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# The Impact of Foreign Direct Investment (FDI) on the Growth of the Nigerian Economy

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## ABSTRACT

The study examined the impact of Foreign Direct Investment (FDI) on the growth of the Nigerian economy, using time series data from 1981 to 2013. The study employed secondary data such as Financial Reviews of Central Bank of Nigeria (CBN), and/or National Bureau of Statistics (NBS). The paper explored various econometrics and statistical analytical (.i.e., Eview 7.2) method to examine the relationship between FDI and economic growth. The paper tested different diagnostic tests of Nigeria's time series data. The entire tests rejected the null hypothesis and accepted the alternative hypothesis. From the empirical result findings, it was discovered that there is a significant relationship between FDI and/or economic growth in Nigeria. The results corroborated with the Harrod-Domar model which proved that the growth rate of national income will directly be related to saving ratio and/or investment (i.e. the more an economy is able to save-and—invest-out of given GNP, the greater will be the growth of that GDP). The study recommended that government should embark on the policies of free-trade and removal of trade barrier, etc, since openness (net export) of the economy has a direct relationship with Nigerian economic growth, management of foreign exchange market and reduction of inflationary pressure, and improve on the macroeconomic indices, hence economic stability and growth.

**Keywords:** FDI, Investment, Exchange Rate, Growth.

## INTRODUCTION

The idea of Foreign Direct Investment (FDI) and trade is an old phenomenon. This idea has been coined since the era of two great political economists (.i.e. Adam Smith, 1776 and David Ricardo, 1817, Haberler, 1959) as cited by (Shuaib, 2011). These duo economists maintained that international trade or free trade (Globalization) or economic liberalization is beneficiary and/or surging the world output, so long as each of the countries specializes in the production of goods, she has absolute advantage or comparative advantage/cost and import that she has absolute disadvantage or comparative disadvantage (*ibid*.).

The quest to accelerate the pace of economic growth and development, which had been experiencing sluggishness in many countries, especially the less developed countries (LDCs) or emerging countries propelled them to make calculated efforts to attract Foreign Private Investments or investors (FPIs) on the one hand. Beside, the former, is the unprecedented economic fisticuffs and/or severe economic crises that engrossed the most developing countries of Africa (including Nigeria) in the past three decades on the other (*loc. cit*). These crises manifested in various ways, which culminate into persistent macroeconomic variables imbalances-such as: widening saving-investment gap, high rates of domestic inflation, chronic balance of payment problems, double digit inflation, high interest, low domestic investment, high both domestic and external debt ratios, huge budget deficit, all these have inverse relationship with economic growth as manifested in Gross Domestic Product (Akpokodge, 1998, Ayanwale 2007; Onu, 2012).

Nigeria is one of the highest recipients of FDI in African Countries, but the pros of FDI have not been felt in the *per se* country. In terms of employment generations, corporate social responsibility, increment in domestic investments, improvement of the exports, etc. Due to the fact that investment determines the rate of accumulation of physical capital (otherwise called capital formation), it then

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becomes a necessary factor in the growth of productive capacity of the nation and contributes to growth generally. As regards this, prominence is being attached to increasing the magnitude of real asset investment in the economy. Though, global Foreign Private Investment flows have been on the rise, what goes to Africa is less than 3% of the total and the least developed countries get under 2% (Todaro & Smith, 2006; Shuaib, 2011).

Over several past decades, the economies of the world have become increasingly dependent (linked), through expanded international trade in services as well as primary and manufactured goods, through portfolio investments such as international loans and purchases of stock, and through Foreign Private Investment, especially on the part of large multinational corporations. Developing countries are importing and exporting more from each other as well as from the developed countries and some parts of the developing world, especially East Asia but notably Latin America. More investments have poured in from developed countries such as the United States, the United Kingdom and Japan. (Todaro & Smith, 2006).

FDI inflows in African Countries has risen substantially over the years, it stood at 78% in 2013 as against 47% in 2005. The growth rate is surged up by cross border Merger and Acquisitions (M & As) of firms, which reflected strategically choices by Multinational Corporations (MNCs) following increased corporation profits and high commodities to gain an access to national resources and generally favourably policy stance for Foreign Domestic Investment (FDI) in these regions (developing and transitional)—(World Bank, 2006; Todaro & Smith, 2006, Omankhanlen, 2011).

FDI has recently been acknowledged as potent source of improving efficiency of the productive sectors through competition, stimulation of economic progress, creation of jobs and fostering of growth in the host economies. However, inspite of the genuine desire and efforts by the LDCs to attract the much needed foreign investment, a number of factors render them unattractive. Some of the factors include heavy debt burden which has eroded confidence in developing countries as well as low credit worthiness. Others are recession and persist macroeconomic and political instability which have further agravitated the perception of foreign investors, (Ayanwale, 2007).

FDI has a direct relationship economic growth, besides, is viewed as stimuli for economic growth in developing countries—such as Nigeria, as it were able to curtailing the problem of dearth of financial resources, technology and skills (Asiedu, 2002). FDI plays a marginal role in global businesses and/or provides firms with new markets and marketing channels, cheaper production facilities, access to new production facilities, access to new technology, product, skills, financing, etc (Uremadu, 2006). In addition, the FDI entrenches much more than the simple transfer of capital or the establishment of local factory in developing nations. Multinationals carry with them 'technology of production, tastes and styles of living, managerial philosophies and diverse business practices, including cooperative arrangements, marketing restrictions, advertising and transfer pricing'( *ibid.,).*

Trade (predominantly agricultural sector) was an engine to economic growth in Nigeria in the 19$^{th}$ and 20$^{th}$ centuries, which evidenced on the GDP. It has acted as an engine of growth for particular national economies. This has been argued that though trade is an engine of growth, but it has been in favour of developed countries, in the sense that the less-developed or emerging countries' produces are centrally on primary (raw materials) goods. To further the pains, the developed economies after the second World War had developed synthetic devices (which enable them to warehouse produces from emerging countries for a long period of times without any iota of deterioration or fading out) as a substitute for natural raw materials and/or other technological advances or robot leading to the reduction in the raw material contents of industrial products (Iyoha, 1996; Oke, 2007; Uremadu, 2006).

Nigerian economy beside China economy is the second largest recipient of FDI for many decades (.i.e., 1950s to late 2009), when the insecurity of lives and properties were being threatened by the dreadful sects (.i.e., Niger-Delta Militias and Boko Haram). These consequences of this insecurity have drained or depleted the FDI coffers in Nigeria. In lieu of the above, some of the expatriates returned to their various countries and while, others relocated from the absolutely unsecured community to relatively secured community. From the above excerpt, the researcher deduced that insecurity has an inverse relationship with economic growth of Nigeria (Ahmed, 2013).

