Public Debt, Foreign Direct Investment and Economic Growth in Nigeria

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https://riiopenjournals.com/index.php/finance-economics-review

Citation: Ogbebor, O., & Aigheyisi, O. (2019). Public Debt, Foreign Direct Investment and Economic Growth in Nigeria. *Finance & Economics Review*, 1(1), 1-23.

Research Article

Abstract

Purpose: *The study examines the short run and the long-run effects of public debt (disaggregated into external and domestic debt) and FDI on economic growth in Nigeria using the Bounds test approach to co-integration and error correction analysis. The short-run causal relationships among the variables are also examined using the Toda-Yamamoto's approach to Granger non-causality test.*
Method: *Annual time series data spanning the period from 1981 to 2016 are utilized for the analysis.*
Results: *The study finds a significant negative effect of domestic debt on economic growth in Nigeria in the short-run and the long-run. It also finds the growth effect of external debt to be non-significant in the short-run, but positive, and significant in the long-run. The growth effects of FDI on economic growth are found to be non-significant in the long-run and in the short-run. Further evidence from the study is that trade openness negatively affects economic growth in the short-run, while its long-run effect is also negative, but not statistically significant. Unidirectional causation was found only from domestic debt to economic growth. No significant causal relationships were found to exist among other variables.*
Implications: *In view of the empirical evidence, the study proffers as recommendations for policy consideration efforts by the government to enhance the creditworthiness of the country so as to be able to access external loans for financing long-run growth. It further recommends some degree of restrictions on imports (especially of consumption goods) as a measure to enhance the country's long-run growth.*

Keywords: External Debt; Domestic Debt; FDI; Economic Growth; Nigeria

1. Introduction

Public debt and foreign direct investment (FDI) are important sources of finance for growth and development especially in less developed countries where there is a dearth of funds for growth financing. Both could be described as a two-edged sword which either impacts positively on the economy if well managed or negatively if poorly managed (Egbetunde, 2012). Public debt refers to resources used by the government, but which does not originally belong to it, obtained through borrowing (Okoro, 2016). Governments all over the world including the developed economies rely to some extent on debt to finance their deficits. Canada, Spain, the United States of America, Japan and Italy are among the most developed economies in the world, yet the countries rely considerably on debt to finance aspects of its expenditures. The same can be said of some other developed countries (Global Finance, 2017). However, some countries, particularly the less developed countries (LDCs) have not been able to harness the benefits of debt due to poor debt management and this has resulted in huge debt overhang, causing serious drawbacks on their development. These countries with high poverty levels and which are heavily indebted especially to international lenders are labeled as highly indebted poor countries (HIPCs) by the International Monetary Fund (IMF).

Public debt can be classified as domestic debt and foreign debt. Domestic debt refers to debt contracted within the domestic economy mainly through issuance of Treasury bills, certificates, and bonds, FGN bonds, promissory notes and development stocks which are all debt instruments. These are issued by the government either to raise funds for financing of projects or to control inflation by way of reducing the amount of money in circulation in the economy in the short run. However, since they constitute loans, they will be repaid in the future by the government, which may then have to charge higher taxes to curtail the possible inflationary effect. This is one of the tenets of the Ricardian Equivalence Hypothesis which posits that debt and taxes have equal effects on private consumption especially in the long run (Ricciuti, 2001).

Foreign debts are contracted outside the shores of a country from multilateral institutions such as the World Bank, the IMF, foreign banks, etc. The effect of these debts on economic performance depends on the use into which they are channeled and how well they are managed. Where debt enhances economic performance, in the long run, it is said to be productive.

Investment gaps resulting from inadequate savings which also result from low income necessitates inflow of FDI to an economy to complement domestic savings and investment, and raise the level of gross investment therein. Bridging the savings gap is a key function of FDI as seen in the dual gap model. Where this transpires, the inflow of FDI which is also the channel through which foreign skill and technology spillover to an economy, will engender improvement in the growth performance of the economy as posited by the endogenous growth theories. However, FDI is not always complimentary to domestic investment. It could crowd-out domestic investment, especially where foreign firms or multinationals (which are the principal medium through which FDI flows to an economy) staged serious competition with domestic firms that cannot compete with the larger foreign firms. Where this transpires, aggregate investment in the economy is reduced, and this could adversely affect economic growth.

The sector of the economy attracting FDI also matters for growth. Where FDI flows evenly to key sectors of an economy such as manufacturing, agriculture, education, banking, telecommunication, etc. of the economy, this may enhance economic growth. However, where it is concentrated in a few sectors of the economy with no linkage or weak linkage to other sectors of the economy, its effect on the economy may be adverse.

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Enhancing economic performance or economic growth is and has always been a major goal of governments in both developed and developing countries. In fact, one of the goals of macroeconomic policies (fiscal policy and monetary policy) is the attainment of long-run growth. All things being equal, improvement in the performance of an economy with enhancement in structural conditions translates into improved living standards. However, while many countries have been able to achieve impressive economic performance, this has been elusive for many countries, especially the less developed countries.

Until recently, Nigeria was on the list of highly indebted poor countries. The status changed following the debt relief granted by the Paris Club, the London Club, and other creditors in 2005. However, the country's debt (both foreign and domestic) has again begun to rise. Nigeria's debt-GDP ratio is fast approaching the unsustainable limit. The continuous use of debt by the Federal government to finance projects many of which are not self-sustaining tend to put the country is bad light in the committee of nations and gives warning signals to foreign investors to steer of the country owing to the implication of huge foreign debt for future investment. The rising domestic debt also has implications for future economic growth. There may be an increase in inflation when the debt is redeemed except the government uses appropriate monetary and fiscal policy to curtail the increase in the money supply that could result there-from.

FDI inflows to the country tend to be concentrated in a few sectors of the economy, particularly oil and gas and telecommunication which do not contribute much to job creation. Increased FDI in the oil and gas sector has been associated with negative externality effects on the agriculture sector as a result of oil spillage which affects plants and aquatic life, and gas flaring which poses a serious threat to human life. The amount of FDI that flows into sectors that account for the large percentage of employment in the country such as the agriculture sector is quite low compared to the amount that flows into the extractive sector. FDI that flows into the employment generating sectors tends to adversely affect the sector as the substitute domestic investment therein instead of complementing it, further plunging the sector and the economy into deeper economic woes. FDI in the economy appears to be concentrated in a few sectors of the economy. This study is motivated by the need to investigate whether these variables play a significant role in the economic performance of the country. Though several studies have attempted to separately investigate the effects of public debt and FDI on economic performance in different countries, regions, and sub regions, the studies have been inconclusive.

