

Capital Accumulation And Economic Development In Nigeria

1970 -2010 (Disaggregated Approach)

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Abstract

This study empirically examine the relationship between capital accumulation and economic development in Nigeria from 1970 – 2010. Capital accumulation was disaggregated into public, domestic private and foreign private capital accumulation, and their impact on economic development was empirically determined. The stationarity and non-stationarity of the data series were examined using Group Unit Root Test. The variables PCGDP, FPI, PINV, PUNIV, INFLA, IEC, attained stationarity after first differences. We established long-run relationship among the variables using Johansen cointegration test. The short-run dynamic adjustment required for stable long-run equilibrium relationship was carried out using the error correction technique. Here private investment (domestic) with a coefficient of 0.0000823 has positive and significant impact on economic development. Public investment with elasticity of -0.077590 impacted negatively and significantly on RPCGDP. The impact of Foreign Private Investment (FPI) with elasticity of -0.00000101 on RPCGDP was negative and insignificant. Monetary, fiscal and exchange rate policies that will stimulate the growth of domestic investment should be vigorously pursued. Stable environment and incentives aimed at encouraging the inflow of foreign capital be a government priority. Transparency, probity and accountability in the management of public fund by public officials be strengthened. The Study showed that disaggregation of Capital accumulation truly revealed the impact of each component on economic development than when the components are aggregated or studied in isolation of the other.

Key Words: Capital accumulation, Economic Development, Public Capital accumulation, Foreign Private Capital accumulation, Domestic Private Capital Accumulation, Disaggregation.

1. Introduction

Capital accumulation is a component of economic growth and development in any society. The other components include growth in population and hence eventual growth in the labour force and technological progress. Capital accumulation results when some proportion of present income is saved and invested in order to augment future output and incomes (Todaro and Smith, 2003).

Conventionally, accumulation is defined as the expansion of the productive potential of the economy. It is the process of production, realization and re-investment in an unending spiral.

Capital Accumulation or formation is an addition to stock of capital assets set aside for future productive endeavour in real sector which will lead to more growth in the physical capital assets of the country. Capital formation captures all the real-value-added to the economy in real-asset-terms which will lead to further enhancement of savings investment and generation of more wealth in future.

Capital formation derives from savings accumulation. Private savings has a positive impact on capital accumulation in the sense that an increase in private savings will lead to more capital formation. This means, increased domestic savings will lead to increase in investment, people will be employed and earn income, demand for investment goods will increase leading to increase in GDP.

The large share of foreign investment in the economy has created its own problem as the three types of capital (Public, Domestic Private and Foreign) are sometimes locked in contradictory alignment. For example, foreign investors generate additional capital resources within the national economy but only to repatriate them abroad as profits. According to the United Nations Centre on Transnational Corporations (UNCTC), between 1975 and 1985, there was a net transfer of capital from Nigeria to the advanced capitalist countries, of approximately \$3.2 billion. Similarly, during 1970-1980, there was a net outflow of capital from the country of \$2.7 billion. For this reason, the Nigerian Indigenization Programme put in place since 1972 has not made much impact in terms of reducing the rate of capital repatriation.

Recent theoretical works centered on either the impact of: public policies or expenditure on economic growth; public expenditure on private investment, foreign private investment on economic growth etc.

The critical question of the impact of public and private sector capital accumulation on economic development is an empirical question which has received inadequate attention within the orthodox analysis. The study therefore disaggregated capital accumulation into public, domestic private, and foreign private and empirically examined the impact of each disaggregated components on economic development and advice policy makers the sector(s) to give priority in the development process.

The major contribution of this study is the fact that capital accumulation was disaggregated into public, domestic private and foreign private capital accumulation and their impact on economic development of Nigeria were measured. Also the findings from the study would enable us advise government appropriately the sector(s) to give priority in the development process.

The rest of the paper is organised as follows: section two is a review of relevant literature. Section three is theoretical framework underlying the study. Methodology and data sources are discussed in section four. Section five contains empirical model specification. The empirical results and discussion of findings are in section six, while section seven discussed policy implications and recommendation. Section eight concludes the paper.