Nigerian governments, in recognizing the relevance of FDI, have been pursuing various strategies involving incentive policies and regulatory measures geared essentially towards the promotion of the

inflow of FDI to the country. FDI is considered as a strategic instrument for economic growth (Onu, 2012).

In this paper efforts will be garnered to ascertain the relationship between FDI and economic growth and/or its impediments that may make not to be effective as expected.

## LITERATURE REVIEW

Multiple and robust research works both theoretically and/or empirically are available in academic circle and/or businessmen's milieu. For more three decades, the emerging economies had been facing slow and sluggish economic growth and development even though with their abundant natural (human and non human) resources. These economies suffered setbacks, exploitation and exploration of the available resources. Actually a messiah was needed to redeem these economies.

Foreign Direct Investment (FDI) is a new phenomenon in modern economic growth theory. And this phenomenon actually gained enormous ground immediately after the Second World War in an attempt for Europe countries to diversify or extend the scope of their investments to underdeveloped countries where they could reap excess profit and/or repatriate the surplus or profit to the parental countries without thinking of the development of the recipient countries (Jhingan, 2006; Todaro and Smith, 2006). FDI was actually needed in Nigeria as a complement to the domestic firms—since it helped in terms of job creation for the teeming unemployed youths and reducing poverty. In this regard, Oyaide (1979) averred the direct employment generation by FDI depended on several factors, such as the nature of the investment e.g. Green-field sites, joint venture or merger and acquisition, trade and industrialization policies and labour market institutions of the host country. He further explained that employment generation is normally higher in green-field FDI.

FDI has enabled Research and Development (R & D) to take place in Nigeria such as, new method (s) of production, transfer of modern technology to recipient community. On the other hand, the endogenous school of thought opined that FDI also influences long-run variables such as research and development (R & D) and human capital development (Oke, 2007; Momoh, 2010). Shuaib (as cited in Borensztein *et al*, 1998; Sjoholm, 1999) opined that through technology transfer to their affiliates and technological spillovers to unaffiliated firms in host economy, Transnational Corporations (TNCs) can speed up development of new intermediate product varieties, raise the quality of the product, facilitates international collaboration on R&D, and introduce new forms of human capital development (*op. cit*). FDI also contributes to economic growth via technology transfer. TNCs can transfer technology either directly (internally) to their Foreign Owned Enterprises (FOE) or indirectly (externally) to domestically owned and controlled firms in the host country. TNCs may have an inverse impact on the direct transfer of technology to the FOEs, however, and thereby reduce the spillover from Foreign Private Investment in the host country in several ways. They can provide their affiliate with too few or the wrong kind of technological capabilities, or even limit access to the technology of the parent company. The transfer of technology can be prevented if it is not consistent with the TNC's profit maximizing objective and if the cost of preventing the transfer is low (UNCTAD, 1999; Lim, 2001; Smarzynska, 2002; Carkovic and Levine, 2002).

The engross of Shuaib (as cited in Edozien, 1968) is on the linkages generated by FI and their impact on Nigeria's economic growth and development. Specifically, He contended further that foreign investment encourages the flow of capital, technical know-how and managerial capacity which interactively will accelerate the pace of economic development, while attenuating the pains and uncertainties that lauded with it. Furthermore, he observed that FDI could be counter-productive if the linkages they spurred are neither needed nor affordable by the host country. He however, suggested that a good test of the impact of such investment on Nigeria's development is how rapidly and effectively it fosters local enterprises to innovation. In line with the above, Shuaib (as cited in Oyaide, 1979) concluded, using indices of dependence and development as mirror of Nigeria's economic performance, that Direct Foreign Private Investment (DFPI) engineers both economic dependence and economic development. In his view, DFPI continuously caused and catalyzed a level of development that would have been impossible without such investment albeit, at the cost of economic dependence.

FDI has resulted to human capital development in Nigeria due to local and foreign training, etc., the level of economic development may not be the main enabling factor in FDI growth nexus. On the other hand, the endogenous school of thought opined that FDI also influences long-run variables such

as Research and Development (R & D) and human capital Shuaib (as cited in Romer, 1986; Lucas, 1988).

Shuaib (as cited in Borensztein, *et al,* 1998; Balasubramanyan *et al.* 1996)) also found that the interaction of Foreign Private Investment and human capital had important effect on economic growth, and suggested that the differences in the technological absorptive ability may explain the variation in growth effects of FPI across countries. They suggested further that countries may need a minimum threshold stock of human capital in order to experience positive effects of FDI. And also reported positive interaction between human capital and FDI. The neoclassical economists argued that FPI influences economic growth by increasing the amount of capital per person. However, because of diminishing returns to capital, it does not influence long-run economic growth (Adofu, 2010).

FDI results to excess reserved revenue (.i.e. external reserve) for the recipient countries via openness in the economy. Shuaib, Ekeria & Ogedengbe, (2015) empirically examined the impact of globalization on the growth of Nigerian economy using times-series data from 1960 to 2010. The paper utilized secondary data and various econometrics and/or statistical packages analytical (View 7.2) method were explored to examine the link between the econometrics variables and their impact on the growth of Nigerian economy. The paper tested the stationarity, cointegration of Nigerian's time series data and used error correction mechanism to determine the long run and short run relationship among the variables examined. The results of the findings supported the Obadan's findings which proved that growth of external debt ratio was an inversely related to economic growth in Nigeria. One indicator of openness is the relative size of the export sector. Singh and Jun (1995) indicated that exports, particularly manufacturing exports, are significant determinants of FDI flows, and their study provided strong evidence that exports precedes FDI flow. In Nigeria, though manufacturing exports may not be major determinants of FDI inflow, non-market seeking FDI is attracted to the extractive sector dominated by activities of the petroleum sub sector. The ODI (1997:2) reported that among low-income countries in 1995, Nigeria was the second largest FDI recipient, next only to China. Asiedu (2002: 8) noted that the impact of openness on FDI depends on the type of investment. Market-seeking and non-market seeking Foreign Private Investment are expected to respond differently to openness of a host economy. He further explained that when investments are market-seeking, trade restrictions (and therefore less openness) can have a positive impact on FPI. The reason stems from the "tariff Jumping" hypothesis, which argues that foreign firms that seek to serve local markets may decide to set up subsidiaries in the host country if it is difficult to import their products to the country.