This study shall contribute to the extant literature by investigating the interrelationships among public debt, FDI and economic growth in Nigeria. In doing this, the public debt shall be disaggregated into external and domestic components, and the effects of these on economic growth shall be investigated. Disintegrating public debt into domestic and foreign debt will enable investigation of the interrelationships among external debt, domestic debt, FDI and economic growth. This marks the novelty of the study especially for Nigeria as no prior study, to the best of our knowledge has undertaken this investigation. Thus the study has a two-fold objective: to investigate the causal relationships among external debt, domestic debt, FDI and economic growth, and to investigate the growth effects of public debt (external and domestic) and FDI in Nigeria.

1. Literature Review

2.1. Theoretical Literature

In this section, the theoretical nexus between public debt and economic growth, and FDI and economic growth are reviewed.

2.1.1. Public Debt and Economic Growth

The Dual Gap Theory

The dual gap theory postulated by Chenery and Strout (1966) which is an extension of the Harrod-Domar model can be used to explain the theoretical relevance of foreign finance such as public debt (foreign and domestic) and FDI to growth in LDCs. The theory identifies two gaps namely the savings gap and the foreign exchange gap. The savings gap arises because the level of savings in LDCs is quite low as a result of low-income levels, and it is not sufficient to finance the needed investment required for economic growth. To bridge the gap, there is a need to attract foreign finance in the form of domestic debt, FDI, etc. to complement domestic savings. This will accelerate the rate of economic growth in the LDCs all things being equal. The foreign exchange gap arises as a result of the shortage of foreign exchange which results from low export earnings. To bridge this gap, the inflow of foreign aid is required ((Akande and Oluyomi, 2010).

However, in deciding whether to borrow externally to finance economic growth and development, a country should put into consideration whether or not the returns on the borrowed funds will be higher than the cost. The import of this is that a country should invest in projects having expected returns higher than the cost of the foreign debt, otherwise there would be problem of default in debt service payments which engenders accumulation of debt and raises the debt burden, making it unsustainable and ultimately impeding the long term growth prospect of the country.

Early development economists and proponents of external debt including Singer (1949), Avramovic (1966), and a host of others argued external capital including external debt can stimulate economic growth, especially in developing countries. Their position was that the transfer of foreign resources to less developed countries (LDCs) which are characterized by the low level of savings and investment as a result of low-income levels will help position them in the sustainable growth path. This implies that the inflow of foreign resources from advanced countries to developing countries is necessary to bridge the savings gap and serves to complement domestic resources with expectant positive effects on growth.

The Debt Overhang Theory

The debt overhang theory shows that if there is some likelihood that in the future debt will be larger than the country's repayment ability, expected debt-service costs will deter further domestic and foreign investment because the expected rate of return from the productive investment projects will be very low to support the economy since a significant portion of any subsequent economic progress or national income will accrue to the creditor country (Krugman, 1988). This eventually will further reduce both domestic and foreign investments and hence retard economic growth.

Where debt-overhung occurs, the government in an attempt to amortize the accumulated debt will increase the tax rate on the private sector (as a means of transferring resources to the public sector). This will discourage private sector investment and also reduce government expenditure on infrastructure as the resources are channeled into debt service payments instead of productive use. This will lead to a reduction in total (private and public) investment in the economy and a downward shift of both the investment and production. This is partly explained by the tax Laffer curve hypothesis which shows that an increase in personal taxes rather will engender a reduction in government revenue as it will create a disincentive to invest, and raise the possibility of tax evasion. Inability to service the debt increases with the debt stock. A country under this situation is totally unable to service the debts and may be declared to be in debt crisis as its debt has reached unmanageable levels. The implication of this theory is that there exists a threshold level of external debt below which external debt has a direct positive effect on economic and above which external debt adversely affects economic growth.

2.1.2. FDI and Economic Growth

Two theories can be used to explain the theoretical linkage between FDI and economic growth. They are the neoclassical growth theory (also referred to as the exogenous growth theory) and the endogenous (or new growth) theories. The exogenous growth theory pioneered by Solow (1956, 57) assumes that growth is generated through the accumulation of exogenous factors of production such as capital stock and labor. Capital accumulation contributes directly to economic growth in proportion to the capital's share of national output. This has been demonstrated by Barro and Sala-i-Martins (1995). The theory posits that FDI inflow increases the stock of capital in an economy and this, in turn, engenders economic growth. This, however, transpires where FDI complements domestic investment. This was recently demonstrated by Herzer, Klasen, and Nowak-Lehmann (2008).

Where FDI complements domestic investment, new technologies are introduced into the economy and this engenders an increase in capital and labor productivity, which then leads further to more consistent returns on investment. Through the exogenous or neo-classical growth model, it has been demonstrated that FDI can impact economic growth directly through capital accumulation and the inclusion of new inputs and foreign technologies in the production function of the host country. Thus, the neoclassical growth model shows that FDI promotes economic growth by increasing the amount and/or the efficiency of investment in the host country (Mahembe and Odhiambo, 2014).

The new growth models assume growth to be driven by two main factors namely the stock of human capital and technological progress (Lucas, 1988 and Romer, 1994). In a study by Nair-Reichert and Weinhold (2001), the researchers argue that the new endogenous growth models consider long-run growth as a function of technological progress. They developed a framework in which FDI can persistently increase economic growth in host countries through technology

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transfers, technology diffusion, and spillover effects. The Organisation for Economic Cooperation and Development, OECD (2002) also highlights the fact that FDI represents a potential determinant of sustainable growth and development considering its presumed ability to generate technology spill-overs, assist in the formation of human capital development, help the host country to integrate into global economy; and assist in the creation of a more competitive business environment and enhance enterprise development

In view of the foregoing discussion, it can be inferred that the exogenous and the endogenous growth theories reveal that FDI can contribute to economic growth through both direct impact and indirect impact. Theoretically, in line with the position of the exogenous growth theory, FDI can boost the host country's economy via capital accumulation, the introduction of new goods and foreign technology. In line with the position of the endogenous growth theory, FDI also boosts the economy through the enhancement of the stock of knowledge in the host country by way of the transfer of skills (Elboiashi, 2011).

