Comparative Analysis of the Relationship between Budget Balance and Selected Macro Economic Variables in Nigeria and Ghana

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Abstract

The export is one of the most important macro economic variable that affects a country's budget balance. This study examines the comparative analysis of budget balance and selected macro economic variables in Nigeria and Ghana using the World Bank Development Indicators data from 1970-2012. The study through the Augmented Dickey Fuller (ADF)/ unit root test found that the variables used in the model are integrated of the order one while export and interest rate are integrated of the order zero. Using the Johansen co integration tests shows the presence of long run relationship between variables. The Error Correction Model (ECM) results suggest that export has a significant impact on budget balance in the short run and . The study therefore recommends that the competitiveness and stability of export should be given due consideration as this will increase economic growth through increased investment.

Keywords: Export, Budget Balance, ADF, ECM, Nigeria, Ghana.

1. Introduction

A budget balance (particularly that of a government) refers to a budget in which revenues are equal to expenditures. Thus, neither a budget deficit nor a budget surplus exists (the accounts balance). More generally, it refers to a budget that has no budget deficit, but could possibly have a budget surplus. It records the difference between national government revenues and expenditures, expressed as a percent of GDP. A positive number indicates that revenues exceeded expenditures (a budget surplus), while a negative number indicates the reverse (a budget deficit) .The fiscal operations of most developing countries have been generally unstable. This is however considered to be one of the major causes of macroeconomic instability in most African countries. In any economy, there is always the need for government to undertake very useful measures aimed at shaping various developmental aspirations. One of such measures is fiscal deficit. Although, in Nigeria, it received over the years much of the blame for the assorted economic ills that beset developing countries in the 1980s: over indebtedness and the debt crisis, high inflation, and poor investment performance and growth.

The growth and persistence of fiscal deficits in both the industrialized and developing countries in recent times have brought the issue of fiscal deficits into sharp focus. The issues surrounding fiscal deficits are certainly not new, but the economic development of the past decade has rekindled the interest in fiscal issues (Islam & Wetzel, 1991). A budget policy plays a vital role in assisting countries achieve macroeconomic stability, poverty reduction, income redistribution and sustainable growth. For this reason, most governments use the budget as effective tool in achieving their economic objectives. This means that large and accumulating budget deficit may not necessarily be a bad policy objective if such deficits are effectively utilized to enhance economic growth. It is in line with this that an appropriate operational definition and measure of budget deficit must be clearly stated. Otherwise, the occurrence of large nominal budget deficit may be misleading depending on the operational measure adopted by a particular country.

Budget balance could be seeing from many angles. It is the gap between the government's total spending and the sum of its revenue receipts and non-debts capital receipts. It represents the total amount of borrowed funds or excess fund required by the government to completely meet its expenditure. Budget deficit could also be defined as the excess of total expenditure including loans net of payments over revenue receipts and non-debt capital receipts. It also indicates the total borrowing of the government, and the increment to its outstanding debt. The history of deficit financing in Nigeria was dated back to 1978 when the nation absorbed a $1billion Jumbo loan presumably needed for rehabilitation, reconstruction and development of the war-torn Nigerian economy. However, this was an aftermath of the Nigerian civil war that lasted till 1970. This action subsequently followed by massive borrowing by both federal and state governments and their institutions to revitalize the already doldrums economy, In Nigeria, the bloating of government bureaucracy, cost of providing critical infrastructures and shortage of revenue generation, among others has over the decades resulted in persistent annual deficits. However, with the extended expansion of government expenditure in Nigeria over the years, the expected results

remained elusive. Majority of Nigeria citizenry are still living in abject poverty, persistent high mortality rate, and low life expectancy due to inaccessibility to medical facilities; with poor road network, shortage of food and essential nutrients for physical growth and embarrassing high rate of unemployment. Ogunleye & Simon-Oke(2004). Thus, government resorted to internal and external borrowing to fill the resource gap.