Inflation is recognized among the banes to the free flow of FDI, Obadan (1994) also noted the high inflation rate reduces international competitiveness of exports, foreign exchange earnings and puts pressure on current account and exchange rates. In short, high inflation rates may be considered as indicator of macroeconomic instability and a country's inability to control macroeconomic policy, both to which contribute to an adverse investment climate. Shuaib, Ekeria & Ogedengbe, (2015) examined the impact of inflation rate on the economic growth in Nigeria. The study explored secondary data for the period of 1960 to 2012 and used E-view 7.2 statistical window in processing and analyzing the time series data. The empirical result of the test showed that for the periods, 1960-2012, there was no co-integrating relationship between Inflation and economic growth for Nigeria data. Furthermore, we examined the causality relationship that exists between the two variables by employing the Pairwise-Granger causality at two lag periods.

Ainabor, Shuaib and Kadiri, (2014) examined the impact of capital formation on the growth of Nigeria using time series data from 1960 to 2010. The paper applied Harrod–Domar model to Nigerian growth model and tested if it has a significant relationship with Nigerian economy. The paper explored various econometrics and statistical analytical method to examine the relationship between capital formation and economic growth. The paper tested the stationarity and co integration of Nigeria's time series data and used an error correction mechanism to determine the long-run relationship among the variables examined. The paper reviewed the literature and discovered that Harrod-Domar model has scarcely been used to test the relationship between capital formation and economic growth. The empirical study found that the data were stationary and co integrated and showed that there is a significant relationship between capital formation and economic growth in Nigeria. The results supported the Harrod-Domar model which proved that the growth rate of national

income will directly be related to saving ratio and capital formation (i.e. the more an economy is able to save-and invest-out of given GNP, the greater will be the growth of that GDP).

FDI leads to infrastructural development in the recipient country. Shuaib (as cited in ODI, 1997) asserted that infrastructure covers many dimensions, ranging from roads, ports, power generations, railways and telecommunication systems to institutional development (e.g. accounting, legal services etc). Thus, both social and economic (including financial) infrastructures are relevant to our definition. Though views differed on whether poor infrastructure is a minor or major incentive, majority view held that poor infrastructure is a major disincentive. Surveys in sub-Saharan Africa indicated that poor accounting standards, inadequate disclosure and weak enforcement of legal obligations have damaged the credibility of financial institutions to the extent of deterring foreign investors. Bad roads, delays in shipment of goods at ports and unreliable means of communication have added to these disincentives.

Shuaib and Kadiri, (2012) examined the impact of Information and Communication Technology (ICT) on the Growth of the Nigerian Economy using annual time series data from 1970 to 2010. The basic variables of concern derived from the literature review are: real gross domestic product proxied as economic growth, ICT proxied as telecommunications (TELCOM), enrolments into Tertiary (TSE), Secondary (SSSE) and Primary (PSE) on educational institutions was used as proxied for human development. With the aid of statistical package (E-views, version 3.1); the model was estimated using annual time series data from 1970 to 2010. The paper employed stochastic characteristics of each time series by testing their stationarity using Augmented Dickey Fuller (ADF) and Phillip Perron (PP) tests, including cointegration tests and Vector Autoregressive Measure. Empirical results revealed that there is, indeed a long-run relationship among government expenditure on education, human capital development proxied as tertiary school enrolments, Secondary school enrolments and Primary school enrolments and economic growth in Nigeria. All the variables have short and long run relationship with each other as revealed by Johansen cointegration. From the Findings, it was revealed that there is a feedback mechanism between ICT and economic growth in Nigeria (Aluyor & Shuaib, 2013).

Political instability as examined is one of the banes of FDI, Agarwal (1980) clarified the determinants of FPIs using two political factors, political instability and threat of nationalization, in conjunction with a variety 169 of economic factors such as: investment incentives; the size and growth of the recipient's market; its degree of economic development proxied by infrastructure; market distance and economic stability in terms of inflation; growth and balance of payments; in his extensive survey of the literature on the determinants of FDI, he found mixed evidence with respect to impact of political instability.

Onu (2012) investigated the impact of foreign direct investment (FDI) on Economic Growth in Nigeria within the period 1986-2007. The objective of this paper is to assess the impact of FDI on Economic Growth in Nigeria within the period under review. The paper employed multiple regression models to determine the impact of some external or macro variables on the gross domestic product (GDP) proxy for economic growth in Nigeria. The paper used time series data to ascertain the inflow of FDI to the Nigerian economy and its implications on economic growth. The study found that FDI has the potential to positively impact upon the economy though its contribution to GDP was very low within the period under review. The multiple regression results also revealed that FDI, government tax revenue (GTR) and savings exerted positive but not significant impact, except savings, on GDP during the study period. However, foreign exchange and public expenditure on education (PEE) had inverse relationship with GDP. The study concluded that FDI induced the inflow of capital, technical know-how and managerial capacity which can stimulate domestic investment and accelerate the pace of economic growth.

Considering the crucial role of FDI, Shuaib, Ekeria and Ogedengbe (2015) examined balance of payments: Nigerian Experience: 1960-2012 using time series data from 1960-2012. The study explored secondary data from the Central Bank Statistical Bulletin for the period of 1960 to 2012 and used various econometric analyses and/or statistical analytical (E-view 7.2) method to examine the relationship between balance of payments and economic growth. The paper tested the stationary—through Group unit root test. The co-integration technique employed in this study is Engle and Granger, (1987) approach in assessing the co-integrating properties of variables, especially in a

multivariate context to determine the long-run relationship among the variables examined. Further effort was made to check the causality relationship that exists between the two variables by employing the Pairwise-Granger causality at one lag period. From the result of empirical findings, it was discovered that in table 3 there was unidirectional from RGDP to BOP, EXCH, EDR, and from EDR to FTD and bidirectional causality only between EDR to EXCH.

Ayanwale (2007) identified three sets of influences on FDI to include: (i) market factors such as the size and growth of the market measured by the Gross National Product (GNP) of the recipient country; (ii) cost factors such as the availability of labour, low labour costs and inflation; and (iii) the investment climate as measured by the degree of foreign indebtedness and state of balance of payments. While, Oyejide (2005) as well as Akinlo (2004), also found a statistical relationship between FDI and market demand as measured by per capita GDP (GNP) of some developing countries. Obadan (1994) submitted that with the presence of large external debt burden also reducing investment activities. This is because the higher debt service payment associated with a large external debt reduces the funds available for investment. He furthered its importance as the center piece of the investment environment derive from the argument that a sustained exchange rate misalignment in terms of overvaluation or undervaluation, is a major source of macroeconomic disequilibria which spells danger for investment. Shuaib (as cited in Essien and Onwioduokit, 1999) confirmed that there is long run equilibrium relationship between FPI flow to Nigeria and variables such as credit rating, debt service, interest rate differential, nominal effective exchange rate and real income.