2.2. Empirical Literature Review

2.2.1. Review of Empirical Literature on Public Debt and Economic Growth

Egbetunde (2012) employs the methodology of vector auto regression (VAR) to investigate the nexus between public debt and economic growth in Nigeria in the period from 1970 to 2010. The stationary test performed using the augmented Dickey-Fuller and the Phillips Peron procedures indicate that the variables of the VAR model were integrated of order 1, while the co-integration test involving the Johansen procedure yields evidence of the long-run relationship between the variables. The VAR analysis reveals the long run bi-causal relationship between public debt and economic growth in the country.

The effect of Public debt on economic growth in Jordan is investigated in Al-Zeaud (2014) using the ordinary least squares estimation technique for analysis of data spanning the period from 1991 to 2010. The empirical evidence indicates that public debt contributes significantly to economic growth in the country. Further evidence from the study is that population growth hinders the growth of the economy of Jordan.

Pattillo, Poirson, and Ricci (2002) investigate the effect of public debt on economic growth in a sample of 93 developing countries over the period from 1969-1998 using a dynamic panel model with fixed effects. The study finds that external debt negatively affects economic growth if the debt burden measured as the debt-GDP ratio is over 35-40%. The researchers also investigate the channels through which public debt affects economic growth in a panel of 61 countries using OLS, instrumental variables and system GMM. The results show that the negative impact of high public debt operates through a strong negative effect of public debt on physical capital accumulation and growth of total factor productivity (Pattillo, Poirson, and Ricci, 2004).

The effect of external debt on economic growth in a sample of 59 developing countries over the period from 1970 to 2002 is investigated in Schclarek (2004) using the system GMM estimator. The study finds that external debt negatively impacts economic growth in the countries. Kumar and Woo (2010) investigate the impact of public debt on economic growth using a panel of 38 developed and developing countries over the period from 1970-2010. The panel model specified is estimated using the panel OLS technique. The empirical evidence indicates a negative relationship between the initial level of public debt and economic growth.

Lainà (2011) examines the dynamic relationship between public debt and economic growth in the United States. Structural vector autoregression, Granger causality, and impulse response functions are employed for analysis of quarterly data spanning the period from 1959 to 2010. The study finds that public debt positively affects economic growth in the short run, but adversely affects it in the long run. The effect of domestic debt on economic growth in Kenya over the period from 1996-2007 is investigated in Maana, Owino, and Mutai (2008) using the OLS estimation technique. The study finds that the growth of domestic debt adversely affects economic growth in the country.

The effect of debt stock on economic growth in Pakistan over the period from 1972 to 2009 is investigated in Sheikh, Faridi and Tariq (2010) using the OLS estimation technique. The empirical evidence indicates that debt stock positively affects economic growth in the country.

Uzun, Karakoy, Kabadayi, and Selcuk (2012) employs the ARDL modeling technique to examine the relationship between debt and economic growth in transition countries, over the period 1991- 2009. The study finds a positive relationship between debt and economic growth in the long run. Iyoha (1999) examines the effect of external debt stock and debt service payment on economic growth in Sub-Sahara Africa using a simultaneous equations model for output and investment demand. The study finds huge debt overhang and crowding out the effect of debt in the SSA, implying that public debt stock and debt service payments adversely affect investment and economic growth in the region. The study concludes that a reduction in the level of debt stock would engender an increase in investment and to a lesser extent, expansion in output (GDP) in subsequent periods.

Panizza and Presbitero (2014) investigate the causal relationship between public debt and economic growth in a sample of OECD countries using the instrumental variable approach. The study finds a negative correlation between public debt and economic growth. However, when corrected for endogeneity, the negative correlation disappears. The researchers conclude that the observation of no causal relationship between public debt and economic growth is important in light of the fact that a negative correlation between both variables is sometimes used to justify policies that assume that public debt negatively affects growth.

Ndeaupa (2018) examines the effect of public debt on economic growth in the CEMAC region using data that span the period from 2000 to 2016. The fixed and random effect models are estimated for the analysis. The results show that public debt adversely affects economic growth in the subregion. Thus huge debt levels are partly responsible for the poor growth of the subregion. Elom-Obed, Odo, Elom-Obed, and Anoke (2017) examined the effect of public debt on economic growth in Nigeria in the period from 1980-2015 using the vector error correction modeling (VECM) approach and Granger causality analysis. Evidence from the study indicates that external debt and domestic debt impact negatively and significantly on economic growth; unidirectional causality exists between external debt and real GDP with causality running from external debt to real GDP; unidirectional causality also exists between domestic debt and real

GDP with causality running from domestic debt to real GDP. The implication of the results is that to ensure sustainable growth, the country needs to minimize its use of debt.

Saifuddin (2016) examines the effect of public debt on economic growth in Bangladesh over the period from 1974 to 2014. Two models – investment model and growth model are specified within a simultaneous equations framework and estimated using the two-stage least squares technique. The results reveal that public debt positively affects investment and economic growth. It also shows that public debt indirectly affects growth through its positive effect on investment. Owosu-Nantwi and Erickson (2016) employ Johansen co-integration and VECM to investigate the long run and short-run impacts of public debt on economic growth in Ghana over the period from 1970 to 2012. The study finds a positive and significant impact of public debt on economic growth in the long run. It also finds a bidirectional Granger causal link between the variables in the short run. The study, therefore, recommends that debt acquired by the country should be channeled into well appraised and self-sustaining projects that could contribute significantly to economic growth.

The effect of external debt on economic growth in Nigeria over the period from 1981 to 2014 is investigated in Ijirshar, Joseph and Godoo (2016) using the methodology of co-integration and error correction modeling. The study finds that external debt stock impacted positively on economic growth in the country, while external debt service payment impacted negatively and significantly on growth in the long run and in the short run. Nwannebuike, Ike and Onuka (2016) examine the effect of external debt, external debt service payment and exchange rate on economic growth in Nigeria in the period from 1980 to 2013 using the ordinary least squares estimator for estimation of a multiple regression model. The study finds that the long-run growth effect of external debt is negative, while the short-run growth effect is positive. Debt service payment is however found to adversely affect economic growth in the country. The study also finds a significantly positive growth effect of the exchange rate.

