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RELATIONSHIP BETWEEN ECONOMIC GROWTH, FISCAL POLICY, REAL INTEREST RATE AND REAL EXCHANGE RATE: AN ECONOMETRIC MODELLING STRUCTURE IN NIGERIA

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Abstract

This study seek to analyse the interplay between economic growth, fiscal policy, exchange rate and interest rate in Nigeria using a dis aggregate estimation to capture the various direction of causality and consociation. The paper employ time series data where three model were estimated. The report from the first model shows that the behaviour of interest rate and exchange rate does not seems to stimulate private consumption. This therefore gives a connotation that the aggregate demand by Nigerians and foreigners for domestic goods exceeds aggregate supply in Nigerian goods which has actually fuel the ongoing exchange rate saga over the years. The second model developed an export demand equation with the intension of examining the interplay between import, export and non-oil export. From the first estimation, the report establishes that the negative behaviour between the ratios of non-oil export to aggregate import gives a unidirectional impression such that the quantum of import to export in Nigeria is imbalance thereby leading to trade deficit. The last model tend to examine the extent to which economic growth, fiscal policy proxy with aggregate government expenditure and interest rate react to real exchange rate in Nigeria. The report shows that The lagged linear value of the real Interest Rate does not statistically influence the linear value of the real Exchange Rate. This implies that the de-trended value of the interest rate won't statistically influence the exchange rate level in the Nigerian context.

Key Words: Fiscal Policy, Econometric Modelling , Finance and Banking

1.0 Introduction

In 1986, the Structural Adjustment Programme (SAP) brought about the foreign exchange market deregulation. The deregulation process introduced market determined and managed floating rate regime. Prior to the implementation of this program, Nigeria operated a fixed

exchange rate regime, sustained by exchange control regulations that created major economic problems till date. Most of the industries in Nigeria depend solely on importation of natural resources, basic materials and finished goods from foreign countries, the CBN usually interfere in the foreign exchange market through its monetary policies and operations in the money market to tilt the exchange rate variability in the desired path such that it raises the competitiveness of the domestic economy. Today exchange rate in Nigeria is determined through the instrument of efficient resource allocation between any interacting economies by the means of import and export (BOP) which invariably affect the demand of the country's currency. Nigerian as an import dependent country was seriously affected by the deregulation exercise. The value of naira depreciates as a result of high degree of currency risk; recurrent changes in exchange rate and inflation.

The effect of instability of interest rate and exchange rate is very significant to foreign direct investment inflow to a developing nation like Nigeria experiencing transition and emerging markets. As such, the response of this instability to economic growth is corrosive. A rise in interest rate will cause an increase in current real exchange rate. Hence, the variation between exchange rate and interest rate consistently correlates to malfunctioning of the economy. Exchange rate and interest rate volatility has grown overtime and such economic variations can result in significant depreciation in the value of assets invested by investors in the host country as well as the future profits created by the investment. Investments in a nation like Nigeria will have a more risky stream of profits due to high degree of volatility of interest rate and exchange rate.

It is a common fact that government is an institution saddled with numerous activities and functions, basically with the aim of achieving economic stabilization. However, fiscal policy is a major tool for economic stabilization especially in developing countries like Nigeria.Meanwhile, Gbosi (2008) reported that this measures are taken to regulate and control the volume of cost and availability as well as direction of money in an economy to achieve some specified macroeconomic policy objectives and to counteract undesirable trend in an economy. But in spite of many and frequent fiscal and other macroeconomic policies, Nigerian economy has suffered series of growth challenges over the years. According to Adeoye (2011), the debate on the effectiveness of fiscal policy as a tool for promoting growth and development remains inclusive, given the conflicting results of current studies. As such, it became imperative to carry out more research on the subject matter.

The empirical argument as regard the direction of causality between economic growth and fiscal policy is inconclusive. The economy is expected to witness growth alongside the policies of the government to ascertain stability. The fiscal policy of the government drives interest and exchange rate and thus determine the extent to which the economy could witness growth. Hence, maladaptation of wrong policy could result into volatility of interest and exchange rate thereby amounting to economic malfunctioning.

The inter-relationships between interest rate, exchange rate and growth in emerging economies have been a challenge. Some researchers have reported that fluctuations on economic growth are caused by changes in exchange rate and interest rate volatilities while others see it the other way round. For instance, Foad (2005), noted that a "Nations with high levels of currency risk will lose out on foreign direct investment compared to nations with more stable currencies." Osinubi and Amaghioyeodiwe (2009), opined that Nigeria is a country with high currency risk. Their

studies revealed "significant and positive correlations between economic growth and exchange rate in Nigeria". This implies that depreciation of the naira increase real inward foreign direct investment into the country and thus stimulate economic growth as the case may be.

Government policies are most time directed at inflation rate and interest rate to guarantee price stability and reliance on the currency which is a deliberate attempt by the central bank of Nigeria. It can either be expansionary or contractionary. The expansionary policy during a time of recession is aimed at fighting unemployment by lowering interest rate to entice businesses to expand since the total supply of money in an economy is increased while the contractionary policy slows down inflation so as to duck the alterations and deteriorations of the value of assets.

The CBN adopted the Structural Adjustment Programme (SAP) in July 1986 sequel to the collapse in the global oil market which brought about the decline of economic conditions in the country. It was directed to achieve fiscal balance and balance of payments feasibility by changing and restructuring the method of production and consumption in the economy. The central plan of SAP was to deregulate the external trade and payments arrangement, to adopt the market-determined exchange rate for the Naira, combat complex price decrease. This placed controls and additional confidence on market forces as the most essential element of fiscal activity.

Following the postulations of fiscal policy theories, it is crystal clear that if fiscal policy is used with circumspection and synchronized with other measures or policies, it will likely smoothen out business cycles and lead to economic growth and stability. However, despite the fact that fiscal policy has become a major economic growth tool/ instrument in Nigeria since her independence, Okunroumu (1993), opined that the management of the Nigerian economy in a bid to achieve macroeconomic stability has been unproductive and negative hence one cannot prove that the economy is performing; this assertion according to Audu (2012), is evidenced in the adverse inflationary trend, undulating foreign exchange rate, fall and rise of gross domestic product, unfavourable balance of payment, price instability as well as increasing unemployment rates in the country; and these have created a lots of dichotomy between theoretical postulations and empirical findings in Nigeria with respect to fiscal policy and economic growth. Hence, this study seek to examine the interplay between this variables and make necessary recommendation when appropriate.

2.0 Model Structure

Here, we present a simplified exposition of the model used to assess the likely impact of debt relief on economic growth in Nigeria with the theoretical structure drawing heavily from Van (1985). The model focus on the inter-temporal choice and the relative price governing it- the real interest rate. Both inter temporal production decision (investment) and consumption decisions (savings) are endogenous. A second problem involves intra-temporal rather than inter-temporal trade because foreigner spend less on Nigerian goods on the margin that Nigerians do, any external transfer has immediate implications for the real exchange rate.

The aggregate supply of non-oil Nigerian goods, Q^sdepends on their relative price against foreign final goods (the real exchange rate e), the real wage, w, the relative price of imported intermediate goods in terms of foreign final goods Pm, and the stock of capital, K

$Q^s = f(e, w, P_m, k)$……(1)

Adding oil revenues, Roil, and subtracting interest payments on external debt, I_B, yields national income $Y = Q_s + R_{oil} - {}_iB$

Tomorrow's capital stock, K_{t-i}, depends on today's capital stock plus net private and public investment (Ip and Ig, respectively):

$K_{t+1} = K_t(1-D) + I_p + I_g$----------(2)

Aggregate expenditure consist of private consumption c, private investment I_p, and government expenditure G. the real interest and after tax income is denoted by r and Y_A. Thus, the current account surplus CAS, can be written as

$CAS = F_S + NPS(r, e) = F_S + Y_A - c - I_p$----------(3)

Where

F_S = Fiscal Surplus

NPS = Net Private Savings Surplus

YA = After-Tax Income

R = Real Interest

e = Exchange Rate

The private se tor surplus of savings (S_P) over investment (I_P), $Nps = S_p - I_p$ depends on the real rate of interest. With regards to the real exchange rate, we can view it as a relative price of Nigerian (non-oil) goods in terms of foreign goods. Therefore, the "market" that the real exchange rate will clear will be the market for Nigerian goods.

One component of the aggregate demand for Nigerian goods comes from Nigerian consumers and investors. At a more appreciated real exchange rate, Nigerians will tend to allocate their aggregate expenditure toward foreign goods rather than domestic goods. Similarly, an appreciated real exchange rate will cause lower export sales X_d.