FDI was encouraged to invest in other key areas beside the oil industry or communication sector, banking industries, etc. Shuaib (as cited in Oseghale & Amenkhienan, 1987) examined the relationship between oil exports, foreign borrowing and direct foreign investment in Nigeria. On the one hand, and the impact of these sectoral performance, on the other. They surmised that foreign borrowing and FDI impacted negatively on the overall GDP but positively on three main sectors (.i.e. manufacturing, transport and communication, and finance and insurance). Shuaib (as cited in Olaniyi 1988) investigated the impact of direct investment to ascertain its overall contribution to the enhancement of the domestic savings capacity in Nigeria. His model of domestic savings and investment financing in Nigeria empirically tested the impact of FDI on the level of domestic savings and investment. His result conformed that domestic savings is far more relevant in determining investment growth than foreign capital inflows in Nigeria. At best, the latter complements the former. This view has also been corroborated by the works of Uremadu (2006) & Adegbite and Owuallah (2007). Ariyo (1998) studied the investment trend and its impact on Nigeria's economic growth over the years. He found that only private domestic investment consistently contributed to the raising GDP growth rates during the period considered (1970-1995) or (1960-2013). Furthermore, here is no reliable evidence that all investment variables included in his analysis have any perceptible influence on economic growth. He therefore suggested the need for an institutional rearrangement that recognizes and protects the interest of major partners in the contributions of the economy. Shuaib, Ekeria and Ogedengbe, (2015) examined the impact of fiscal policy on the growth of the Nigerian economy using time series data from 1960-2012. The study explored secondary data from the Central Bank Statistical Bulletin for the period of 1960 to 2012 and used various econometric analyses and/or statistical analytical (E-view 7.2) method to examine the relationship between fiscal policy and growth. The paper tested the stationarity—through Group unit root test, and stationarity found at first differenced at 5% level of significance. Factor method, Goodness-of- fit summary, VAR and its properties were tested. Also, the Co-integration Technique and Pairwise-Granger Causality were employed in this study to test and determine the long-run relationship among the variables examined. From the result of the empirical findings, it was discovered that fiscal policy has a direct relationship with growth.

In the study of the determinants of FDI in Nigeria, Shuaib (as cited in Anyanwu, 1998; Jerome & Ogunkola 2004) assessed the magnitude, direction and prospects of FPI regime in Nigeria. They noted that while the FDI regime in Nigeria was generally improving, and/or some serious deficiencies remain. Despite the rationales behind FDI, particularly those that are on the side of the developing countries, some studies have revealed that developing countries should be cautious about taking too uncritical an attitude toward the benefits of FDI. It is sometimes feared whether FDI contributed to the broader aspect of development and the distribution of income in host economies. Likely reasons for caution are better examined within the framework of the link between FDI and economic growth.

Umo (2007) observed that Nigeria's external trade (exports and imports) constitutes a substantial component of her GDP and both exports and imports have grown explosively over the last four decades. He furthered the work by saying that a good proportion of the import trade of Nigeria is on non-oil items---such as foods, raw materials, capital goods, etc, while, the export trade of Nigeria is on primary goods---such as, crude oil, raw materials, staple foods and food stuffs. Even though, it has been said that foreign trade is against the developing countries (Nigeria), but it is critically important for the survival of the Nigeria economy.

Shuaib (2011) drew a partial conclusion that FDI and trade had assisted the emerging countries to grow at significant rates. This could only be achieved if and only if there is proper and/or friendly industrial policies, such as: economic and political stability, infrastructural development policy, external debt burden policy, socio-economic factors, market size and privatization and commercialization policies. It is therefore deduced that without these factors properly curtailed then no positive effect of FDI and trade would be felt by developing countries (Nigeria). The importance or role of FDI and external trade can never be underscored in the growth of Nigeria's economy. For instance, Nigeria's major export is ranged within the scope of raw materials and crude oil, while, import is consumable items and capital goods (industrial machines). So the contributions to Nigeria's Gross Domestic Product (GDP) are substantially low. Hence, growth in the *per se* economy is less apparent. And again, synthesis devices had been developed to reduce the importation of raw materials from developing countries, In other words, the quotas of world trade from developing countries, such as Nigeria is low.

## THEORETICAL FRAMEWORK

Jhingan (as cited in Harrod & Domar, 1967), Harrod–Domar model describes the economic mechanism by which more investment leads to more growth. For a country to develop and grow, it must divert part of its resources from current consumption (or save) and invest them in capital formation. Diversion of resources from current consumption is called saving. While saving is not the only determinants of growth, the Harrod Domar model suggests that it is an important ingredient for growth. Its argument is that every economy must save a certain proportion of its national income if only to replace worn-out of capital goods. The model shows mathematically that growth is directly related to saving and indirectly related capital output ratio. Suppose we define national income as Y, growth as G, capital output ratio as K, saving as S, and investment as l, and average saving ratio as s and incremental capital output ratio as k, then we can construct the following simple model of economic growth.

$S = sY$ (1)

i.e. saving (S) is some proportion of (s) of national income (Y)

$I = \Delta k$ (2)

i.e.net investment (I) is defined as the change in capital stock K

$G = \Delta Y$ (3)

$\Delta Y$ i.e. growth is defined as change in National income $\Delta Y$ divided by the value of the National income.

But since the total stock, K, bears a direct relationship to total national income, or output Y, as expressed by

the capital/output ratio k, then it follows that:

$$K = \frac{K}{Y} \quad (4)$$

or $K = \frac{\Delta K}{\Delta Y}$

or, finally,

$$\Delta K = K\Delta Y$$

Finally, since total national saving, S, must equal total investment, I we can write this equality as

$S = I$ 5

But from Equation (I) above we know that S = sY and from Equations (2) and (3) we know that:

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

It therefore follows that we can write the identity of saving equalling Investment shown by Equation (6) as

$$S = sY = k\Delta Y = \Delta k = I \quad (6)$$

or simply as

$$sY = k\Delta Y \quad (7)$$

$$\Delta Y = G = sY\ K \quad (8)$$

Now by dividing both sides of Equation (8) by Y and later by K, we derive the growth Model $\Delta Y/Y$ which represents the rate of change of national income or rate of GDP (i.e., It is the percentage change in GDP)

Equation (8), which is a simplified version of the famous Harrod –Domar equation in the theory of economic growth, implies that the rate of growth of GDP ($\Delta Y/Y$) is determined jointly by the national saving ratio, s, and national capital/output ratio, k. More specifically, it says that in the absence of government, the growth rate of national income will be directly or positively be related to saving ratio (i.e. the more an economy is able to save-and- invest-out of given GDP, the greater will be the growth of that GDP) and inversely or negatively; relate to the economy's capital/output ratio (i.e., the higher the k is, the lower will be the rate of GDP growth).

