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FOREIGN PRIVATE INVESTMENT AND ECONOMIC GROWTH IN NIGERIA

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Abstract: *Despite the increased flow of investment to developing countries in particular, Sub-Sahara African (SSA) countries, Nigeria inclusive, are still characterized by low per-capita income, high unemployment rates and low and falling growth rates of GDP, problems which foreign private investment are theoretically supposed to solve. The Nigerian government has been focusing on policies that will help attract foreign investors and yet the economy is still dwindling. It is against this background, that this study analyzed the direction and significance of the effect of foreign private investment on economic growth in Nigeria. Secondary data for the period 1970 to 2005 was used for the study. Among the findings was that Foreign Private Investment, Domestic Investment growth and Net Export growth were positively related to economic growth in Nigeria. More so, the Foreign Private Investment, Domestic Investment growth, Net export growth and the lagged error term were statistically significant in explaining variations in Nigeria's economic growth.*

Keywords: *Foreign Private Investment, Domestic Investment Growth, and Economic Growth*

1. INTRODUCTION

In most economies however, domestic private investment has proven to be insufficient in giving the economy the required boost to enable it meet its growth target because of the mismatch between their capital requirements and saving

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capacity. Foreign private investment, thus, augments domestic resources to enable the country carry out effectively her development programmes and raise the standard of living of her people.

Though foreign private investment is made up of Foreign Direct Investment and Foreign Portfolio Investment, Foreign Direct Investment is often preferred as a means of boosting the economy. This is because FDI disseminates advanced technological and managerial practices through the host country and thereby exhibits greater positive externalities compared with Foreign Portfolio investment which may not involve positive transfers, just being a change in ownership. In addition, available data suggest that FDI flows tend to be more stable compared to Foreign Portfolio Investment (Lipsey, 1999). This is because of the liquidity of Foreign Portfolio Investment and the short time horizon associated with such investments. Also, FDI inflows can be less affected by change in national exchange rates as compared to Foreign Portfolio Investment. However, a balanced combination of the two, taking into consideration the unique characteristics of the recipient economy will bring about the required effects on the economy.

The benefits of Foreign Private investment include transfer of technology, higher productivity, higher incomes, more revenue for government through taxes, enhancement of balance of payments ability, employment generation, diversification of the industrial base and expansion, modernization and development of related industries. According to Feldstein (2000), first, international flows of capital reduce the risk faced by owners of capital by allowing them to diversify their lending and investment. Second, the global integration of capital markets can contribute to the spread of best practices in corporate governance, accounting rules, and legal traditions. Third, the global mobility of capital limits the ability of governments to pursue bad policies. Four, Foreign investment through FDI allows for the transfer of technology - particularly in the form of new varieties of capital inputs - that cannot be achieved through financial investments or trade in goods and services. Foreign investment through FDI can also promote competition in the domestic input market. Five, recipients of FDI often gain employee training in the course of operating the new businesses, which contributes to human development in the host country. Lastly, profits generated by Foreign Investments contribute to corporate tax revenues in the host country. However, the arguments against foreign private investment are that it may cause capital flight which may lead to net capital outflow and thus create balance of

payment difficulties, it also creates income distribution problems when it competes with home investment. Foreign Private investments may also actually be capital intensive, which may not fit in the factor proportions of the recipient country.

Since the 1980s, flows of investment have increased dramatically the world over. Despite the increased flow of investment to developing countries in particular, Sub-Sahara African (SSA) countries are still characterized by low per-capita income, high unemployment rates and low and falling growth rates of GDP, problems which foreign private investment are theoretically supposed to solve.

Nigeria, being one of the top three countries that consistently received FDI in the last decade (Ayanwale, 2007) is not exempted from this category. The Nigerian Government is putting so much effort into attracting foreign investors and yet the economy is still dwindling. Against this background, this study is focused on analyzing the direction and significance of the effect of foreign private investment on the GDP of Nigeria.

The rest of this study is divided into three sections. Section two reviews the literature, section three contains the methodology and empirical results while section four concludes the study.

