

PUBLIC SECTOR DEFICIT, EXCHANGE RATE AND EXTERNAL ACCOUNTS: EVIDENCE FROM NIGERIA

LIKITA OGBA Phd

Department of Economics, University of Jos, Nigeria

Abstract

This paper used a macroeconomic model to determine the effect of public sector deficit on external Accounts in Nigeria. The objective was to measure the impact of deficit on exchange rate and external accounts. The method of analysis follows the Keynesian approach of income analysis. Evidence shows that deficit emanating from increase in government expenditure affects the external accounts whether it is financed by monetization or borrowing. The estimated equations have a coefficient of determination of 0.6 and above showing a good fit; it also shows that in all the equations 60% of the model is explained by the estimated variables. Real exchange rates presented significantly negative elasticity with respect to the share of government spending in gross domestic product confirming the theoretical prediction. In addition, the proportion of government spending devoted to non- tradable activities in the model affect negatively real exchange rates. Therefore, the option for the government is to adopt demand management Policies such as taxation and expenditure reduction to maintain external balance and minimize the deficit.

Key words: Public Sector deficit, Exchange Rate, External Account, Economic Development, Trade Balance

Introduction

In the 1960's agriculture was the main stay of the Nigerian economy and the private sector was dominant. However by 1971 a year after the end of the civil war, oil replaced agriculture as the dominant sector of the economy. To strengthen and establish government control in the oil industry the Nigerian national Oil Corporation was established. This strengthens the revenue base of the government from oil exports.

This gave government the impetus to set in motion a wide range of public sector investment policy in all sectors of the

economy. By 1986 the number of public enterprises had grown to over five hundred.

The perception in developing countries is that the state is a major promoter of economic activities in order to stimulate economic development, reduce poverty and increase infrastructural facilities. A strong public sector was thus considered an indispensable vehicle for propelling economic growth. The government committed a large amount of resources in the provision of infrastructure and the collages of the oil price led to expenditure overrun, by 1983 the

government declared austerity measure due to the high import dependence, the decline in foreign exchange earnings, and the depletion of the external reserves (Ogba, 2013)

The Nigerian external accounts and real exchange rates are determined to a large extent by foreign exchange allocation system. The government has adopted various methods such as the second tier foreign exchange market, (SFEM), Interbank foreign exchange market, (IFEM) etc. In deciding how to allocate foreign exchange, government makes projections of the availability of finance resources, subject to the macroeconomic goal and the foreign debt position. Projections of the total export under different assumptions with respect to the domestic value of foreign prices and supply variable like the export of crude oil. This provides an idea around how much imports the nation can afford and therefore the basis for the foreign exchange allocation (Ogba, 2013)

The federal government however does not only manage the quantitative mechanism of centrally allocating foreign exchange but it also controls the exchange rate through its intervention mechanism and sets import tariffs. In Nigeria, the exchange rate policy play an important role when the foreign exchange projection is made for total exports, sensitive to the real exchange rate which in turn can be affected by the nominal exchange rate policy. The setting of trade taxes in Nigeria seems to respond in the past more to the objective of raising fiscal revenues than to the purpose of protecting domestic production or limiting imports in general terms. In spite of this, custom duties have significantly increased in the last decade, cooperating to the goal of import reduction so as to adjust to the

decreasing availability of foreign exchange and the desire of the government to reduce foreign debt and stabilize the external account.

Literature Review

In the process of estimating the relationship between external variables like the trade balance and the real exchange rate, on one side and fiscal policies, we have proceeded following the two-step procedure proposed by Obadan (1994) Esterly, (1989) amended. The first amendment is less emphasis is placed on the accumulation of net foreign assets (or debts) as a means to bring long-term driving force, due to the lack of access of domestic private agents to foreign financial market unlike developed economics where such agents had access. The second amendment is in the determination of the trade balance in each period is in itself a two-step procedure. This is because at the beginning of the year, the federal government projects the trade balance on the basis of the difference between income and absorption.