The aggregate supply of Nigerian goods Qs increases when the real exchange rate appreciate, because intermediate imports will become cheaper in terms Nigerian goods. Therefore the commodity market equilibrium can be presented as

$Q^s(e) = C_d(e, c) + Ip_d, (e, I_p) + G_d + X_d$…….(4)

Growth, Real interest Rates, and the Exchange Rate

As long as domestic interest rate are not completely linked to foreign interest rates, changes in domestic real interest rates can resolve potential discrepancies between fiscal deficits and external targets through their impact on the net private savings surplus (S_p-I_p). The effect on private investment, and hence on the growth of output, is one of the more important links between fiscal policy and output growth.

$$CAS = FS + NPS(r) = FS + S_p(r) - I_p(r) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

A higher real interest rate will slow down private sector investment and possibly increase private savings, and so, increasing the net private savings surplus. the net private savings plus the fiscal surplus equals the external deficit that is compatible with given real interest rates and the fiscal surplus. The real interest rate at which the target value for the current account surplus equals the actual current account surplus is the real rate at which fiscal policy and current account targets are in line.

An increase in the fiscal deficit leads to a downward movement in the feasible current account surplus. While an increase in the interest rate is needed to call forth the extra net private savings required. Conversely, with a cut in the fiscal deficit, a given current account target can be met with a lower real interest rate and hence higher private investment. However, growth in output depends not just on private savings, but on the sum of public and private investment. The impact of changes in fiscal deficits on growth in output will depend on whether the underlying adjustment is made out of public investment or put of public consumption. The model therefore breaks down public expenditure into consumption and investment.

The Real Exchange Rate, Interest Rate and the Current Account.

An external deficit indicate that aggregate expenditure by Nigerians on foreign goods and domestic goods exceed aggregate income. It provides no indication, however, that aggregate demand by Nigerians and foreigners for domestic goods exceeds aggregate supply in Nigerian goods at the going exchange rate

Various combination of the exchange rate and real interest rate will allow the achievement of a particular current account target for given fiscal policy. Higher real interest rate with other things been equal, reduced private consumption and investment and thus improve current account balance. In which direction will the real exchange rate have to move to bring the current account into line with itstarget? Theory suggests that the answer is something unclear. From our empirical services, we shall try to confirm this claim.

For a constant rate of time preference the exchange rate has no effect on private consumption (Razim and Svenson 1983). Mostly because of its impact on intermediate import prices, a devaluation will have a negative effect on investment, but this effect takes after a lag. In the short run, the only effect is the negative impact of a real depreciation on aggregate supply. This in the short run, a real devaluation is in fact likely to deteriorate the current account. In the longrun, because of the negative impact on investment, an appreciation will be necessary.

What does the analysis suggest will happen if, because of inflation and a fixed nominal exchange rate, the real exchange rate becomes over valued?

First, there will be an excess supply of domestic goods and hence falling exports, declining capacity utilization, and Keynesian unemployment. If the government respond to the rising unemployment and falling capacity utilization by raising government purchases of domestic goods than devaluating, the market curve shift negatively (leftward) and the commodity market problem will be resolved.

If the fiscal expansion is not matched by increasedrevenues, the current account will deteriorate. Thus an overvalued exchange rate will lead to unemployment and possibilities to a deteriorating

current account as it goes by, or to no unemployment but a real current problems if fiscal policy is used to offset the employment effect t of the overvalued exchange rate. That is, the appropriate policy response to falling export and suggest capacity utilization is a real depreciation.

Review of Related Literatures

Alaba (2003) examined exchange rate, interest rate volatility and economic growth in Sub Sahara Africa economies between 1982 and 1998. He adopted GARCH model and error correction technique. His result revealed that exchange rate volatility was not significant for foreign direct investment inflows in both agricultural and manufacturing segment of Nigeria and as such, economic growth was negatively affected.

Ogunleye (2008) investigated exchange rate volatility, fiscal policy and economic growth in Sub Sahara Africa (SSA), they investigated nine countries in the region, Country-specific time series data and panel model estimation techniques were employed. The study establish "that exchange rate instability generally limits foreign direct investment inflows to SSA and thus debars economic growth.

Udoh and Egwaikhide (2008) investigate "the impact of exchange rate volatility and inflation certainty on economic growth in Nigeria, between the periods 1970 to 2005. Adopting the Generalized Autoregressive Conditional Heteroskedastic (GARCH) estimation model. The study concluded that exchange rate uncertainty have a negative impact on economic advancement in Nigeria.

Pain and Welsum (2011) investigated the relationship between stock market returns and interest rate in Finland. Employing monthly data for the period 1987 to 2010, during the crisis free period, interest rate granger causes fluctuation in stock prices, while in turn, stock price movement granger cause adjustments in interest rate in the period of economic crisis.

Bekhet and Mator (2013) examined the relationship between economic growth and interest rate alongside other macroeconomic variables. Regress Jodan data for the period 1998 to 2010 using the ARDL bound testing techniques, the study report that interest rate influence economic growth.

Chinazara (2011) studied the impact of some macroeconomic variables on economic growth in South Africa, and reported that interest rate and exchange rate volatility exhibit the strongest influence on the behaviour of stock price and growth in South Africa economy.

Olweny and Omodi (2011) determined the effect of some selected macroeconomic variables on market activities utilizing monthly data for the period January 2001 to December 2010. The study reported that leverage effect exist between bad news emanating from the macroeconomic variables especially interest rate and stock return volatility. The effect is dual in nature. As such change in macroeconomic variables could result in stock return volatility and vice versa.

Alam and Uddin (2009) investigated the connectivity between exchange rate and interest rate movement for fifteen (15) African economies. The study reported that interest rate movement or fluctuations exerts strong impact on domestic market.This was supported by Gupta and Modise

(2011) who posited that interest rate movement could be used to predict stock market activities for some African countries economy.

In Nigeria, Ologunde et al. (2006) examined the nature of relationship between exchange rate and interest rate in Nigeria. They reported that strong and positive correlation exist between interest rate and exchange rate. They added that government development stock rate exist negative impact on exchange rate.

Ayopo, Isola and Olukayode (2016) investigated the relationship between macroeconomic variables volatility including interest rate and exchange rate in Nigeria. Employing exponential generalize autoregressive conditional heteroskedascity estimation techniques on monthly Nigeria data for the period of January 1985 to December 2013. The findings reveal that exchange rate responds from interest rate and real gross domestic product (RGDP). The authors recommend that policy makers should consider fluctuations in both interest rate and real gross domestic product while formulating and implementing capital market development policies.

Brunnermeier, Eisenbach, and Sannikov (2013) studied the relationship between interest rates and economic growth using sensitivity analysis and VAR Model, they found that there exists negative correlation between interest rates and productivity as a measure of economic growth. This suggest that when interest is high, it tend to reduce investment and productivity due to increase in the cost of loanable funds.

Owolabi, and Adegbite, (2014) the study empirically scrutinizes the impact of interest rate and exchange rate on capital market performance in Nigeria. The data were obtained from central bank of Nigeria statistical bulletin and Security exchange commission (SEC) from 1978 to2012. The study employed multiple regressions and Unit roots to analyse data on interest rate, exchange rate, and market capitalization with the adjusted R^2 significant at0.9256 (92.6%), it indicates that interest rate and exchange rate accounts for 92.6% of the difference in the influence of the market capitalization in Nigerian capital market. They established that exchange rate has positive impact on capital market however there is an adverse relationship between interest rate and capital market performance. The result proposes that Government should ensure appropriate decision of interest rate level that will break the double-edge result of interest rate on savers and local investors in order to boost investment and transactions in Nigerian Capital Market. The interest rate policy that will help the economy are the ones that can attract savings mobilization and encourage domestic investment.

Nam (2011) in his work centred on existing literature, his reasoning and observations made, and found out that the theory shows interest rates and anticipation as the key roles in making house prices more volatile than otherwise. The validity of the work was tested using diverse regression plan from collective empirical models and the volatile components of house prices were employed as dependent variable as a replacement for house prices. He found out that the empirical results were consistent with the theory which confirms that the prevalence of interest rates aids in generating house price fluctuations and also the significance of expectation channel which transfers the effects of interest rates.

Sensoy and Sobaci (2015) examined the interest rate impact on economic growth in Jiangsu Province of China which has the largest quantity of investment in China. They employed nexus Johansen Co-integration as a long run test and vector error correction model (VECM) for short

run. The period covered was 2003-2012. They found out that there is a long-term relationship between all the variables. It revealed an adverse relationship in the long run and was progressive in the short run. They made submissions that will help interest rate policy that will improve investment and promote economic growth in Jiangsu Province.

Were and Wambua (2014)studied the determinants of interest rate spread in Kenya's banking sector based on panel data analysis. There work revealed that bank-specific factors play a major role in the determination of interest rate spreads. Which comprises bank size, credit risk as measured by non-performing loans to total loans ratio, return on average assets and operating costs, hence a clear influence interest rate spreads exists while higher bank liquidity ratio has an adverse influence on the spreads. In a nutshell, bigger banks have greater spreads when compared to smaller banks. The macroeconomic variables like real economic growth is irrelevant, the effect of the monetary policy rate is positive but not very weighty. In conclusion, the findings reflects to a great extent the structure of the banking industry, wherein a few big banks control the major share of the market.