2. REVIEW OF EMPIRICAL LITERATURE.

The contribution of Foreign Private Investment to the economy has been debated extensively over the years. These debate covers both the developed and developing economies. However, a lot more focus has been put into the study of Foreign Direct Investment since it is seen to have a larger impact on the economy.

In the developed world, it is agreed that Foreign private investment generally play a positive role in the economy, although it varies from county to country and depends on country characteristics, policy environment and sectors. Blomström and Kokko (1997) reviewed the empirical evidence on host country effects of foreign direct investment. They conclude that MNCs may play an important role for productivity and export growth in their host countries, but that the exact nature of the impact of FDI varies between industries and countries, depending on country characteristics and the policy environment. Alfaro(2003) in an empirical analysis using cross-country data for the period 1981-1999 suggests that total FDI exerts an ambiguous effect on growth. From the results, foreign direct investments in the primary sector tend to have a negative effect on growth, while investment in manufacturing a positive one. Evidence from the service sector is ambiguous.

Lensink and Morrissey (2001) in a cross-country study of 88 countries including 20 developing countries, studied the effect of volatility of FDI flows on growth over the 1970-1998 period. They estimated the standard model using cross-section, panel data and instrumental variable techniques. Whilst all results were not entirely robust, there was a consistent finding that FDI has a positive effect on growth whereas volatility of FDI has a negative impact. Ledyaeva and Linden (2006) determined the FDI impact on per capita growth in 74 Russian regions during period of 1996-2003.Their framework related real per capita growth rate to initial levels of state variables, such as the stock of physical capital and the stock of human capital, and control variables viewed as important factors in the Russian economy's regional development in the analyzed period. Their results imply that in general FDI (or related investment components) do not contribute significantly to economic growth in Russia in the analyzed period. However some evidence of positive aggregate FDI effects in higher-income regions is relevant. However FDI seems not to play any significant role in the recent growth convergence process among Russian regions.

Empirical evidence from the Czech Republic points to a mixed experience for the impact of foreign investment on domestic firms. Based on firm-level data from the period 1994-1998, an industry-wide inverse relationship was detected between the extent of foreign investment and the turnover of domestic firms (Djankov and Hoekman, 2000). This finding was similar to that of a study focusing on regional effects (1993-1998) which indicated that the productivity of domestic firms had declined in proportion to the level of foreign investment (Torlak, 2004) in a given industry. However, these negative or neutral findings stand in contrast to those of other studies that have detected positive effects. For instance, the introduction of foreign investment was found to have a positive effect on the entry rates of domestic firms at intra- and inter-industry level (Ayyagari and Kosova, 2006), across all industries, during the period 1994-2000.

Ewe-Ghee Lim (2001) summarizes recent arguments/findings on FDI and its correlation with economic growth focusing on literature regarding spillovers from FDI and finds that while substantial support exists for positive spillovers from FDI, there is no consensus on causality.

Mishara and Mody (2001) observed that foreign private investment has been associated with higher growth in some advanced countries. Within the LDCs, however, Foreign private investment is associated with high incidence of crises.

For developing countries, findings have been a little different. Investigations show that they do not benefit as much from foreign investment and most times, face crowding out of their domestic investment due to the inflow of foreign capital. The extent of benefits from foreign private investment depend on their overall macro-economic stability and policy framework. Aremu (1997) submitted that foreign Private Investment accelerate the pace of economic development of the LDCs up to a point where a satisfactory rate of growth can be achieved on a self-sustaining basis. He observe that the main responsibility of foreign private, investment in LDCs is to raise the standard of living of its people so as to enable them move from economic stagnation to self-sustaining economic growth. He therefore concluded his study by recommending that foreign private investment should continue to rise till a certain level of income is reached in the undeveloped countries. The LDCs should also mobilize a level of capital formation sufficient to ensure adequate level of economic growth and development.