Simultaneously, it projects total exports based on the value of the appropriate relative prices. The terms of trade and the real export exchange rate. Based on the given projected trade balance and export level, the government allocate some projected foreign exchange to import of goods and services. As a developing economy naturally, projected ex ante and actual ex post foreign exchange resources will differ because of unexpected changes in the exogenous variable that drive the trade balance and export behaviour that may be outside the controls of the government.

However, the government can affect the actual trade balance through its exchange rate policy, if the real exchange rate is affected by the nominal exchange rate

policy. The extent of these effects may be tested in this empirical work. Mundell, (1968), McKinnon, (1971), IMF, (1997) posited that exchange rate policy is a primary facet of external Sector performance. Even though there is no general consensus on the right policy framework, Van't dack (2001) observed that a right strategy under a particular economic and financial environment in which it is deployed, stands to enjoy acceptability and in turn will grant the Central Bank the credibility which would further amplify its effectiveness.

There are several regimes of exchange rate management, this ranges from the extreme regimes, such as the fixed exchange rates (currency board and unions) to a completely free floating, to intermediate regimes (adjustable or crawling peg and target zones/crawling brands). There are a number of theoretical arguments and experiences about the relative stability of the exchange rate under these regimes. However, the choice of regimes has some implications for the external sector policy of a country in an attempt to finance its public sector deficit.

Some literature focus on the question whether a country would be better off or otherwise, under a fixed or flexible exchange rate arrangement. Gust and Vigfussion (2010) in examining the entry dynamics and the decline of exchange rate stated that export prices and exchange rate are important variables in small economies because their exports are not end – use capital goods but primary and intermediate products which are limited in terms of pass through. One of the limitations that confront developing countries therefore is to diversify the export base and produce intermediate or finished goods that provide them with avenues to earn adequate foreign exchange to finance deficits. Most of the

empirical studies suggest that small open economies are better served under fixed exchange rate regime as a country source of funds externally to finance its public sector deficit. Similarly, it has been argued that the less diversified a country's export and production structure and more geographically concentrated its trade, the stronger the case for the country to adopt a fixed exchange rate regime (flood 1989). Consequently, policy makers adopt a fixed exchange rate regime in the hope of gaining credibility in an attempt to reduce inflation. The use of fixed exchange rate as a commitment technique to minimize inflation which is relatively common in Africa and latin American countries (Frieden 2000). Nevertheless, while fixing the exchange rate may provide price stability, it however, undermines policy flexibility, which have serious implications for domestic and external balance.

One major consideration as to the choice of an exchange rate regime focuses on the effects of the various random shocks on the domestic economy. Therefore, the optimal regime is that which ensures macroeconomic and external sector stability. Overall, there is a general consensus in the literature that a greater degree of fixity is preferred if the source of macroeconomic instability is predominantly endogenous and government's attempt to moderate the economy through deficit spending is to yield the desired result. Conversely, a flexible regime is preferred if disturbances are predominantly exogenous in nature (Nnanna 2007).

Theoretical Framework

The theoretical relationship between public sector deficit, exchange rate and external accounts that informs the estimated model is the fiscal approach to the balance of payment that was developed and used in a

number of papers (Milne, 1977, Bartoli, 1989, Egwaikhide 1995). According to this approach current account is the difference between the monetary value of domestic output and aggregate absorption. Government expenditure constitute an important element of aggregate absorption in the economy. An increase in expenditure that exceeds revenue often triggers a series of changes in the economy thereby affecting the national income and economic performance. Using the national income identity provide the linkages which states that

$$X - M = (I - S) + (G - T)$$

Where M represents imports of goods and services, X represents exports of goods and services from Nigeria to other trading partners, S stands for savings, T stands for government expenditure, T stands for taxes by the government.