Adedoyin, Babalola, Otekunri, and Adeoti (2016) examine the nexus between external debt and economic growth in Nigeria in the period from 1981 to 2014 using annual time series data analyzed with ARDL modeling and Granger causality test. The ARDL analysis finds a significant relationship between the variables in the long run and in the short run. However, the Granger causality test results indicate no causal relationship between the variables. The study recommends that loans obtained by the government should be invested in profitable and self-sustaining projects. The macroeconomic impact of public debt in Nigeria over the period from 1970 to 2014 was examined in Essien, Agboegbulem, Mba, and Onumonu (2016). The study involves the application of Vector Auto regression (VAR) framework, Granger causality test, impulse response and variance decomposition for analysis of annual times series data. The study finds that shock to external debt engenders an increase in prime lending rate with a lag. It further finds that the level of external and domestic debt has no significant impact of price and output levels over the study period.

The impact of public debt on economic growth in Malaysia over the period 1991-2013 is investigated in Lee and Ng (2015). The study finds a negative effect of debt on economic growth. Further evidence from the study is that budget deficit, government consumption, and external debt service adversely affects the nation's GDP. Mohanty, Patra, Kumar, and Mohanty (2016) analyzed the effect of public debt on economic growth in 15 states of India in the post-reform era (1991-2015) within a panel data set using the Dumitrescu-Hurlin causality test and applying the Fully Modified OLS (FMOLS) for the analysis. The causality test indicates a two-way causal relationship between the variables. The result of the estimation of the long-run model using FMOLS indicates that public debt, total government revenue, and total credit positively affects economic growth in the country. The paper recommends inter alia, suitable debt management strategy, and adoption of tax reforms by the government to minimize leakages, to achieve sustainable growth. Obademi (2012) examines the impact of public debt on economic growth in Nigeria over the period 1975 to 2005 using the methodology of co-integration and error correction analysis. The study finds that public debt negatively affects economic growth in the long run, but its short-run effect is positive. External debt service payment is also found to adversely affect the long-run growth of the economy.

Okwu, Obiwuru, Obiakor and Oluwalaiye (2016) employ the methodology of co-integration and error correction to examine the effect of domestic debt stock, domestic debt service payment and bank lending rate on economic growth (using real GDP as proxy) in Nigeria in the period from 1980 to 2015. The error correction results show that domestic debt stock is positively and significantly related to real GDP while domestic debt serving is inversely (negatively) and significantly related to real GDP. The effect of the bank lending rate on real GDP in the period covered by the study is not statistically significant. Bakare, Ogunlana, Adeleye and Mudasiru (2016) employ the ordinary least squares (OLS) estimation technique to estimate a linear regression model in a study to examine the impact of domestic debt and other variables such as interest rate, domestic credit to the private sector and budget deficit on economic growth in Nigeria over the period from 1981 to 2012. The study finds that domestic debt positively and significantly affects economic growth in the country. The effects of other variables on economic growth are observed to be statistically not significant.

Sánchez-Juárez and García-Almada (2016) examine whether public debt enhances public investment and whether enhanced public investment resulting from public debt enhances economic growth in Mexico. Using a panel dataset on 32 states in Mexico spanning the period from 1993 to 2012 analyzed with the system GMM technique, the study finds that public debt positively correlates with public investment and this, in turn, engenders economic growth in the country. Gómez-Puig and Sosvilla-Rivero (2017) employ the autoregressive distributed lag (ARDL) approach to cointegration and error correction analysis to investigate the short-run and long-run effects of public debt on economic growth in both central and peripheral countries of the euro area (EA). The results show that public debt negatively affects economic growth in the long run. However, depending on country-specific conditions, the short-run effect of public debt on growth varies.

2.2.2. Review of Empirical Literature on FDI and Economic Growth

Olokoyo (2012) examines the impact of FDI on economic growth in Nigeria in the period from 1970 to 2012 using the OLS estimation technique. The Cochrane-Orcutt iterative method is

employed to correct for autocorrelation. The study finds no significant effect of FDI on economic growth in the country.
John (2016) employed the OLS technique to estimate a multiple regression model in a study to examine the effect of FDI on economic growth in Nigeria in the period from 1981 to 2015. The study finds that FDI positively and significantly affects economic growth. Further evidence from the study is that the effect of the exchange rate on the GDP is not statistically significant.
Umoh, Jacob and Chuku (2011) examine the effect of FDI on economic growth in Nigeria using a VECM and a system of simultaneous equations. The study finds positive feedback (two-way) effects between FDI and growth. The study recommends articulation and implementation of policies to attract more FDI into the country to enhance the growth of its economy.
The impact of FDI on the economic growth of Pakistan is investigated in Ali and Ussain (2017). Correlation and multiple regression models estimated with the OLS technique are used to analyze annual time series data spanning the period from 1991 to 2015. The study finds that FDI positively and significantly affects the country's economic growth and therefore recommends efforts by the government to enhance the attractiveness of the economy to FDI by embarking on reforms of the domestic market.
Sârbu and Carp (2015) investigated the effect of FDI on economic growth in Romania in the period from 2000 to 2013 using the OLS estimation technique. The study finds that FDI positively and significantly affects economic growth in the country, and recommends the implementation of policies to attract more FDI into the country. The effect of FDI on economic growth in Tunisia over the period from 1975-2009 was investigated in Hassen and Anis (2012) using the methodology of co-integration and error correction. The study finds that positively affects the long-run growth of the economy. Further evidence from the study is that human capita (represented by secondary school enrolment) and financial development also positively and significantly affect the long-run economic growth of the country.
Onakoya (2012) examines the effect of FDI on economic growth in Nigeria using a system of simultaneous equations estimated with the three-stage least squares estimation technique. The study that that FDI positively and significantly affects output in the country, but the effect of FDI differs across sectors of the economy. The paper, therefore, recommends sector-specific policies, trade openness, import substitution strategies, etc. to enhance the growth of the nation's economy. Yaseen (2014) investigated the impact of FDI on the economic growth of Jordan in the period from 1990 to 2012 using a linear regression model estimated with the OLS technique. The study finds that FDI, domestic investment and trade positively and significantly affect the growth of the country's economy. Further evidence from the study is that inflation and debt adversely affect the growth of the nation's economy.
Edoumiekumo (2009) employed the Granger causality test to investigate the relationship between FDI and economic growth in Nigeria in the period from 1970 to 2007. The study finds a significant bi-causal relationship between FDI and economic growth in the country. Adeleke, Olowe, and Fasesin (2014) investigated the effects of FDI and other variables such as export earnings and exchange rate on economic growth in Nigeria over the period from 1999 to 2013 using the OLS estimation technique for estimation of a multiple regression model. The study