Kumar and Pradhan (2002) analyze the relationship between FDI, growth and domestic investment for a sample of 107 developing countries for the 1980-99 period. Their model uses flow of output as the dependent variable and domestic and foreign owned capital stock, labor, human skills capital stock and total factor productivity as their independent variables. Their results show that panel data estimations in a production function framework suggest a positive effect of FDI on growth and although FDI appears to crowd-out domestic investments in net terms, in general, some countries have had favourable effect of FDI on domestic investments in net terms suggesting a role for host country policies. Aitken and Harrison (1999) in testing if domestic firms benefit from direct foreign investment in Venezuela used panel data on Venezuelan plants, and found that foreign equity participation is positively correlated with plant productivity, but this relationship was only robust for small enterprises. They concluded that foreign investment negatively affects the productivity of domestically owned plants. The net impact of foreign investment, taking into account these two offsetting effects, is quite small. The gains from foreign investment appear to be entirely captured by joint ventures.

Borensztein *et al* (1998) in a study using panel data of 69 developing countries over two periods, 1970-79 and 1980-89 investigate the impact of FDI on growth. They used a basic estimating equation of growth in real GDP as the dependent variable, and *FDI,* measure of schooling and initial GDP as their independent variables. They find that FDI has a positive impact on growth but this

is only realized when *their measure of schooling* is above some critical level (estimated as 0.52); at low levels of their measure of schooling, FDI has a negative impact on growth confirming the complementarity of FDI and human capital in the process of diffusion.

Agosin and Mayer (2000) assessed the extent to which foreign direct investment in developing countries crowds in or crowds out domestic investment. Their model is run for three developing regions (Africa, Asia and Latin America) with panel data for the period 1970–1996 and the two sub-periods 1976–1985 and 1986–1996. Their model differed from previous models with the inclusion of lagged variables in the model (lagged FDI, lagged domestic investment and lagged growth rates). The results indicate that in Asia – but less so in Africa – there has been strong crowding in of domestic investment by FDI; by contrast, strong crowding out has been the norm in Latin America. The conclusion they reached was that the effects of FDI on domestic investment are by no means always favourable and that simplistic policies toward FDI are unlikely to be optimal. Assanie and Singleton (1999) studied the impact of FDI on economic growth in 67 developing countries. They find that while FDI has a positive impact on economic growth in middle-income countries (MICs), low-income countries (LICs) have not benefited from FDI flows.

Mohey-ud-din(2006) studied the impact of foreign capital flows on economic growth in Pakistan from 1975 to 2004 using GDP as the dependent variable and net inflow of FDI and ODA (Official Development Assistance and Official Aid) as the independent variable. Co-efficients of 61.4 for FDI and 22.7 for ODA showed a high positive impact of foreign capital inflows on the GDP growth in Pakistan during the period of 1975-2004. Weeks (2001) investigates the relationship between FDI and domestic investment: that foreign direct investment may ‘crowd-in’ or ‘crowd out’ domestic investors using 18 countries in Latin America. He incorporates real export growth and elasticity of domestic and foreign investment into his model and concludes that the stimulant effect foreign direct investment varies considerably across Latin American countries. This suggests that purposeful policy can increase the benefits of foreign investment inflows.

In Africa, Foreign private investment has been found to enhance economic growth although it crowds out domestic investment. Fedderke and Romm (2005) were concerned with the growth impact and the determinants of foreign direct investment in South Africa. Their estimation is in terms of a standard spillover

model of investment, and in terms of a new model of locational choice in FDI between domestic and foreign alternatives. They find complementarity of foreign and domestic capital in the long run, implying a positive technological spillover from foreign to domestic capital. While there is a crowd-out of domestic investment from foreign direct investment, this impact is restricted to the short run. Irandoust and Ericsson (2005) investigated the foreign aid, domestic saving, and economic growth relationships for a panel of African countries including Nigeria over the period 1965–2000. Using unit root and co-integration tests, the results revealed that the variables contain a panel unit root and they cointegrated in a panel perspective. The findings show that foreign aid and domestic saving enhance economic growth for all countries in the sample.