Based on the model it can be understood that the transmission channel of an increase in expenditure for locally produced goods and services engendered by bank credit that are often inadequate tend to increase the demand for imports to augment the shortage in the domestic economy, this directly affects the exchange rates. An increase in the amount of imports that is more than exports as is usually the case for Nigeria leads to balance of payment deficits.

Methodology

The model used in the research is a simple Keynesian external account macroeconomic model. It is a simultaneous equation model designed to show the relationship between export and import and further introduces public sector deficit as providing the link through its reaction with exchange rate. The structural model is made up of four behavioral equations explaining respectively

the export level, the import function, the terms of trade and exchange rate. Two stage least square method was used to estimate the equation variables, this is to avoid the problem of simultaneous equation bias that could reduce the reliability of the estimated model

The method of estimation follows that of Egwaikhide (1995), Calisir and Sekmen (2011) where all the behavioural equations have been specified in their logarithmic forms to mitigate the divergences in the variables used in the model and bring about uniformity where the import and export variables measure the elasticity of the functions estimated. The data for the study was obtained from the central bank of Nigeria annual reports and statistical bulletins, the world bank statistical yearbook and United Nations Comtrade data base

Model Specification

The amendments to the Rodriguez (1989) model result into a two stage regression model where fiscal policies are still reflected in the trade balance and the real exchange rate equations. The relative prices of (or relevant exchange rates for) exports and imports are specified thus.

Equation 1

$$Ex = (P_x/P_N) = ex (TT^*, tm, T_s/Y, G/Y, G_N/G) \\ Ex_1, ex_3, \geq 0; ex_4, ex_5, \leq 0; ex_2 = 0$$

Equation 2

$$Em (P_m/P_N) = em (TT^*, tm, T_s/y, G/Y, G_N/G) \\ em_2, em_3, \geq 0; em_1, em_4, em_5, \leq 0$$

Equation 3

$$T_s/y = ts (ird, OD_G/Y, NFA/Y, B_1/Y, \text{tax}) \\ — ts_5 \geq 0; t_s, ts_2, ts_3, ts_4 \leq 0$$

The export function equation

Equation 4

$$X/Y = x(TT, Y/YP);$$

$$x/Y = x^1(ex, Y/yp)$$

$$x_1; x_2 \geq 0; x_2 \leq 0$$

The uncovered interest rate differential is define as

Equation 5

$$Ird = [1 - (i^* + \hat{E}^* + i^* \hat{E}^*)] / [1 + (i^* + \hat{E}^* + i^* \hat{E}^*)]$$

P_x = price export, P_m = price of imports, P_N = Price of non - tradeable goods, TT^* = foreign terms of trade, TT = domestic terms of trade, t_m = average tariff rate, T_s = government surplus, G = government spending, G_N = government spending an non- tradeable goods, i = average domestic interest rate, i^* = foreign interest rate, E^* = expected rate of nominal devaluation, OD = public sector deficit. B_1 = lagged – end of period domestic capital stock, Y = GDP, YP = Potential GDP., CA – capital accounts , X = total exports, π tax = inflation tax.

The signs under equation 1-3 represent the signs of the corresponding partial derivatives and are consistent with the previous work of Easterly (1989) and in Rodriguez (1989). Similarly the effect of the relative prices of export, either terms of trade (TT) or ex on exports is positive for the Nigerian economy while the effect of the cyclical indicator of economic activity (Y/YP) is expected to be negative. The result of equation one and two are shown below.

Discussion of Empirical Results.

Empirically, equations one to four were estimate in log linear form annual data. The processes of the regressions were two stage least squares (2SLS), with a maximum likelihood procedure to correct for first order auto correlation and to correct for simultaneous bias in the model. The result of the regression is shown below.