finds that FDI, export earnings and exchange rates are positively and significantly related to economic growth in the country.
Adamu and Oriakhi (2013) utilized a fixed-effect model to investigate the impact of FDI on economic growth in the Economic Community of West African States in the 2000-2009 period. The study finds that FDI-GDP ratio, exports, and human capital positively and significantly affect economic growth in the subregion. The study recommends the provision of adequate legal and institutional framework to protect foreign investors, improved governance, etc., as measures to enhance the attractiveness of the subregion to FDI and accelerate its economic growth. Mazenda (2014) employs the methodology of Johansen Cointegration and Vector Error Correction Modelling to examine the effect of FDI on economic growth in South Africa over the period from 1980 to 2010. The output of estimation of the long-run model shows that FDI, real exchange rate and foreign debt negatively and significantly impact growth. Domestic investment is however found to impact growth positively and significantly.
The influence of institutional quality on the effect of FDI on economic growth in Kenya over the period from 1975 to 2013 is investigated in Meah, Onono and Ocharo (2016) using the OLS technique for estimation of a multiple regression model. The study finds that FDI positively affects economic growth and that quality institution enhances the effect of FDI on economic growth in the country. Chiwira and Kambeu (2016) examine the relationship between FDI and economic growth in Botswana over the period from 1980 to 2012 using a dynamic causality test. The Johansen cointegration test finds a long-run relationship between FDI and growth in the country. However, the Granger causality test yields no evidence of a causal relationship between the variables.
Elbolashi (2015) examines the effect of FDI On economic growth and the importance of the host country's characteristics in a sample of 56 developing countries using the system GMM technique for estimation of a dynamic panel data model. The study finds that FDI positively and significantly affects economic growth in the countries, but the effect depends on the host country preparedness to achieve growth and sustainable development. The study further finds that domestic investment, infrastructure, human capital, financial market development, trade openness, and institutional quality positively and significantly affect economic growth.
Blin and Ouattara (2009) examine the effect of FDI on economic growth in Mauritius in the period from 1975-2000 using the ARDL approach to co-integration and error correction. The effects of other variables such as domestic private investment and public investment on growth are also investigated in the study. The study finds that FDI positively and significantly affects economic growth in the country. It also finds that domestic private investment and public investment are also found to positively affect economic growth, though the effect of public investment is significant at the 10% level. The paper recommends that the country should put measures in place to attract more FDI, and articulate and implement policies that that will enhance domestic private investment.
The impact of FDI on economic growth in Tunisia over the period from 1980-2011 is investigated in Wahiba (2014) using OLS. The study finds that FDI impacts positively and significantly on economic growth in the country. It has found positive and significant impacts of

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human capital (represented as tertiary school enrolment) and financial development on economic growth. Pandya and Sisombat (2017) examine the impact of FDI on economic growth in Australia in the period from 2001 to 2013 using multiple regression analysis. The study finds that FDI contributes significantly to the growth of the country's economy. It also finds that FDI contributes to export performance and employment in the country.

Hussain and Haque (2017) investigate the effect of FDI and trade on economic growth in Bangladesh over the period from 1973 to 2014 using the methodology of cointegration and vector error correction modeling. The study finds a long-run relationship between the variables. It further finds that FDI and trade positively and significantly impact the growth of the nation's economy. In view of these findings, the study recommends policies to promote trade and attract FDI into the country to enhance its economic growth. Ugochukwu and Okore (2013) employ the OLS estimation technique to estimate a multiple regression model in a study to examine the impact of FDI on Nigeria's economy in the period from 1981 to 2009. The study finds that FDI positively affects the economy, but the effect is not significant. The effects of gross fixed capital formation (a proxy for domestic investment) and the exchange rate on the economy are found to be positive and significant.

Whereas previous related studies separately examined the effects of public debt on economic growth, and the effect of FDI on economic growth in Nigeria, this study differs from the previous studies by jointly examining the effects of public debt and FDI on economic growth in Nigeria using the ARDL approach to co-integration and error correction modeling analysis. It also examines the causal relationship among the three variables within the framework of the Toda-Yamamoto approach to Granger non-causality testing. A related study was conducted by Onafowora and Owoye (2019), however, their study focused on five Caribbean countries and employed the generalized forecast error variance decomposition and the Granger causality testing technique. The techniques employed for the current study permit investigation of the long-run and short-run effects of public debt (disaggregated into domestic and external debt) and FDI on economic growth, as well as the causal relationship among them, taking into consideration the possibility of the variables having mixed order of integration.

3. Methodology

3.1.Model

We build on the basic Solow growth model by expressing economic growth (real GDP per capita growth, RGDPPCG) as a function of investment. In our model, aggregate investment is disaggregating into domestic capital formation and FDI *à la Agosin and Mayer (2000). Public debt is also disaggregated into domestic and foreign debt, and these are incorporated in the basic Solow growth model. Thus the functional form of our theoretical model is expressed as:*

$$RGDPPCG = f\,(EXDT, DDT, FDI, DFCF) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{[1]}$$

Where RGDPPCG = Annual growth rate of real GDP per capita (a proxy for economic growth; EXDT = External debt as a percentage of GDP; DDT = Domestic debt as a percentage of GDP;

FDI = Net foreign direct investment inflows as a percentage of GDP, DFCF = Domestic fixed capital formation. Following Agosin and Mayer (2000), domestic investment (DFCF) is measured as the difference between gross fixed capital formation and FDI. To avoid problems of omitted variable bias, we incorporate theoretically identified variables such as trade openness (TOPEN) and real interest rate (RINTR) identified by endogenous growth theories as growth determinants. Hence our growth model is re-expressed functionally as:

$$RGDPPCG = f\ (EXDT, DDT, FDI, DFCF, TOPEN, RINTR) \ldots\ldots\ldots\ldots [2]$$

The long run (static) model is specified in the form in which it can be estimated as:

$$RGDPPCG_t = \beta_0 + \beta_1 EXDT_t + \beta_2 DDT_t + \beta_3 FDI_t + \beta_4 DFCF_t + \beta_5 TOPEN_t + \beta_6 RINTR_t + \varepsilon_t \ldots\ldots[3]$$

The βs are the long run parameters, ε is the residual term. The *a priori* expectations are: $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 > 0$, $\beta_6 > 0$.