The Ghana economy has persistent tendency towards budget deficit since independence as a result of ever expanding government expenditure, inadequate revenue generation capacity of government and increasing debt levels (Pomeyie 2001). The deficit-GDP of Ghana increased from 7.8 percent in 2005 to 8.1 percent in 2006 and 9.6 percent in 2007 and 14.5 percent in 2008. As the economy of Ghana grows, policy makers have been concerned with the extent to which the budget deficit is sustainable. For most years, government expenditure has exceeded government revenue in Ghana leading to deficits on the budget. Expenditure has been rising steadily due to increase demand for infrastructure and payment of interest on debt. For instance, total expenditure to GDP increased from 31.62 percent in 2005 to 33.71 percent in 2006 and 35.9 percent in 2007 (Bank of Ghana 2007). Yet, it is important that the government of Ghana run some fiscal deficits in order to stimulate economic growth by building up enough capital stock. This would place the economy on its steady state growth path so that debt can be issued to cover the deficits and repaid in the future (Xiomara & Greenidge, 2003). The size of budget deficit and ways of financing it determine the fiscal constraints that a country will be subject to in the long term. In this sense, the budget deficit of Ghana and its sustainability becomes important factor that occupy the attention of policy makers (Kustepeli &Onel, 2004).

The relationship between budget balance whether surplus or deficits and macroeconomic variables (such as growth(GDP), interest rates, inflation, exchange rate, among others) represents one of the most widely debated topics among economists and policy makers in both developed and developing countries (Saleh 2003). There is therefore a strong argument that fiscal deficits are major cause of inflation. This relationship can either be negative, positive or a no positive or negative relationship. The relationship also depends on how the deficit is financed. It stipulates that money creation leads to inflation, government borrowing crowds out private investment and external debt leads to balance of payments crises (Easterly et al. 1994). However, deficit financing is not without its problems, its several macroeconomic implications on the output growth cannot be overemphasized. The question of whether deficit financing had actually contributed positively or otherwise to economic growth is thus pertinent in the field of finance. One wonders the reason why poverty is vividly written in the face of individual citizenry in Nigeria with the sea of evidence in the literature on the positive impact of deficit financing on economic growth and investment Ogunleye & Simon-Oke (2004), Ojong et al.(2013). The outrageous macroeconomic instability and imbalance in the Nigerian economy over the years had been attributed to the growth in fiscal deficit.

In spite of government efforts at devising policy measures aimed at overcoming fiscal deficit, fiscal deficit has persisted in the nation's economy with its adverse effect being perceived on key macroeconomic variables. In less developed nations, borrowing from international financial institutions and Central Bank to finance sizeable portion of the deficits contribute to liquidity and inflation. The impact of fiscal deficit on macroeconomic aggregates depends on the financing techniques (Inflation tax or bond financed deficit). Money creation to finance deficit often leads to inflation while domestic borrowing inevitably leads to a credit squeeze through higher interest rates or through credit allocation (Easterly & Rebelo 1994, Sowa 1994).

2 Literature Review

The relationship between fiscal deficits and inflation has provoked considerable interest in the macroeconomics literature. While the theory postulates that fiscal deficits lead to inflation, empirical research has been less conclusive about the relationship. Ezeabasili et al. (2012) considered this issue in the context of a developing country, Nigeria, using data over 1970–2006, a period of persistent inflationary trends. They adopted a modeling approach that incorporates cointegration techniques and structural analysis. The results reveal a positive but insignificant relationship between inflation and fiscal deficits in Nigeria and no strong evidence linking past levels of fiscal deficits with inflation in Nigeria during the period. Rather, there was a positive long run relationship between money supply and inflation in the Nigerian economy, suggesting that money supply is procyclical and tends to grow at a faster rate than inflation rate.

Also Egwaikhide et a1.(1994) in their study titled Exchange rate depreciation, budget deficit and inflation: the Nigerian experience examined the quantitative effects of exchange rate depreciation on inflation, government revenues and expenditures, and money supply in Nigeria. The findings revealed that domestic money supply, real output, the shadow price of exchange rate (the parallel market exchange rate) and more recently official exchange rate are the proximate causes of inflation in Nigeria. In a related study Ariyo & Raheem (1991) made an in-depth investigation of the impact of fiscal deficit on the level and direction of economic growth and development as might be reflected in the behaviour of key macroeconomic indicators such as current account balance, government investment, private investment, inflation, interest rate, external and internal debts profiles, etc. Also Ozurumba (2012) examines the causal relationship between inflation and fiscal deficits in Nigeria, covering the period 1970-2009. This was carried out by way of developing an estimation model of inflation and fiscal deficit, with a view