Richard, Geoffrey and Robert (2012) Reported that the reaction of the economy to fiscal policy depend on the nature of growth as at when those policies were implement. Theirstudy titled the macroeconomics of fiscal policy reveals that monetary and fiscal policy tools has a large effect on economic growth. The study gave and instances that if a consumer decide to reduce her consumption in other to increase savings for future investment, the producer who is not part of the plan will be unaware of the development but could only sense their reaction responding from drop in demand for commodity and the ripple effect his sends to the economy at large of low level of productivity and lay off of worker which will amount to high level of unemployed as the case may be.

Monogbe and Okah(2017) empirically examined the consociations between exchange rate, interest rate and economic development in Nigeria using the structural analysis. The study employed time data between the periods 1986 to 2016 where unit root test and auto regressive distributed lag. From the statistical report, findings reveals that foreign direct investment and interest rate exhibit a direct relationship to economic development in Nigeria. Study further suggest that the low rate of interest promote investment paradox and thus stimulate economic development in Nigeria while the report from the exchange rate shows that if exchange rate is appreciating, economic development is been stimulated. This therefore suggest that an appreciating exchange rate is capable of attracting foreign investors and thus promote economic development as the case may be. The inter-relationship between exchange rate, foreign investment and economic development is expected to be direct accordingly such that rise in exchange rate attract foreign investment and thus promote economic development in Nigeria. The policy implication of this is that if Exchange Rate appreciates, then Naira will be cheap relative to other currencies, this can attract Foreign Direct Investment inflow into the Nigerian economy through the window of reduce Naira value and cheap investment in Nigeria. Based on this findings, the study recommends that authorities in charge of managing the Nigerian economy should as a matter of urgency revamp the lending habit by introducing low interest rate as this will make it cheaper to borrow and this encourages spending and investment lending to higher aggregate demand which will further stimulate economic development.

Monogbe, Harry and Achugbu (2017)empirically examined the response of macroeconomic performance indices to government fiscal deficits in Nigeria using three different models. This study covers for 19 years (1997-2016) been the years of consistent trend of fiscal deficits in

Nigeria. Findings reveal that macroeconomic performance indices captured in this study react to government fiscal deficits in an assorted manner and as such government fiscal deficits has not really guarantee macroeconomic stability in Nigeria as the report shows its ephemeral contribution to the economy. Hence, the study recommends that borrowed fund should be adequately utilised in capital projects which is capable of yielding better returns and the omnibus pattern of spending in the legislative arm of the government should be reviewed downward.

Sweder, Robert and Anand (1989) Using an empirical approach affirms that the demand for money is a function of inflation volatility. Their study shows that if inflation rate increase, the private demand for base money drops considering the quantity and quality of commodity such money can acquire during inflation. Conversely, when the rate of inflation falls, the request for based money rises has investment bid will be rewarding at that point in time.

Monogbe and Davies (2016) examined the classical verse the Keynesian preposition of the superior tools in ascertaining economic stability of a nation. The fiscal policy and monetary tools were considered findings shows that fiscal policy tools of government expenditure is a key stimuli to economic growth in the long run has it revamp job creation and economic expansion.

Monogbe, Achugbu and Davies (2016) empirically investigate fiscal policy and economic stability in Nigeria. Fiscal policy was captured with total government expenditure, tax, government debt and gross revenue while consumer price index was used as proxy for economic stability. The study employed preliminary econometrics investigation of descriptive analysis and graphical representation. Findings reveals that tax, aggregate revenue and external debt posit an optimistic association to economic stability in Nigeria while from the causality wings, total government expenditure causes economic stability. The study thereby conclude that fiscal stimulus is a paramount tools for economic stability.

Peter, Rosina and Jordi (2008) examined fiscal policy, interest rate and economic integration, the pooled ordinary least square method was employed and the result shows a strong existence of inverse and bidirectional association betweensurplus gross domestic product and interest rate such that a percent rise in GDP surplus is capable of increase interest rate to the tune of 109 percent all thing been equal.This therefore suggest that the extra demand of government in the financial market to augment her deficit has a ripple effect of crowding out the private investor from the competition.

Njuguna (2000) in his quest to examine the exchange rate and interest rate differential in Kenya reported that exchange rate and interest rate react to each other in a bidirectional manner such that interest rate differential will rise as soon as exchange rate appreciate while in the local market, the domestic inflation will rise as the international exchange rate appreciate and vice-verse. The study finally conclude that the stability function ascribe to interest rate as a tools for exchange rate stability and lowing inflation rate is inefficiency

3.0 Model Equation

Aggregate Expenditure

$$\text{Log } C_p = ß_o - ß_1 \log (1+r) + ß_2 \log Y_T + ß_3 \log Y_P + ß_4 \log_e + \boldsymbol{\pi}_I \text{ ----------(4a)}$$

The above model is re-casted where temporary and permanent disposal income were merge as

$\text{Log } C_p = ß_o - ß_1 \log (1+r) + ß_2 \log Y_{TP} + ß_3 \log_e + \pi_I$ ----------(4b)

Where

C_P = Private Consumption

r = After-Tax-Real Rate of Interest

e = Real Exchange Rate

Y_T &Y_P= Temporary and permanent disposal income. Disposal income equals GNP – government revenue plus the domestic real interest rate on government debt times the part of domestic government debt held outside the public sector.

$\text{Log } I_P = ß_o - ß_1 \log [1+r(-1)] - ß_2 \log [1+r(-2)] + ß_3 \log(Y/k) - ß_4 \log [P_{m-1}/P_{GNP}(-1)] + \pi_2$--------(5)

Equation 2 is the second component of aggregate expenditure that is sensitive to interest rate. This is private investment or fixed capital formation.

Private investment depend on real interest rates, the relative price of intermediate input, and the ratio of output to capital, as a proxy for capital utilization. The relative interest rate should be the pre-tax nominal interest rate, converted into real rate using expected generated from a regression of inflation on its own past values plus a constant term. The measure of intermediate imports price should be the unit value of intermediate imports Pm converted to naira and deflated by the Nigerian GNP deflator.

Aggregate Supply

Aggregate supply of non-oil domestic goods depend on the beginning of period capital stock K_t, on the relative price of intermediate import in terms of domestics goods P_M/P_{GNP}, and on the relative final price of domestics goods in terms of an index of foreign competitors prices oversea, P_{GNP}/P_F(an aggregate of the naira based whole sale price index of Nigeria's main trading partners.

$\text{Log}(Y/K) = -ß_o + ß_1 \log (P_{GNP}/P_F) + ß_2 \log (P_{GNP(-1)}/P_F(-1)] - ß_3 \log[(P_M(-1)/P_{GNP(-1)}] + \pi_3$-------(6)

Aggregate Employment

Aggregate employment, A_N, depends on the realproduct wages, W/P_{GNP}, and on aggregate non-oil output, dlogX, is the log difference

LogX – logX(-1)

$\text{dlog}N_t = ß_o + ß_1 \text{ dlog}(W/P_{GNP}) + ß_2 \text{ dlog}Y + \pi_4$----------(7)

Next year's capital stock depends on this year's capital stock minus depreciation and on total fixed capital formation.

$K_{t+1} = (I - ß_1 K_t + (I_p + I_G)$

The depreciation rate can be derived from government data

Allocation of Expenditure and the Real Exchange Rate.

Here, we focus on intra-temporal trade using the real exchange ratio as the relevant relative price variable. We analyse the allocation of domestic expenditure over foreign and domestic goods by explicitly estimating import demand equations for the different import categories, capital goods, consumption goods, intermediate import the equation of export demand is specifies as;

The volume of capital goods imported M_K,depend on the relative price of imports that are capital goods versus those that are investment goods in general (the GNP deflations for investment) and on aggregate investment.

$\text{Log } (M_K) = ß_o - ß_1 \log (P_{MK}/P_f) - ß_2 \log[P_{MK-1}/P_{F(-1)} + ß_3 \log (I_P + I_G) - ß_4 M_{R(-1)} + \pi_5$----------(8)

Where

M_R = is included in an admittedly crude attempt to account for the many changes in trade regime that have taken place in Nigeria over the sample period. By M_R, we mean the fraction of imports covered by quantitative restriction over the periods in question.