2. The Literature

Most economist and trade analyst have opined that economic growth oriented trade policies would lead to increase in investment. This view was held by (OECD, 2001; Rodrik, 1997; Winters, 2001; Yanikkay, 2003; Tybout and Erken, 2003)

In the same vein, studies have shown that trade liberalization have contributed positively and significantly to increase capital accumulation, the growth rate of Gross domestic product. (see Sachs and Warner, 1995; Dollar, 1992; Edward, 1993, 1998; Ben-David, 1993; Frankel and Romer, 1999 for these and other related issues). Contrary views were held by Bhagwati and Romer 1993 that negative relationship exist between openness to trade and economic growth most especially in the developing countries that are predominantly primary commodity producers and exporters of primary products which are vulnerable to external shocks arising from the goods and capital market. Also the devaluation and depreciation of their domestic currencies impacts negatively on their economies that are import dependent.

From the policy viewpoint, an extremely important form of uncertainty faced by investors is the credibility of policy reforms. "Investment-friendly reforms raise expected returns, but may increase uncertainty if investors believe that the reform measures could be reversed. In such a situation, investor's perception about the probability of policy reversal becomes a key determinant of the investment response"(Michael et al 2012: 69-88).

Although different reasons have been advanced for the slowdown of these economies, Greene and Villannueva (1991) attribute the problem to the decline of investment rates in the affected economies. In Nigeria, for example, Akpokodje (1998), maintained that domestic investment as a ratio of Gross Domestic Product (GDP) declined from an average of 24.4 per cent during the 1973-1996 period to 13.57 per cent between 1982 and 1996.

The average rate of investment of 13.57 per cent during the 1982-1996 period implied that the country barely replaced its depreciating capital. In the same vein, private investment rate depreciated from 8.6 per cent in 1973-1981 periods to 4.2 per cent in the 1982-1996 era. To the extent that investment determines the rate of accumulation of physical capital (otherwise called capital formation), it is a vital factor in the growth of productive capacity of the nation in particular and contributes to economic development generally. It is in the light of this that prominence is being attached to increasing the magnitude of real asset investment in the economy.

Central to the less than satisfactory growth registered by countries of sub Saharan Africa is low level of investment as a result of low domestic saving. Attracting foreign investment is therefore crucial from a number of standpoints and of course, there is never shortage of theoretical arguments (Chete, 1998). Consistent and regulated inflow of foreign investment provides an important source of foreign exchange earnings needed to supplement domestic savings and raise investment levels "Import substituting investment would serve to reduce the import bills as investment in export industries could directly increase the country's foreign exchange earnings"(Michael et al 2012).

Some other benefits might also accrue "from increased foreign private investment. These include the creation or rather expansion of local industries to supply inputs to the newly established plants; a rise in the overall level of domestic demand to boost incomes and through taxation, state revenues; and the transference of labour (human capital) skills and technology"(Michael et al 2012:203 -217). Yet another set of benefits arises from the forecasting of efficiency in the domestic economy, an effect that might even occur prior to the anticipated investment flows (Chete, 1998).

When Savings- Investment or foreign investment gap or both exist in the domestic economy, external capital flow in the form of Foreign Private investment becomes necessary to close the gap(s) for sustainable development., and even the volatility and unpredictable nature of capital markets might result to capital market flight (Ogamba, 2003).

Ogundipe and Aworinde (2011) in their study on the impact of public investment on economic growth in Nigeria from 1970-2008 disaggregated public investment into expenditure on education, Agriculture, defence and internal security, health, transport and communication. The stationary status of the variables were examined and the long run equilibrium relationship among the variables were estimated. Their regression result showed that a positive and significant relationship exist between economic growth and education, agriculture, defence and internal security, and structural adjustment programme while the other variables (health, transport and communication) impacts insignificantly on economic growth. They recommended a reduction in government expenditure on defence and internal security and an increase public expenditure on productive sectors like education, agriculture, transport and communication.

Studies carried out in some other countries on the impact of public investment on economic growth reveals that negative relationship exist between public investment and economic growth (see. Ghali (1998) on Tunisia, Bogunjoko (1998) on Nigeria). Others found a weak relationship between public investment and economic growth. (see Al-Faris (2002), on six gulf cooperation council countries, Kweka and Morrisey (1999), on Tanzania).

Aggregate production function was used to examine the impact of public investment on economic growth using US data by Toen-Goet and Jongeling (1994). Their result shows a significant positive relationship between public investment on infrastructure and economic growth and also a significant positive relationship exist between public investment and private output - a phenomenon referred to as crowding in of private investment by public investment.

3. Theoretical Framework

The neoclassical theory of investment provided explanation for investment expenditure in addition to changes in output. Inducement to invest may also be simulated by favourable changes in relative prices where downward shifts in the real user cost of capital services imply that the firm has to restore equilibrium by cutting down the marginal productivity of capital stock (Jorgensen, 1963). Jorgensen model is based on the theory of optimal capital allocation.

Solow's model of economic growth postulates a continuous production function linking output to the inputs of capital and labour which are substitutable. Solow's basic assumptions are: one composite commodity is produced; output is regarded as net output after making allowance for the depreciation of capital; constant returns to scale; the two factors – labour and capital are paid according to their marginal physical productivities; flexibility of prices and wages; full employment of the available stock of capital. Given these assumptions, Solow shows in his model that, with variable technical coefficient, there will be tendency for capital - labour ratio to adjust itself through time in the direction of equilibrium ratio.

The Solow neoclassical growth model uses a standard aggregate production function in which $y = k^a (AL)^b$, where y = GDP, k = stock of capital which may include human as well as physical capital. L = labour and A = efficiency parameter.

4. Methodology and Data

In estimating the model for the study, we used three steps methodology. These steps includes;

- i. Univariate Statistical Analysis of time series (Test for unit root using Group Unit Root Test by Levin, Lin and Chu and individual unit root process by Im, Pesaran and Shin Test) to ascertain the stationary or non stationary status of the data series.
- ii. Multivariate Cointegration Analysis and the estimation of the long run equilibrium model of disaggregated capital accumulation using Johansen (Trace and Max-Eigen Statistics) cointegration test.
- iii. To obtain the parsimonious short run dynamic model of disaggregated capital accumulation through the error correction mechanism which has been shown to better capture the short run dynamics of the relationships.

Data for the study were obtained from various CBN Bulletins, Annual Reports and Statement of Accounts, National Bureau of Statistics [NBS] which cover the period 1970-2010.

5. Empirical model Specification

The augmented Solow neoclassical model was used in estimating the relationship between capital accumulation (disaggregated) and economic development in Nigeria.

The Solow neoclassical growth model uses aggregate production function in which

$$Y = AK^\alpha L^{1-\alpha} \dots\dots\dots (1)$$

$$Y/L = AK^\alpha L^{-\alpha}/L \dots\dots\dots (1.1)$$

$$y = AK^\alpha L^{1-\alpha-1} \dots\dots\dots (1.2)$$

$$y = AK^\alpha L^{-\alpha} \dots\dots\dots (1.3)$$

$$y = AK^\alpha / L^\alpha \dots\dots\dots (1.4)$$

$$y = Ak^\alpha \dots\dots\dots (2)$$

where

Y/L = y = real per capita GDP

A = efficiency parameter

k = stock of physical capital

In the augmented Solow neoclassical model, the efficiency parameter (A) is expanded to include inflation and index of energy consumption. Inflation is included as an independent variable in the model because high rate of inflation has harmful effects on the efficient allocation of resources being particularly detrimental in creating distortions in investment patterns and thus discourages investment generally. High rate of inflation is a sign of macroeconomic instability and government's inability to manage the economy effectively. Index of energy consumption is an efficiency parameter. K is expanded to include public, domestic private and foreign capital.

$$A = f(IEC, INFLA) \dots\dots\dots (3)$$

$$\text{Similarly, } A = \alpha IEC^{\alpha_1} INFLA^{\alpha_2}$$

$$K = PUINV + PINV + FPI \dots\dots\dots (4)$$

Substituting equations 3 and 4 into equation 2 gives:

$$Y = K^{\alpha_1} INFLA^{\alpha_2} IEC^{\alpha_3} \dots\dots\dots (5)$$

$$\text{Similarly, } Y = f(K, INFLA, IEC) \dots\dots\dots (5.1)$$

Taking natural logarithm of equation 5, gives

$$\log y = \log \alpha + \alpha_1 \log K + \alpha_2 \log INFLA + \alpha_3 \log IEC \dots\dots\dots (6)$$

The functional form of the disaggregated capital accumulation and economic development model is stated as follows:

$$\Delta PCGDP = f(\Delta FPI, \Delta PINV, \Delta PUINV, INFLA, \Delta IEC)$$

The multivariate specification of the equation for estimation in our model is given as

$$\Delta LPCGDP = a_0 + a_1 \Delta FPI + a_2 \Delta PINV + a_3 \Delta LPUINV + a_4 INFLA + a_5 \Delta IEC + \pi \dots\dots\dots (7)$$

$$a_1 > 0, a_2 > 0, a_3 > 0, a_4 < 0, a_5 > 0,$$

Where:

$\Delta LPCGDP$ = Change in log of growth rate of real per capita GDP, a measure of economic development

ΔFPI = change in foreign private investment

$\Delta PINV$ = change in domestic private Investment

$\Delta LPUINV$ = change in log of public Investment

INFLA = Inflation rate

ΔIEC = change in index of energy consumption

π = Random error term.

6.0 Results of disaggregated capital accumulation and economic development model

6.1 Results of unit root test for disaggregated capital accumulation and economic development model

Group unit root test: Summary LEVEL

Series: LPCGDP, LPUINV, PINV, FPI, INFLA, IEC

Method	Statistic	Prob.**	Cross-Sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	0.84103	0.7998	6	181
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.32671	0.0100	6	181
ADF - Fisher Chi-square	35.5554	0.0001	6	181
PP - Fisher Chi-square	15.7755	0.1062	6	190

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Group unit root test: Summary FIRST DIFFERENCE
 Series: LPCGDP, LPUINV, PINV, FPI, INFLA, IEC

Method	Statistic	Prob.**	Cross-Sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-7.88169	0.0000	6	175
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-12.9215	0.0000	6	175
ADF - Fisher Chi-square	119.348	0.0000	6	175
PP - Fisher Chi-square	151.676	0.0000	6	185

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Note: L implies natural logarithm

Source: Authors Computation

Section 6.2: Results of Johansen cointegration test for disaggregated capital accumulation and economic development model

Series: LPCGDP LPUINV PINV FPI INFLA IEC

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.760434	111.6301	69.81889	0.0000
At most 1 *	0.588032	60.18873	47.85613	0.0023
At most 2	0.405415	28.26354	29.79707	0.0743
At most 3	0.192336	9.547441	15.49471	0.3172
At most 4	0.050289	1.857497	3.841466	0.1729

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

* denotes rejection of the hypothesis at the 0.05 level

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.760434	51.44133	33.87687	0.0002
At most 1 *	0.588032	31.92519	27.58434	0.0130
At most 2	0.405415	18.71610	21.13162	0.1054
At most 3	0.192336	7.689944	14.26460	0.4111
At most 4	0.050289	1.857497	3.841466	0.1729

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

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

Source: Author's Computation

The Johansen cointegration Test of Trace and Maximal Eigen Value Statistics implemented with linear deterministic trend indicates the existence of two cointegrating equation(s) each, at the five percent level of significance. This means the existence of a stable and unique long run relationship among the variables in the model. We therefore reject the null hypothesis of no cointegration relationship among variables at the five percent level of significance.

Since there is one cointegrating vector, an economic interpretation of the long-run real per capita GDP can be obtained by normalizing the estimates of the unrestricted cointegrating vector on RPCGDP. The normalized cointegrating equation suggest that there is a negative long run relationship between PCGDP and PUINV, FPI. Both PUINV and FPI are statistically significant, while PINV and INFLA has positive long run relationship with RPCGDP and are statistically significant. PINV maintains apriori expectations while PUINV, FPI and INFLA are wrongly signed.

The identified cointegration equation(s) was used as an error correction term (ECM_{t-1}) in the error correction model. This series form the error correction variables. The result of the over parameterized model are presented in section 6.3

In the over parameterized model, foreign private investment in the current period, impacts negatively and insignificantly on economic development but in the one lag period, its impacts on RPCGDP was positive and insignificant.

Section 6.3: Results of over parameterized error correction for disaggregated capital accumulation and economic development model

Dependent Variable: $\Delta LPCGDP$

	Coefficient	Std. Error	t-Statistic	Prob.
C	0.013071	0.047125	0.277364	0.7838
ΔFPI	-6.06E-07	3.25E-06	-0.186120	0.8539
$\Delta FPI(-1)$	7.36E-07	3.26E-06	0.225812	0.8232
$\Delta PINV$	4.36E-08	1.65E-08	2.642820	0.0479
$\Delta PINV(-1)$	-1.46E-07	2.28E-07	-0.640995	0.5274
$\Delta LPUINV$	-0.082380	0.041200	-2.014061	0.0545
$\Delta LPUINV(-1)$	0.002484	0.087234	0.028480	0.9775
$\Delta INFLA(-1)$	0.002670	0.002155	1.239097	0.2268
$\Delta INFLA$	0.005179	0.002055	2.520031	0.0185
ΔIEC	-0.003436	0.001706	-2.014770	0.0548
$\Delta IEC(-1)$	0.000738	0.001559	0.473528	0.6399
$ECM(-1)$	-0.339360	0.075452	-4.486549	0.0001
R-squared	0.638739	Mean dependent var		-0.001820
Adjusted R-squared	0.549783	S.D. dependent var		0.251879
S.E. of regression	0.181671	Akaike info criterion		-0.316636
Sum squared resid	0.825106	Schwarz criterion		0.205824
Log likelihood	17.85776	Hannan-Quinn criter.		-0.132444
F-statistic	4.018360	Durbin-Watson stat		1.865863
Prob(F-statistic)	0.001910			

Source: Author's Computation

This implies that a one percent change in Foreign Private Investment in the current period results to a 0.0000006 percent reduction in Economic Development while a unit change in FPI in the one lag period brings about a 0.000000736 percent increase in Economic Development. This result explains the volatility or instability associated with FPI and economic development of Nigeria. Conditions favourable to FPI in previous periods may be absent in the current period.

Public investment in the current period, has negative and significant impact on RPCGDP with elasticity of 0.082380. This implies that a one percent change in Public Investment in the current period results to a 0.0823

percent reduction in Economic Development. public investment in the one lag period has positive and insignificant impact on economic development, though with low elasticity (0.002484). This means that a unit change Public Investment in the one lag period brings about a 0.002484 per cent increase in Economic Development.

Private investment (PINV) in the current period impacts positively and significantly on economic development while its impact on economic development in the one lag period was negative and insignificant. A unit change in PINV in the current period brings about a 0.000000436 per cent increase in Economic Development, while a one percent change in PINV in the one lag period brings about a 0.00000146 percent reduction in Economic Development. Impact of INFLA on RPCGDP in the current and one lag period was positive. It was significant only in the current period. This is contrary to apriori expectations.

Infrastructure proxied by IEC satisfy apriori expectation in the one lag period (i.e. positive but insignificant). In the current period, IEC impact negatively and significantly on RPCGDP. The poor state of infrastructure (i.e. the unsteady power supply) in the country may be responsible for the negative impact of IEC on RPCGDP.

The ECM(-1) is statistically significant. The negative sign confirms the presence of cointegration relationship among the variables in the model. The statistically significant coefficient of the ECM(-1) implies disequilibrium in the long run. The coefficient of the ECM(-1) shows that about 34 percent of the disequilibrium in the long run is corrected in the short run. It also depicts low speed of adjustment. The adjusted R^2 of 0.549783 implies that about 55 percent variation in RPCGDP is explained jointly by all the regressors in the model. The model is a good fit.

The F statistics of 4.018360 is statistically significant. This means that the explanatory variables are jointly significant and is a good fit. The standard error of 0.173447 implies that about two-third of the, the expected value of RPCGDP will be within 17 per cent of the actual value. The Durbin Watson statistics of 1.865863 means the absence of serial correlation in the model. The AIC, SC and HQ information criteria shows that the model is correctly specified. The model passes the normality and diagnostic test. In the over parameterized model, FPI, PUINV, INFLA, DIEC are contrary to apriori expectations while PINV, DIEC(-1) satisfy apriori expectations.

The parsimonious model which was derived from a stepwise elimination of the jointly insignificant variables in the over parameterized model is presented in section 6.4.

A careful examination of the parsimonious result reveals that the error correction term (ECM(-1)) is well specified which indicates a feedback of approximately 40 per cent of the previous year's disequilibrium from the long run elasticities. The strong significance of the coefficient of ECM(-1) (-0.3979) support our earlier conclusion that the RPCGDP and its regressors (PUINV, PINV, FPI, INFLA, IEC) are indeed cointegrated.

The speed of adjustment is the coefficient of the error correction term (ECM(-1)). It also indicates how the departure from the long run equilibrium is corrected in the short run. In the parsimonious model, the ECM(-1) is correctly signed (satisfy apriori expectation) and highly significant at five percent level of significance. The coefficient of the error term ECM (-1) is -0.398 which suggest a slow adjustment process, nearly 40 per cent of the disequilibrium of the previous year's shock adjust back to the long run equilibrium.

The adjusted R^2 of the parsimonious model shows that about 63percent of the variation of real per capita GDP is explained jointly by all the independent variables. The high value of adjusted R^2 (0.625) shows that the overall goodness of fit of the model is satisfactory. The F statistics of 5.989985 shows that the overall regression is significant at the five percent level and is a good fit.

Section 6.4: Results of parsimonious error correction for disaggregated capital accumulation and economic development model

Dependent Variable: Δ LPCGDP

	Coefficient	Std. Error	t-Statistic	Prob.
C	0.009485	0.038178	0.248429	0.8056
Δ FPI	-1.01E-06	2.35E-06	-0.431939	0.6691
Δ PINV	8.23E-05	1.47E-05	5.603012	0.0000
Δ LPUINV	-0.077590	0.033151	-2.093312	0.0503
Δ INFLA(-1)	0.002634	0.002034	1.294595	0.2060
Δ INFLA	0.005130	0.001942	2.641288	0.0134
Δ IEC	-0.003810	0.001405	-2.710979	0.0113
Δ IEC(-1)	0.000968	0.001433	0.675525	0.5049
ECM(-1)	-0.397930	0.081692	-4.776431	0.0001
R-squared	0.731190	Mean dependent var		-0.001820
Adjusted R-squared	0.625816	S.D. dependent var		0.251879
S.E. of regression	0.173447	Akaike info criterion		-0.458118
Sum squared resid	0.842346	Schwarz criterion		-0.066273
Log likelihood	17.47519	Hannan-Quinn criter.		-0.319975
F-statistic	5.989983	Durbin-Watson stat		1.888479
Prob(F-statistic)	0.000166			

Source: Author's Computation

Similarly the Durbin Watson statistics of approximately two (i.e. 1.888479) signifies the absence of serial correlation. The equation standard error of 0.173 implies that about two thirds of the time, the predicted values of RPCGDP would be within 17.3 percent of the actual values. The Akaike, Schwarz, and Hannan-Quin information criteria (AIC, SIC, HQ) of -0.458118, -0.066273, -0.319975 respectively shows that the model is well specified. The estimated model passes the normality and diagnostic test. We therefore reject the null hypothesis that the error terms are not normally distributed. This suggest that the ordinary least square estimator is unbiased, has minimum variance, consistent and follow a normal distribution.

The result as shown in section 6.5 shows that public investment in the current period did not conform with apriori expectations. Its impact on economic development is negative and statistically significant. The result showed that a unit change in Public Investment results to a 0.077590 percent reduction in Economic Development. The result is consistent with the findings by Abu- Bader and Abu- Qarn 2003. This view is contrary to the findings by Aka (2002) who posits that in the long run, the impact of public sector investment on GDP is higher than that of private investment.

The negative impact of public investment on GDP is also in conflict with Wagner's law of rising public expenditure as National economy grows. Also in conflicts was the findings by Ranjan and Sharma (2009), Islam (2001) who established a positive relationship between public investment and economic growth. The result is consistent with the assertion that much of public sector investment covered in the period of the study was directed towards promoting economic growth and development but the growth rate of GDP has been poor and disappointing. This implies wasteful spending and corruption that characterize the public sector. The colossal waste of public funds through mismanagement, frauds, embezzlement and other white collar crimes have contributed in no small measure to the poor state of our economy. The waste and corruption refer to explain why public projects in Nigeria generally cost more than similar projects in other countries.

Foreign Private Investment (FPI) in the current period has a negative and insignificant impacts on economic development. The result showed that a one percent change in FPI in the current period brings about a 0.00000101 percent decrease in Economic Development. This negates economic theory. The result is in conflict with the findings of Chete (1998), Odozi (1995), Ekpo (1997), Uremadu (2006) etc who stressed that Sub Saharan Africa countries including Nigeria, have a low level of investment as a result of low domestic savings. Attracting foreign investment is therefore crucial for their development. This is because local industries would

expand to supply inputs to the newly established plants; a rise in the overall level of domestic demand to boost income and through taxation state revenue and the transfer of human skills and technology etc.

Private Investment (PINV) in the current period has a significant positive impacts on RPCGDP. The result showed that a one percent change in Private Investment results to about a 0.0000823 percent increase in Economic Development. This conforms with apriori expectations. The positive impact of private investment on RCGDP need to be sustained by government with appropriate policies and incentives to enable PINV play their expected leadership role in economic development in line with World Bank and IMF policy of private sector driven economies as a way of stimulating economic growth and development.