The economy logic of equation (8) is very simple. In order to grow, economies must save and invest a certain proportion of their GDP. The more an economy can save, and invest, the faster they can grow, for any level of the rate of growth depends on how productive the investment is.

## MODEL SPECIFICATIONS

The econometric model of multiple regression analysis of Shuaib (2011) was modified for this paper with inclusion of few variables to test the relationship between the dependent and independent variables. The structural equation is designed as thus below.

$$RGDP = f\ (BTD, DINV, EDEBT, ER, FDI, GCF, NEXCH, TS) \quad (9)$$

Mathematically, this structural equation may be specified in linear form as thus below:

$$RGDP = \beta_0 a_0 + \beta_1 BTD \pm \beta_2 DINV \pm \beta_3 EDEBT \pm \beta_4 ER \pm \beta_5 FDI \pm \beta_6 GCF \pm \beta_7 NEXCH \pm \beta_8 TS + \mu \quad (10)$$

Where: RGDP = Real gross domestic product proxied for economic growth; BTD = Balance of Trade proxied for openness of the economy; DINV = Domestic Investment; EDEBT = External debt; ER = External Reserve; FDI = Foreign Direct Investment; GCF= Gross Capital Formation; NEXCH = Nominal Exchange Rate; TS = Total Saving; $\mu$ = Error or stochastic term

For the purpose of this paper, the model is transformed into double-linear form. Which is expressed as thus below:

$$Log\ RGDP = \beta_0 + \beta_1 logBTD \pm \beta_2 logDINV \pm \beta_3 logEDEBT \pm \beta_4 logER \pm \beta_5 logFDI \pm \beta_6 logGCF \pm \beta_7 logNEXCH \pm \beta_8 logTS + \mu \quad (3)$$

Where: Log (RGDP) = Log of Real gross domestic product; Log (BOP) = Log of Balance of Trade; Log (DINV) = Log of Domestic Investment; Log (EDEBT) = Log of External debt; Log (ER) = log of external reserve; Log (FDI) = log of Foreign Direct Investment; Log (GCF) = Gross Capital Formation; Log (NEXCH) = Log of Nominal Exchange Rate; Log (TS) = Log of Total Saving; $\mu$ = white noise error term

The a priori expectations are as follows:

$\beta_0 > 0, \beta_1 > 0, \beta_2 < 0, \beta_3 < 0, \beta_4 < 0, \beta_5 > 0, \beta_6 < 0, \beta_7 < 0, \beta_8 > 0.$

Where:

$\beta_0$= Intercept, $\beta_1$ = Coefficient of Balance of Trade, $\beta 2$ = Coefficient of domestic investment, $\beta_3$ = Coefficient of external debt, $\beta_4$ = Coefficient of External Rate, $\beta_5$ = Coefficient of Foreign Direct Investment, $\beta_6$ = Coefficient of Gross Capital Formation, $\beta_7$ = Coefficient of Nominal Exchange Rate, $\beta_8$ = Coefficient of Total Saving, and $\mu$ = white noise error term.

The contribution of this study to knowledge is in terms of the estimation techniques employed and/or the data used which is extended to 2013. An attempt will be made to empirically investigate the

relationship between the impact of foreign direct investment and trade on the growth of the Nigerian Economy for the period 1981 – 2013 under review. The equation was estimated using a variety of analytical tools, including, 3SLS method, . The results are discussed below. The time series data used for the study covers the period 1981 and 2013. The study employed secondary data which are derived from various issues of CBN *Annual Report and Statement of Accounts (2013),* and CBN *Statistical Bulletin (2014).*

## MODEL SUMMARY

The researcher choose to use system three-stage least squares (S3SLS) to analyze the time series data from 1960-2013. S3SLS is the two-stage least squares version of the SUR method. It is an appropriate technique when right-hand side variables are correlated with the error terms, and/or there is both heteroskedasticity, and contemporaneous correlation in the residuals. Since STSLS (S2SLS) is a single equation estimator that does not take account of the covariances between residuals, it is not, in general, fully efficient. 3SLS is a system method that estimates all of the coefficients of the model, then forms weights and re-estimates the model using the estimated weighting matrix. It should be viewed as the endogenous variable analogue to the SUR estimator described above.

In the appendix, table 1, the first two stages of 3SLS are the same as in TSLS. In the third stage, we apply feasible generalized least squares (FGLS) to the equations in the system in a manner analogous to the SUR estimator.

SUR uses the OLS residuals to obtain a consistent estimate of the cross-equation covariance matrix $\Sigma$. This covariance estimator is not, however, consistent if any of the right-hand side variables are endogenous. S3SLS uses the S2SLS residuals to obtain a consistent estimate of $\Sigma$.

From the table 1 in the appendix, all the nine coefficients are positive and/or the probability (*p-value*) of obtaining the values are statistically significant—since they are greater than zero and/or less than five (.i.e., $0 \leq 0.05$). From the above premise, it is succinctly clear that the null hypothesis is rejected and/or alternative hypothesis accepted. In other words, FDI and trade have a direct relationship with Nigerian economic growth. The determinant residual covariance is 171.E-11.

### System Wald Test (Swt)

Having estimated both heteroskedasticity, and/or contemporaneous correlation in the residuals with the use of S3SLS.

The next stage of estimating residuals is the Wald test, which helps to measure the Chi-square value and/or its probability (*p-value*) and null hypothesis.

From table 2 in appendix, the Chi-square value is 148.3304 and/or the probability to obtain Chi-square value is greater than zero and/or less than five (.i.e., $0 \leq 0.05$). This states that null hypothesis has to be rejected and accepted the alternative hypothesis, which says that there are residuals in the model.

### System Residual Normality Tests (SRNTs)

Residual Normality Tests enables the researcher to examine normal distribution of residual for the equation.

From table 3 in the appendix, the properties to be examined are: Joint Component, Skewness, chi-sq, df and probability as it appeared in the first part. The second part has the following properties: Joint Components, Kurtosis, Chi-sq, df, and probability. While the third part has the following properties: Joint Components, Jarque-Bera, Chi-sq, df, and probability.

From the table 3, it is seen that the Jarque-Bera statistic rejects the hypothesis (or null hypothesis) of normal distribution for the second equation but not for the other equations.

### Variance Ratio Test on Cumulated log_rgdp_

The variance ratio test view allows the research to perform the Lo and Mackinlay variance ratio test to determine whether differences in series are uncorrelated, or follow a random walk or martingale property. In addition, Lo and Mackinlay (1988, 1989) variance test ratio enables for homoskedastic and heteroskedastic random walks using asymptotic normal distribution or wildbootsrap to evaluate statistical significance (*loc. cit*).