Volume of Consumption Goods, M_C

$\text{Log } (M_C) = ß_o - ß_1 \log (P_{MC}/P_{CPI}) - ß_2 \log [P_{MC}(-1)/P_{CPI(-1)}] + ß_3 + \log C_P - ß_4 \log M_{R(-1)} + \pi_6$----(9)

Demand for Intermediate Imports M Equals

$\text{Log } M = - ß_o - ß_1 \log(P_M/P_{GNP}) + ß_2 \log Y - ß_3 \log M_{R(-1)}$----------(10)

Total demand for domestic goods by domestic residents in any given period can be obtained by combining the import demand equations with the equations for aggregate domestic expenditure and scaling by the relevant relative prices.

Export Demand Equation for Nigerian Non-Oil Goods.

To complete the analysis of commodity market equilibrium in the market for non-oil domestic goods, we added an additional element. Foreign demand for Nigerian goods.

To specify the equation for export demand X_d, we assumed that domestic exporters compete not so much with domestic producers in Nigeria's export market, but with other exporters to the same markets (primarily the USA,EU,ASIA). That is, the relevant activity variable is aggregate imports into Nigeria's export markets (weighted by their share in Nigeria's total exports), and the relevant relative price variable is the ratio of Nigerians export price over the aggregate price index of import into Nigeria export markets.

$d\log X_d = ß_o - ß_1 d\log X_P + ß_2 d\log [X_{P(-1)}] + ß_3 d\log M_V$----------(11)

Where

$X_P = P_X/P_M$ dollar price of Nigerian non-oil exports over the aggregate dollar based price index of imports into Nigeria's export markets.

M_V = volume of imports into those markets (again weighted by each country's share in Nigeria's total non-oil exports).

Overall Model

This paper present a model to analyse the interaction between fiscal policy, real interest rate and the real exchange rate.

$REXCH = f(GDP, A_{GXP}, R_{INTR})$----------(12)

We convert the model into an econometrics model thus;

$R_{EXCH} = ß_O + ß_1\ GDP + ß_2\ A_{GXP} + ß_3\ R_{INTR} + \pi_7$ ----------(13)

REXCH = real exchange rate

GDP = gross domestic product

A_{GXP} = aggregate government expenditure

R_{INTR} = Real Interest Rate

$ß_O$=Constant

$ß_1$- $ß_4$ = slope

On a priori, we expect a mixed reaction between the explanatory variables and exchange rate.

4.0 Presentation of Result and Analytical Interpretation

We start the analytical estimation with reliability test on the time series employed using augmented dickey fuller unit root test thus;

Table 1 Presentation of Unit Root Test

Variables	**ADF-statistic Test Values**	**Critical**	**Order of Integration**	**Prob.**
LOG(Cp)	-4.743213	1% level = -3.679322 5% level = -2.967767 10% level = -2.622989	I(1)	0.0007

LOG(1+r)	-3.792291	1% level = -3.711457 5% level = -2.981038 10% level = -2.629906	I(1)	0.0083
LOG(Ytp)	-5.501624	1% level = -3.679322 5% level = -2.967767 10% level = -2.622989	I(1)	0.0001
LOG(e)	-6.076720	1% level = -3.769597 5% level = -3.004861 10% level = -2.642242	I(1)	0.0001
Dlog(Xd)	-9.645396	1% level = -3.68914 5% level = -2.97183 10% level = -2.62531	1(1)	0.0000
Dlog(Xp)	-9.645396	1% level = -3.689194 5% level = -2.971853 10% level = -2.625121	1(1)	0.0000
Dlog(Mv)	-4.822972	1% level = -3.724070 5% level = -2.986225 10% level = -2.632604	1(1)	0.0007
Rexch	-5.127721	1% level = -3.679322 5% level = -2.967767 10% level = -2.622989	1(1)	0.0003
Gdp	-3.816559	1% level = -3.679322 5% level = -2.967767 10% level = -2.622989	1(1)	0.0072
Agxp	-3.853822	1% level = -3.724070	1(1)	0.00990

		5% level = -2.986225 10% level = -2.632604		
Rintr	-5.962485	1% level = -3.689194 5% level = -2.971853 10% level = -2.625121	1(1)	0.0000

Source: E-view output

The result of the reliability test show the viability of the data set as their all appear to be stationary at order 1 and significant at 5% level of significant thereby suggesting that the data set is fit for econometrics analysis and estimation. Having fulfil this condition, we proceed to test the long run association among the employed variables using johansen co-integration test thus; this section of the analysis, captures each of the estimated model separately;

Aggregate Expenditure Model

$\text{Log } C_p = ß_o - ß_1 \log (1+r) + ß_2 \log Y_{TP} + ß_3 \log_e + \pi_I$ ----------(4)

Table 2: presentation of the Co-integration Test

Date: 08/04/17 Time: 15:50
Sample (adjusted): 1988 2016
Included observations: 22 after adjustments
Trend assumption: Linear deterministic trend
Series: $LOGC_P$ LOG1+R $LOGY_{TP}$LOGe
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.606294	39.82815	47.85613	0.2287
At most 1	0.471976	19.32083	29.79707	0.4700
At most 2	0.194966	5.271323	15.49471	0.7794
At most 3	0.022479	0.500175	3.841466	0.4794

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: E-views Extraction

The result above showcases absent of long run association between the variables under investigation as the critical value appears to be greater than the trace statistics at all level and all of the P-value seems to be insignificant at all level. Thus, suggesting that we proceed to

unrestricted VAR estimation thus, using the AIC criterion, we present the lag length table which helps us to select the best lag length for our estimation,

Table 3 Presentation of VAR Lag Order Selection

VAR Lag Order Selection Criteria
Endogenous variables: LOGCP LOGIR LOGYTP LOGE
Exogenous variables: C
Date: 08/06/17 Time: 14:54
Sample: 1986 2016
Included observations: 22

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-93.87876	NA	0.086019	8.898069	9.096441	8.944800
1	-17.86895	117.4697*	0.000380*	3.442632*	4.434489*	3.676283*
2	-11.25343	7.818340	0.001057	4.295766	6.081109	4.716339

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: E-view Extraction

The result above suggest that lag 1 is most appropriate using the Akaike information Criterion. Hence, our unrestricted VAR is estimated using lag 1 thus;

Table 4 Presentation of Unrestricted VAR Estimate

Vector Autoregression Estimates
Date: 08/06/17 Time: 15:00
Sample (adjusted): 1987 2016
Included observations: 25 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	LOGCP	LOGIR	LOGYTP	LOGE
LOGCP(-1)	0.847666	-0.061715	-0.151849	0.477686
	(0.14335)	(0.06762)	(0.06028)	(0.20694)
	[5.91320]	[-0.91272]	[-2.51905]	[2.30830]
LOGIR(-1)	-0.626566	0.236965	-0.148702	-0.345807
	(0.40286)	(0.19003)	(0.16941)	(0.58158)
	[-1.55527]	[1.24702]	[-0.87778]	[-0.59460]

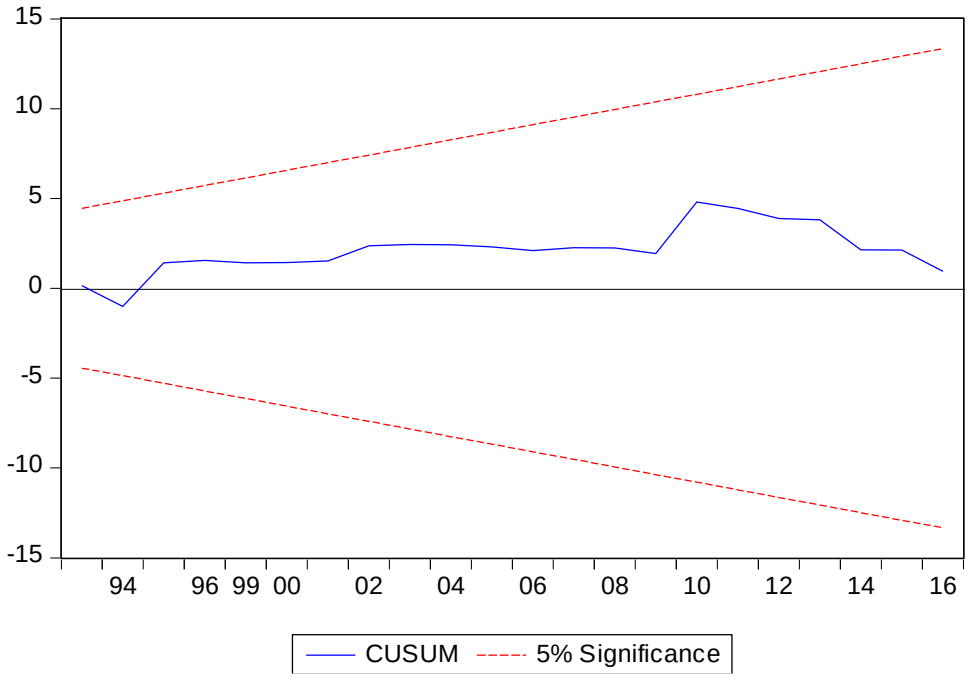
LOGYTP(-1)	0.222981	-0.003553	0.547568	0.688580
	(0.31179)	(0.14707)	(0.13111)	(0.45011)
	[0.71516]	[-0.02416]	[4.17637]	[1.52982]
LOGE(-1)	-0.049493	-0.023012	0.130883	0.600002
	(0.11874)	(0.05601)	(0.04993)	(0.17141)
	[-0.41683]	[-0.41088]	[2.62139]	[3.50046]
C	2.398325	2.863430	1.456756	1.545278
	(1.58354)	(0.74693)	(0.66589)	(2.28600)
	[1.51453]	[3.83358]	[2.18769]	[0.67597]
R-squared	0.802507	0.339178	0.963269	0.947922
Adj. R-squared	0.763008	0.207013	0.955923	0.937507
Sum sq. resids	7.134013	1.587227	1.261473	14.86719
S.E. equation	0.597244	0.281711	0.251145	0.862183
F-statistic	20.31733	2.566332	131.1251	91.01066
Log likelihood	-19.79844	-1.012373	1.858979	-28.97698
Akaike AIC	1.983875	0.480990	0.251282	2.718158
Schwarz SC	2.227650	0.724765	0.495057	2.961933
Mean dependent	5.380884	2.884167	4.236606	14.14157
S.D. dependent	1.226832	0.316353	1.196238	3.448923
Determinant resid covariance (dof adj.)		0.000568		
Determinant resid covariance		0.000233		
Log likelihood		-37.32433		
Akaike information criterion		4.585947		
Schwarz criterion		5.561047		

