by postponing repayment i.e. rearranging maturities and grace period involves the rescheduling of the interest payment.
- ✓ Refinancing of an existing loan by raising fresh or complementary fund to meet existing obligation that is making provision for new credit's with proceeds to be used to repay outstanding loans.
- ✓ Restoring of trade-related bank credit lines.
- ✓ Persuading the financial community to restore inter-banks lines of credit to a certain minimum level.

2.4 EMPIRICAL FINDINGS

In 1983-1990 for Africa and south Saharan countries after excluding exports revenue growth Amaeteng and Amoako-Adu (2002) said that the empirical study depicts that there is a unidirectional and non-negative underlying relationship between external debt and GDP growth. Afxention and Serletis, 2004(a), argued that indebtedness have impacts on the economic activity of developing countries. It is also argued that if external loan are converted into capital and other necessary inputs, there will be development. On the other hand, if resources are mismanaged by borrowing countries, the economic development is negatively affected.

Studies on external debt revealed divergent views on the implication of external debt to the debtor country. Audu (2004) studied the impact of external debt on economic growth and public investment in Nigeria. His study concluded that debt servicing pressure in Nigeria has had a significant adverse effect on the growth process of the country. He added that Nigeria frequently diverts resources to take care of pressing debt service obligations instead of being allocated to

the development of infrastructures that would improve the well-being of the citizenry. Osinubi&Olaleru (2006) examined how the use of budget deficits as an instrument of stabilization leads to the accumulation of external debt with the attending effects on growth in Nigeria between 1970 and 2003. Their study concluded that if debt-financed budget deficits are operated in order to stabilize the debt ratio at the optimum sustainable level, debt overhang problems would be avoided and the benefits of external borrowing would be maximized.

Adepoju, Salau&Obayelu (2007) studied the effects of external debt management on sustainable economic growth and development in Nigeria. Their study concluded that though debt is an important resource needed to support sustainable economic growth; a huge external debt without servicing as it is the case for Nigeria before year 2000 constituted a major impediment to the revitalization of her shattered economy as well as the alleviation of debilitating poverty. Their study concentrated only on the management aspect of the external debt. However, according to the study carried out by Ayadi (2008), external debt has more positive impact on South African economy than Nigeria. His study concluded that external debt performs better in South Africa than Nigeria as it contributed positively to the growth of the South African economy. His study, however, did not bring out the impact on the component of economic growth and neglected the long run impact on the economic development.

Ndekwu (1996) examines the historical trend structures and growth of Nigerians public debt. He also reviews the debt policy for the purpose of a sound debt management policy. The study use analytical approach to arrive at reasonably conclusion. The gap left in this study is in the area of qualification of the effect of external debt causes on the movement of external debt indicators and the growth of the economy through empirical models. Despite gaps, it was concluded that excessive rate of government borrowing requirements arising from persistent and growing

budget deficit has largely caused Nigeria external debt crises sustainability of debt servicing, borrowing countries need to adopt efficient external debt management strategies. He observed that problem usually exist when more and more resources are deployed to serve the loan.

Essien (1998) examines the impact external debt has on economic growth. It is found that the degree of responsiveness of growth to external finance in Nigeria is elastic. The policy lesson from the study is that government should put in Place the appropriate debt management strategy which should include feasibility study of projects to be financed from external resource since the prospects of economic growth from-externally injected resources invested in productive ventures are very bright.

Batool and Zulfiqar (2012) appraised the determinants of External Debt in Pakistan. They noted that external debt is considered to be one of the symbols of an ailing economy. The reasons why financially weak countries have to take external debt are crystal clear, but what determines their debts is a matter that makes the position of one country different from the other. Economic freedom of a country is eclipsed by the clutches of external debt. They revealed that Pakistan is one of the countries that is under the stronghold of external debt by employing OLS regression technique on time series data for the period 1973-2010. The main determinants of the external debt considered are consumption, private investment, public investment, remittances, lending rate and a dummy variable for democracy. The findings indicated that consumption and private investment have positive and significant effects on external debt. Whereas Public investment and remittances show negative but significant relationship with external debt, Lending rate and democracy have positive but insignificant effects on external debt. They conclude that external debt is harmful for an economy so it should be minimized or avoided.

Skiod (2001) on his part found that there exists a debt overhang and crowding out effect of external debt on growth. Akinlo (2004) investigates the impact of foreign direct investment [FDI] on economic growth in Nigeria, for the period 1970 – 2000. The study made use of error correction modeling in investigating the relationship. The results of the study show that both private and lagged foreign capitals have small and not a statistically significant effect on growth. Also the results show that export has a positive and statistically significant effect on growth. The findings of the study suggest that there is the need for labour force expansion and education policy to raise the stock of human capital in the country. Most of the studies reviewed above studies the relationship between debt and economic growth, Private investment and growth. It is very clear from the literature that huge external debt negatively impact on foreign private investment but the direction of the relationship is yet to be explored. This study therefore intends to look at the direction of causation between external debt and foreign private investment in Nigeria.

Adegbite et al. (2008) in their study adopted the neoclassical growth model which incorporates external sector, debt indicators and some macroeconomic variables to examine the effect of Nigerian external debt on economic development and found among other things that there is a negative impact of debt (and its servicing requirements) on growth in Nigeria and that external debt contributes positively to growth up to a point after which its contributions become negative reflecting the presence of nonlinearity in effects. From the above, it is obvious that it is not the acquisition of external debt that is the major problem of economic growth especially in developing economies but the inappropriate application of such funds. Debt service payment reduces export earnings and other resource and therefore retards growth. The mechanism

through which external debt affects economic growth is through investment. Investment behavior is adversely affected by debt servicing, especially in heavily indebted economies.

Using macro-economic data for a panel of 100 developing countries over the period of 1980-2002 (which include per capital GDP measured at purchasing power parity, population growth, fiscal balance, investment, Aid, primary education, exports and import, terms of trade, inflation, domestic credit, urbanization, debt stock and institutional variables) covering 1984-1997, Presbitero (2004) found from his growth model regression that:

...The crowding out effect is due to debt service Payment, while the stock debt works in a more complex way, since it has generally a non-linear relation with investment and a strong negative effect on growth.

Akpan and Festus (1998), examine the determinants of private investment in Nigeria with particular reference to the effects of debt service burden. After carefully considering the theoretical and empirical argument concludes that external debt burden has contributed significantly to a decline in investment in Nigeria.

The empirical enquiry of Green and Villanueva (1991) covered twenty-three developing countries for the period of 1975 and 1987. It is evident from their quantitative estimates that the ratio of GDP and debt service ratio significantly affect private investment in the sampled countries. The works of Borenstein (1993), Serven and Solimano (1993), and Partor and Hilt (1993) which cover a number of developing countries for much of the 1980s, support the hypothesis that the debt crises was a major determinant of investment decline after 1982.

In conclusion, there are divergent views on external debt as given by the empirical findings, various researchers posits that there is a negative relationship between external debt and

CHAPTER 3 RESEARCH METHODOLOGY

The whole of economic theory can be viewed as a collection of relation among variables. The subject economic focuses on the testing of the theoretical prepositions embodied in these relations and on the estimation of the variable involves. The relationships of economic theory which can be measured with one or another econometric technique are causal, i.e they are relationship in which some variables are causes of the variation in other variables. Therefore, this study adopts econometric method of analysis in determining the impact of external debt on economic growth in Nigeria and also whether estimation of the parameters has theoretical meaningful and statistically significant.