The associated error correction model is specified as:

$$\Delta RGDPPCG_t = a_0 + a_1 \Delta RGDPPCG_{t-1} + \sum_{i=0}^{m}(\theta_i \Delta EXDT_{t-i}) + \sum_{j=0}^{n}\left(\phi_j \Delta DDT_{t-j}\right) + \sum_{x=0}^{P}(Ч_x \Delta FDI_{t-x}) + \sum_{r=0}^{q}(\partial_r \Delta DFCF_{t-r}) + \sum_{w=0}^{v}(\Pi_w \Delta TOPEN_{t-w}) + \sum_{n=0}^{t}(\Gamma_n \Delta RINTR_{t-n}) + \Omega\varepsilon_{t-1} + \mu_t \qquad [4]$$

3.2.Causality Test

The Toda-Yamamoto (TY) approach to Granger noncausality developed by Toda and Yamamoto (1995) is employed to test the causal relationships among the variables. This approach is applicable irrespective of the order of integration of the variables of a VAR model. It involves using a modified Wald statistic to test the statistical significance of the parameters of a VAR (k) model, where k represents the optimal lag of the original VAR system. Thus the TY causality test involves estimating an augmented VAR model, VAR(k + d_{max}) model, where d_{max} represents the highest order of integration of variables of the VAR model. Application of TY procedure "ensures that the usual test for Granger-causality has the standard asymptotic distribution where valid inferences can be made" (Wolde-Rufaei, 2005, p.896).

Following Wolde-Rufaei (2005), to undertake the TY approach to the Granger-causality test, we present DDT-RGDPPCG, EXDT-RGDPPCG, FDI-RGDPPCG model with the augmented VAR system:

$$Y_t = a_0 + \sum_{i=1}^{k}(\alpha_{1i} Y_{t-i}) + \sum_{j=k+1}^{dmax}(\alpha_{2j} Y_{t-j}) + \sum_{i=1}^{k}(\phi_{1i} X_{t-i}) + \sum_{j=k+1}^{dmax}\left(\phi_{2j} X_{t-j}\right) + \lambda_{1t} \quad [5]$$

$$X_t = a_0 + \sum_{i=1}^{k}(\varphi_{1i} X_{t-i}) + \sum_{j=k+1}^{dmax}\left(\varphi_{2j} X_{t-j}\right) + \sum_{i=1}^{k}(\varrho_{1i} Y_{t-i}) + \sum_{j=k+1}^{dmax}\left(\varrho_{2j} Y_{t-j}\right) + \lambda_{2t} \quad [6]$$

Where X and Y represent pairs of variables as indicated above. From equation [5] Granger causality from X to Y implies $\phi_{1i} \neq 0\ \forall\ i$; similarly, from equation [6], Granger causality from Y to X implies $\varrho_{1i} \neq 0\ \forall\ i$.

3.3. Estimation Procedures

The times series properties of stationarity of the variables were tested using the augmented dickey fuller (ADF) unit root test and the Philips-Perron unit root test. The Toda-Yamamoto approach to the Ganger causality test developed by Toda and Yamamoto (1995) was utilized to test the causal relationships among the variables. This is because the variables were of mixed order of integration as indicated by the results of the unit root tests conducted. Following these, the test for co-integration, and error correction modeling were performed using the ARDL (Bounds test) approach to co-integration and error correction analysis to determine whether or not a long-run relationship exists between the variables. The test is aimed at investigating whether the variables will converge in the long run as this will enhance the reliability of policies formulated based on a model estimated using the converging variables.

3.4. Data and their Sources

Annual time series data spanning the period from 1981 to 2016 were employed in the study. The data were sourced from the CBN Statistical Bulletin (2016) and the World Bank's World Development Indicators (2016). Specifically, data on growth rate of real per capita income (GRGPC), foreign direct investment (FDI), trade openness (TOPN), inflation (INF), and gross fixed capital formation or domestic fixed capital formation (DFCF) were obtained from the WDI, while data on domestic debt stock and external debt stock were obtained from the CBN Statistical Bulletin.

4. Empirical Analysis

4.1. Unit Root Test

The results of the unit root test for the variables involving the Augmented Dickey-Fuller test and the Phillip-Perron test are presented in Table 3 This is done to ascertain the stationarity property of the variables. The unit root test results indicate that the variables are of mixed order of integration, that is, some are stationary at levels, while others are stationary at first difference. They are stationary at their first differences. In spite of this, there exists the possibility of a linear combination of the variables to be stationary. In other words, there is the possibility for long-run relationship(s) to exist among the variables. To test this possibility the co-integration test is performed using the Bounds test.

Table 3. Unit Root Test Results

Augmented Dickey-Fuller (ADF) Unit Root Test							
Variables	**Level**			**First Difference**			**d**
	ADF Test Stat	Critical Value (5%)	Inference	ADF Test Stat	Critical Value (5%)	Inference	
Rgdppcg	-4.83	-2.95	S	-8.73			0
Exdt	-2.51	-3.55	NS	-4.34	-3.55	S	1
Ddt	-2.89	-3.55	NS	-4.60	-3.55	S	1
Fdi	-3.46	-3.54	NS	-8.10	-3.55	S	1
DFCF	-3.41	-3.54	NS	-5.40	-3.56	S	1
TOPEN	1.38	-3.60	NS	-5.37	-3.58	S	1
RINTR	-7.29	-3.54	S	-	-	-	0

Phillips-Perron (PP) Unit Root Test							
Variables	Level			First Difference			d
	PP Test Stat	Critical Value (5%)	Inference	PP Test Stat	Critical Value (5%)	Inference	
Rgdppcg	-5.03	-3.54	S	-	-	-	0
Exdt	-2.20	-3.54	NS	-4.33	-3.55	S	1
Ddt	-2.64	-3.54	NS	-4.49	-3.55	S	1
Fdi	-3.37	-3.54	NS	-17.84	-3.55	S	1
DFCF	-6.35	-3.54	S	-	-	-	0
TOPEN	-1.55	-3.54	NS	-9.67	-3.55	S	1
RINTR	-6.99	-3.54	S	-	-		0

NS = Non-stationary; S = Stationary; d = order of integration

Source: Authors' computation using EVIEWS 9.