Estimated Real Exchange Rates results**Equation 1**

$$Ex = -0.98 - 0.62 \frac{G}{Y} - 0.28 \frac{G_N}{G} + 0.8 \frac{T_s}{Y} + 0.39TT - 0.25t_m$$

$$(-4.22) \quad (-2.98) \quad (-1.61) \quad (2.03) \quad (1.66) \quad (-1.05)$$

$$R^2 = 0.69$$

$$R^2 = 0.60$$

$$DW = 1.81$$

$$Rho = 0.62$$

Equation 2

$$Em = -0.65 - 0.40 \frac{G}{Y} - 0.17 \frac{G_N}{G} + 0.08 \frac{T_s}{Y_{-1}} - 0.76TT^* + 0.25t_m$$

$$(-2.21) \quad (-2.47) \quad (-0.93) \quad (1.99) \quad (-3.01) \quad (0.96)$$

$$R^2 = 0.70$$

$$R^2 = 0.62$$

$$DW = 1.68$$

$$Rho = 0.77$$

Equation 3

$$\ln^{TS}/Y = -4.59 - 3.0 \text{ ird} - 0.59 \text{ }^{odG}/Y + 0.39 \text{ }^{TS}/Y_{-1} - 0.26 \text{ }^{CA}/Y + 0.48 \text{ }^{By}/Y$$

$$R^2 = 0.81$$

$$p^2 = 0.74$$

$$DW = 1.62$$

$$\ln^{TS}/Y = -3.4.2 - 2.6 \text{ ird} - 0.60 \text{ }^{odG}/Y + 0.41 \text{ }^{TS}/Y_{-1} - 0.20 \text{ }^{CA}/Y - 0.51 \text{ ptm}$$

(-0.80) (-0.42) (-2.35) (1.96) (-2.18) (-0.39)

$$R^2 = 0.78$$

$$R^2 = 0.69$$

$$DW = 1.65$$

Equation 4

$$\ln^x/y = -1.27 + 0.58 \text{ ex} - 0.45 \text{ }^y/yp$$

(-12.26) (3.83) (-1.72)

$$R^2 = 0.76$$

$$R^2 = 0.68$$

$$DW = 1.83$$

$$\text{Rho} = 0.88$$

$$\ln^x/y = -1.30 + 0.25 \text{ TT} - 0.53 \text{ }^y/Yp$$

(-15.43) (1.3) (-1.44)

$$R^2 = 0.62$$

$$R^2 = 0.56$$

$$DW = 1.78$$

$$\text{Rho} = 0.79$$

Based on the empirical result, the goodness of fit of the equations is above sixty percent showing a satisfactory performance of the model estimates for all the equation.

In terms of the effects of individual variables, the performance seems to vary. Both real exchange rates presented significantly negative elasticity with respect to the share of government spending in gross domestic product confirming the theoretical prediction. In addition, the proportion of government spending devoted to non-tradable activities in the model affect negatively real exchange rates.

Foreign terms of trade also exhibit the right signs in both equations, but they affect more significantly the imports and

exchange rate. The coefficients that accompany, the series reflecting implicit tariff rates also show the correct signs.

The estimated result of equation three and four where the trade balance equation were estimated in two version, depending on the style through which government finances its deficit. Based on Rodriguez (1989) procedure, attempt was made to use debt financing by including the variable $B-1/y$ and later with the option of inflationary financing by including the inflation tax. The complete adjustment looks a little better than the first model, despite the fact that the sign of the coefficient of $B-1/y$ is wrong.

In assessing individual variable, all the coefficients show the correct sign in both equations, except for public debt to Gross Domestic Product (GDP) ratio. The coefficient of the interest rate differential is not significant in equation three. Using the implicit interest rate paid as an alternative method did not improve the result by increasing the significance of interest rate differential.

What seems significant in the estimated equation three is the effect of deficit of the public sector on one side and the capital account to gross domestic product ratio (ca/y) on the other. The capital account variable that was used as a flow proxy for net foreign assets (NFA) in Rodriguez (1989) which seem to be appropriate than net foreign asset in Nigerian situation, due to the way government decides on the allocation of foreign exchange. As theoretically expected the effect of capital account to Gross Domestic Product ratio on trade balance to Gross Domestic Product ratio is negative: meaning the more foreign funds flow into the economy the more funds are available for imports without a corresponding increase in export. The estimated elasticities show that an increase in capital inflow does not lead to an equal increase in the trade surplus.