to testing causes and effects as well as the relationship between them. The estimation technique used is the autoregressive distributed lag (ARDL) model and the Granger-causality test. The result of the Granger-causality test shows that the null hypothesis which says that fiscal deficit does not cause inflation should be rejected since the result is significant with probability less than 0.05. This implies that fiscal deficit/GDP causes inflation. However, no feedback mechanism was observed. The results from the ARDL test confirm a significant negative relationship between growth in fiscal deficit (% of GDP) and inflation. The above results confirm the a priori expectation. It is recommended that policies targeted at inflationary control in Nigeria could best be achieved if they are aimed at fiscal deficits reduction. In addition, the government should support growth in the real sectors of the economy .On the other hand, Ebiringa (1998) examined the macroeconomic impact of public sector deficit on macroeconomic performance with a particular reference to the Nigeria experience for the period 1988-1997. On finding an insignificant negative relationship between growth in public sector deficit (% of GDP) and inflation, he concluded that large accelerations of monetary financing cannot consistently result in higher inflation. This study was based on regression analysis in the form of stepwise regression method.

3 Data and methodology
3.1 Data sources
Data used for this study were obtained from the World Bank Development Indicators. The study covered a period of 42 years (1970-2012). Annual data on buget balance (BB), inflation, gross domestic product (GDP), gross national expenditure (GNE), gross national income (GNI), exports (EXP), exchange rate (EXR), and imports (IMP), were collected from the mentioned source.

3.2 Analytical technique
This study aimed at determining the relationship between budget balance and some selected macroeconomic variables as listed above in Nigeria and Ghana. Firstly, graphical analysis was performed to understand the pictorial trends of selected macroeconomic variables. The use of time series data for analysis demands the investigation of presence of unit root in the data. This is to avoid spurious regression. The Johansen co-integration test and error correction model (ECM) were used to examine the long-run relationship and the stability of the equilibrium among budget balance and some selected macroeconomic variables in Nigeria and Ghana. The estimation procedure takes the following forms:

3.3 Unit Root Test
Given that the initial step in carrying out a time series analysis is to test for stationarity of the variables {in this case, budget balance (BB), inflation, gross domestic product (GDP), gross national expenditure (GNE), gross national income (GNI), exports (EXP), exchange rate (EXR), and imports (IMP)}.

A series is said to be stationary if the means and variances stay constant over time. It is denoted as I(0), meaning integrated of order zero. Non stationary stochastic series have changing mean or time varying variance. All the variables used in this study were first tested for stationarity. The rationale was to overcome the problems of spurious regression. A stationary series tends to always return to its mean value and variations around this mean value. A variable that is non-stationary is said to be integrated of order d, written as $I(d)$, if it must be differenced d times to be made stationary. In the same way, a variable that has to be differenced once to become stationary is believed to be $I(1)$ that is integrated of order I(1).According to Gujarati (2003), the Augmented Dickey Fuller (ADF) test entails running a regression of the form:

$$\Delta Z_t = \beta_1 + \beta_{2t} + \delta Z_{t-1} + \sum_{t-1}^{m} \alpha_1 \Delta Zt - 1 + \varepsilon_t \tag{1}$$

Where Δ= the change operator; Z_t = variable series (inflation, gross domestic product (GDP), gross national expenditure (GNE), gross national income (GNI), exports (EXP), exchange rate (EXR), and imports (IMP),being investigated for stationarity); Z_{t-1} = lagged values of variables; t = time variable and ε_t is the white noise error. The null hypothesis that $\delta = 0$ means existence of a unit root in Z_t or that the time series is non-stationary. The decision rule is that if the computed ADF statistics is greater than the critical at the specified level of significance, then the hull hypothesis of unit root is accepted otherwise it is rejected. In other words, if the value of the ADF statistics is less than the critical values, it is concluded that Z_t is stationary i.e $Z_t \sim I(0)$. When a series is found to be non-stationary, it is first-differenced (i.e the series $\Delta Z_t =Z_t - Z_{t-1}$ is obtained and the ADF test is repeated on the first-differenced series. If the null hypothesis of the ADF test can be rejected for the first-differenced series, it is concluded that $Z_t \sim I(1)$.