From the table 4 in the appendix, the researchers maintained that since the specified test is more than one test period, there are two sets of test results. The "Joint Tests" are the tests of the joint null hypothesis for all periods, while the "Individual Tests" are the variance ratio tests applied to individual periods. Here, the Chow-Denning maximum statistic of 9.473597 is associated with the period 4 individual test. The approximate *p*-value of 0.0000 is obtained using the studentized maximum modulus with infinite degrees of freedom so that we strongly reject the null of a random walk. The results are quite similar for the Wald test statistic for the joint hypotheses. The individual statistics generally reject the null hypothesis since all the period variance ratio statistic *p*-value is less than 0.05.

The bottom portion of the output shows the intermediate results for the variance ratio test calculations, including the estimated mean, individual variances, and number of observations used in each calculation.

## BDS Test

The BDS test is a portmanteau test for time based dependence in a series. It can be used for testing against a variety of possible deviations from independence including linear dependence, non-linear dependence, or chaos. The test can be applied to a series of estimated residuals to check whether the residuals are independent and identically distributed (*iid*) (Brock, Dechert, Scheinkman & LeBaron, 1996).

The BDS test proceeds by noting that under the assumption of independence, this probability will simply be the product of the individual probabilities for each pair.

When working with sample data, we do not directly observe $c_{1(\epsilon)}$ or $c_{m(\epsilon)}$. We can only estimate them from the sample. As a result, we do not expect this relationship to hold exactly, but only with some error. The larger the error, the less likely it is that the error is caused by random sample variation. The BDS test provides a formal basis for judging the size of this error.

To estimate the probability for a particular dimension, we simply go through all the possible sets of that length that can be drawn from the sample and count the number of sets which satisfy the condition. The ratio of the number of sets satisfying the condition divided by the total number of sets provides the estimate of the probability (*loc.cit*).

From the table 5 above, the output shows that probability (*p-value*) and bootstrap probability of obtaining the BDS and z-statistic values are less than the size, in other words, *p-value* greater than 0 and less than 0.05. Which states that the null hypothesis has to be rejected, in that it refers that there exists no BDS or portmanteau test (or residual) in the series? While, the alternative hypothesis has to be accepted, in that it states the presence of the residual in the series.

## Exponential Smoothing

Exponential smoothing is a simple method of adaptive forecasting. It is an effective way of forecasting when you have only a few observations on which to base your forecast. Unlike forecasts from regression models which use fixed coefficients, forecasts from exponential smoothing methods adjust based upon past forecast errors.

The first part displays the estimated (or specified) parameter values, the sum of squared residuals, the root mean squared error of the forecast. The zero values for Beta and Gamma in this example mean that the trend and seasonal components are estimated as fixed and not changing.

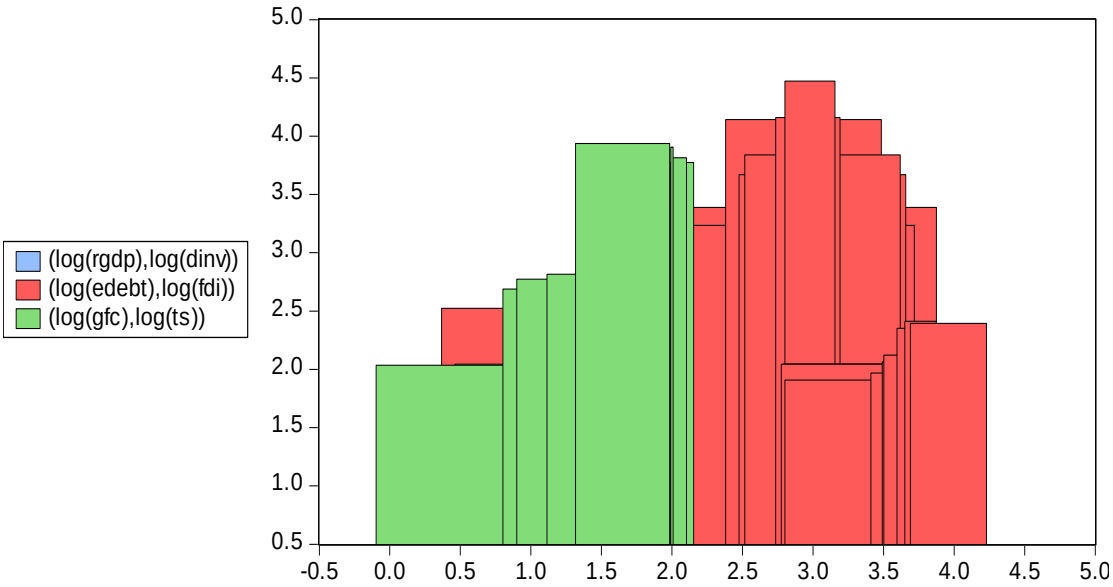
The second part of the table displays the mean $\alpha$, (1.0000) and trend $\beta$ (0.0000) at the end of the estimation sample that are used for post-sample smoothed forecasts.

For seasonal methods, the seasonal factors $\gamma$ (0.0000) used in the forecasts are also displayed.

## XY BAR (X-X-Y triplets)

Having estimated the time series data with several statistical tools, the researcher wishes to employ the use of graph to display the result as shown in diagram 1. XY bar graphs display the data in sets of three series as a vertical bar. For a given observation, the values in the first two series define a region along the horizontal axis, while the value in the third series defines the vertical height of the bar.

While technically an observation graph since every data observation is plotted, this graph is primarily used to display summary results. For example, the XY bar is the underlying graph type used to display histograms.




The histogram graph view displays the distribution of your series in bar graph form. The histogram divides the horizontal axis into equal length intervals or bins, and displays a count or fraction of the number of observations that fall into each bin, or an estimate of the probability density function for the bin.

## Summary of Result Findings

The paper empirically examines the impact of Foreign Direct Investment (FDI) on the Growth of the Nigerian economy, using annual time series data from 1960 to 2013. The paper employs stochastic characteristics of each time series data by testing their covariance and residuals using System Three Stage Least Square (S3SLS), System Wald Test (SWT), System Residual Normal Tests (SRNTs), Variance Ratio Test (VRT), BDS Test, Exponential Smoothing (ES), and/or XY Bar (X-X-Y triplets).

From the entire test carried out with different diagnostic tests, it was revealed that all the null hypotheses were rejected (.i.e., there is no significant relationship between FDI and Trade and/or economic growth) and/or accepted the alternative hypotheses (.i.e., there is significant relationship between FDI and Trade and economic growth).