Gyapong and Karikari (1999) examined causal relationships between direct foreign investment (DFI) and economic performance in two Sub-Saharan African countries(Ghana and Ivory Coast), from the 1960s to 1980.Using correlation , causality, stationarity and cointegration tests, their results show that the impact of higher economic performance on DFI depends crucially on the strategy of the investment. Specifically, in Ivory Coast, a superior economic performance enhanced the inflow of export-oriented DFI; but, in Ghana, where DFI took the form of market-development in response to an import-substitution strategy, the effect is ambiguous. Obwona (2001) studied the impact of FDI on growth in Uganda. As expected, FDI impacted on growth positively though the coefficient was insignificant.

In the case of Nigeria, Ayashagba and Abachi (2002) carried empirical investigation on the effects of foreign direct investment on economic growth in Nigeria from 1980 to 1997. The result presented showed that foreign direct investment had significant impact on economic growth in Nigeria. They therefore concluded that the presence of foreign direct investment in the LDCs particularly in Nigeria is not totally useful. Akinlo (2004) also investigated the impact of foreign direct investment (FDI) on economic growth in Nigeria, for the period 1970–2001. The ECM results showed that both private capital and lagged foreign capital have small, and not a statistically significant effect, on the economic growth. The results seem to support the argument that extractive FDI might not be growth enhancing as much as manufacturing FDI. Obadan (2004) addressed the various issues associated with capital flows in both conceptual and empirical contexts. He posits that the desirability or otherwise of foreign capital depends on the use to which

such capital is put. Foreign capital, if channelled into productive uses, as against consumption, can be highly desirable, as it will bring about the much needed economic growth and development. Ayanwale and Bamire (2004) reported a positive and significant effect of FDI on firm's productivity of both domestic and foreign firms in the Nigerian Agro/agro allied sector.

3. METHODOLOGY AND EMPIRICAL RESULTS

3.1 The Model

The methodology for this study was adapted with some modifications from Obwona, (2001).

Obwona's equation was derived from a neoclassical aggregate production function comprising exports. The model equation is stated as follows:

$$G_Y = á_1 + á_2 FDI + á_3 GDS + á_4 OCF + á_5 EXGR + á_6 AID + \mu$$

Where: G_Y = Annual growth rate of nominal GDP,

FDI = Foreign Direct Investment,

GDS = gross domestic savings as proportion of GDP,

OCF= other capital inflows,

EXGR= rate of growth of real exports,

AID= net current transfers to government plus official long-term borrowing,

μ = disturbance term.

His reason for the inclusion of the export variable in the equation is that it is well documented in the literature that trade, especially exports, may increase competition, permit the realization of comparative advantage, enable countries to purchase goods from abroad, and provide opportunities to gain access to new technology as well as managerial skills. Thus, the export variable is expected to have a positive co-efficient. The coefficient of FDI denotes the impact of FDI on economic growth. According to modernization hypothesis, it should be positive. But dependency hypothesis would expect the coefficient FDI to be uncertain. The same follows for the AID and OCF variables. Finally, the variable GDS is standard

in a production function and as usual, the coefficient of GDS is expected to be positive.

In this study, some modifications were done. These modifications include that: The FDI, AID and OCF variables will be summed up to give Foreign Private Investment which is the subject of this study; The GDS variable will be replaced by Gross Fixed Capital Formation, since this is a better measure of domestic investment because not all the Gross Domestic Savings may be transformed into productive uses in investment; Rather than use GDS as a proportion of GDP we use growth rate of GFCF; and Export growth is replaced with net export growth for better results. Thus, the model equation for this study is stated as:

$$Yg = \alpha_0 + \alpha_1 FPI + \alpha_2 INVg + \alpha_3 NETXg + \mu$$

Where: Yg = Income growth measured by GDP growth rate.

FPI = Foreign Private Investment

$INVg$ = Domestic Investment Growth rate

$NETXg$ = Growth rate of net exports.

$\alpha_0, \alpha_1, \alpha_2, \alpha_3$ = co-efficients

μ = error term.

The above equation was estimated using the Ordinary Least Square (OLS) method. And in doing this some test were carried out, this tests include unit root test, co-integration and error correction model analysis. Other diagnostic tools of analysis like the R- squared, statistical tests for significance (T and F tests) and Durbin Watson test were used to interpret the results. The software application utilised was E-views 5.1. Secondary data for the period 1970 to 2005 was used for the study and this was sourced through the publications of the Central bank of Nigeria, such as the Statistical Bulletin, the CBN's annual report and the Bullion.

3.2 Empirical Results

3.2.1 Augmented Dickey-Fuller (ADF) Test For Unit Root

The ADF test was done with the following hypothesis:

- Null hypothesis (H_0): Variable contains unit root and hence is non-stationary.

- Alternative hypothesis (H_1): Variable does not contain unit root and hence is stationary

The decision rule was that: If the calculated ADF Test statistic is greater than the MacKinnon critical values, reject the null hypothesis of non-statonarity and accept the alternative of stationarity, otherwise accept the null hypothesis of non-stationarity.

The results for the Augmented Dickey-Fuller Test for Unit Root (See appendix 1) is summarized as follows:

VARIABLE	ADF TEST STATISTIC	95% CRITICAL VALUE FOR THE ADF STATISTIC
GDP Growth (Yg)	-3.643288**	-2.9558
FPI	-1.850737	-2.9499
Investment growth (INVg)	-3.184728**	-2.9750
NETEXPORT growth (NETXG)	-3.052181**	-2.9527

** Stationary at 5% level of Significance

These results show that growth rate of GDP (GDPG), growth rate of Foreign Private Investment, growth rate of Gross Fixed Capital Formation, and net export growth are stationary and Foreign Private investment is non-stationary at 5% level of significance. However, the fact that the variable FPI growth is stationary while FPI itself is not means that FPI is stationary after first difference {I(1)} while the other variables are stationary at level {I(0)}. Since there exists a non-stationary time series among our variables, we go further to carry out co-integration tests to ensure that though there is a non-stationary time series, the variables have a long-term or equilibrium between them i.e. the variables are co-integrated.

3.2.2 Co-Integration Tests

Theoretically, it is expected that a regression involving non-stationary time series may produce spurious results. Co-integration tests prove that the combination of stationary and non-stationary variables has a long-term relationship. In this study the Johansen Test for Co-integration and the ADF unit root test on the residuals were used.

The Johansen Test for Co-integration on all the variables in the series with no lag intervals showed four co-integrating equations (See Appendix 2), allowing us to conclude that the combination of the included variables are co-integrated.

While the ADF unit root test on the residuals works with the same decision rule as unit root test. For co-integration, it tests for unit root in the residuals obtained from the OLS regression of the model. The result shows that the ADF test statistic (-4.69) was greater than the 5% critical value (-2.98), in absolute terms (See Appendix 3). This implies that the residuals are stationary, leading us to conclude that the variables are co-integrated. Therefore, based on both tests, it can be concluded that the included variables are co-integrated. This implies that although there is the presence of one non-stationary time series among them (FPI), there is a long-run equilibrium relationship between them. Given this conclusion, a parsimonious error correction model can then be used to explain the relationship between the variables.

3.2.3 Parsimonious Error Correction Model

The original model is:

$$Yg = \alpha_0 + \alpha_1 FPI + \alpha_2 INVg + \alpha_3 NETXg + \mu$$

Where: Yg = Income growth measured by GDP growth rate.

FPI = Foreign Private Investment

$INVg$ = Domestic Investment Growth rate

$NETXg$ = Growth rate of net exports.

$\alpha_0, \alpha_1, \alpha_2, \alpha_3$ = co-efficients

μ = error term.

Therefore the parsimonious error correction model is given as:

$$d(Yg) = \alpha_0 + \alpha_1 d(FPI) + \alpha_2 d(INVg) + \alpha 3 d(NETXg) + \alpha_4 \mu_{t-1} + \varepsilon$$

Where: d = first difference operator

μ_{t-1} = lagged residual

ε =error term

The results of the above stated model (see appendix 4) is summarised as follows:

$$d(Yg) = 0.304 + 0.00059d(FPI) + 0.3739d(INVg) + 0.0338d(NETXg) - 0.9643\mu_{t-1} + \varepsilon$$

t-stat	(0.087)	(2.899)**	(2.217)**	(2.895)**	(-4.145)**
R^2	0.6977		F – statistic:	13.2693	
Adjusted R^2	0.6451		DW - statistic:	1.7697	

The regression result above is in line with the a priori expectations that the independent variables of Foreign Private Investment (FPI), Growth rate of Gross Fixed Capital Formation (GFCF growth) and net export growth rate (NETEXPORTGROWTH) have positive impact on growth rate of Gross Domestic Product (GDPG). The constant term is given as 0.304. This implies that the model passes through 0.304 and if all the included variables are zero, the first difference of the growth rate of GDP will be 11.37. The coefficient of d(FPI) is 0.00059. This implies that there is a positive relationship between Foreign Private Investment and GDP growth rate in the short run such that a unit increase in Foreign Private Investment will bring about an increase of 0.00059 in the growth rate of GDP, all other variables being held constant.

The coefficient of d(INVg) is 0.3739. This implies that there is a positive relationship between growth rate of Domestic Investment (gross fixed capital formation) and GDP growth rate in the short run such that a unit increase in growth rate of gross fixed capital formation will increase the growth rate of GDP by 0.3739, all other variables being held constant. The coefficient of d(NETXg) is 0.0338. This implies that there is a positive relationship between growth rate of net exports and GDP growth rate in the short run such that a one- unit increase in growth rate of net exports will increase the growth rate of GDP by 0.0338, all other variables being held constant.

The co-efficient of μ_{t-1} is –0.9643. This shows that there is a negative relationship between the growth rate of GDP and the equiibrum error term. This is in line with the a priori expectation. The results also show that 0.96 of the discrepancies in the variables are eliminated in the next time period. This confirms the long-run relationship between them.

The coefficient of determination (R^2) from our results is given as 0.6977. This implies that 69.77% of the variations in the growth rate of the GDP of Nigeria are accounted for by the included explanatory variables of Foreign Private Investment, Growth rate of Gross Fixed Capital Formation and Net export growth. The adjusted coefficient of determination (adjusted R^2) is given as 0.6451. This means that precisely 64.51% of the variations in the growth rate of the Gross Domestic Product of Nigeria are accounted for by the included variables, after the co-efficient of determination has been adjusted to make it insensitive to the number of included variables.

The statistical test for significance of the individual parameter estimates (i.e t-statistic) using 95% confidence interval and 23 degree of freedom (n – k = 28 - 5) gives 1.708 from the statistical table. And since the calculated t-statistics of foreign private investment, growth rate of domestic investment, net export growth and the lagged error term are higher than the one from the table and the t-statistic of the constant term is lower than the one from the table, it can be concluded that foreign private investment, domestic investment, net export growth and lagged error term are significant in describing variations in the growth rate of the Gross Domestic Product in Nigeria and therefore cannot be ignored. The constant term however, is not significant and therefore its impact can be ignored in explaining variations in the growth rate of Gross Domestic Product in Nigeria.

Also the statistical test for joint significance of the parameter estimates (i.e. F-statistic) using 95% confidence interval and 4, 23 degree of freedom gives the figure 2.79 from the statistical table. And since the calculated f-statistics from our results gives 13.2693, which is higher than that from the table, we reject the null hypothesis and accept the alternative hypothesis, concluding that the joint influence of all included explanatory variables is significant and therefore cannot be ignored in explaining variations in growth of Gross Domestic Product in Nigeria. The calculated Durbin-Watson statistic from our results is 1.7697. Checking the statistical tables at 95% confidence interval gives a lower limit (*dl*) of 1.104 and an upper limit (*du*) of 1.747. Since the calculated statistic is higher than the upper limit, we conclude that there is no autocorrelation. This result is also consistent with the calculation of ê (DW = 2(1 - ê)) which gives 0.1151, implying that there is no auto correlation since its value is tending towards zero. This is in line with the assumption of non autocorrelation of the error terms in the ordinary least squares method of regression.

4. CONCLUSION

Foreign Private Investment, which comprises Foreign Direct Investment (investment in real assets) and Foreign Portfolio Investment (investment in financial assets), augments domestic resources of any economy and enhances the economic development of the country. With current increased in-flow of foreign capital, Sub-Sahara African (SSA) countries including Nigeria are still characterized by low per-capita income, high unemployment rates and low and falling growth rates of GDP. This has stimulated a lot of arguments in the literature. This study therefore examined the issue of Foreign Private Investment and its impact on the Nigerian Economy. Among the findings was that Foreign Private Investment was non-stationary while the variables were jointly co-integrated. Also, Foreign Private Investment, Domestic Investment growth and Net Export growth were positively related to GDP growth rate. More so, the Foreign Private Investment, Domestic Investment growth, Net export growth and the lagged error term were statistically significant in explaining variations in the GDP of Nigeria.

Based on the above, it can be deduced that though the experience of other developing countries give contradicting reports on the effect of Foreign Private Investment, the Nigerian case is a bit different in that Foreign Private Investment has a positive significant effect on GDP growth rate of Nigeria. By implication issues on Foreign Private Investment should not be ignored in policy decisions aimed at promoting the economic development of Nigerian. Consequently, steps to attract more Foreign Private Investment should be undertaken by the Nigerian government as one of the ways of boosting the Nigerian economy.

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APPENDIX 1 (UNIT ROOT TESTS)

GDP GROWTH RATE (Yg)

ADF Test Statistic	-3.643288	1% Critical Value*	-3.6496
		5% Critical Value	-2.9558
		10% Critical Value	-2.6164

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(YG)

Method: Least Squares

Date: 11/08/07 Time: 11:19

Sample(adjusted): 1973 2004

Included observations: 32 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
YG(-1)	-0.855352	0.234775	-3.643288	0.0010
D(YG(-1))	0.106719	0.188315	0.566707	0.5753
C	22.13923	7.633774	2.900169	0.0070

R-squared	0.390369	Mean dependent var	-0.100425
Adjusted R-squared	0.348325	S.D. dependent var	31.32149
S.E. of regression	25.28470	Akaike info criterion	9.387336
Sum squared resid	18540.17	Schwarz criterion	9.524749
Log likelihood	-147.1974	F-statistic	9.284869
Durbin-Watson stat	1.846555	Prob(F-statistic)	0.000765

FOREIGN PRIVATE INVESTMENT (FPI)

ADF Test Statistic	-1.850737	1% Critical Value*	-3.6353
		5% Critical Value	-2.9499
		10% Critical Value	-2.6133

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(FPI)

Method: Least Squares

Date: 11/08/07 Time: 11:21

Sample(adjusted): 1972 2005

Included observations: 34 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FPI(-1)	-0.383061	0.206977	-1.850737	0.0738
D(FPI(-1))	-0.519354	0.159062	-3.265093	0.0027
C	4253.362	2551.968	1.666699	0.1056

R-squared	0.555419	Mean dependent var	752.7676
Adjusted R-squared	0.526737	S.D. dependent var	16366.68
S.E. of regression	11259.32	Akaike info criterion	21.57988
Sum squared resid	3.93E+09	Schwarz criterion	21.71456
Log likelihood	-363.8579	F-statistic	19.36430
Durbin-Watson stat	2.355139	Prob(F-statistic)	0.000003

INVESTMENT GROWTH RATE (INVg)

ADF Test Statistic	-3.184728	1% Critical Value*	-3.6959
		5% Critical Value	-2.9750
		10% Critical Value	-2.6265

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INVG)

Method: Least Squares

Date: 11/08/07 Time: 11:22

Sample(adjusted): 1978 2004

Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INVG(-1)	-0.680965	0.213822	-3.184728	0.0040
D(INVG(-1))	0.187812	0.191301	0.981760	0.3360
C	12.86506	6.351131	2.025632	0.0541