The exports were specified according to two different versions. The first follow

Rodriguez (1989) model by inserting the domestic terms of trade as the relevant relative price variable, while the other specifies the real export exchange rate in such a role. Both versions of the model include the ratio of current to potential Gross Domestic Product as an additional explanatory variable in the system. The main reason being that the higher this ratio, the lower is the share of exportable goods produced that effectively ends up in foreign markets. But from the estimates the sign of the variable and the sign of the either measure of relative prices are correct. On the overall fit of the version with the real export exchange rate as the relevant relative price variable is reasonable.

Conclusion

The empirical results tend to confirm the relevance of public sector deficits and public sector spending on the Nigerian external sector. There is the need to promote the export of goods and services so as to build the external account. The import content needs to be reduced to minimize the excessive spending by the government thereby reducing the public sector deficit. This will stabilize the foreign exchange market, the external account and the entire economy.

References

- Alexander, S. S. (1952). The effects of devaluation on trade balance. IMF Staff Papers Vol. 5.
- Attah J. (1987). The budget and the second foreign exchange market. The Nigerian economy under SFEM, Gaskiya Corporation Zaria.
- Buiter, H. W. (1983). Measurement of the public sector deficit and its implications for policy evaluation and design. IMF Staff papers, (30) 2, June.
- Calisir, M. & Sekmen, F. (2011). Is there a trade – off between current account deficit and economic growth?. International Research Journal of Finance and Economics 62(166)
- Central Bank of Nigeria: Annual reports and statement of accounts, various issues, Lagos.
- Easterly, W. R. (1989). Fiscal adjustment and deficit financing during the cost crisis, dealing with the debt crisis. World Bank Washington DC.
- Egwaikhide, F. O. (1995). Effects of budget deficit on current account balance in Nigeria: A simulation exercise. African Economic Research Consortium research paper 28
- Ekuerhare, B. U. (1983). The foreign exchange effects of the development of the Nigerian textile industry. Nigerian Journal of Economic and social sciences.25(3)
- John, G. G. (1985). Formulation of exchange rate policies in adjustment programmes. IMF Washington DC.
- Kaldor, N. (1983). Devaluation and adjustment in developing countries. Finance and Development.
- Lizondo, J. (1985). Unifying multiple exchange rates. Finance and Development.
- McCulloch, R. (1983). Unexpected consequences of floating exchange rate. Essays in International Finance. Princeton University, New Jersey.
- Muns, J. (1984). Adjustment conditionality and international financing. IMF Washington DC.
- Nashashibi, K. (1983). Devaluation in developing countries: the difficult choices. Finance and Development. 20(1)
- Ndebbio J. E. U. (1987). The second- tier foreign exchange market: capital flows, investments and general price level in Nigeria. The Nigerian economy under SFEM. Gaskiya corporation. Zaria.
- Ogba, L. (2013). The impact of trade balance on budget deficit in Nigeria. A PhD thesis submitted to the postgraduate school University of Jos, Jos Nigeria.
- Ojowu, O. (1987). Long term management of Nigeria foreign exchange. The Nigerian economy under SFEM.. Gaskiya corporation, Zaria.
- Pfelfman, G (1985). Over - valued exchange rates and development. Finance and Development, 22 (1).
- Rodriguez, C.A. (1989). The external effects of public sector deficit. World Bank Working paper (299), The World bank, Washington, D. C. November.
- Rossi, N. (1988). Government spending the real Interest rate, and the behaviour of Liquidity – constrained consumption in developing countries. IMF Staff papers,(35),1 March.
- Tanzi, V. (1987). Inflation and the measurement of fiscal deficits. IMF Staff papers (34), 4 December.