4.2. Co-integration Test

The result of the co-integration tests is presented in Table 4.

Table 4: ARDL Bounds Test

Sample: 1982- 2016
Included observations: 35
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	6.431672	6
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Source: Author's computation using Eviews 9

The result of the test for co-integration indicates the existence of the level (long run, co-integrating) relationship between real per capita income growth and the explanatory variables as the F-statistic value of 6.43 is greater than the upper bound critical value even at the 1% significance level. Thus the null hypothesis of no level relationships is strongly rejected, and we infer that the variables are co-integrated.

4.3. Toda-Yamamoto Causality Test

The results of the Toda-Yamamoto approach to the Granger non-causality test are presented in Table 5.

Table 5: Toda-Yamamoto Granger Non-causality Test Result (Modified Wald Test)

Sample: 1981- 2016
Included observations: 34

Excluded	Chi-sq	Df	Prob.
Dependent variable: RGDPPCG			
FDI	1.158054	1	0.2819
DDT	6.239600	1	0.0125
EXDT	1.083751	1	0.2979
All	7.740673	3	0.0517
Dependent variable: FDI			
RGDPPCG	0.266128	1	0.6059
DDT	6.01E-05	1	0.9938
EXDT	0.580850	1	0.4460
All	1.132309	3	0.7693
Dependent variable: DDT			
RGDPPCG	0.268065	1	0.6046
FDI	0.480278	1	0.4883
EXDT	0.949417	1	0.3299
All	1.804530	3	0.6139
Dependent variable: EXDT			
RGDPPCG	0.766904	1	0.3812
FDI	0.909864	1	0.3402
DDT	0.021786	1	0.8827
All	1.607008	3	0.6578

Source: Authors' Estimation using Eviews 9

The causality test results indicate that unidirectional (short-run) causation runs from domestic debt to economic growth (rgdppcg). This suggests that domestic debt is a significant predictor of economic growth in the short run. However, all the excluded variables jointly Granger-cause economic growth at the 10% significant level. No causal relationship exists between the other variables as indicated by other results having FDI, DDT, and EXDT as dependent variables.

4.4. Model Estimation Results

The results of the estimation of the short-run model (co-integrating form) and the long-run equation based on the estimated ARDL model shown in the Appendix are presented in Table 6.

Table 6: ARDL Co-integrating and Long Run Form

Dependent Variable: RGDPPCG
Selected Model: ARDL(1, 1, 0, 0, 0, 1, 0)
Sample: 1981 2016
Included observations: 35

Co-integrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXDT)	-0.048399	0.116998	-0.413673	0.6826
D(DDT)	-1.293996	0.406220	-3.185455	0.0039
D(FDI)	0.120354	0.566552	0.212431	0.8335
D(DFCF)	-0.064644	0.070155	-0.921436	0.3656
D(TOPEN)	-0.216730	0.094632	-2.290239	0.0307
D(RINTR)	0.066221	0.117893	0.561705	0.5793
CointEq(-1)	-1.137280	0.159623	-7.124782	0.0000

Cointeq = RGDPPCG - (0.2391*EXDT -1.1378*DDT + 0.1058*FDI -0.0568 *DFCF -0.0147*TOPEN + 0.0582*RINTR + 11.8941)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXDT	0.239085	0.074910	3.191646	0.0038
DDT	-1.137799	0.342427	-3.322750	0.0027
FDI	0.105826	0.495547	0.213553	0.8326
DFCF	-0.056841	0.060101	-0.945754	0.3533
TOPEN	-0.014668	0.074686	-0.196400	0.8459
RINTR	0.058227	0.102232	0.569564	0.5741
C	11.894122	5.240317	2.269733	0.0321

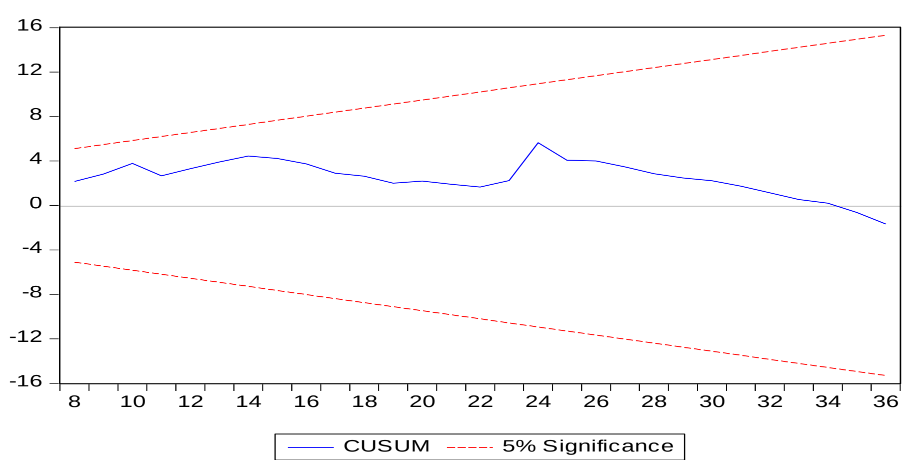
Source: Authors' Estimation using Eviews 9.

The error correction result (co-integrating form) indicates the three explanatory variables of interest, domestic debt negatively and significantly affects economic growth in the short run. The effect is significant at the 1% level. This is in sync with the evidence from James, Magaji, Ayo, and Musa (2016), The short-run growth effects of other variables of interest – external debt, and FDI are not statistically significant at the conventional levels. This further confirms the result of the causality test which indicated that among these variables, only domestic debt, Granger causes (uni-directionally) economic growth in the short-run. We observe also that

among the control variables, trade openness significantly affect economic growth in the short run. The effect is negative and significant at the 5% level. Thus openness of the economy to global trade adversely affects its growth in the short run. The short-run growth effects of other control variables – domestic fixed capital formation and real interest rate – are not statistically significant. The coefficient of the error correction term is negatively signed and statistically significant, as expected. This further confirms that the variables will converge in the long run. However, the size coefficient of the error correction term (-1.137) suggests that convergence towards long-run equilibrium in the event of short-run deviation therefrom is oscillatory.
The long-run coefficients show that external debt positively and significantly affects economic growth in Nigeria in the long run. The effect is significant at the 1% level. This corroborates the evidence from Adegbite, Ayadi, and Ayadi (2008) and Ndubuisi (2017). As in the short run, the long-run growth effect of domestic debt is negative and significant at the 1% level. This corroborates Oyeiwu (2015) and Singh (1999). Thus domestic debt adversely affects economic growth in the short run and also in the long run in Nigeria. These could be attributed to the fact that growth in domestic debt limits the chances of private sector borrowing, thus crowding out domestic investment which is an important requirement for economic growth. The long-run growth effects of the other variables – FDI, DFCF, TOPEN, and RINTR – are statistically not significant.