The paper discovered that the FDI and/or its components (determinants) have significant relationship with the economic growth of Nigeria. Rejecting null hypotheses in the diagnostic tests corroborated the fact that FDI and Trade have a direct relationship with Nigerian economic growth.

## RECOMMENDATIONS

From the econometric study of the impact of Foreign Direct Investment (FDI) on the growth of Nigerian economy, the following recommendations are stated below:

- Government should embark on the policies of free-trade and removal of trade barriers, etc, since openness (net export) of the economy has a direct relationship with Nigerian economic growth;
- Government policies should be tailored towards the management of foreign exchange market and the reduction of inflationary pressure on the economy;
- Government should improve on the macroeconomic indices such as: general price level, interest rate and exchange rate, etc, since they have a positive relationship with Nigerian economy growth;
- Government should encourage domestic investors to invest in Nigeria as to snowballing in job creations.
- Business expectations or environment in Nigeria should be such that encourage both the foreign and domestic investors, in doing so, the economic growth shall be achieved.

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## APPENDICES

### Table1

System: UNTITLED
Estimation Method: Three-Stage Least Squares
Date: 03/27/15 Time: 20:56
Sample: 1984 2013
Included observations: 29
Total system (unbalanced) observations 252
Stacked instruments: (RGDP,*) (ER(-1),*) (LOG_BTD_,*) (FDI(-1),*) (DINV,*) (GFC,*) (NEXCH,*) (TS(-1),*)
Linear estimation after one-step weighting matrix

| | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C(1) | 2.637201 | 0.032645 | 80.78431 | 0.0000 |
| C(2) | 2.451196 | 0.203278 | 12.05835 | 0.0000 |
| C(3) | 1.276075 | 0.032158 | 39.68148 | 0.0000 |
| C(4) | 2.751774 | 0.119507 | 23.02611 | 0.0000 |
| C(5) | 3.928237 | 0.100220 | 39.19626 | 0.0000 |
| C(6) | 2.673179 | 0.193609 | 13.80712 | 0.0000 |
| C(7) | 1.599992 | 0.057597 | 27.77932 | 0.0000 |
| C(8) | 1.512913 | 0.116040 | 13.03785 | 0.0000 |
| C(9) | 2.458051 | 0.175094 | 14.03848 | 0.0000 |
| Determinant residual covariance | | 1.71E-11 | | |

Equation: LOG_RGDP_ = C(1)
Eqn specific instruments: C
Observations: 29

| | | | |
|---|---|---|---|
| R-squared | -0.000000 | Mean dependent var | 2.637201 |
| Adjusted R-squared | -0.000000 | S.D. dependent var | 0.178910 |
| S.E. of regression | 0.178910 | Sum squared resid | 0.896248 |
| Durbin-Watson stat | 0.020726 | | |

Equation: LOG_BTD_ = C(2)
Eqn specific instruments: C
Observations: 29

| | | | |
|---|---|---|---|
| R-squared | 0.000000 | Mean dependent var | 2.451196 |
| Adjusted R-squared | 0.000000 | S.D. dependent var | 1.114061 |
| S.E. of regression | 1.114061 | Sum squared resid | 34.75171 |
| Durbin-Watson stat | 0.091347 | | |

Equation: LOG_DINV_ = C(3)
Eqn specific instruments: C

Observations: 29

| | | | |
|---|---|---|---|
| R-squared | 0.000000 | Mean dependent var | 1.276075 |
| Adjusted R-squared | 0.000000 | S.D. dependent var | 0.176241 |
| S.E. of regression | 0.176241 | Sum squared resid | 0.869706 |
| Durbin-Watson stat | 0.360975 | | |

Equation: LOG_EDEBT_ = C(4)
Eqn specific instruments: C
Observations: 29

| | | | |
|---|---|---|---|
| R-squared | -0.000000 | Mean dependent var | 2.751774 |
| Adjusted R-squared | -0.000000 | S.D. dependent var | 0.654955 |
| S.E. of regression | 0.654955 | Sum squared resid | 12.01103 |
| Durbin-Watson stat | 0.101949 | | |

Equation: LOG_ER_ = C(5)
Eqn specific instruments: C
Observations: 29

| | | | |
|---|---|---|---|
| R-squared | -0.000000 | Mean dependent var | 3.928237 |
| Adjusted R-squared | -0.000000 | S.D. dependent var | 0.549253 |
| S.E. of regression | 0.549253 | Sum squared resid | 8.446995 |
| Durbin-Watson stat | 0.294396 | | |

Equation: LOG_FDI_ = C(6)
Eqn specific instruments: C
Observations: 20

| | | | |
|---|---|---|---|
| R-squared | -0.015027 | Mean dependent var | 2.780092 |
| Adjusted R-squared | -0.015027 | S.D. dependent var | 0.894814 |
| S.E. of regression | 0.901512 | Sum squared resid | 15.44174 |
| Durbin-Watson stat | 0.802982 | | |

Equation: LOG_GFC_ = C(7)
Eqn specific instruments: C
Observations: 29

| | | | |
|---|---|---|---|
| R-squared | 0.000000 | Mean dependent var | 1.599992 |
| Adjusted R-squared | 0.000000 | S.D. dependent var | 0.315657 |
| S.E. of regression | 0.315657 | Sum squared resid | 2.789900 |
| Durbin-Watson stat | 0.614987 | | |

Equation: LOG_NEXCH_ = C(8)
Eqn specific instruments: C
Observations: 29

| | | | |
|---|---|---|---|
| R-squared | -0.000000 | Mean dependent var | 1.512913 |
| Adjusted R-squared | -0.000000 | S.D. dependent var | 0.635956 |
| S.E. of regression | 0.635956 | Sum squared resid | 11.32431 |
| Durbin-Watson stat | 0.307934 | | |

Equation: LOG_TS_ = C(9)
Eqn specific instruments: C
Observations: 29

| | | | |
|---|---|---|---|
| R-squared | 0.000000 | Mean dependent var | 2.458050 |
| Adjusted R-squared | 0.000000 | S.D. dependent var | 0.959598 |
| S.E. of regression | 0.959598 | Sum squared resid | 25.78322 |
| Durbin-Watson stat | 0.014527 | | |

**Table2**

Wald Test:
System: Untitled

| Test Statistic | Value | df | Probability |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Chi-square | 148.3304 | 2 | 0.0000 |

Null Hypothesis: C(2)=0, C(4)=3*C(9)
Null Hypothesis Summary:

| Normalized Restriction (= 0) | Value | Std. Err. |
|---|---|---|
| C(2) | 2.451196 | 0.203278 |
| C(4) - 3*C(9) | -4.622377 | 0.460163 |

Restrictions are linear in coefficients.