Inflation in the current period impacts positively and significantly on economic development. Its impacts on RPCGDP in the one lag period is positive and insignificant. A one percent change in inflation rate in the previous year would result to 0.005 percent rise in growth rate of GDP. This positive impact may be as a result of CBN's recent macro economic management policies aimed at stimulating the growth of productive investment through expansion of banking system credit to the private sector which may counter the negative effects of inflation on domestic capital accumulation.

Index of energy consumption (IEC) in the current period impacts negatively and significantly on economic development. The result indicates that a one percent change in IEC in the current period brings about a 0.003810 per cent reduction in Economic Development. Infrastructure proxied by index of energy consumption is a major determinant of economic growth. Its efficiency will create a conducive environment for investors. But in most developing countries including Nigeria, the inefficient power supply reduces return on investment and thus discourage potential investors from investing in the economy, the end result will be fall in GDP. AFDB (2004), ODI (1997) have admitted that, the decline in the relative position of industrial class arose because of their reduced dependence on public electric power supply as they acquire standby generating set to minimize production losses that would have result from power outages. The impact of IEC on RPCGDP in the one lag period is positive and insignificant with very low elasticity of 0.000968. This implies that a unit change in IEC in the one lag period results to 0.000968 increase in Economic Development. This satisfy apriori expectations.

Section 6.5: Analysis of the results of disaggregated capital accumulation and economic development model

The Group Unit Root Test result shows that the variables attain stationary status in their first difference. We therefore reject the null hypothesis of non stationarity of all variables. Johansen Trace and Maximal Eigen value test reveals the existence of two cointegrating equations at the five percent level of significance. We therefore reject the null hypothesis of no cointegration relationship among the variables in the model. The significance of the error correction term (ECM(-1)) at the five percent level also confirms the existence of long run equilibrium relationship among the variables. The coefficient of ECM(-1) is -0.397930 indicates low speed of adjustment of the dynamics of the short run to long run equilibrium.

In the parsimonious model public investment and foreign private investment impacts negatively on economic development. Public investment impacts negatively and significantly on economic development while the impact of FPI on economic development was negative and insignificant. The positive and significant impact of domestic private investment on economic development may be as a result of recent effort by government to increase banking system credit to the private sector amidst other incentives and policies of the government.

On the aggregate there is a significant relationship between public and private capital accumulation and economic development. This is the disaggregated model specifying the impact of public capital accumulation, foreign private capital accumulation and domestic private capital accumulation on economic development. The negative impact of public investment on economic development is higher than Foreign Private Investment. As noted earlier, wasteful spending, mismanagement and corruption in the public sector may be responsible for the negative impact of public investment on RPCGDP.

The negative impact of foreign private investment on economic development is something to worry about, because public sector is characterized by inefficiency and mismanagement. Due to savings-investment and foreign exchange gap that exist in developing countries which calls for incentives and policy measures to attract FPI has not yielded the expected result. Foreign private sector is vulnerable with high incidence of capital flight and therefore cannot be totally relied upon for economic development. A country with a strong domestic private capital is a sign of economic prosperity.

7. Policy implications and recommendation

- i. Policies that will increase foreign private investment should be pursued vigorously as our results revealed a negative and statistically insignificant relationship with economic development. It is noteworthy that this will greatly benefit the manufacturing sector especially in the form of technology transfer.

- ii. To optimally raise the level of capital accumulation in Nigeria, government has to maintain a steady supply of energy (power) and other infrastructural supplies. We cannot raise Gross Domestic investment and national productivity level without maintaining adequate supply of energy to all facets of our industrial machinery.
- iii. Our results further revealed that domestic private investment contribute to economic development than public investment.

8. Conclusion

The impact of public capital accumulation on economic development was negative and statistically significant in the disaggregated model of capital accumulation. On the other hand the impact of FPI on economic development was negative and statistically insignificant (contrary to apriori expectations) domestic private investment impact positively and significantly on economic development. Index of energy consumption in the current period impact negatively and significantly on economic development while its impact on economic development in the one lag period was positive but insignificant.

Thus, in view of the above considerations the study showed that disaggregation of capital accumulation truly revealed the impact of each components on economic development than when the components are aggregated and/or studied in isolation of the other.

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