Source: E-view Extraction

The result above reveals that logCp(private consumption) appear to be significant at lag 1 which suggest that all things been equal, private consumption will increase to the tune of 0.8515 unit. However, log(1+r) (after tax real interest rate) and loge (real exchange rate) report a negative correlation to private consumption at lag 1Such that rise in interest after tax and exchange rate could cushion collapse in private consumption as the case may be. Meanwhile, Temporary and permanent disposable income seem to positively correlate private consumption as its report a positive coefficient of 0.31179 thus suggesting that increase inincome is capable of stimulating consumptionin the nation. The report from this findings shows that the behaviour of interest rate and exchange rate does not seems to stimulate private consumption. This therefore gives a connotation that the aggregate demand by Nigerians and foreigners for domestic goods exceeds aggregate supply in Nigerian goods which has actually fuel the ongoing exchange rate instability over the years. Furthermore, the study forecast that at one year lag, after tax interest rate and real exchange rate will not support private consumption. The economic implication of this is that domestic and industrial savings will be negatively affected and finally investment could be dampen.

Diagram 1 Model Stability Diagnostic Test

Cusum Stability Test



The classical assumption demands that when employing the VAR family estimation, all necessary test of stability and residual diagnostic test must be taken care of in order to establish the reliability of the result. Thus, we subject our time series to stability test to ascertain the adequacy of our model using Cusum stability test. The result shows that at 5% alpha level, the model is stable and could be used for further analysis as the case may be.

Table 5 Residual Diagnostic Test

Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.003207	Prob. F(1,21)	0.9554
Obs*R-squared	0.004123	Prob. Chi-Square(1)	0.9488

Source: Extraction from E-views

LM serial correlation test is employed as a diagnostic test so as to ascertain the efficiency of the model. So far, the test report an absence of serial correlation among the employed variables as the Obs R-square coefficient seems to be greater than 5% alpha level. Hence we reject the null hypothesis and thus conclude that this model is free from the problem of serial correlation suggesting that the outcome of this findings could be used for decision making.

Table 6 Heterosckedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.125731	Prob. F(4,22)	0.3699
Obs*R-squared	4.587378	Prob. Chi-Square(4)	0.3323
Scaled explained SS	10.99682	Prob. Chi-Square(4)	0.0266

Source: Extraction from E-views

The report here also validate that of the serial correlation test and thus suggest absence of Heteroscedasticity. This conclusion was made following the report of the Obs R-square which is greater than the 5% alpha level thereby reporting the presence of homosckedasticity as the case may be.

Table 7 Presentation of Granger Causality Test Output

VAR Granger Causality/Block Exogeneity Wald Tests
Date: 08/06/17 Time: 22:12
Sample: 1986 2016
Included observations: 25

Dependent variable: LOGCP

Excluded	Chi-sq	df	Prob.
LOGIR	2.418880	1	0.1199
LOGYTP	0.511447	1	0.4745
LOGE	0.173750	1	0.6768
All	3.981385	3	0.2635

Dependent variable: LOGIR

Excluded	Chi-sq	df	Prob.
LOGCP	0.833057	1	0.3614
LOGYTP	0.000583	1	0.9807
LOGE	0.168826	1	0.6812
All	4.560451	3	0.2070

Dependent variable: LOGYTP

Excluded	Chi-sq	df	Prob.

LOGCP	6.345633	1	0.0118
LOGIR	0.770491	1	0.3801
LOGE	6.871703	1	0.0088
All	8.986505	3	0.0295

Dependent variable: LOGE

Excluded	Chi-sq	df	Prob.
LOGCP	5.328264	1	0.0210
LOGIR	0.353552	1	0.5521
LOGYTP	2.340350	1	0.1261
All	6.706471	3	0.0819

Sources: Extraction from E-view

The report above reveals that log1+r (after tax interest rate) does not seems to granger cause private consumption as its P-value is higher than the preferred 5% alpha level. Further, there exist no causalrelationsp between logYtp and logCp as there P-value are also higher than the preferred alpha level respectively. Meanwhile at the third cadre, loge (real exchange rate) seems to stimulate private consumption as its P-value appears to be significant (0.0088) at 5% alpha level. This therefore suggest that real exchange rate could affect private consumption. The positive effect of this can only be felt if the aggregate demand for local goods outsmart that of the foreign goods such that exchange rate appreciation in favour of naira and thereby normalise exchange rateinstability which will finally promote private consumption accordingly.

Export Demand Equation For Nigerian Non-Oil Goods.

$\text{dlog}X_d = ß_o - ß_1 \text{dlog}\, X_P + ß_2 \text{dlog}\, [X_{P(-1)}] + ß_3 \text{dlog}\, M_V$----------(11)

Table 8 Presentation of Co-Integration Test

Date: 08/07/17 Time: 08:39
Sample (adjusted): 4 31
Included observations: 28 after adjustments
Trend assumption: Linear deterministic trend
Series: DLOG(XD) DLOG(XP) DLOG(MV) LOG(XPI)
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.572082	55.11371	47.85613	0.0090
At most 1 *	0.486716	31.34663	29.79707	0.0329
At most 2	0.304663	12.67268	15.49471	0.1274

At most 3	0.085371	2.498636	3.841466	0.1139

Trace test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Sources: E-view Extraction

The result presented in table 8 above reveals the existence of at list two co-integrating equation thereby suggesting the existence of long run association among the employed variables. Having fulfil this condition, we proceed to vector error correction model so as to ascertain the speed at which distortion is adjustment accordingly.

Table 9 Presentation of Vector Error Correction Model Output

Vector Error Correction Estimates
Date: 08/07/17 Time: 08:45
Sample (adjusted): 5 31
Included observations: 27 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Error Correction:	D(DLOG(XD))	D(DLOG(XP))	D(DLOG(MV))	D(LOG(XPI))
CointEq1	-1.175160	-0.767536	0.875048	0.598501
	(1.52191)	(1.13435)	(1.38312)	(1.24007)
	[-0.77216]	[-0.67663]	[0.63266]	[0.48263]
D(DLOG(XD(-1)))	0.727713	1.519447	-1.903524	-0.337553
	(2.96663)	(2.21118)	(2.69609)	(2.41726)
	[0.24530]	[0.68717]	[-0.70603]	[-0.13964]
D(DLOG(XD(-2)))	-0.339168	0.001608	-0.252956	0.024784
	(0.41506)	(0.30936)	(0.37721)	(0.33819)
	[-0.81716]	[0.00520]	[-0.67060]	[0.07328]
D(DLOG(XP(-1)))	-0.857532	-2.374099	2.775364	0.227279
	(4.77718)	(3.56067)	(4.34153)	(3.89252)
	[-0.17951]	[-0.66676]	[0.63926]	[0.05839]
D(DLOG(XP(-2)))	0.050433	0.497129	0.171262	0.587399
	(0.30263)	(0.22557)	(0.27504)	(0.24659)
	[0.16665]	[2.20390]	[0.62269]	[2.38208]
D(DLOG(MV(-1)))	-1.374237	-1.365611	0.978532	0.325907
	(2.98504)	(2.22489)	(2.71282)	(2.43225)
	[-0.46038]	[-0.61379]	[0.36071]	[0.13399]
D(DLOG(MV(-2)))	-0.066375	0.060101	-0.219911	0.009433
	(0.44976)	(0.33523)	(0.40875)	(0.36648)