R-squared	0.310789	Mean dependent var	-0.360602
Adjusted R-squared	0.253355	S.D. dependent var	28.27790
S.E. of regression	24.43454	Akaike info criterion	9.334312
Sum squared resid	14329.13	Schwarz criterion	9.478294
Log likelihood	-123.0132	F-statistic	5.411220
Durbin-Watson stat	1.955358	Prob(F-statistic)	0.011487

NET EXPORT GROWTH RATE (NETXg)

ADF Test Statistic	-3.052181	1% Critical Value*	-3.6422
		5% Critical Value	-2.9527
		10% Critical Value	-2.6148

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(NETXG)

Method: Least Squares

Date: 11/08/07 Time: 11:23

Sample(adjusted): 1973 2005

Included observations: 33 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NETXG(-1)	-0.762079	0.249683	-3.052181	0.0047
D(NETXG(-1))	-0.225993	0.178261	-1.267764	0.2146
C	34.00333	46.12194	0.737248	0.4667

R-squared	0.516836	Mean dependent var	1.402891
Adjusted R-squared	0.484625	S.D. dependent var	358.3260
S.E. of regression	257.2408	Akaike info criterion	14.02441
Sum squared resid	1985185.	Schwarz criterion	14.16046
Log likelihood	-228.4028	F-statistic	16.04538
Durbin-Watson stat	2.065495	Prob(F-statistic)	0.000018

APPENDIX 2 (JOHANSEN'S COINTEGRATION TEST)

Date: 10/29/07 Time: 23:56

Sample: 1970 2005

Included observations: 28

Test assumption:
Linear
deterministic
trend in the data
Series: YG FPI INVG NETXG

Lags interval: No lags

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.727829	87.36828	47.21	54.46	None **
0.601183	50.93120	29.68	35.65	At most 1 **
0.388181	25.19210	15.41	20.04	At most 2 **
0.335286	11.43516	3.76	6.65	At most 3 **

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 4 cointegrating equation(s) at 5% significance level

APPENDIX 3 (ADF UNIT ROOT TEST ON RESIDUALS)

ADF Test Statistic	-4.694451	1% Critical Value*	-3.6959
		5% Critical Value	-2.9750
		10% Critical Value	-2.6265

*MacKinnon critical values for rejection of hypothesis of a unit root.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(RESID01)

Method: Least Squares

Date: 10/30/07 Time: 00:04

Sample(adjusted): 1978 2004

Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID01(-1)	-1.278154	0.272269	-4.694451	0.0001
D(RESID01(-1))	0.430019	0.204202	2.105856	0.0459
C	0.555098	3.257571	0.170402	0.8661

R-squared	0.512236	Mean dependent var	-0.903352
Adjusted R-squared	0.471589	S.D. dependent var	23.11016
S.E. of regression	16.79922	Akaike info criterion	8.584981
Sum squared resid	6773.127	Schwarz criterion	8.728962
Log likelihood	-112.8972	F-statistic	12.60206
Durbin-Watson stat	2.074153	Prob(F-statistic)	0.000181

APPENDIX 4 (PARSIMONIOUS ERROR CORRECTION MODEL)

Dependent Variable: D(YG)

Method: Least Squares

Date: 10/30/07 Time: 00:18

Sample(adjusted): 1977 2004

Included observations: 28 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.304468	3.493667	0.087149	0.9313
D(FPI)	0.000586	0.000202	2.898523	0.0081
D(INVG)	0.373851	0.168611	2.217242	0.0368
D(NETXG)	0.033790	0.011672	2.894898	0.0082
RESID01(-1)	-0.964309	0.232629	-4.145268	0.0004
R-squared	0.697676	Mean dependent var		-0.739468
Adjusted R-squared	0.645098	S.D. dependent var		30.73862
S.E. of regression	18.31212	Akaike info criterion		8.813436
Sum squared resid	7712.676	Schwarz criterion		9.051330
Log likelihood	-118.3881	F-statistic		13.26933
Durbin-Watson stat	1.769654	Prob(F-statistic)		0.000010