3.1 SOURCES OF DATA COLLECTION

This research work which is an operational analysis of external debt dynamics and its impact on economic growth in Nigeria depends mainly on secondary data covering a period of 31 years i.e. 1981 – 2012 gotten from World Bank Statistical Database (WDI, 2014) which are time series data.

3.2 MODEL SPECIFICATION

Specification of econometric model is based on economic theory and on any valuable information relating to the phenomenon being studied.

All data collection for the purpose of the study will be evaluated, cross checked compared and critically analyzed. To gauge the relationship between the external debt and growth of the Nigeria economy, a simple open macro-economic debt growth model was applied. The functional relationship between the variable and proxies can be expressed as

$$\text{Real GDP} = f(\text{GEXP, EDS, GCF, DSP, EXCH}) \dots \dots \dots (1)$$

The model employed in the study includes the following.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + U \dots \dots \dots (2)$$

$$\text{That is, } Y = \beta_0 + \beta_1 \text{GEXP} + \beta_2 \text{EDS} + \beta_3 \text{GCF} + \beta_4 \text{DSP} + \beta_5 \text{EXCH} + U_t$$

Where:

Y = Real GDP

GEXP = Government expenditure

EDS = External debt stock

GCF = Gross capital formation

DSP = Debt service payment

EXCH = Exchange Rate

U_t = Stochastic error term

β₀ = constant

β₁, β₃, β₅ > 0, β₂, β₄ < 0 slope of the regression equation

3.3 ESTIMATION TECHNIQUES

The data collected will be tested and analyzed adopting the regression technique of ordinary least square method. Thus is a simple mathematical form, the relationship between the variables under consideration becomes.

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3.3.1. Apriori criteria

This refers to the supposed relationship between and or among the dependent or independent variables of the model as determined by the postulations of economic theory. The result or parameter estimates of the models will be interpreted on the basis of the supposed signs of the parameters as established by economic theory. Put differently, the parameter estimates of the model will be checked to find out whether they conform to the postulations of economic theory.

There is a positive relationship between Government Expenditure and Real GDP; there is positive relationship between External debt stock and Real GDP; there is a positive relationship between Real GDP and Gross Capital Formation; there is a positive relationship between Real GDP and Debt Service Payment; there is a positive relationship between Real GDP and Exchange Rate.

3.3.2 Statistical criteria: First order test

The theories of statistic prescribe some test of finding out how accurate the parameter estimates of a model are, these test help to suggest whether or not the parameter estimates of the model are accurate. It will tell us whether it's a good fit or not.

Such statistical criteria tests are:

T tests: The co-efficient of the model will be tested for significance using the t- test. The T testing procedure is based on the assumption that the error term U follows the normal distribution.

F test: The F test will be used to test the overall significance of the model

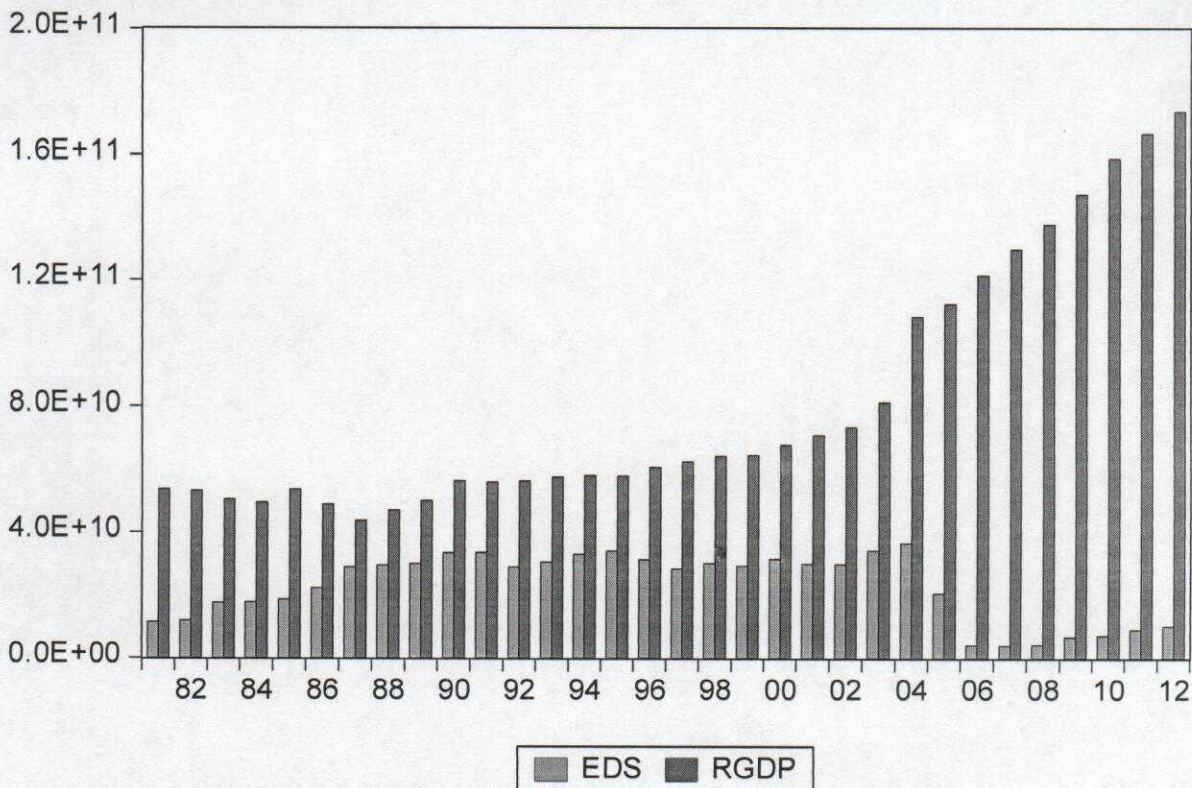
3.3.3 Econometric criteria: second order test

These are set by the theory of econometrics and are aimed at investigating whether the assumptions of the econometric method employed are satisfied or not. Thus, the assumptions of OLS will be investigated.

CHAPTER 4 DATA PRESENTATION AND ANALYSIS

4.0 Introduction

The study aim to examine the impact of external debt on economic growth in Nigeria, as such this section presents the data analysis, interpretation of results and discussion of findings. The chapter begins with the descriptive analysis of the variables, after which the trend analysis of the data is examined. Econometrics analysis for the study started with the stationarity test using the Augmented Dickey-Fuller and Phillips-Perron tests, after which the impact of the independent variables on the dependent variable was ascertained using the ARDL approach. Also the causal relationship existing among the variables were determined using the Toda-Yamamoto causality test.



The graph above depicts the trend of External debt and Real GDP from 1981 to 2012, the lower blue bars represents External debt, while the higher Red bars represents the Real GDP. We

observe that From 1982 to 2012 external debt impact on economic growth have the same level of effect, from 1983 up till 1985 then rises until 1991, after which it fell in 1992 and rises again till 1996 when it falls and then stabilizes till 2002 when it maintains an upward trend to 2004, after which it fell heavily from 2003 to 2007 and rose a bit from 2009 to 2012

4.1 Stationarity Test

Variables	Augmented dickey-fuller t-Statistics	P- Value	Phillips Perron t-statistics	P-value	Level of integration
DSP	-4.2008	0.0029	-3.962844	0.0224	I(1)
EXCH	-5.2354	0.0002	-5.226733	0.0011	I(1)
GEXP	-3.6157	0.0114	-4.298305	0.0100	I(1)
LEDS	-3.7788	0.0077	-3.567552	0.0501	I(1)
RGDP	-3.4850	0.0156	-5.190160	0.0012	I(1)
EDS	-4.2967	0.0022	-3.562001	0.0507	I(1)

Table 4.1 shows that DSP, EXCH, LEDS, EDS are integrated of order 1 and the result is significant at 1%. But GEXP and RGDP are integrated of order 1 and at 5% levels of significance.