	[-0.14758]	[0.17928]	[-0.53801]	[0.02574]
D(LOG(XPI(-1)))	0.284335	0.956555	-2.068634	0.237278
	(4.84495)	(3.61118)	(4.40312)	(3.94773)
	[0.05869]	[0.26489]	[-0.46981]	[0.06010]
D(LOG(XPI(-2)))	-0.872169	-2.695208	2.536563	-0.259399
	(4.73282)	(3.52761)	(4.30122)	(3.85638)
	[-0.18428]	[-0.76403]	[0.58973]	[-0.06727]
ECM(-1)	-0.065849	-0.013643	-0.028686	0.006356
	(0.09268)	(0.06908)	(0.08423)	(0.07552)
	[-0.71051]	[-0.19750]	[-0.34058]	[0.08417]
R-squared	0.493041	0.733000	0.595761	0.403042
Adj. R-squared	0.224650	0.591647	0.381752	0.087006
Sum sq. resids	3.774490	2.096900	3.117459	2.505973
S.E. equation	0.471199	0.351208	0.428229	0.383940
F-statistic	1.837029	5.185605	2.783810	1.275303
Log likelihood	-11.74912	-3.813756	-9.167287	-6.219684
Akaike AIC	1.611046	1.023241	1.419799	1.201458
Schwarz SC	2.090986	1.503181	1.899739	1.681398
Mean dependent	-0.037707	-0.006619	-0.010549	-0.010810
S.D. dependent	0.535126	0.549600	0.544621	0.401818

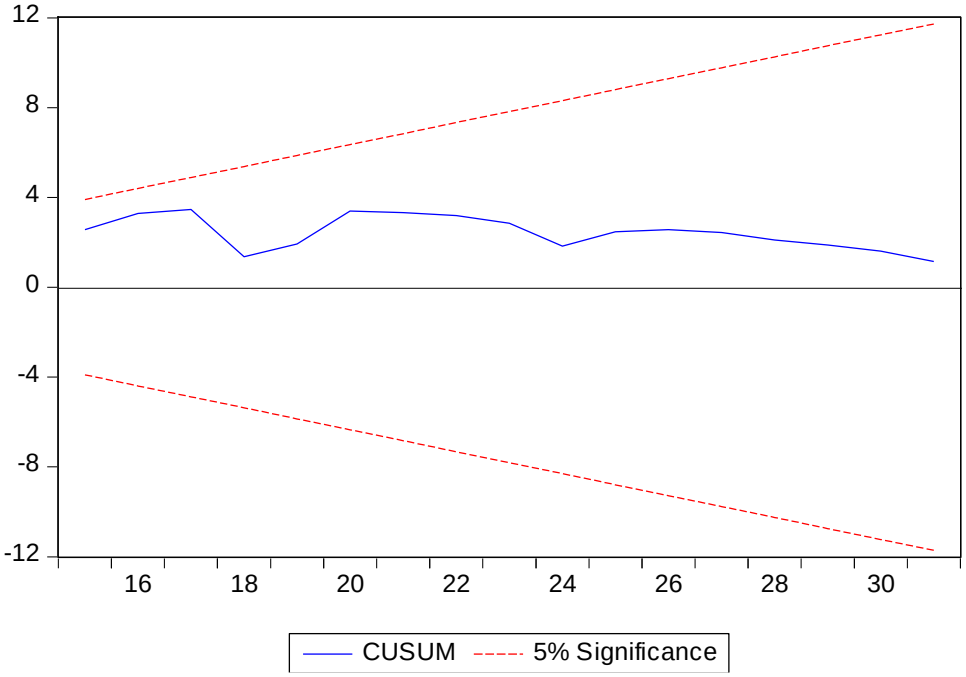
Source: Extraction from E-view output

The result presented in table 9 above shows the output of the restricted VECM estimate. The report suggest that X_P seems to be negative and insignificant in stimulating export demand. Xp report a negative coefficient of -0.857532, -0.339168 and insignificant association to export demand at lag 1 and 2. This therefore suggest that the percentage of non-oil export to total import in Nigeria is on the increase and thus dampens balance of trade. The report further suggest that export demand is insignificant prior to the exchange rate saga and high cost of exportation. Hence, Nigerians gave more credibility to foreign commodity and less credence to local production which has led to unfavourable balance of payment and thus render the exchange rate volatile. Further, dlog(Mv) report a negative coefficientof (-0.1.37423 and -0.066375) to import at both lag. This negative behaviour between the ratios of non-oil export toaggregate import gives a unidirectional impression such that the quantum of import to export in Nigeria is imbalance, thereby leading to trade deficit. The economic implication of this is unfavourable balance of payment and exchange rate trauma in favour of foreign currency.

The ecm coefficient is negative as expected with an insignificant P-value of 0.4870 which suggest that the error is corrected in the long run to the tune of 0.06584 unit accordingly. The global statistics reveals that the export demand variables jointly account for about 22%variation in the explained variable while the Durbin Watson statistics with a coefficient of 2.12136 suggest an absence of auto correlation thus confirming the efficacy of the model.

Diagram 2Model Stability Diagnostic Test

Cusum Stability Test



The stability test is in line with the classical linear regression model assumption. The report suggest that at 5% alpha level, our model is adequate considering the fact that the employed variables are in-between thecusum significant line.

Heterosckedasticity Test

Table 10 Residual Diagnostic Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.166667	Prob. F(15,11)	0.9991
Obs*R-squared	5.000004	Prob. Chi-Square(15)	0.9921
Scaled explained SS	4.813616	Prob. Chi-Square(15)	0.9936
Sources: E-views Extract			

The report of the heterosckedasticity test shows that the Obs R-square has a coefficient of 0.9921 which suggest absence of heterosckedasticity and thus suggest the presence of homosckedasticity. The practical implication of this is that the model is fit for forecast and decision making.

Table 11 Presentation of Granger Causality Test

Pairwise Granger Causality Tests
Date: 08/07/17 Time: 11:58
Sample: 1 31
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
XP does not Granger Cause XD	29	0.10800	0.8981
XD does not Granger Cause XP		2.04014	0.1520
MV does not Granger Cause XD	29	0.74610	0.4849
XD does not Granger Cause MV		2.44729	0.1078
XPI does not Granger Cause XD	29	0.11454	0.8923
XD does not Granger Cause XPI		2.51380	0.1020

Source: Extract from E-view output

The result present above suggest the absence of unidirectional and bidirectional relationship between export demand and the explanatory variables as there P-value appear to be greater than 5% level of alpha respectively.

Overall Model

This paper present a model to analyse the interaction between fiscal policy, real interest rate and the real exchange rate.

$R_{EXCH} = ß_O + ß_1\ GDP + ß_2\ A_{GXP} + ß_3\ R_{INTR} + \square_7$ ----------(13)

Table 12 Presentation of Co-integration Test

Date: 08/07/17 Time: 12:39
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: EXCR GDP AGXP RINTR
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.746904	74.99839	47.85613	0.0000
At most 1 *	0.580393	35.15284	29.79707	0.0110
At most 2	0.289488	9.968172	15.49471	0.2832
At most 3	0.001958	0.056839	3.841466	0.8115

Trace test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: E-view Extraction

The result above show the existence of two co-integrating equation which suggest the existence of long run relationship among the employed variables. Hence, we conclude that there exist a long run association between the time series under investigation. This conclusion lead us to vector error correction estimate thus;

Table 13 Presentation of Error Correction Model Output

Vector Autoregression Estimates
Date: 08/07/17 Time: 12:40
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	EXCR	GDP	AGXP	RINTR
EXCR(-1)	0.995581	115.7370	30.66260	-0.016362
	(0.22675)	(61.6247)	(15.3425)	(0.05453)
	[4.39060]	[1.87810]	[1.99854]	[-0.30006]
EXCR(-2)	-0.030663	-125.5712	-40.30508	0.006013
	(0.24663)	(67.0267)	(16.6874)	(0.05931)
	[-0.12433]	[-1.87345]	[-2.41529]	[0.10139]
GDP(-1)	-0.000208	1.100649	-0.095039	-0.000105
	(0.00094)	(0.25501)	(0.06349)	(0.00023)
	[-0.22203]	[4.31613]	[-1.49695]	[-0.46635]
GDP(-2)	7.23E-06	-0.850535	-0.237344	0.000104
	(0.00137)	(0.37145)	(0.09248)	(0.00033)
	[0.00529]	[-2.28980]	[-2.56650]	[0.31754]
AGXP(-1)	0.000985	-1.129058	2.127660	0.001061
	(0.00402)	(1.09146)	(0.27174)	(0.00097)
	[0.24534]	[-1.03445]	[7.82985]	[1.09866]
AGXP(-2)	-0.000722	5.182179	0.342274	-0.001778
	(0.00660)	(1.79339)	(0.44649)	(0.00159)
	[-0.10938]	[2.88961]	[0.76658]	[-1.12045]
RINTR(-1)	-0.564100	140.1665	10.44441	-0.002361
	(0.89249)	(242.551)	(60.3872)	(0.21462)
	[-0.63206]	[0.57788]	[0.17296]	[-0.01100]