**Table3**

System Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: residuals are multivariate normal
Date: 03/27/15 Time: 20:33
Sample: 1984 2013
Included observations: 29

| Component | Skewness | Chi-sq | df | Prob. |
|---|---|---|---|---|
| 1 | 0.359079 | 0.623199 | 1 | 0.4299 |
| 2 | 0.166417 | 0.133858 | 1 | 0.7145 |
| 3 | 3.220238 | 50.12134 | 1 | 0.0000 |
| 4 | -0.082948 | 0.033255 | 1 | 0.8553 |
| 5 | -0.146815 | 0.104181 | 1 | 0.7469 |
| 6 | 0.297750 | 0.428500 | 1 | 0.5127 |
| 7 | -0.738691 | 2.637379 | 1 | 0.1044 |
| 8 | -0.682822 | 2.253522 | 1 | 0.1333 |
| 9 | 0.124364 | 0.074755 | 1 | 0.7845 |
| Joint | | 56.40999 | 9 | 0.0000 |

| Component | Kurtosis | Chi-sq | df | Prob. |
|---|---|---|---|---|
| 1 | 2.028089 | 1.141406 | 1 | 0.2854 |
| 2 | 2.087514 | 1.006096 | 1 | 0.3158 |
| 3 | 14.59006 | 162.3148 | 1 | 0.0000 |
| 4 | 2.314581 | 0.567675 | 1 | 0.4512 |
| 5 | 2.718248 | 0.095922 | 1 | 0.7568 |
| 6 | 1.233245 | 3.771719 | 1 | 0.0521 |
| 7 | 3.274542 | 0.091076 | 1 | 0.7628 |
| 8 | 4.207643 | 1.762235 | 1 | 0.1843 |
| 9 | 2.390612 | 0.448720 | 1 | 0.5029 |
| Joint | | 171.1996 | 9 | 0.0000 |

| Component | Jarque-Bera | df | Prob. |
|---|---|---|---|
| 1 | 1.764604 | 2 | 0.4138 |
| 2 | 1.139953 | 2 | 0.5655 |
| 3 | 212.4361 | 2 | 0.0000 |
| 4 | 0.600930 | 2 | 0.7405 |
| 5 | 0.200103 | 2 | 0.9048 |
| 6 | 4.200220 | 2 | 0.1224 |
| 7 | 2.728455 | 2 | 0.2556 |
| 8 | 4.015757 | 2 | 0.1343 |

| | | | |
|---|---|---|---|
| 9 | 0.523475 | 2 | 0.7697 |
| Joint | 227.6096 | 18 | 0.0000 |

**Table4**

Null Hypothesis: Cumulated LOG_RGDP_ is a martingale
Date: 03/28/15 Time: 08:07
Sample: 1981 2013
Included observations: 33 (after adjustments)
Heteroskedasticity robust standard error estimates
User-specified lags: 2 4 8 16
Test probabilities computed using wild bootstrap: dist=normal, reps=1000, rng=kn, seed=782151345

| Joint Tests | Value | df | Probability |
|---|---|---|---|
| Max \|z\| (at period 16) | 9.473597 | 33 | 0.0000 |

Individual Tests

| Period | Var. Ratio | Std. Error | z-Statistic | Probability |
|---|---|---|---|---|
| 2 | 1.942001 | 0.232310 | 4.054940 | 0.0000 |
| 4 | 3.616200 | 0.418152 | 6.256575 | 0.0000 |
| 8 | 5.978962 | 0.603603 | 8.248734 | 0.0000 |
| 16 | 8.158887 | 0.755667 | 9.473597 | 0.0000 |

Test Details (Mean = 2.61280652222)

| Period | Variance | Var. Ratio | Obs. |
|---|---|---|---|
| 1 | 0.03346 | -- | 33 |
| 2 | 0.06498 | 1.94200 | 32 |
| 4 | 0.12101 | 3.61620 | 30 |
| 8 | 0.20007 | 5.97896 | 26 |
| 16 | 0.27301 | 8.15889 | 18 |

**Table5**

BDS Test for LOG_RGDP_
Date: 03/28/15 Time: 08:15
Sample: 1981 2013
Included observations: 33

| Dimension | BDS Statistic | Std. Error | z-Statistic | Normal Prob. | Bootstrap Prob. |
|---|---|---|---|---|---|
| 2 | 0.171887 | 0.009250 | 18.58192 | 0.0000 | 0.0000 |
| 3 | 0.269446 | 0.015033 | 17.92396 | 0.0000 | 0.0000 |
| 4 | 0.321484 | 0.018305 | 17.56242 | 0.0000 | 0.0000 |
| 5 | 0.345563 | 0.019516 | 17.70648 | 0.0000 | 0.0000 |
| 6 | 0.349826 | 0.019260 | 18.16290 | 0.0000 | 0.0000 |

| | | | | |
|---|---|---|---|---|
| Raw epsilon | 0.284667 | | | |
| Pairs within epsilon | 775.0000 | V-Statistic | 0.711662 | |
| Triples within epsilon | 19141.00 | V-Statistic | 0.532627 | |

| Dimension | C(m,n) | c(m,n) | C(1,n-(m-1)) | c(1,n-(m-1)) | c(1,n-(m-1))^k |
|---|---|---|---|---|---|
| 2 | 348.0000 | 0.701613 | 361.0000 | 0.727823 | 0.529726 |
| 3 | 327.0000 | 0.703226 | 352.0000 | 0.756989 | 0.433780 |
| 4 | 308.0000 | 0.708046 | 343.0000 | 0.788506 | 0.386562 |
| 5 | 291.0000 | 0.716749 | 333.0000 | 0.820197 | 0.371185 |
| 6 | 274.0000 | 0.724868 | 321.0000 | 0.849206 | 0.375042 |

**Table6**

Date: 03/28/15 Time: 09:30
Sample: 1981 2013
Included observations: 33
Method: Holt-Winters Additive Seasonal
Original Series: LOG_RGDP_
Forecast Series: LOG_RGSM

| | | | |
|---|---|---|---|
| Parameters: | Alpha | | 1.0000 |
| | Beta | | 0.0000 |
| | Gamma | | 0.0000 |
| Sum of Squared Residuals | | | 0.009584 |
| Root Mean Squared Error | | | 0.017042 |
| End of Period Levels: | Mean | | 2.982169 |
| | Trend | | 0.017900 |
| | Seasonals: | 2009 | -0.007380 |
| | | 2010 | 0.005394 |
| | | 2011 | 0.007149 |
| | | 2012 | -0.000770 |
| | | 2013 | -0.004393 |