4.2 ARDL Table Presentation of Regression Analysis (Least Square Method)

The main objective of a regression analysis is to show the impact of the independent (explanatory) variables on the dependent (explained) variable. Below is the result of the regression analysis.

Table 4.2 Result of the ARDL regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.81E+08	9.87E+08	0.284205	0.7804
D(DSP)	-86917857	3.46E+08	-0.251511	0.8051
D(EDS)	-0.131348	0.028084	-4.675238	0.0105
D(EXCH)	76269925	66364526	1.149257	0.2697
D(GEXP)	3.758433	0.568696	6.608856	0.0000
D(LGFCF)	9.38E+09	6.02E+09	1.558370	0.1015
D(RGDP(-1))	0.598207	0.217737	2.747385	0.0157
D(DSP(-1))	-2.28E+08	4.31E+08	-0.530207	0.6043
D(EDS(-1))	0.056403	0.199367	0.282908	0.7814
D(EXCH(-1))	-42076952	55326371	-0.760523	0.4596
D(GEXP(-1))	-2.225753	0.653182	-3.407553	0.0042
D(LGFCF(-1))	-1.03E+10	6.56E+09	-1.576770	0.1372
ECT(-1)	-0.861866	0.229991	-3.747387	0.0022
C	2.81E+08	9.87E+08	0.284205	0.7804
D(DSP)	-86917857	3.46E+08	-0.251511	0.8051

Source: Author's compilation

Adjusted R-squared 0.742866

Durbin Watson Statistics 1.958532

F-statistics 7.259556

Prob(F-statistics) 0.000406

Table 4.2 captures the impact of the explanatory variables on the explained variable using the general-specific approach; having specified on Auto regressive Distributed Lagged (1, 1) model. The regression result shows that a million increases in external debt stock will reduce economic growth by 0.13% holding other variables constant. Notice that the result is significant at 5% and supports the a priori expectations. This finding is in line with the works of Adepoju, Salau and Obayelu (2007), Batool and Zulfiqar (2012), Skoid (2001), Adegbite et al (2008). Also, GEXP, LGFCF, RGDP(-1), impacts positively on economic growth and the result is significant at 1% levels while D(GEXP(-1)) impacts negatively on economic growth at 1% levels of significance.

Note that a million naira increase in GEXP triggers off 3.75% increase in economic growth. The above supports the Keynesian theory. But a million naira increase in the lagged value of GEXP(-1) reduces economic growth by 2.22%. This might be as a result of sky-rocketing of the percentage of GEXP spent on recurrent expenditure. The President of the Federal Republic of Nigeria rejected the 2015 budget, pleading with the house to cut down on recurrent expenditure. The statistics in the result are favorable. The R² Adjusted is approximately 74% indicate that 74 percent of variations in the dependent variable is explained by the independent variable while only 26% of the variation in the dependent variable is explained by the stochastic term. This model is of good-fit as the value of the probability (F statistic) is less than 1%. The Durbin Watson (1.95) shows that the above result is free from first order serial correlation.

4.3 Johansen Co-integration Test table

Series: DRGDP DLGFCF DGEXP DEXCH DEDS DDSP

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace result)

Hypothesized No of CE (s)	Eigenvalue	Trace Statistic	0.05 Critical value	Probability**
None *	0.842168	123.4494	95.75366	0.0002
At most 1 *	0.656596	75.44767	69.81889	0.0166
At most 2	0.556113	47.65764	47.85613	0.0522
At most 3	0.489048	26.54080	29.79707	0.1134
At most 4	0.261175	9.082337	15.49471	0.3578
At most 5	0.045556	1.212273	3.841466	0.2709

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

All the variables specified in the ARDL(1, 1) model were integrated of order 1 as shown in the ADF test. This shows that there is a short-run dis-equilibrium, hence the need to ascertain whether or not these variables co-move in the long-run. Table 4.4 reports the Johansen Co-integration test that in the long-run, at least three variables co-integrate. This is captured in the trace test we thus establish that EDS and economic growth co-move in the long run.

Furthermore, the researcher computed the speed of adjustment (Error Correction Mechanism) using the Parsimonious ECM. This is computed by taking note of the value, sign and size of the lagged value of the residue (ECT(-1)). The coefficient of the ECT (-1) is negative and significant at 1%. The PECT show that it will take approximately 1.2 years for the short run disequilibrium to be cleared. This is clearly shown in table 4.2

4.4 Granger Causality Test

Granger causality test was conducted to show whether a variable cause another variable. Below is the result of the test and other results are shown in the appendix.

Excluded	Chi-Square	Df	Probabilty
RGDP does not Granger cause EDS	13.51098	2	0.0012
EDS does not Granger cause RGDP	2.252231	2	0.3243

Source: Author's compilation from eviews 7

Since it has been established that the independent variable (EDS) has an impact on the dependent variable (economic growth), it is paramount that the research ascertains the direction of causality. This is computed using the "Toda-Yamamoto Approach" in table 4.5 shows that the variables experience a uni-directional causality running from RGDP to EDS. Meaning that it is economic growth that causes EDS.

4.5 FINDINGS

The result of the stationarity test conducted using both the Augmented and Phillips-Perron stationarity tests. The result of the stationarity test showed all the variables to be integrated of order one. Table 4.2 contains the results of the ADRL estimation result, from the result we find that External debt stock impacts negatively on the economy this result seems to conform the with the classical stance that government borrowing constitutes a burden to the economy, the negative relationship between external debt and economic growth in Nigeria may be attributed to the fact borrowed resources were not efficiently invested in the economy. The result also reveals that government expenditure has a positive impact on the economic growth of Nigeria in the long run, this is as expected and both impacts are significant at 5% level. The result also reveals that government expenditure has a significant effect on the economic growth of Nigeria in the short run however this impact is negative but turns positive in the long run. The Error correction term (ECT) in the model is also negative and significant and its coefficient means that it will take 11 years for the ECT to correct the long run disequilibrium in the model. The model is of good fit given its R-squared value of 0.86 which means that about 86 percent of variations in RGDP is explained by the independent variables while the remaining 14 percent variation can be attributed to the stochastic term. The F-statistic value of 7.259556 is significant at 1% showing the overall significance of the model, also the Durbin-Watson value of 1.958532 means that there is absence of first order serial correlation among the variables in the model. After ascertaining that External debt and Government expenditure impacts on the economic growth of Nigeria, we went ahead to confirm the existence of long run relationship among the variables using the Johansen co-integration test, the result of the trace statistics reveal that three variables in the model co move in the long run. Finally from the result of the Toda Yamamoto causality test

conducted we found the existence of a unidirectional causation between external debt and Real GDP with the causation running from RGDP to EDS. These findings support the works of Adepoju, Salau and Obayelu (2007), Batool and Zulfiqar (2012), Skoid (2001), Adegbite et al (2008).

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter is focused on drafting an appropriate summary, conclusion as well as the due policy recommendation from the analysis of parameter estimates done in the previous chapter for the entire research work. In fact, this chapter is expected to reflect the main objective of the entire work in the summary and conclusions as well as designing appropriate and applicable suggestions for policy makers in this regard.

5.2 Summary of findings

The empirical analysis revealed a uni-directional causality running from RGDP to EDS. The ADF test shows that there is a short-run dis-equilibrium and that in the long run at least three variables co-integrate. This is captured in the trace test where we thus establish that EDS and economic growth co-move in the long run. Also the Granger causality test showed that external debt (LEDS) Granger causes economic growth (LRGDP) and economic growth (LRGDP) Granger causes external debt (LEDS). The regression analysis shows that $GEXP$, $LGFCF$, $RGDP$ (-1), impacts positively on economic growth and the result is significant at 1% levels while $D(GEXP (-1))$ impacts negatively on economic growth at 1% levels of significance.

5.3 CONCLUSIONS

This study empirically examined external debt dynamics and its impact on economic growth in Nigeria. This was done by examining the long run, short run and causal relationship between external debt and economic growth. This study carried out an econometric analysis to determine the impact of the explanatory variables on the dependent variable. The Real Gross Domestic Product is the Independent variable and was used as a proxy for Economic growth of Nigeria.

External Debt is the major independent variable in the model. Other independent variables are Debt service payment, Government Expenditure, and Exchange rate. This brought about a number of findings and these findings will provide the base for appropriate policy recommendations for managing the debt situation in Nigeria.

5.4 RECOMMENDATIONS

Based on the findings of this research study, the following recommendations are given:

External borrowings should be discouraged in Nigeria, this is because it appears to have adverse effect on the nation's economic growth, and since repayment of external loans constitute a form of capital flight which drains resources away from the economy, rather government should seek loans for its deficit financing internally this will mean taking idle resources from one sector and investing them in another sector all within the same economy. More so as servicing domestic debt can be seen as a form of plough into the economy.

Government should also ensure that loans are contracted for purely economic purposes and not for political and social expenditures that would not yield enough returns for the repayment of the loans.

Government should also ensure that borrowed funds are optimally utilized in the economy by investing the funds on the development of the nation's productive capacity and also they should ensure that borrowed resources are used for the economic development purposes for which they are obtained and not diverted into individual accounts as the reason why the country seems not to benefit from external borrowing can be attributed to the gross mismanagement of the borrowed funds as a result of high level of corrupt practices in the financial affairs of the country.

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APPENDIX

Appendix 1: Data Presentation

YEARS	RGDP	LEDS	EXCH	GEXP	EDS	DSP%EXP
1981	53813895882	10.05863507	0.617708175	1017547171	11445508000	0.790957191
1982	53247135432	10.07890871	0.673461262	1041308378	11992472000	1.10920584
1983	50557914890	10.2449446	0.724409851	1065069584	17576994000	0.841154667
1984	49535867647	10.2500126	0.766527449	1088829909	17783310000	1.622777273
1985	53658653551	10.2708041	0.893774083	1112591116	18655380000	0.800637771
1986	48961280055	10.34666149	1.754523004	1136352322	22215776000	0.994275295
1987	43697110039	10.46277055	4.016037344	1160112648	29024888000	1.128398048
1988	46992974188	10.47164549	4.536966667	1183873854	29624122000	0.387295909
1989	50032099653	10.47888379	7.364735	1207635061	30121999000	0.40920951
1990	56419202084	10.52425229	8.038285	1231395386	33438924000	0.83434822
1991	56070615712	10.52539735	9.909491667	1244442862	33527205000	1.884073686
1992	56313808190	10.46267816	17.298425	1280238404	29018714000	3.008954755
1993	57490979535	10.48764202	22.0654	1317295526	30735623000	4.153609985
1994	58014011388	10.51972677	21.996	1336098516	33092286000	7.377074556
1995	57835636305	10.53268359	21.89525833	1335317077	34094442000	14.67532707
1996	60723777678	10.49713362	21.884425	1373960863	31414751000	15.90144435
1997	62425413647	10.45434995	21.88605	1397722070	28467541000	10.62709744
1998	64120663262	10.48163911	21.886	1421483276	30313711000	5.099037325
1999	64424747541	10.46787474	92.3381	1445243601	29368025000	9.711178733
2000	67850915775	10.49943693	101.6973333	1469004808	31581804000	9.561868599
2001	70843863906	10.47758052	111.23125	1291569710	30031742000	11.96841781
2002	73525054914	10.47593593	120.5781583	1366210786	29918232000	11.80890929
2003	81137974801	10.53322101	129.22235	1039327910	34136659000	9.162958334
2004	1.0851E+11	10.56454011	132.888025	6917131148	36689358000	11.09153314
2005	1.12248E+11	10.31124357	131.2743333	7641277503	20475927000	11.89633904
2006	1.21465E+11	9.598163774	128.6516667	10373082381	3964275000	6.962237404
2007	1.29759E+11	9.573791355	125.8081083	16265056358	3747929000	6.803501856
2008	1.37895E+11	9.606679249	118.5460167	20171289986	4042772000	4.215709789
2009	1.47458E+11	9.830270497	148.9017417	20317239349	6765042000	4.565022452
2010	1.59018E+11	9.857741325	150.298025	22735820234	7206781000	..
2011	1.6679E+11	9.952443657	153.8616083	23775660455	8962799000	4.609622109
2012	1.73927E+11	10.00255084	157.4994258	23304435951	10058908000	6.304022028

Appendix 2: Unit Root Tests

Dependent variable: LGDP
 Method: Least Squares
 Date: 08/06/15 Time: 10:45
 Sample (adjusted): 1 32
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEDS	0.053662	0.086052	0.623598	0.5390
GEXP	8.66E-12	8.56E-12	1.011245	0.3224
EXCH	0.000305	0.000942	0.323230	0.7494
DSP	0.009266	0.005022	1.844940	0.0780
LGFCF	0.673834	0.106819	6.308202	0.0000
LPOP	1.407342	0.933933	1.506899	0.1454
TRD	-0.002188	0.001610	-1.359133	0.1873
C	-7.721776	8.106382	-0.952555	0.3507
R-squared	0.972714	Mean dependent var		10.70941
Adjusted R-squared	0.964409	S.D. dependent var		0.387686
S.E. of regression	0.073139	Akaike info criterion		-2.175281
Sum squared resid	0.123033	Schwarz criterion		-1.805219
Log likelihood	41.71685	Hannan-Quinn criter.		-2.054650
F-statistic	117.1314	Durbin-Watson stat		1.282294
Prob(F-statistic)	0.000000			

Dependent Variable: RGDP
 Method: Least Squares
 Date: 08/06/15 Time: 10:48
 Sample (adjusted): 1 32
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LEDS	6.32E+09	6.12E+09	1.033485	0.3117
GEXP	3.717298	0.280219	13.26567	0.0000
EXCH	1.74E+08	34217622	5.079791	0.0000
LGFCF	1.02E+10	5.48E+09	1.855548	0.0758
DSP	5.92E+08	3.14E+08	1.883976	0.0717
TRD	-28487193	75843418	-0.375605	0.7105
C	-1.17E+11	1.02E+11	-1.136855	0.2668
R-squared	0.984748	Mean dependent var		7.86E+10
Adjusted R-squared	0.980935	S.D. dependent var		3.79E+10
S.E. of regression	5.23E+09	Akaike info criterion		47.78844
Sum squared resid	6.56E+20	Schwarz criterion		48.11225
Log likelihood	-733.7209	Hannan-Quinn criter.		47.89400
F-statistic	258.2637	Durbin-Watson stat		1.213465
Prob(F-statistic)	0.000000			

Null Hypothesis: D(DSP) has a unit root

Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.200799	0.0029
Test critical values:		
1% level	-3.689194	
5% level	-2.971853	
10% level	-2.625121	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(DSP,2)
 Method: Least Squares
 Date: 08/06/15 Time: 10:50
 Sample (adjusted): 3 33
 Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DSP(-1))	-0.838892	0.199698	-4.200799	0.0003
C	0.239303	0.536216	0.446281	0.6591
R-squared	0.404308	Mean dependent var		0.085931
Adjusted R-squared	0.381397	S.D. dependent var		3.599178
S.E. of regression	2.830801	Akaike info criterion		4.987746
Sum squared resid	208.3493	Schwarz criterion		5.082903
Log likelihood	-67.82844	Hannan-Quinn criter.		5.016837
F-statistic	17.64671	Durbin-Watson stat		1.913502
Prob(F-statistic)	0.000276			

Null Hypothesis: D(EXCH) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.235377	0.0002
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(EXCH,2)
 Method: Least Squares
 Date: 08/06/15 Time: 10:58
 Sample (adjusted): 3 32
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
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D(EXCH(-1))	-0.987222	0.188567	-5.235377	0.0000
C	5.162260	2.758370	1.871489	0.0718
R-squared	0.494668	Mean dependent var	0.119402	
Adjusted R-squared	0.476621	S.D. dependent var	19.56891	
S.E. of regression	14.15712	Akaike info criterion	8.202653	
Sum squared resid	5611.873	Schwarz criterion	8.296066	
Log likelihood	-121.0398	Hannan-Quinn criter.	8.232536	
F-statistic	27.40917	Durbin-Watson stat	2.004822	
Prob(F-statistic)	0.000015			

Null Hypothesis: D(GEXP) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.615659	0.0114
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation
 Dependent Variable: D(GEXP,2)
 Method: Least Squares
 Date: 08/06/15 Time: 11:03
 Sample (adjusted): 3 32
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GEXP(-1))	-0.642375	0.177665	-3.615659	0.0012
C	4.71E+08	3.24E+08	1.454238	0.1570
R-squared	0.318287	Mean dependent var	-16499524	
Adjusted R-squared	0.293940	S.D. dependent var	1.92E+09	
S.E. of regression	1.61E+09	Akaike info criterion	45.30406	
Sum squared resid	7.28E+19	Schwarz criterion	45.39747	
Log likelihood	-677.5608	Hannan-Quinn criter.	45.33394	
F-statistic	13.07299	Durbin-Watson stat	2.112750	
Prob(F-statistic)	0.001165			

Null Hypothesis: D(LED5) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.778799	0.0077

Test critical values:	1% level	-3.670170
	5% level	-2.963972
	10% level	-2.621007

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LED5,2)

Method: Least Squares

Date: 08/06/15 Time: 11:05

Sample (adjusted): 3 32

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LED5(-1))	-0.677103	0.179185	-3.778799	0.0008
C	-0.001402	0.027360	-0.051255	0.9595
R-squared	0.337738	Mean dependent var		0.000994
Adjusted R-squared	0.314086	S.D. dependent var		0.180891
S.E. of regression	0.149814	Akaike info criterion		-0.894501
Sum squared resid	0.628440	Schwarz criterion		-0.801088
Log likelihood	15.41752	Hannan-Quinn criter.		-0.864618
F-statistic	14.27932	Durbin-Watson stat		1.859940
Prob(F-statistic)	0.000758			

Null Hypothesis: D(RGDP) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=7)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.485002	0.0156
Test critical values:		
1% level	-3.670170	
5% level	-2.963972	
10% level	-2.621007	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RGDP,2)

Method: Least Squares

Date: 08/06/15 Time: 11:08

Sample (adjusted): 3 32

Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-1))	-0.600695	0.172366	-3.485002	0.0016
C	2.52E+09	1.22E+09	2.062034	0.0486
R-squared	0.302533	Mean dependent var		2.57E+08
Adjusted R-squared	0.277623	S.D. dependent var		6.67E+09

S.E. of regression	5.67E+09	Akaike info criterion	47.81846
Sum squared resid	9.00E+20	Schwarz criterion	47.91188
Log likelihood	-715.2770	Hannan-Quinn criter.	47.84835
F-statistic	12.14524	Durbin-Watson stat	2.182517
Prob(F-statistic)	0.001639		

Dependent Variable: RGDP
Method: Least Squares
Date: 08/06/15 Time: 11:18
Sample (adjusted): 1 32
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGFCF	1.07E+10	5.82E+09	1.830398	0.0791
EDS	0.172669	0.181610	0.950767	0.3508
EXCH	1.68E+08	33181060	5.065134	0.0000
GEXP	3.709609	0.271073	13.68489	0.0000
DSP	5.52E+08	3.01E+08	1.835265	0.0784
C	-6.11E+10	5.91E+10	-1.034223	0.3109
R-squared	0.984506	Mean dependent var	7.86E+10	
Adjusted R-squared	0.981407	S.D. dependent var	3.79E+10	
S.E. of regression	5.16E+09	Akaike info criterion	47.73968	
Sum squared resid	6.67E+20	Schwarz criterion	48.01722	
Log likelihood	-733.9650	Hannan-Quinn criter.	47.83015	
F-statistic	317.7068	Durbin-Watson stat	1.160379	
Prob(F-statistic)	0.000000			

Phillips-Perron Test Equation
Dependent Variable: D(DSP)
Method: Least Squares
Date: 08/11/15 Time: 15:13
Sample (adjusted): 2 33
Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DSP(-1)	-0.260372	0.127462	-2.042746	0.0510
C	0.580283	0.978856	0.592817	0.5582
@TREND(1)	0.080783	0.067383	1.198870	0.2410
R-squared	0.133880	Mean dependent var	0.317929	
Adjusted R-squared	0.069723	S.D. dependent var	2.726165	
S.E. of regression	2.629410	Akaike info criterion	4.866036	
Sum squared resid	186.6725	Schwarz criterion	5.006155	
Log likelihood	-69.99053	Hannan-Quinn criter.	4.910861	
F-statistic	2.086753	Durbin-Watson stat	1.527733	
Prob(F-statistic)	0.143650			

Null Hypothesis: D(DSP) has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 12 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.962844	0.0224
Test critical values:		
1% level	-4.323979	
5% level	-3.580623	
10% level	-3.225334	

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

Residual variance (no correction)	7.437646
HAC corrected variance (Bartlett kernel)	2.607298

Phillips-Perron Test Equation
 Dependent Variable: D(DSP,2)
 Method: Least Squares
 Date: 08/11/15 Time: 15:15
 Sample (adjusted): 3 33
 Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DSP(-1))	-0.841330	0.204878	-4.106488	0.0004
C	0.350469	1.174499	0.298399	0.7679
@TREND(1)	-0.007094	0.066337	-0.106942	0.9157
R-squared	0.404580	Mean dependent var		0.085931
Adjusted R-squared	0.356947	S.D. dependent var		3.599178
S.E. of regression	2.886202	Akaike info criterion		5.058717
Sum squared resid	208.2541	Schwarz criterion		5.201453
Log likelihood	-67.82204	Hannan-Quinn criter.		5.102353
F-statistic	8.493595	Durbin-Watson stat		1.910766
Prob(F-statistic)	0.001532			

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

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.123328	0.5133
Test critical values:		
1% level	-4.284580	
5% level	-3.562882	
10% level	-3.215267	

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

Residual variance (no correction)	153.4134
HAC corrected variance (Bartlett kernel)	153.4134

Phillips-Perron Test Equation
 Dependent Variable: D(EXCH)
 Method: Least Squares
 Date: 08/11/15 Time: 15:17
 Sample (adjusted): 2 32
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCH(-1)	-0.226554	0.106698	-2.123328	0.0427
C	-7.132719	6.313894	-1.129686	0.2682
@TREND(1)	1.599564	0.701629	2.279785	0.0304

R-squared	0.156573	Mean dependent var	5.060701
Adjusted R-squared	0.096328	S.D. dependent var	13.70970
S.E. of regression	13.03267	Akaike info criterion	8.064561
Sum squared resid	4755.814	Schwarz criterion	8.203334
Log likelihood	-122.0007	Hannan-Quinn criter.	8.109798
F-statistic	2.598943	Durbin-Watson stat	1.866435
Prob(F-statistic)	0.092186		

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

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-5.226733	0.0011
Test critical values:		
1% level	-4.296729	
5% level	-3.568379	
10% level	-3.218382	

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

Residual variance (no correction)	183.9259
HAC corrected variance (Bartlett kernel)	183.7785

Phillips-Perron Test Equation
 Dependent Variable: D(EXCH,2)
 Method: Least Squares
 Date: 08/11/15 Time: 15:16
 Sample (adjusted): 3 32
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCH(-1))	-1.007842	0.192821	-5.226837	0.0000

C	1.848712	5.621729	0.328851	0.7448
@TREND(1)	0.207205	0.305360	0.678560	0.5032
R-squared	0.503142	Mean dependent var		0.119402
Adjusted R-squared	0.466337	S.D. dependent var		19.56891
S.E. of regression	14.29553	Akaike info criterion		8.252410
Sum squared resid	5517.776	Schwarz criterion		8.392530
Log likelihood	-120.7861	Hannan-Quinn criter.		8.297235
F-statistic	13.67072	Durbin-Watson stat		1.996871
Prob(F-statistic)	0.000079			

Null Hypothesis: GEXP has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-0.723334	0.9622
Test critical values:		
1% level	-4.284580	
5% level	-3.562882	
10% level	-3.215267	

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

Residual variance (no correction)	2.12E+18
HAC corrected variance (Bartlett kernel)	3.40E+18

Phillips-Perron Test Equation
 Dependent Variable: D(GEXP)
 Method: Least Squares
 Date: 08/11/15 Time: 15:19
 Sample (adjusted): 2 32
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEXP(-1)	-0.023452	0.056746	-0.413289	0.6825
C	-7.37E+08	6.20E+08	-1.187375	0.2451
@TREND(1)	98389065	45912251	2.142981	0.0409
R-squared	0.215105	Mean dependent var		7.19E+08
Adjusted R-squared	0.159041	S.D. dependent var		1.67E+09
S.E. of regression	1.53E+09	Akaike info criterion		45.23040
Sum squared resid	6.58E+19	Schwarz criterion		45.36917
Log likelihood	-698.0712	Hannan-Quinn criter.		45.27564
F-statistic	3.836785	Durbin-Watson stat		1.590189
Prob(F-statistic)	0.033679			

Null Hypothesis: D(GEXP) has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-4.298305	0.0100
Test critical values:		
1% level	-4.296729	
5% level	-3.568379	
10% level	-3.218382	

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

Residual variance (no correction)	2.14E+18
HAC corrected variance (Bartlett kernel)	2.42E+18

Phillips-Perron Test Equation
 Dependent Variable: D(GEXP,2)
 Method: Least Squares
 Date: 08/11/15 Time: 15:21
 Sample (adjusted): 3 32
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GEXP(-1))	-0.841961	0.200428	-4.200822	0.0003
C	-5.70E+08	6.34E+08	-0.899117	0.3765
@TREND(1)	72237401	38366198	1.882840	0.0705

R-squared	0.397407	Mean dependent var	-16499524
Adjusted R-squared	0.352770	S.D. dependent var	1.92E+09
S.E. of regression	1.54E+09	Akaike info criterion	45.24736
Sum squared resid	6.43E+19	Schwarz criterion	45.38748
Log likelihood	-675.7103	Hannan-Quinn criter.	45.29218
F-statistic	8.903178	Durbin-Watson stat	1.935048
Prob(F-statistic)	0.001072		

Null Hypothesis: LEDS has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.030804	0.5623
Test critical values:		
1% level	-4.284580	
5% level	-3.562882	
10% level	-3.215267	

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

Residual variance (no correction)	0.019158
HAC corrected variance (Bartlett kernel)	0.021863

Phillips-Perron Test Equation
 Dependent Variable: D(LED5)
 Method: Least Squares
 Date: 08/11/15 Time: 15:22
 Sample (adjusted): 2 32
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LED5(-1)	-0.185861	0.094176	-1.973563	0.0584
C	2.001772	0.990767	2.020427	0.0530
@TREND(1)	-0.005726	0.003194	-1.793044	0.0838
R-squared	0.153766	Mean dependent var		-0.001809
Adjusted R-squared	0.093321	S.D. dependent var		0.152952
S.E. of regression	0.145640	Akaike info criterion		-0.923588
Sum squared resid	0.593911	Schwarz criterion		-0.784815
Log likelihood	17.31561	Hannan-Quinn criter.		-0.878351
F-statistic	2.543885	Durbin-Watson stat		1.344032
Prob(F-statistic)	0.096576			

Null Hypothesis: D(LED5) has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 12 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.567552	0.0501
Test critical values:		
1% level	-4.296729	
5% level	-3.568379	
10% level	-3.218382	

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

Residual variance (no correction)	0.020595
HAC corrected variance (Bartlett kernel)	0.006140

Phillips-Perron Test Equation
 Dependent Variable: D(LED5,2)
 Method: Least Squares
 Date: 08/11/15 Time: 15:22
 Sample (adjusted): 3 32
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LED5(-1))	-0.704895	0.185478	-3.800433	0.0007
C	0.035235	0.060504	0.582369	0.5651
@TREND(1)	-0.002226	0.003271	-0.680638	0.5019
R-squared	0.348909	Mean dependent var		0.000994

Adjusted R-squared	0.300680	S.D. dependent var	0.180891
S.E. of regression	0.151271	Akaike info criterion	-0.844847
Sum squared resid	0.617839	Schwarz criterion	-0.704727
Log likelihood	15.67271	Hannan-Quinn criter.	-0.800022
F-statistic	7.234436	Durbin-Watson stat	1.844927
Prob(F-statistic)	0.003049		

Null Hypothesis: RGDP has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-0.287508	0.9874
Test critical values:		
1% level	-4.284580	
5% level	-3.562882	
10% level	-3.215267	

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

Residual variance (no correction)	2.09E+19
HAC corrected variance (Bartlett kernel)	2.10E+19

Phillips-Perron Test Equation
 Dependent Variable: D(RGDP)
 Method: Least Squares
 Date: 08/11/15 Time: 15:23
 Sample (adjusted): 2 32
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RGDP(-1)	-0.013472	0.047446	-0.283956	0.7785
C	-2.59E+09	2.06E+09	-1.257694	0.2189
@TREND(1)	4.70E+08	1.91E+08	2.454452	0.0206

R-squared	0.407965	Mean dependent var	3.87E+09
Adjusted R-squared	0.365676	S.D. dependent var	6.03E+09
S.E. of regression	4.81E+09	Akaike info criterion	47.51589
Sum squared resid	6.47E+20	Schwarz criterion	47.65466
Log likelihood	-733.4963	Hannan-Quinn criter.	47.56113
F-statistic	9.647232	Durbin-Watson stat	1.968774
Prob(F-statistic)	0.000650		

Null Hypothesis: D(RGDP) has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 3 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
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Phillips-Perron test statistic		-5.190160	0.0012
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

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

Residual variance (no correction)	2.15E+19
HAC corrected variance (Bartlett kernel)	1.92E+19

Phillips-Perron Test Equation
 Dependent Variable: D(RGDP,2)
 Method: Least Squares
 Date: 08/11/15 Time: 15:24
 Sample (adjusted): 3 32
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RGDP(-1))	-1.005813	0.193455	-5.199203	0.0000
C	-3.19E+09	2.04E+09	-1.565810	0.1290
@TREND(1)	4.39E+08	1.34E+08	3.269511	0.0029
R-squared	0.500351	Mean dependent var		2.57E+08
Adjusted R-squared	0.463340	S.D. dependent var		6.67E+09
S.E. of regression	4.89E+09	Akaike info criterion		47.55158
Sum squared resid	6.44E+20	Schwarz criterion		47.69170
Log likelihood	-710.2737	Hannan-Quinn criter.		47.59641
F-statistic	13.51897	Durbin-Watson stat		1.982146
Prob(F-statistic)	0.000086			

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

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-1.204646	0.6596
Test critical values:	1% level	-3.661661
	5% level	-2.960411
	10% level	-2.619160

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

Residual variance (no correction)	2.25E+19
HAC corrected variance (Bartlett kernel)	2.25E+19

Phillips-Perron Test Equation
 Dependent Variable: D(EDS)
 Method: Least Squares

Date: 08/11/15 Time: 16:29
 Sample (adjusted): 2 32
 Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EDS(-1)	-0.100022	0.083031	-1.204646	0.2381
C	2.28E+09	2.12E+09	1.074541	0.2914
R-squared	0.047656	Mean dependent var		-44729032
Adjusted R-squared	0.014816	S.D. dependent var		4.94E+09
S.E. of regression	4.90E+09	Akaike info criterion		47.52647
Sum squared resid	6.97E+20	Schwarz criterion		47.61899
Log likelihood	-734.6603	Hannan-Quinn criter.		47.55663
F-statistic	1.451173	Durbin-Watson stat		1.191887
Prob(F-statistic)	0.238079			

Null Hypothesis: D(EDS) has a unit root
 Exogenous: Constant, Linear Trend
 Bandwidth: 16 (Newey-West automatic) using Bartlett kernel

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-3.562001	0.0507
Test critical values:		
1% level	-4.296729	
5% level	-3.568379	
10% level	-3.218382	

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

Residual variance (no correction)	2.01E+19
HAC corrected variance (Bartlett kernel)	4.59E+18

Phillips-Perron Test Equation
 Dependent Variable: D(EDS,2)
 Method: Least Squares
 Date: 08/11/15 Time: 16:30
 Sample (adjusted): 3 32
 Included observations: 30 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EDS(-1))	-0.686840	0.184347	-3.725793	0.0009
C	1.80E+09	1.93E+09	0.929495	0.3609
@TREND(1)	-1.11E+08	1.05E+08	-1.058301	0.2993
R-squared	0.339787	Mean dependent var		18304833
Adjusted R-squared	0.290882	S.D. dependent var		5.62E+09
S.E. of regression	4.73E+09	Akaike info criterion		47.48700
Sum squared resid	6.04E+20	Schwarz criterion		47.62712
Log likelihood	-709.3050	Hannan-Quinn criter.		47.53183
F-statistic	6.947935	Durbin-Watson stat		1.685654

Appendix 3: Regressiontest

TABLE 4.2

Dependent Variable: D(RGDP)

Method: Least Squares

Date: 08/06/15 Time: 11:25

Sample (adjusted): 3 29

Included observations: 27 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.81E+08	9.87E+08	0.284205	0.7804
D(DSP)	-86917857	3.46E+08	-0.251511	0.8051
D(EDS)	-0.131348	0.028084	-4.675238	0.0105
D(EXCH)	76269925	66364526	1.149257	0.2697
D(GEXP)	3.758433	0.568696	6.608856	0.0000
D(LGFCF)	9.38E+09	6.02E+09	1.558370	0.1015
D(RGDP(-1))	0.598207	0.217737	2.747385	0.0157
D(DSP(-1))	-2.28E+08	4.31E+08	-0.530207	0.6043
D(EDS(-1))	0.056403	0.199367	0.282908	0.7814
D(EXCH(-1))	-42076952	55326371	-0.760523	0.4596
D(GEXP(-1))	-2.225753	0.653182	-3.407553	0.0042
D(LGFCF(-1))	-1.03E+10	6.56E+09	-1.576770	0.1372
ECT(-1)	-0.861866	0.229991	-3.747387	0.0022
R-squared	0.861543	Mean dependent var	3.49E+09	
Adjusted R-squared	0.742866	S.D. dependent var	6.15E+09	
S.E. of regression	3.12E+09	Akaike info criterion	46.86569	
Sum squared resid	1.36E+20	Schwarz criterion	47.48962	
Log likelihood	-619.6869	Hannan-Quinn criter.	47.05122	
F-statistic	7.259556	Durbin-Watson stat	1.958532	
Prob(F-statistic)	0.000406			

TABLE 4.4

Date: 08/06/15 Time: 11:34

Sample (adjusted): 4 29

Included observations: 26 after adjustments

Trend assumption: Linear deterministic trend

Series: DRGDP DLGFCF DGEXP DEXCH DEDS DDSP

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 *	0.842168	123.4494	95.75366	0.0002
At most 1 *	0.656596	75.44767	69.81889	0.0166
At most 2	0.556113	47.65764	47.85613	0.0522
At most 3	0.489048	26.54080	29.79707	0.1134

At most 4	0.261175	9.082337	15.49471	0.3578
At most 5	0.045556	1.212273	3.841466	0.2709

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.842168	48.00177	40.07757	0.0053
At most 1	0.656596	27.79003	33.87687	0.2234
At most 2	0.556113	21.11684	27.58434	0.2692
At most 3	0.489048	17.45846	21.13162	0.1514
At most 4	0.261175	7.870064	14.26460	0.3920
At most 5	0.045556	1.212273	3.841466	0.2709

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):

DRGDP	DLGFCF	DGEXP	DEXCH	DEDS	DDSP
3.88E-11	0.431250	-8.07E-10	-0.048523	-2.86E-10	-0.247085
3.34E-10	-8.597562	-7.00E-10	0.027399	4.65E-11	0.015517
-1.15E-12	1.006192	1.42E-10	-0.026577	2.19E-10	-0.473090
-1.59E-10	-5.643241	7.05E-10	0.072359	-6.46E-11	-0.232700
5.37E-11	-6.182775	2.46E-10	-0.065778	-3.96E-11	0.184951
1.98E-10	0.533569	9.04E-11	0.016499	-2.62E-11	0.039602

Unrestricted Adjustment Coefficients (alpha):

D(DRGDP)	68525436	-1.06E+09	-3.63E+08	-2.84E+08	-1.37E+09	-8.50E+08
D(DLGFCF)	-0.002135	0.033949	-0.018589	0.024993	0.034629	-0.011027
D(DGEXP)	7.48E+08	2.81E+08	-1.92E+08	-3.43E+08	-4.65E+08	-1.39E+08
D(DEXCH)	5.603413	-3.512501	8.752674	-1.478130	3.784765	0.108852
D(DEDS)	2.03E+09	-1.29E+09	-1.27E+09	1.59E+09	2.14E+08	-9442813.
D(DDSP)	1.586257	0.436270	1.542265	0.701739	-0.270640	0.036484

1 Cointegrating Equation(s): Log likelihood -1926.185

Normalized cointegrating coefficients (standard error in parentheses)

DRGDP	DLGFCF	DGEXP	DEXCH	DEDS	DDSP
1.000000	1.11E+10	-20.76127	-1.25E+09	-7.364187	-6.36E+09
	(2.9E+10)	(2.70435)	(3.1E+08)	(0.97677)	(1.6E+09)

Adjustment coefficients (standard error in parentheses)

D(DRGDP)	0.002662
	(0.04593)
D(DLGFCF)	-8.29E-14
	(9.6E-13)
D(DGEXP)	0.029055

	(0.01222)
D(DEXCH)	2.18E-10 (1.4E-10)
D(DEDS)	0.078937 (0.03110)
D(DDSP)	6.16E-11 (2.3E-11)

2 Cointegrating Equation(s): Log likelihood -1912.290

Normalized cointegrating coefficients (standard error in parentheses)

DRGDP	DLGFCF	DGEXP	DEXCH	DEDS	DDSP
1.000000	0.000000	-15.13530 (1.78224)	-8.48E+08 (2.1E+08)	-5.102529 (0.68175)	-4.43E+09 (1.1E+09)
0.000000	1.000000	-5.07E-10 (7.0E-11)	-0.036141 (0.00816)	-2.04E-10 (2.7E-11)	-0.173957 (0.04362)

Adjustment coefficients (standard error in parentheses)

D(DRGDP)	-0.351708 (0.38873)	9.15E+09 (9.9E+09)
D(DLGFCF)	1.13E-11 (7.8E-12)	-0.292796 (0.20048)
D(DGEXP)	0.122791 (0.10345)	-2.09E+09 (2.6E+09)
D(DEXCH)	-9.56E-10 (1.1E-09)	32.61542 (29.3800)
D(DEDS)	-0.352268 (0.24914)	1.20E+10 (6.4E+09)
D(DDSP)	2.07E-10 (2.0E-10)	-3.066786 (5.03787)

3 Cointegrating Equation(s): Log likelihood -1901.731

Normalized cointegrating coefficients (standard error in parentheses)

DRGDP	DLGFCF	DGEXP	DEXCH	DEDS	DDSP
1.000000	0.000000	0.000000	-6.38E+08 (5.4E+08)	4.878919 (1.55901)	-1.17E+10 (3.0E+09)
0.000000	1.000000	0.000000	-0.029106 (0.01807)	1.30E-10 (5.2E-11)	-0.416053 (0.09969)
0.000000	0.000000	1.000000	13880949 (3.7E+07)	0.659481 (0.10813)	-4.78E+08 (2.1E+08)

Adjustment coefficients (standard error in parentheses)

D(DRGDP)	-0.351289 (0.38766)	8.78E+09 (1.0E+10)	0.635875 (1.24180)
D(DLGFCF)	1.13E-11 (7.7E-12)	-0.311500 (0.19824)	-2.47E-11 (2.5E-11)
D(DGEXP)	0.123013 (0.10232)	-2.28E+09 (2.6E+09)	-0.827061 (0.32777)
D(DEXCH)	-9.66E-10 (9.1E-10)	41.42229 (23.5643)	-8.15E-10 (2.9E-09)
D(DEDS)	-0.350808 (0.22805)	1.07E+10 (5.9E+09)	-0.914858 (0.73052)
D(DDSP)	2.06E-10 (1.5E-10)	-1.514970 (3.97501)	-1.37E-09 (4.9E-10)

4 Cointegrating Equation(s): Log likelihood -1893.002

Normalized cointegrating coefficients (standard error in parentheses)

DRGDP	DLGFCF	DGEXP	DEXCH	DEDS	DDSP
1.000000	0.000000	0.000000	0.000000	1.790195 (0.30027)	1.21E+09 (5.7E+08)
0.000000	1.000000	0.000000	0.000000	-1.05E-11 (1.9E-11)	0.171198 (0.03626)
0.000000	0.000000	1.000000	0.000000	0.726708 (0.13792)	-7.58E+08 (2.6E+08)
0.000000	0.000000	0.000000	1.000000	-4.84E-09 (2.3E-09)	20.17635 (4.47410)

Adjustment coefficients (standard error in parentheses)

D(DRGDP)	-0.306089 (0.42823)	1.04E+10 (1.2E+10)	0.436031 (1.48119)	-43244898 (1.1E+08)
D(DLGFCF)	7.30E-12 (8.2E-12)	-0.452540 (0.22858)	-7.09E-12 (2.8E-11)	0.003336 (0.00210)
D(DGEXP)	0.177611 (0.10916)	-3.49E+08 (3.0E+09)	-1.068460 (0.37757)	-48280003 (2.8E+07)
D(DEXCH)	-7.31E-10 (1.0E-09)	49.76374 (27.8874)	-1.86E-09 (3.5E-09)	-0.707708 (0.25648)
D(DEDS)	-0.604247 (0.21026)	1.72E+09 (5.8E+09)	0.205702 (0.72724)	14746098 (5.4E+07)
D(DDSP)	9.38E-11 (1.6E-10)	-5.475055 (4.42417)	-8.71E-10 (5.5E-10)	-0.055229 (0.04069)

5 Cointegrating Equation(s): Log likelihood -1889.067

Normalized cointegrating coefficients (standard error in parentheses)

DRGDP	DLGFCF	DGEXP	DEXCH	DEDS	DDSP
1.000000	0.000000	0.000000	0.000000	0.000000	8.12E+09 (1.6E+09)
0.000000	1.000000	0.000000	0.000000	0.000000	0.130792 (0.02759)
0.000000	0.000000	1.000000	0.000000	0.000000	2.05E+09 (4.2E+08)
0.000000	0.000000	0.000000	1.000000	0.000000	1.489575 (1.73741)
0.000000	0.000000	0.000000	0.000000	1.000000	-3.86E+09 (8.4E+08)

Adjustment coefficients (standard error in parentheses)

D(DRGDP)	-0.379553 (0.41529)	1.88E+10 (1.3E+10)	0.099191 (1.44745)	46804820 (1.3E+08)	-0.076218 (0.41003)
D(DLGFCF)	9.16E-12 (7.7E-12)	-0.666646 (0.24749)	1.43E-12 (2.7E-11)	0.001058 (0.00238)	-4.87E-12 (7.6E-12)
D(DGEXP)	0.152659 (0.10230)	2.53E+09 (3.3E+09)	-1.182869 (0.35654)	-17694216 (3.1E+07)	-0.202623 (0.10100)
D(DEXCH)	-5.28E-10 (9.6E-10)	26.36339 (30.6612)	-9.25E-10 (3.3E-09)	-0.956661 (0.29427)	9.98E-11 (9.4E-10)
D(DEDS)	-0.592757 (0.21158)	3.99E+08 (6.8E+09)	0.258382 (0.73744)	662669.4 (6.5E+07)	-1.030164 (0.20890)
D(DDSP)	7.93E-11	-3.801748	-9.38E-10	-0.037427	-1.30E-10

(1.6E-10) (5.09682) (5.5E-10) (0.04892) (1.6E-10)

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

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-2.225061	0.4595
Test critical values:		
1% level	-4.296729	
5% level	-3.568379	
10% level	-3.218382	

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

Residual variance (no correction)	6.222418
HAC corrected variance (Bartlett kernel)	7.713220

Appendix 4: Causality Test

TABLE 4.3
 VAR Granger Causality/Block Exogeneity Wald Tests
 Date: 08/06/15 Time: 11:28
 Sample: 1 33
 Included observations: 30

Dependent variable: EDS

Excluded	Chi-sq	df	Prob.
RGDP	13.51098	2	0.0012
All	13.51098	2	0.0012

Dependent variable: RGDP

Excluded	Chi-sq	df	Prob.
EDS	2.252231	2	0.3243
All	2.252231	2	0.3243