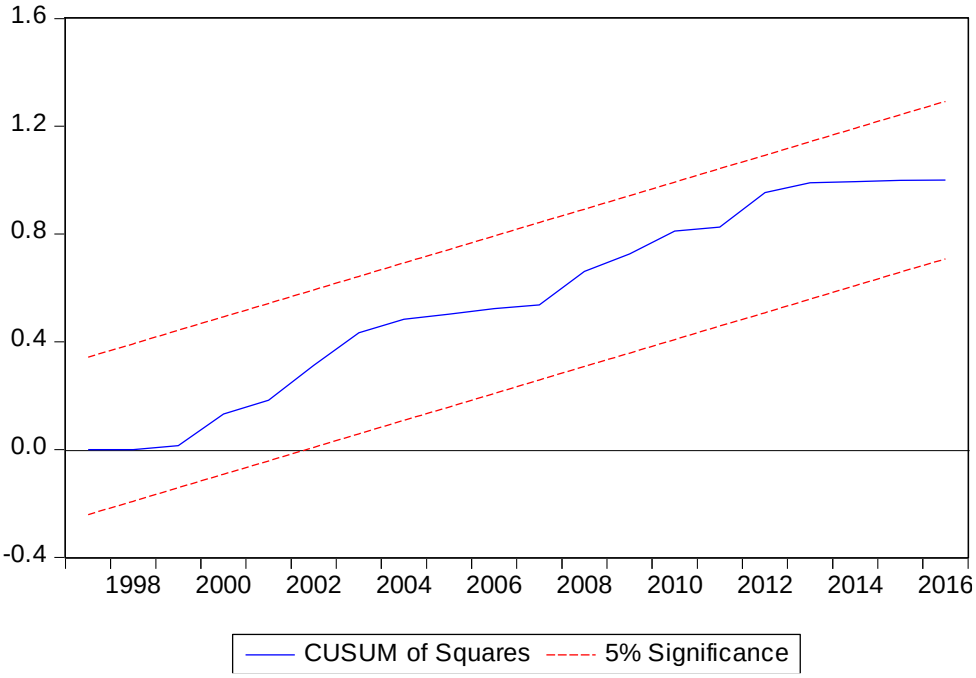
RINTR(-2)	-0.340523	42.17430	50.80008	0.065294
	(0.76346)	(207.486)	(51.6572)	(0.18359)
	[-0.44603]	[0.20326]	[0.98341]	[0.35565]
C	27.49664	-4640.032	-1428.894	21.14943
	(23.2589)	(6321.08)	(1573.74)	(5.59320)
	[1.18220]	[-0.73406]	[-0.90796]	[3.78128]
R-squared	0.947165	0.986826	0.976020	0.710090
Adj. R-squared	0.926030	0.981556	0.966428	0.594126
Sum sq. resids	5387.065	3.98E+08	24662683	311.5254
S.E. equation	16.41198	4460.288	1110.466	3.946678
F-statistic	44.81678	187.2678	101.7524	6.123357
Log likelihood	-116.9039	-279.4476	-239.1251	-75.57490
Akaike AIC	8.683027	19.89294	17.11207	5.832752
Schwarz SC	9.107360	20.31727	17.53641	6.257085
Mean dependent	89.48674	24995.83	5331.442	18.29816
S.D. dependent	60.34408	32842.79	6060.579	6.194923
Determinant resid covariance (dof adj.)		4.99E+16		
Determinant resid covariance		1.13E+16		
Log likelihood		-700.5512		
Akaike information criterion		50.79664		
Schwarz criterion		52.49397		

Source: E-view Extraction

The result above shows that at lag 1, gross domestic product report a negative coefficient of -0.000208 to real exchange rate. This negative coefficient implies that continuous increase in exchange rate instability is capable ofdampening the economic growth process in Nigeria to the tune of 0.000208 all thing been equal.At lag 2 however, an adjustment took palace where the coefficient of gross domestic product to exchange rate became positive 0.00000723 though insignificant. This therefore suggest that if adequate policy is put in place by the government, better growth could be recorded via stable balance of exchange all thing been equal.

Aggregate government expenditure seems to report a positive coefficient of (0.0000985) at Lag 1 thereby suggesting that rise in government spending is capable of normalizing exchange rate instability in Nigeria to the tune of 0.000983 while at Lag 2, negative reaction could be foreseen. Finally, real interest rate at both lag exhibit a negative coefficient of (-0.564100 and -0.340523). The lagged linear value of the Interest Rate (INT) does not statistically influence the linear value of the Exchange Rate (ECXR) based on the probability level of 0.5345 which is greater than the 0.05 (5%) significance level. showing that the de-trended value of the interest rate won't statistically influence the exchange rate level in the Nigerian context.

Diagram 3Model Stability Test



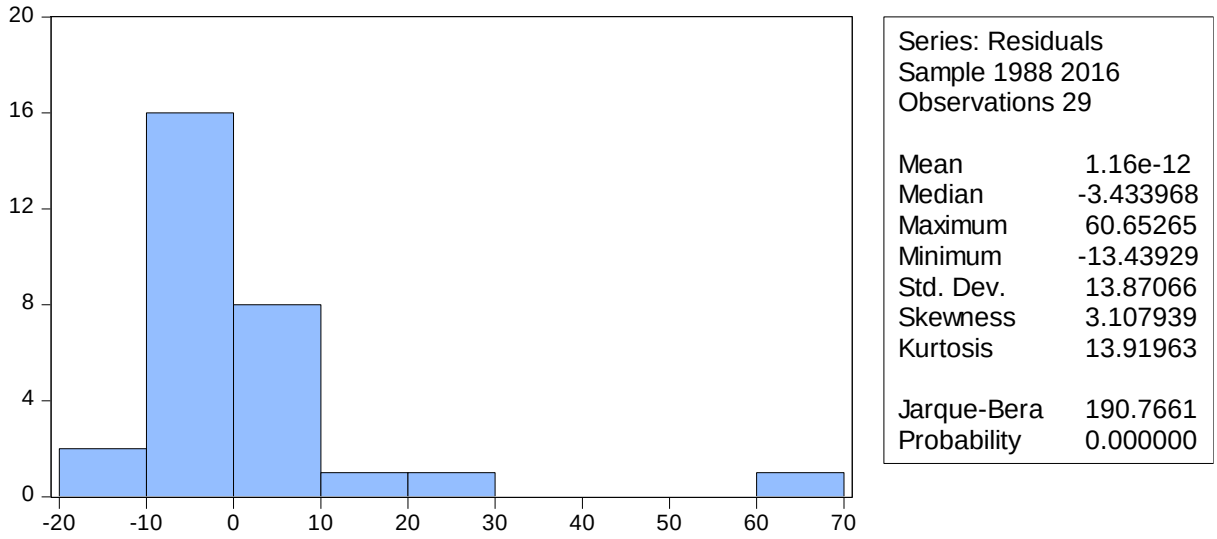
The diagram above established the adequacy of our model at 5% alpha level as the time series movement is in-between the cusum square line thereby approving the stability of the research model accordingly.

Table 14 Diagnostic Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.106528	Prob. F(2,18)	0.8995
Obs*R-squared	0.339243	Prob. Chi-Square(2)	0.8440

The LM serial correlation test tends to ascertain the adequacy of the model considering the Obs-Square. The decision rule here states that if theObs R-square is greater than 5% alpha level, we reject the null hypothesis and if otherwise, we do not. The report above show that the obs R-square exhibit a coefficient of 0.8440 which is greater than the 5% alpha level thereby suggesting that we ignore the null hypothesis and thereby concludes that the model is free from serial correlation.

Diagram 4 Jarque-Bera Normality Test



The result of the normality test suggest that the residual are normally distributed as the P-value appear to be significant at 5% alpha level. The report shows a positive skewness coefficient of 3.10793 and a corresponding leptokurtic kurtosis coefficient of 13.91963. This element jointly suggest that the residual are normally distributed and that the conclusion from this finding could be used for decision making.