4.5. Model Stability Test

The method of testing the long-run stability of the regression model suggested by Brown, Durbin, and Evans (1975) was used to test the structural stability of the estimated model. This involves plots of the cumulative sum of recursive residuals (CUSUM) and that of the cumulative sum of squared recursive residuals (CUMSUMSQ). The plots are presented in Figure 1. Both plots (CUSUM and CUSUMSQ) lie between the critical bounds at the 5% significance level. Thus it can be reasonably inferred that the long-run relationship between the dependent variable and the explanatory variable is stable. Model stability enhances its reliability for policy pursuit.



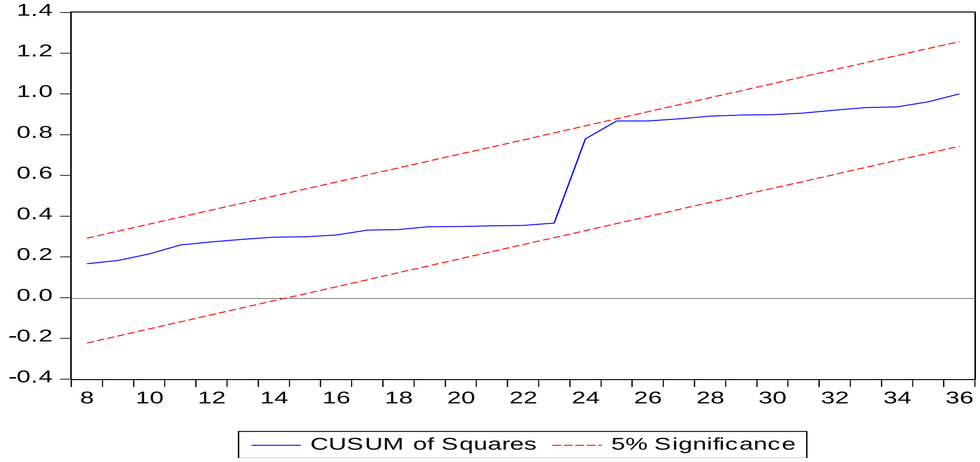


Fig. 1: Plots of CUSUM & CUSUMSQ

5. Conclusion and Policy Recommendations

5.1. Conclusion

The study examined the relationship between external debt, domestic debt, FDI and economic growth in Nigeria. The Toda-Yamamoto approach to Granger non-causality test was employed to examine the causal relationships among the variables, while the ARDL (Bounds test) approach to co-integration and error correction modeling was employed to determine the short run and the long-run effects of external debt, domestic debt, FDI and economic growth in the country. The causality analysis only indicates unidirectional causality between domestic debt and economic growth, with causation running from domestic debt to economic growth. No causal relationships were found between external debt, FDI and economic growth. The co-integration and error correction analysis show that domestic debt negatively and significantly affected economic growth in the short run. Trade openness was also found to adversely affect economic growth in the short run in the country. The short-run effects of external debt and FDI on economic growth were found to be statistically not significant. The estimated long-run coefficient revealed that domestic debt and external debt significantly affect economic growth in the country. While the long-run growth effect of external debt is positive, that of domestic debt remains negative as in the short run. Also as in the short run, the long-run growth effect of FDI is statistically not significant. In view of the empirical evidence, less reliance on domestic debt, proper use of external debt and some restrictions on trade particularly the importation of consumer goods were recommended as measures to enhance the growth of the nation's economy.

5.2. Policy Recommendations

Based on the empirical evidence, the following are recommended for policy consideration:

i. Less reliance on domestic debt as this adversely affects economic growth in the short run and in the long run.
ii. Judicious use and management of the nation's external debt, as this positively affects economic growth in the long run.

iii. Restriction on imports. To this end, there is a need for the imposition of tariff, ban, quota, etc. on some categories of imports particularly those which the country can produce at a lower cost. This would ensure the protection of local infant industries in the economy.

Conflicts of Interest: The authors declare no conflict of interest.

Authors' contribution: Osazee Ogbebor and Oziengbe Scott Aigheyisi conceived the idea and collected data; Osazee Ogbebor analyzed the data; Oziengbe Scott Aigheyisi wrote the paper.

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Appendix

Dependent Variable: RGDPPC
Method: ARDL
Date: 03/31/19 Time: 06:57
Sample (adjusted): 2 36
Included observations: 35 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): EXDT DDT FDI DFCF TOPEN RINTR
Fixed regressors: C
Number of models evaluated: 64
Selected Model: ARDL(1, 1, 0, 0, 0, 1, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RGDPPC(-1)	0.926240	0.065437	14.15465	0.0000
EXDT	-0.921927	1.739672	-0.529943	0.6008
EXDT(-1)	3.358078	1.818915	1.846199	0.0767
DDT	-16.95531	5.633133	-3.009926	0.0059
FDI	-0.281066	8.144827	-0.034509	0.9727
DFCF	-1.994630	1.302511	-1.531373	0.1382
TOPEN	-3.335380	1.458345	-2.287100	0.0309
TOPEN(-1)	2.913269	1.265553	2.301974	0.0299
RINTR	0.604460	1.695920	0.356420	0.7245
C	380.8486	207.1241	1.838746	0.0779

R-squared	0.980274	Mean dependent var	1670.070
Adjusted R-squared	0.973172	S.D. dependent var	485.1213
S.E. of regression	79.45901	Akaike info criterion	11.82332
Sum squared resid	157843.4	Schwarz criterion	12.26770
Log likelihood	-196.9080	Hannan-Quinn criter.	11.97672
F-statistic	138.0378	Durbin-Watson stat	2.217534
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection