

Empirical Analysis of the Effect of Exchange Rate Volatility and Capital Inflows on Economic Growth in Nigeria (1970 – 2013)

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Abstract

This study examines the effects of exchange rate volatility and capital inflows on the economic growth (GDP) in Nigeria between 1970 and 2013. The study used FDI and remittance which proved to be most vital components of Foreign Capital inflow to Nigeria currently as demonstrated by various literature to proxy capital inflow. The result of our Generalised Method of Moments (GMM) estimator shows that Foreign Direct Investment (FDI), Capital, Financial Development (FD) had significant positive effects on Gross Domestic Product (GDP) while Remittance, the lag value of Exchange Rate Volatility ($EXRV_{t-i}$), Financial liberalisation (FL) and Labour force had significant negative effect on GDP. On the other hand, Exchange Rate volatility (EXRV) has positive but insignificant effect on GDP. This study therefore enjoined the present administration in Nigeria to provide enabling financial and infrastructural environment that will attract the inflow of FDI to agric sector, solid minerals and agro allied industry which the government intends to use as vocal points to diversify the economy from present dependence on failing oil revenue. Equally economic policy that will encourage more of the remittances inflow to Nigeria to productive investment rather than consumption which has no positive impact on economy should be enthreshed into Nigeria financial policy. Finally, more financial reforms that will not only improve financial inclusion especially at the rural sector but that will also remove totally the negative effect of EXRV on economic growth should be introduced into Nigerian financial system.

Keywords: Exchange rate volatility, Capital inflows, Economic growth, Saving- Investment gap, General Method of Moment and Nigeria

Introduction

Nigeria is the largest economy in Sub-Sahara Africa, which is monoculturally dependent on oil revenue in the last few decades. However, due to the dwindling oil revenue arising from the fall in international oil prices, the nation is currently facing an economic downturn. This trend is making the current administration in Nigeria to think along policy shift from overdependence on oil to agriculture, solid mineral and agro allied industries. It is on record that Nigeria is a toast of the world for business expansion based on her endowment of both human and natural resources as

well as her rich population. Notwithstanding the above positive prerequisite, the lean purse of the Nigerian government did not encourage the development of the necessary infrastructures for economic development that could attract foreign investment to the nation (Kumura and Todo, 2010; Selaya and Sunesen, 2011). Since this policy shift is vital to the future development of the nation, the policy makers must consider alternative means of achieving this desire development by attracting foreign capital inflow to develop the identified sectors.

The role of capital (fund) in motivating investment cannot be overemphasised in the developing countries. Theoretical and empirical literature has applauded investment as a fundamental channel of accelerated economic growth (Agosin and Mayer, 2000). The shortage in investment coupled with the poor state of infrastructure has further been identified as a long standing obstacle to the growth of most developing countries. Moreover, it has been discovered that domestic savings in developing countries has been inadequate to bring about the investment required for steady growth. According to Ogunleye (2008) foreign capital inflow has been perceived as an important source of augmenting the savings - investment gap in most capital resource deficient economies like Nigeria. This opinion was corroborated by Elahi and Ahmad (2011) as well as Haider and Azim (2012). Thus, there is the quest to attract foreign fund across the globe to mitigate the effect of the shortfall. No wonder, in the last few decades Nigeria's dependence on foreign investors to develop its economy either in the form of foreign direct investment (FDI) or foreign portfolio investment (FPI) via stock exchange operation has been on the increase especially in the structural adjustment era. For instance FDI which was just ₦128.6 million in 1970 rose to ₦434.1 million in 1985 (237.56% increase). While within the next one year (1986) after the introduction of structural adjustment programme (SAP) it almost doubled as it rose to ₦735.8 million. This geometric increase pushed FDI to ₦722, 115.34 million in 2013. In recent times, the drive for capital inflow via remittance has also been on the increase. For instance remittance that stood at \$644,000 in 1970 rose to \$22,000,000; \$1,391,800,049 and \$21,958,109,264 in 1980, 2000 and 2013 respectively.

Exchange rate volatility which is the risk associated with unexpected and unpredictable movement in the exchange rate has been proved in literature as impediment to foreign capital inflow. As a matter of fact neither low nor high exchange rate volatility is good for the economy (Chunz and Seungnoralan, 2009). The Structural Adjustment Programmes (SAP) introduced by Nigerian Government in 1986 to stabilise overvalued naira was however not successful. Rather than achieving this naira has plummeted from N0.8938 to \$1 in 1985 shortly before the advent of SAP in 1986 to N8.0378 to \$1, N102.1052 to \$1 and N159.05 to \$1 in 1990, 2000 and 2013 respectively. Currently (2016) the exchange rate hovers around N300 – N330 to \$1

A closer assessment of the reviewed literature reveals the following gaps that need to be filled urgently. First, majority of the literature especially on Nigeria focused on the impact of foreign Direct Investment on growth while other components of foreign capital inflows such as Foreign Portfolio Investment, Foreign Aid and Remittances were more or less excluded. The importance of these other components of foreign capital inflow to economic growth of any nation calls for fresh study that will incorporate more of these various components of foreign capital inflow in a single study that will explore the impact of foreign capital inflow on economic growth.

Secondly, there were conflicting views on the role of foreign capital inflow on economic growth. While some studies found capital inflows to be growth enhancing (Mishra et al, 2000; Edward, 2001; Klen, 2005; Ayanwale, 2007; Abhijit, 2010; Nkoro and Uko, 2012; Auragzeb and Haz, 2012) some other literature found foreign capital inflow as growth retarding (Oyinlola, 1995; Calvo et al 1996; Adelegan, 2000; Ndukumana, 2003; Rodrick and Subramanian, 2009; Kuwait and Lambarte, 2008, Ghosh, 2010; DePaula et al, 2012; Rashid and Hussain, 2010). Equally, literature is not conclusive on the effect of exchange rate volatility on economic growth. While

some support the fact that exchange rate volatility improves economic growth (Froot and Stein, 1991;Blonigen, 1997; Ford, 2005) some others proffer a negative impact of exchange rate volatility on economic growth.(Campa, 1993,Dixit and Pindyck, 1994)

Thirdly, most of the examined literature especially on Nigeria adopted OLS estimator techniques to estimate their econometric models. This might have been the source of the conflicting reports of findings in literature specified above. There is therefore the need to test improved estimator technique such as GMM to resolve this conflict..

This paper therefore examine the effect of exchange rate volatility and capital inflow on economic growth in Nigeria between 1970 and 2013 using GMM with a view to identify areas that require policy improvement so as to attract adequate foreign capital to grow the economy.

Literature Review

Several relevant theories on the effect of exchange rate volatility and foreign capital inflow on economic growth are available in literature. However our review will focus on theories on exchange rate volatility, theories on FDI, theories on workers remittance and some basic economic growth theories. It has been theorised that exchange rate volatility has direct impact on the economic growth however it is dependent on the level of financial development in the economy (Aghion, Howit and Mayer, 2005). In other words low financial development in the presence of high exchange rate volatility will aggravate the divergence of the economy growth from the world frontiers while a country with well developed financial system will have less adverse effect of the exchange rate volatility on the economic growth (Aghion et al, 2006). An example of this occurred in Chile between 1975 and 2000 where tremendous improvement in financial depth reduced the negative impact of exchange rate volatility buttressed this theoretically. Some other theories anchor the effect of the exchange rate volatility on the exchange rate regime in operation. While it was argued that flexible exchange rate is highly detrimental to economic growth as it fuel exchange rate volatility, the fixed exchange rate is less detrimental to economic growth.

Many theories in literature have explained the impact of foreign capital inflow on the economy. While some theories tested how capital inflow in form of FDI affects the economic growth, some others theorised the effect of remittance on economic growth. Argawal (1991) explained the flow of FDI using three microeconomic theories namely: Electic theory, theory of differential rate of returns and the portfolio theory. In advancing the eclectic theory propounded by Dunning(1998,1995,1997) to explain motives behind FDI flow to another country, three main conditions considered by firms for making investment abroad were identified as firm specific ownership advantage, Location advantage and Internalisation incentives (OLI). The firm specific advantage includes competitive advantage over local firms, proprietary, technology, managerial and marketing advantages. While considering the internalisation incentive, effort must be made to ensure that the cost of exploiting the advantages is lower than the cost of sales of patient rights to the foreigners. Location advantage arise from either or combination of the low labour cost, cheap raw materials, abundant natural resources adequacy of necessary infrastructure among others. For the success of FDI, Dunning (1995) emphasised the significant role of the government in regards to monetary and fiscal policies and its ability to attract FDI flow. .Argawat (1980) criticized this OLI theory as being eclectic, static and not paying particular attention to political and sociological element. Also Rivoli and Solorio (1996) while criticizing OLI theory argued that some of the predictions of the theory may not hold especially when faced with uncertain environment.

The rate of return theory on FDI on the other hand postulates that FDI flows is a function of international differences in rates of returns on capital relative to the required rate of return. They argued that capital will naturally flow from countries with low rate of returns to countries with higher rate of returns. This hypothesis was evidenced in the work of Popkin (1965), Rueber et al

(1978) and Blaise (1975). However research works by Bandra and Lacken (1978) and Walia (1975) did not find evidence to support this hypothesis. The Portfolio theory by Tobin (1958) and Markowitz (1959) theorised that investors besides maximizing profit also endeavor to minimize their risk by way of spreading their investment in various countries. Some authors adopted this theory in their analysis of FDI flow abroad (Steven, 1968; Prachway, 1972; Cohen, 1975; Rugma, 1975).

Some other theories on foreign capital inflow dealt largely with theories on workers remittance. Three theories of importance here are: Pure altruism theory, implicit family agreement theory and portfolio management theory. In advancing motives for workers remittance Kaasschieter (2014) anchored his argument on migrants concern for the welfare of their family and associate in his or her home country. However the volume of funds remitted is largely dependent on the income of the migrant and that of their family and associates at home. The second theory of workers remittance is the implicit family agreement theory propounded by Lucas & Stark (1995). Here the family agreed to sponsor the migrant abroad on the premise that as soon as the migrant is gainfully employed he will need to remit both the principal and interest thereof back home. This theory was reinforced by the empirical work of Poirine (1997). The third theory is the portfolio management decision in which the migrant consider macroeconomic factors such as interest rate, exchange rate, inflation rate and economic policies prevalent in both home and foreign countries before taking decision on remitting fund home for investment purpose. Furthermore, Straubbaar (1986) provide empirical evidence on this theory in his research of Turkey. It is worthy of note that it is only the portfolio management decision theory that has element of investment drives which have the ability to grow the economy. The other theories are consumption oriented and bear no direct effect on economic growth.

One of the topical issues in economics from time immemorial has been that of economic growth. The earlier classical economics theories pioneered by Smith (1876), Ricardo (1824) and Malthus (1798) all recognised the mechanism that influence economic growth as productive investment as well as capital accumulation. The classical economist did not make allusion to financial capital in their analysis but concentrated on physical capital. The first Economist to recognise the place of financial capital in growth theory was Keynes (1936) in his simple macroeconomic open economic model of national income where he theorised that foreign capital flow (E-M) is required to bridge the saving-Investment gap in the domestic economy. Interestingly too Harrod (1939) and dommar (1946) expanded Keynesian growth model by identifying precondition necessary for an industrial economy such as USA to attain a steady-state of equilibrium growth. The model identified three gaps of savings, trade balances and financial gaps as a limiting factor to growth which could be remedy by foreign capital inflow. This model was adapted in their studies for open economies in less developed countries by Little (1960), Chenery & Bruno, (1962), Mckianon, (1964) and Chenery and Strout, (1966). In advancing growth model further the Neoclassical economist champion by Solow (1956) postulates the place of steady state where investment is equal to depreciation as a sinequanon for economic growth. However as the capital growth overtime diminishing returns set in to make depreciation higher than investment and thereby impede economic growth. To guarantee economic growth therefore savings need to be stepped up so as to ensure the steady state. Solow therefore encourage the flow of foreign capital to improve savings required for growth in the domestic economy

Review of Empirical Review

Existing literature offers conflicting views concerning the effect of exchange rate volatility on capital inflow. While some discovered positive effect others noted negative effects. Those reporting positive effects argued that devaluation of the host country currency via exchange rate volatility increased FDI and vice versa because it has the capacity to increase the wealth of the foreigners as well as making assets acquisition cheaper thereby encouraging multinationals to

promote local production in place of exportation to host countries (Froot and Stein, 1991; Blonigen, 1997; Ford, 2005). On the other hand, some argued that decision to invest by any company is based on expectation of profitability in future and the risk attached to the stream of future profit which in their opinion is negatively affected by the exchange rate volatility (Campa, 1993; Dixit and Pindyck, 1994).

In Nigeria, Osinubi and Amaghionyeodiwe (2009) used OLS and Error Correction model (ECM) estimation techniques to examine the effect of exchange rate volatility on FDI in Nigeria for the period 1970-2004 and discovered a significant positive relationship. This study tried to allay the worry of foreign investors on the effect of exchange rate volatility on their investment. This result was not in agreement with the outcome of the work of Ogunleye (2008) who noted that exchange rate volatility negatively influenced FDI inflow to Nigeria and South Africa. He equally noted that in both countries FDI aggravated exchange rate volatility. The position of Ogunleye (2008) was corroborated by Udoh and Egwaikhide (2008) who using GARCH model to examine the effect of exchange rate volatility and inflation uncertainty on FDI in Nigeria between 1970 and 2005 indicated that exchange rate volatility and inflation uncertainty exerted significant negative influence on FDI. The study further revealed that status of infrastructural development, appropriate size of government sector and International competitiveness are very crucial determinant of FDI inflow into the country.

Most of the reviewed literature on the effect of foreign capital inflow on economic growth adopted FDI to proxy foreign capital inflow. Interestingly, almost all of them noted a positive relationship between FDI and economic growth. At the international level, Soltani and Ochi (2012) while examining the effect of FDI inflow on GDP of Tunisia between 1975 and 2000 noted that FDI promoted long economic growth in Tunisia.. This view was buttressed by Insah (2003) in his dynamic OLS study of the impact of FDI flow to Ghana between 1980 and 2010 noted a positive impact on GDP in Ghana. Still on Ghana, Aveh, Kraah and Dadzie (2013) came up with slightly different result. Their study using 2SLS and quarterly data from 2004 to 2011 shows that there was an insignificant positive relationship between FDI and economic growth in Ghana. This shows that model specification and methodology of data analysis could determined the outcome of the result. Lee (2007) took a different approach in his study of the effect of FDI on economic growth in Vietna. He noted that the positive impact of FDI flow to Vietna on GDP was activated through the spillover effects of technological transfer brought about by the GDP. The same position was taken by De Grorio & Whalee (1998).in their study.

Nigeria's experience shows that there was positive effect of FDI flow to the country on the economic growth regardless of the method adopted. Some literature in Nigeria for instance used OLS technique of estimation to study the effect of FDI on GDP and came up with a positive result (Ayanwale, 2007; Adofa, 2009; Abu and Achegbolu,2011; Egbo, 2011). On the other hand some literature used Johansen Co-integration test and Vector Autoregressive (VAR) within Vector error correction model to study the impact of FDI flow on GDP in Nigeria and they all obtained positive effect of FDI on economic growth of Nigeria.(Okodua, 2008; Egwaikhide,2012, Ogunmuyiwa & Ogunleye, 2011). However the only negative voice to this discussion was that of Oyinlola (1995) who arrived at the negative effect of FDI on economic growth using the two-gap model.

Looking at the impact of FDI on economic growth from different perspective, Dutse (2009) noted that FDI affect economic growth through the spillover effect of FDI on technological and efficiency. Ayanwale (2008) and Egwaikhide (2011) in their different studies examined the impact of FDI on sectorial output. They both noted positive impact of FDI on telecommunication while insignificant positive effect was noted on real sector such as agric, mining, petroleum and manufacturing sector.

Some other authors studied the effect of ODA on economic growth. For instance, Burnside and Dollar (2000) in his panel data study of 56 countries using 2SLS estimation technique discovered that ODA had robust impact on economic growth of the selected countries but he was quick to add that this is dependent on good policy environment. This position was supported by Hansen and Tarp (2001) in their panel data analysis of the effect of ODA to 56 countries between 1970 and 1993 where they noted that ODA increased economic growth. In his study of the impact of ODA on GDP of 67 LDCs between 1970 and 1988 Bowen (1988) took a different approach by examining the direct and indirect effect of ODA. He noted that direct aid had no significant effect on economic growth while indirect aid had significant effect on economic growth via its interaction with domestic savings. Most of the studies on Nigeria noted positive effect of ODA on economic growth regardless of the analysis method adopted (Fasanya, and Onakoya, 2012;Mba Bell-Gen and Ubi, 2012; Bashir, 2013). The only dissenting voice here is that of Bakare (2011) who noted a negative relationship between ODA and GDP.

Most of the studies that used remittance to proxy foreign capital inflow in their study of the impact of foreign capital inflow on economic growth both internationally and in the local Nigerian context found a positive relationship between remittance and economic growth (Glytson,2005; Fayisa, and Nshar, 2008; Malik and Junaid, 2009;Iheke, 2013; Ukeje and Obiechina, 2013).

Some other authors in the quest to find robust analysis of the effect of foreign capital inflow decided to apply more than one components of foreign capital inflow (FDI, FPI, ODA and Remittance) to carry out their study. In this situation some authors applied FDI and FPI as a proxy for foreign capital inflow in their studies and noted positive impact of FDI on economic growth and negative effect of FPI on economic growth (Soto, 2000;Shen & Lee, 2010; Shabbir & Asher, 1992). Some other literature selected ODA and FPI as a proxy for capital inflow and noted positive impact of ODA on economic growth while FDI has negative or no impact on economic growth (Gupta and Islam, 1993; Khan & Rahim, 1993). Some other literature adopted ODA and FDI and discovered that ODA impact positively on economic growth while FDI retards economic growth (Stoneman, 1975; Oyinlola, 1995). The only study that adopted FDI, ODA and FPI in his study was Shabbir & Azher (1992) who noted significant positive impact of FDI on economic growth while ODA had positive impact on economic growth but FPI had significant negative impact on savings and by extension on economic growth.

Deduction from the above is that FDI, ODA and Remittance have a positive impact on economic growth while FPI has negative impact on economic growth. However the effect may differ depending on model specification and method of analysis.

Model Specification

This study adopts a model developed by Borensztein, De Grezorio and Lee (1998) and Fry (1997) including Bosworth and Collins (1998). This model will be constructed to test the effect of FDI, Remittances and Exchange Rate Volatility (EXRV) on economic growth as represented by GDP in Nigeria. Overall a model of the impact of capital flow on economic growth must identify the role and relative capital on the rate of economic growth. Here foreign capital flow is used as input in addition to labour and domestic capital stock.

The model starts from general production function given by Solow which is explicitly given as:

$$Y = f(K,L,A) \tag{1}$$

Where Y = GDP

K =Capital input (capital formation in an economy which is equal to domestic Investment + foreign capital inflow).

L = Labour input

A = the level of technological knowledge.

If we decompose capital to physical capital (K) and financial capital (FDI and REM.) as presented by Balassa (1978), then we have:

$$Y = f(K, FDI, REM, L, A) \quad (2)$$

In Asian developing countries financial liberalization or openness is used as indicator of technological knowledge. This is based on the assumption that financial liberalization or openness provide and impose a higher efficiency on financial system and the economy. If we denote financial liberalization as FL, then substituting we have:

$$Y = f(K, FDI, REM., L, FL) \quad (3)$$

Financial development as represented by FD could be introduced into the model. We introduce this variable because the level of financial development in a given economy will help to explain the extent to which capital introduced into an economy can be effective. Therefore we have:

$$Y = f(K, FDI, REM, L, FL, FD) \quad (4)$$

Note that the level of financial development could be proxy by money supply (M_2).

We can also introduce other variables of interest into the model. This in our own case is the Exchange rate volatility (EXRV). Thus the equation becomes:

$$Y = f(K, FDI, REM, L, FL, M_2, EXRV) \quad (5)$$

From the implicit model above, we therefore proceed to build our explicit model thus:

$$Y = \alpha_0 + \alpha_1 K + \alpha_2 FDI + \alpha_3 REM + \alpha_4 L + \alpha_5 FL + \alpha_6 M_2 + \alpha_7 EXRV + U \quad (6)$$

The apriori expectation provides the expected significance of the values of the coefficients to be estimated, We expect the coefficient to have the following signs:

$$\alpha_0 > 0, \alpha_1 > 0, \alpha_2 > 0, \alpha_3 > 0, \alpha_4 > 0, \alpha_5 > 0, \alpha_6 > 0, \alpha_7 < 0.$$

The role of capital inflow (FDI, REM) which is counted as endogenous variables in process of economic growth is explained by the fact that in developing countries, the gap of domestic savings and investment is lagged and foreign capital plays a key role in the development process. It is therefore supposed that foreign capital flow raises capital stock and increased capital formation which will in turn lead to increase in the growth of GDP.

Estimation Techniques

The study employs annual time series data for Nigeria between 1970 and 2013 which will be analysed using econometric techniques. A simple ordinary least square (OLS) method of estimation will be used in the first instance on equation 6 since it is efficient, sufficient and best linear unbiased estimator. However because of the inconsistency of the result of OLS in literature, we shall equally adopt the Generalised Method of Moments (GMM) estimators which provide consistent estimators when lagged of dependent variables are used. This is necessary in order to overcome the problem of endogeneity that is inherent in the long run growth determinants in line with Arellano and Bond (1991). This modified method was adopted in similar studies in Pakistan and other related studies (Malik and Junaid, 2009; Aghion P. et al, 2006; Gunther S, 2007; Benhima K. 2013; Hanseith and Tarp F, 2000; Carerera and Vulesin, 2003). This method is widely used by other studies because of its consistency (Chang and Ying, 2008; Aghion, Howwitt and Martins, 2010; Islam, 2010; Hokayem and Ziliak, 2011). In applying this method, the explanatory variables are instrumentalized with their suitable lags so that the instruments are not correlated with the error term.

GMM is a dynamic model estimation technique which is valid because the instruments (Variables) are exogenous implying that the over identified restriction on instrument is valid (Roodman, 2006). The two popular and similar tests of over identifying restriction hypothesis in GMM estimates are the Satgan (1958) and J- Statistic of Hansen (1982) tests. They both test the Null hypothesis that the overidentifying restrictions are valid. A rejection of this null hypothesis implies that the instructions are not satisfying the orthogonality conditions required for their adoption; the instrument are not truly exogenous or heteroscedasticity problem is in existence as against Homoscedasticity assumption in Sargan tests (Baaun, Schaffer and Stillman, 2003). It has also been shown that the presence of intra – cluster correlation can cause an over-identification statistics to over – reject the Null hypothesis (Hoxby and Paserman, 1998).

Therefore this study adopted GMM. Taking the first-difference transformation of equation 6, the fixed country-specific effect and the correction between the error terms and the lagged dependent variables are removed, specifically for lag order greater than or equal to 2 then we have.

$$\Delta Y_t = \alpha_1 \Delta Y_{t-1} + \alpha_2 \Delta K_t + \alpha_3 \Delta FDI_t + \alpha_4 \Delta REM_t + \alpha_5 \Delta L_t + \alpha_6 \Delta FL_t + \alpha_7 \Delta M_2 + \alpha_8 \Delta EXRV_t + \Delta U_t \text{ ----- (7)}$$

Estimation of Exchange Rate Volatility

We adopt the Standard Deviation of the first difference of logarithms of the exchange rate in estimating Exchange Rate Volatility. Here the change in exchange rate is computed over one month using end of month data. The standard deviation is calculated over a one year period as an indicator of short run volatility as well as over a forty three years period to capture long run variability.

The first order difference (FD) measures consider the difference between the current logarithm value of exchange rate and the previous value. It is defined as:

$$FD_t = (\ln EXR_t - \ln EXR_{t-1}) - \overline{\ln EXR}$$

Where EXR = Bilateral exchange rate.

$\overline{\ln EXR}$ = The mean of the bilateral exchange rate.

ln = Natural log.

The second measure of standard deviation of the growth rates of exchange rate (SD^{43}) is approximated by time – varying measure defined as follows:

$$SD_{t+m} = \left(\frac{1}{m} \sum_{i=1}^m (inEX_{t+i-1} - EXR_{t+i-2})^2 \right)^{1/2}$$

Where m = the order of moving average.

The last alternative measure of the exchange rate volatility is defined as the time-varying twelve months co-efficient of variation (CV) of the bilateral exchange rate (this is in fact a measure of dispersion of the real exchange rate). It is define as:

$$CV_{t+m} = \frac{\left(\frac{1}{m} \sum_{i=1}^m (inEXR_{t+i-1} - EXR)^2 \right)^{1/2}}{EXR}$$

Where \overline{EXR} is the mean of the bilateral exchange rate between month t and t+m.

Sources of Data

Data on various variables to be used in the study such as Exchange rate, GDP, FDI and money supply, were sourced from volumes of the Central Banks of Nigeria (CBN) Statistical Bulletin. On the other hand, data on Workers' remittances, Capital and labour were sourced from the World Development Indicator (WDI). Exchange rate volatility was computed by the author by applying standard deviation on the exchange rate data collected from CBN Statistical Bulletin.

Results and Discussion

We present the table of our results of both OLS and GMM estimation techniques below. The results of the effects of the variables of interest in both methods of estimation were almost the same with minor variations. Since GMM has already helped us to overcome the problem of autocorrelation and heteroscedasticity inherent in OLS, we stick to GMM analysis in this paper.

The R- Squared of 0.986413 shows that the variation in dependent variable (GDP) was 98.64 percent jointly explained by all the explanatory variables (L, K, FDI, REM, FL, FD and EXRV). The Adjusted R² of 0.982531 shows that the model has high goodness of fit as the explanatory power of this model is approximately 98 percent of the total variation in GDP. The validity of the instrument in the estimation was justified by the Prob. J- Statistics of 0.999404 which is closer to 1.0. Also the standard error of all the variables which lies between 0 and 1 indicates that the coefficients of the estimator are reliable.

Model ESTIMATION (OLS & GMM)

Dependent Variable: LY

Method: Least Squares

Date: 02/22/16 Time: 18:47

Sample (adjusted): 1970 2012

Included observations: 43 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	80.84579	18.66521	4.331362	0.0001
LL	-4.690621	1.115186	-4.206132	0.0002

LK	0.022268	0.057297	0.388641	0.6999
LFDII	0.014429	0.063081	0.228737	0.8204
LREM	-0.046764	0.052440	-0.891768	0.3786
LFL	-0.398184	0.095824	-4.155354	0.0002
LFD	1.081215	0.120642	8.962204	0.0000
EXTV	-0.008150	0.034755	-0.234490	0.8160
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R-squared	0.978808	Mean dependent var	11.93976	
Adjusted R-squared	0.974570	S.D. dependent var	1.528077	
S.E. of regression	0.243679	Akaike info criterion	0.180311	
Sum squared resid	2.078280	Schwarz criterion	0.507976	
Log likelihood	4.123324	Hannan-Quinn criter.	0.301143	
F-statistic	230.9421	Durbin-Watson stat	0.673977	
Prob(F-statistic)	0.000000			

Dependent Variable: LY

Method: Generalized Method of Moments

Date: 02/22/16 Time: 18:52

Sample (adjusted): 1976 2012

Included observations: 37 after adjustments

Linear estimation with 1 weight update

Estimation weighting matrix: HAC (Bartlett kernel, Newey-West fixed
bandwidth = 4.0000)

Standard errors & covariance computed using estimation weighting matrix

Instrument specification: LK(-1) LL(-1) LFDII(-1) LREM(-1) LFL(-1) EXTV(-1)

LFD(-1) LK(-2) LL(-2) LFDII(-2) LREM(-2) LFL(-2) EXTV(-2) LFD(-2)

LK(-3) LL(-3) LFDII(-3) LREM(-3) LFL(-3) EXTV(-3) LFD(-3) LK(-4) LL(-4)

LFDII(-4) LREM(-4) LFL(-4) EXTV(-4) LFD(-4) LK(-5) LL(-5) LFDII(-

5) LREM(-5) LFL(-5) EXTV(-5) LFD(-5) LK(-6) LL(-6) LFDII(-6) LREM(-

6) LFL(-6) EXTV(-6) LFD(-6) LK(-6) LL(-6) LFDII(-6) LREM(-6) LFL(-6)

EXTV(-6) LFD(-6)

EXTV(-6) LFD(-6)

Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	92.52159	5.283602	17.51108	0.0000
LY(-1)	0.082556	0.038611	2.138150	0.0417
LK	0.050607	0.004571	11.07106	0.0000
LL	-5.303872	0.307631	-17.24105	0.0000
LFDII	0.063944	0.003358	19.04463	0.0000
LREM	-0.062961	0.004724	-13.32847	0.0000
LFL	-0.184613	0.006960	-26.52529	0.0000
EXTV	0.005670	0.002864	1.979911	0.0580
EXTV(-1)	-0.024395	0.002012	-12.12669	0.0000
LFD	0.883576	0.045644	19.35817	0.0000

R-squared	0.988770	Mean dependent var	12.42286	
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Adjusted R-squared	0.985027	S.D. dependent var	0.959214
S.E. of regression	0.117373	Sum squared resid	0.371964
Durbin-Watson stat	1.273402	J-statistic	9.779424
Instrument rank	38	Prob(J-statistic)	0.999435

We now examine the effect of each of the explanatory variables on the growth of the Nigerian economy. The coefficient of FDI which is 0.063944 shows that there was positive but very significant effect of FDI on GDP as demonstrated in the probability of 0.0000. In other words a percentage change in FDI lead to 0.064 percentage change in GDP. This shows that FDI has great impact on economic growth of Nigeria between 1970 and 2013. This could have been the direct implication of this kind of inflow on local investment, employment and indirectly on consumption. This therefore suggests an area of policy shift for government to meet her current economic diversification strategy.

Remittance on the other hand had significant negative effect on the Nigerian economy as evidenced in its negative coefficient of 0.026961 and probability of 0.00000. This shows that a one percent change in remittance will lead to 0.068 percentage change in GDP. This result was contrary to empirical evidence in previous literatures on Nigeria which produced positive relationship between remittance and economic growth (Iheke, 2013; Ukeje and Obiechina, 2013; Kanu and Ozurunbo, 2013). However literature that support negative impact of remittance on economic growth anchored their argument on the fact that remittance only have direct impact on consumption and not on investment and therefore could not form capital formation required for economic growth (Karagoz, 2009; Sanni and Mohammed, 2012). In particular Sanni and Mohammed (2012) found negative effect of remittance on MENA countries economic growth between 1970 and 2009 while examining channels through which remittance can promote economic growth in these countries. They concluded that remittance was consumed and thus could not stimulate growth which could only be stimulated by investment.

The negative effect of remittance on economic growth in Nigeria could be justified by the fact that most of the fund that come to Nigeria via remittance were consumed rather than invested. Effort should therefore be geared towards encouraging remittance flow towards investment that could lead to both human and physical capital accumulation.

Exchange rate volatility which is one of the key explanatory variables of interest in this study shows an interesting position. Here there is positive and significant effect of EXRV on GDP as evidence in its coefficient of 0.005670 and probability of 0.0000 this is contrary to the theory which specified that EXRV has a negative effect on GDP. But a study by Aghion, Howit and Mayer (2005) opined that the extent of financial development will dictate the impact of EXRV on economic growth. For instance a lower degree of financial development with high EXRV will aggravate the divergence of the economy growth rate while a country with well developed financial system will neutralize the negative effect of EXRV. The various reforms implemented by Nigeria's government overtime might have explained the positive effect of EXRV on GDP in Nigeria. Such reforms include financial structure reform; monetary policies reforms; foreign exchange market reforms; liberalisation of the capital market and capital market reform. However we extend the study further to see the lag effect of EXRV for one period on economic growth. The outcome shows a negative but significant effect of this lag value of EXRV on GDP as evidenced in its negative coefficient of 0.024395 and probability of 0.0000 shown in the regression table above. This is the only situation that corroborates the theory on exchange rate volatility.

Financial liberalisation was found to have negative but highly significant effect on economic growth. This shows that a percentage increase in financial liberalisation will lead to retardation in economic growth by 0.185 percent. Therefore policy formulators must be careful about the level

of financial liberalisation to be accepted in the economy. On the other hand financial development was also found to have positive significant effect on the economic growth in Nigeria as evidenced in the positive coefficient of 0.883676 and probability of 0.0000 That is for every percentage change in financial development there is 0.884 percentage increase in economic growth. Financial development is required to bring about speedy economic growth required in the economy. For the economy to grow therefore much effort must be directed towards developing the financial sector of the economy so that the sector could play a big role of the engine of growth ascribed to it as normal function. Capital has a positive and significant effect on economic growth on the other hand labour has a negative and significant effect on economic growth of Nigeria between 1970 and 2013.

The objective of this study was to assess the effect of capital inflow and exchange rate volatility on economic growth in Nigeria between 1970 and 2013. The result of the general Method of Moment (GMM) regression analysis show that R^2 of 0.978808 imply that all the explanatory variables jointly explain the variation in the GDP by 97.88 percent. This was buttressed further by Adjusted R^2 of 0.985027 which imply that the model has high goodness of fit. The FDI was discovered to have significant positive effect on GDP as shown by the co-efficient of 0.063944 which indicate that a percentage increase in FDI will lead to 0.064 percentage change in GDP. We also noted that Workers Remittance have a significant negative effect on FDI as shown by the coefficient of -0.62961. This was because remittance does not have direct impact on investment but rather impacted on consumption which does not have capacity to build up capital stock.

Exchange rate volatility has positive but insignificant effect on economic growth contrary to negative effect posited by theory but which could be justified by the level of financial development prevalent in Nigeria in line with the findings of Aghion et al (2005). However, the lag of EXRV has a negative and significant effect on economic growth in Nigeria. Financial development has a positive and very significant effect on economic growth in Nigeria as demonstrated by the coefficient of 0.883576 signifying that a percentage change in financial development will lead to 0.884 percentage change in economic growth, On the other hand financial liberalisation has a negative but significant effect on economic growth in Nigeria.

Conclusion and Recommendation

The study shows that FDI has a positive and significant effect on economic growth in Nigeria which identified FDI as a focal point to channel the policy to grow the economy. On the other hand remittance has a negative effect on the economic growth in Nigeria as it affects consumption and not investment which is capable of improving economic growth. Also EXRV has positive but insignificant relationship with economic growth in Nigeria contrary to basic theory on EXRV. However this was made possible because of the level of financial development prevalent in Nigeria arising from various financial reforms carried out in Nigeria financial system.

It is common knowledge that the present political administration intend to introduce economic reform that will diversify the Nigerian economy from the present monocultural dependency on oil revenue in her quest to bail out the nation from the dwindling economic fortune. The template in particular seeks to grow the nation agricultural base, solid mineral development and local industry development. This study therefore admonishes government to provide enabling infrastructural and financial development that will attract the inflow of FDI to agric sector, solid mineral sector and agro allied industry. This will help to bridge financial, technological and managerial gap that exist in the domestic economy of Nigeria presently.

We also recommend that government should introduce financial reform that will encourage greater financial inclusion of Nigerian citizens in the financial sector of the economy. More importantly the impact of financial reform in Nigeria should not be restricted to urban areas but should equally be felt in the rural areas. In this way rural agricultural development needed to anchor the economic diversification of the present administration will be easily attainable. The space of financial development will also go a long way to further reduce the negative effect of EXRV on the economic growth.

More fiscal and monetary policies that will curtail the present overbearing control of foreign exchange by parallel market instead of real banking sector led control should be put in place. The mafia that presently control bureau de change in Nigeria should be dismantled. Government must put in place stringent control on the activities of these bureau de changes. Policy that will diversify more of remittance which is on the increase to the nation now from consumption to investment should be put in place. In this way the remittance will have direct impact on economic growth in Nigeria. Recipient household of international workers remittance should be re-oriented to channel more of the remittances to investment purpose rather than consumption so as to boost the growth of Nigerian economy.

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