Table 15 Presentation of Granger Causality Test

Pairwise Granger Causality Tests
Date: 08/07/17 Time: 13:05
Sample: 1986 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause EXCR	29	0.07893	0.9243
EXCR does not Granger Cause GDP		2.99479	0.0690
RINTR does not Granger Cause EXCR	29	0.10790	0.8981
EXCR does not Granger Cause RINTR		2.60484	0.0947
AGXP does not Granger Cause EXCR	29	0.06210	0.9399
EXCR does not Granger Cause AGXP		1.84971	0.1790

Source: E-views Extraction

The causal association between interest Rate(RINT). Gross domestic product (GDP) and Exchange Rate (ECXR) shows the inexistence of a causal relationship between both variables as their probability levels appeared to be above the 0.05 (5%) significance level showing an absence of both uni and bi directional promotion amongst variables, this goes a long way to show that in relations to each other, there is an intrinsic and homogenous characteristics exhibited by the two variables, as the nation's interest rate is not significantly causing significant changes in the exchange rate. a scenario in which despite the increase in the official interest rate, the crowding out effect and demand for loans still increases, and the presence of the parallel market activities and leakages has constantly opposed the movement of the Exchange rate.

5.0 Concluding Remark and Recommendation

This study seek to analyse the interplay between economic growth, fiscal policy, exchange rate and interest rate in Nigeria using a dis aggregate estimation to capture the various direction of causality and consociation. The paper employ time series data where three model were estimated. The report from the first model shows that the behaviour of interest rate and exchange rate does not seems to stimulate private consumption. This therefore gives a connotation that the aggregate demand by Nigerians and foreigners for domestic goods exceeds aggregate supply in Nigerian goods which has actually fuel the ongoing exchange rate saga over the years. Further, the study forecast that at one year lag, after tax interest rate and real exchange rate will not support private consumption. The economic implication of this is that domestic and industrial savings will be negatively affected and finally investment could be dampen.

The second model developed an export demand equation with the intension of examining the interplay between import, export and non-oil export. From the first estimation, the report establishes that the negative behaviour between the ratios of non-oil export to aggregate import gives a unidirectional impression such that the quantum of import to export in Nigeria is imbalance thereby leading to trade deficit. The economic implication of this is unfavourable balance of payment and exchange rate trauma in favour of foreign currency.

The last model tend to examine the extent to which economic growth, fiscal policy proxy with aggregate government expenditure and interest rate react to real exchange rate in Nigeria.The report shows that The lagged linear value of the real Interest Rate (RINT) does not statistically influence the linear value of the real Exchange Rate (ECXR) based on the probability level of 0.0.5345 which is greater than the 0.05 (5%) significance level. showing that the de-trended value of the interest rate won't statistically influence the exchange rate level in the Nigerian context.

6.0 Policy Implication

Although correct between deficits and inflation and deficit and real interest rates were found to be weak at best, the paper offer strong evidence that money financing leads higher inflation and debt financing to higher real interest rates. As deficit financing grows, the terms become increasingly unfavourable to the extraction of these unconventional taxes from the private sector.

Increasing public investment was found to reduce private investment in Nigeria confirming previous studies that show that the net effect of public investment on private investment depend on its composition.

Strong evidence was also found in favour of the hypotheses that fiscal deficit spill over into external account deficits, leading in turn to depreciation of the exchange rate. We can drive several policy implications from the above thus;

- The evidence of a strong relation between fiscal and external deficits complement the policy implication derived from the finding that private savings does not affect changes in public savings. Fiscal adjustment is effective in boosting national savings and therefore, in increasing the trade surplus as well. It must be noted that exchange rate should be driven by fundamentals and not the other way round, which should serve as a reminder to Nigerian. Policy makers that nominal devaluation alone cannot restore macroeconomic balance.Policy maker should pay attention to the compensation of government spendingwhen deciding on an accommodating exchange rate policy.
- Real interest rate and private sector credit do significantly affect private investment, so whetherthereis financial repression or not, increasing public deficit reduces private investment. The compensation of public spending matters as well, since increasing public investment depresses private investment in some cases, especially when large public enterprises compete with private firms and have preferential access to domestic financial resources. The policy implication is that the prospects for higher private investment and growth are improved by reforming public firms, concentrating public investment on public and social infrastructure and deregulating domestic financial markets by removing credit ceiling interest control, compulsory credit allocation and preferential access of the government to credit.
- For fiscal deficits financed by money creation, the relation between deficits and inflation is indisputable. Considering the unfavourable trade-off between additional inflation and revenue, however, a fiscal motivation hardly explains chronic high inflation like we are currently experiencing. The inflation tax or seigniorage is at best, only a temporary means of generating revenue. And because the inflation tax is a tax after all, there is no reason to expect adjustment through inflation to be any less contractionary than conventional fiscal adjustment.

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Appendix

Dependent Variable: LOGCP
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 08/06/17 Time: 19:55
Sample (adjusted): 1987 2016
Included observations: 27 after adjustments
LOGCP = C(1)*LOGCP(-1) + C(2)*LOGIR(-1) + C(3)*LOGYTP(-1) + C(4)
*LOGE(-1) + C(5)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.851545	0.135557	6.281825	0.0000
C(2)	-0.644821	0.389366	-1.656081	0.1119
C(3)	0.182771	0.298893	0.611492	0.5471
C(4)	-0.044804	0.115111	-0.389223	0.7009
C(5)	2.546065	1.493714	1.704520	0.1024

R-squared	0.811900	Mean dependent var	5.336769
Adjusted R-squared	0.777701	S.D. dependent var	1.229390
S.E. of regression	0.579640	Akaike info criterion	1.912758
Sum squared resid	7.391627	Schwarz criterion	2.152728
Log likelihood	-20.82224	Hannan-Quinn criter.	1.984114
F-statistic	23.73984	Durbin-Watson stat	2.028470
Prob(F-statistic)	0.000000		

Dependent Variable: D(DLOG(XD))
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 08/07/17 Time: 11:25
Sample (adjusted): 5 31
Included observations: 27 after adjustments
D(DLOG(XD)) = C(1)*(DLOG(XD(-1)) - 0.723117293315*DLOG(XP(-1)) - 1.01789938922*DLOG(MV(-1)) + 0.0514557183265*LOG(XPI(-1)) + 0.208098263957) + C(2)*D(DLOG(XD(-1))) + C(3)*D(DLOG(XP(-1))) + C(4)*D(DLOG(MV(-1))) + C(5)*D(LOG(XPI(-1))) + C(6)*D(DLOG(XD(-2))) + C(7)*D(DLOG(XP(-2))) + C(8)*D(DLOG(MV(-2))) + C(9)*D(LOG(XPI(-2))) + C(10)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.175160	1.521906	-0.772163	0.4506
C(2)	0.727713	2.966633	0.245299	0.8092
C(3)	-0.857532	4.777184	-0.179506	0.8597
C(4)	-1.374237	2.985036	-0.460375	0.6511
C(5)	0.284335	4.844946	0.058687	0.9539
C(6)	-0.339168	0.415057	-0.817161	0.4251
C(7)	0.050433	0.302634	0.166649	0.8696
C(8)	-0.066375	0.449765	-0.147577	0.8844
C(9)	-0.872169	4.732823	-0.184281	0.8560
C(10)	-0.065849	0.092679	-0.710508	0.4870

R-squared	0.493041	Mean dependent var	-0.037707
Adjusted R-squared	0.224650	S.D. dependent var	0.535126
S.E. of regression	0.471199	Akaike info criterion	1.611046
Sum squared resid	3.774490	Schwarz criterion	2.090986
Log likelihood	-11.74912	Hannan-Quinn criter.	1.753757
F-statistic	1.837029	Durbin-Watson stat	2.121363
Prob(F-statistic)	0.133974		

Dependent Variable: EXCR
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 08/07/17 Time: 13:45
Sample (adjusted): 1988 2016
Included observations: 29 after adjustments
EXCR = C(1)*EXCR(-1) + C(2)*GDP(-1) + C(3)*AGXP(-1) + C(4)*RINTR(-1) + C(5)*EXCR(-2) + C(6)*GDP(-2) + C(7)*AGXP(-2) + C(8)*RINTR(-2) + C(9)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.995581	0.226753	4.390598	0.0003
C(2)	-0.000208	0.000938	-0.222030	0.8265
C(3)	0.000985	0.004016	0.245339	0.8087
C(4)	-0.564100	0.892486	-0.632055	0.5345
C(5)	-0.030663	0.246630	-0.124327	0.9023
C(6)	7.23E-06	0.001367	0.005286	0.9958
C(7)	-0.000722	0.006599	-0.109384	0.9140
C(8)	-0.340523	0.763461	-0.446026	0.6604
C(9)	27.49664	23.25894	1.182197	0.2510

R-squared	0.947165	Mean dependent var	89.48674
Adjusted R-squared	0.926030	S.D. dependent var	60.34408
S.E. of regression	16.41198	Akaike info criterion	8.683027
Sum squared resid	5387.065	Schwarz criterion	9.107360
Log likelihood	-116.9039	Hannan-Quinn criter.	8.815923
F-statistic	44.81678	Durbin-Watson stat	2.001730
Prob(F-statistic)	0.000000		