3.4 Johansen's Co integration test
This statistical concept introduced by Granger (1983), Granger and Weiss (1983) and Engle and Granger (1987) has received wide attention and is beginning to be applied to test the validity of various theories and models. The

Johansen's co-integration tests are very sensitive to the choice of lag length. Firstly, a VAR model is fitted to the time series data in order to find an appropriate lag structure. The Akaike Information Criterion (AIC) was used to select the number of lags required in the co-integration test. The lagged terms are included to ensure that the errors are uncorrelated. The number of lagged difference terms to be included can be chosen based on t-test, F-test or the Akaike's Information Criterion (AIC) (Greene, 1993).The null hypothesis is that the variable y_t is a non-stationary series (H_0: $\beta = 0$) and is rejected when â is significantly negative (H_a: $\beta<0$). The null hypothesis is that the variable y_t is anon-stationary series (H_0: $\beta = 0$) and is rejected when β is significantly negative (H_a: $\beta<0$). If the calculated ADF statistic is higher than McKinnon's critical values, then the null hypothesis (H_0) is not rejected and the series is non-stationary or not integrated of order zero I(0).

3.5 Engle-Granger Error Correction procedure

This study used the Engle and Granger (1987) approach to ECM which consist of three steps: the first step is the estimation of the co-integrating regression as shown in equation (1):

$$Y_t = \alpha + \delta X_t + e_t \quad (1)$$

From these estimate, the residual term was generated

$$\hat{e}_t = Y_t - \hat{a} - \lambda X_t \quad (2)$$

and the residual term was included in the short term equation as shown in equation (3):

$$\Delta Y_t = \beta \Delta X_{t-1} - \rho \hat{e}_{t-1} \quad (3)$$

Where

Y_t= dependent variable; X_t= explanatory variables; e_t= residual error term; $\hat{e}_t$= estimated residual term;

$\hat{e}_{t-1}$ = error correction term.

Model specification

BB = f (Inflation ,GDP,GNE,GNI,EXP, EXR, IM)

Variables are defined as follows:

GDP- Gross Domestic Product; GNE- Gross National Expenditure; GNI-Gross National Income;; EXP- Exports; EXR-Exchange rate; IMP- Imports; ECT- Error Correction Term.

4. 0 Results and discussion

4.1 Trend Analysis of some selected macro economic variables

Gross domestic product (GDP) measures the aggregate output of a nation and it usually use as one of principal economic growth indicators. Therefore, figure 1a presents the comparison of trend of per capita GDP of nigeria and Ghana over a period of 54 years. The economy of Ghana was better (in term of average output per citizen) prior to early 1970s in comparision with Nigerian economy. However, per capita GDP of Nigerian economy witness rapid economy boost between mid –'70s and mid-80s which made the Nigerian economy to better off. This period in history of Nigerian economy concised with economic boom through oil trade in internatonal market. Further, Ghana economy picked up over Nigerian and this was maintained for a period of more than ten years. Since late '90s, although the economy of the two nations trend upward, but over the time, per capita GDP of Nigerian economy gained better boost. This implies that the speed of economic growth was rapid and higer in Nigerian compared with Ghanan economy.

Gross national expenditure is the sum total of the expensis expended in a country for twelve calender months. This is an indication of level of investment or amount of money injected into economy of a nation. While per capita gross national expenditure implies the average expenditure per person in a country over one year. In line with this figure 1c shows the trend and pattern of per capita national expenditure of Nigeria and Ghana over time. Up to 1970s per capita expenditure in Ghana economy was higher than Nigerian economy (it implies that an average citizen of Ghana has higher propensity to consume when compare with a typical Nigerian citizen during this period). However, the trend was reveresed during mid-'70s and mid '80s when Nigerian national expenditure was higher in comparison with Ghana national expenditure. Nevertheless, period of mid '80s and early 2000s, Ghana economy witness better investment progress through higher national expenditure over nigerian economy. Interestingly the trend of national expenditure of these nations had been upward since early 2000s, but Nigerinan national expenditure is leading. The economic implication is that both countries are increasing their investment through improved national expenditure with expectation of better national economic growth and performance.

Figure 1c, below presents the comparison between per capita national income of Nigeria and Ghana. In the early 1960s to mid 1970s, Ghana per capita income was found to be greater than Nigerian per income. This period preceeded oil discovery in Nigeran economy. Immediately after discovery of oil in the early 1970s, termed oil boom era in Nigeria, per capita income of Nigerian almost double per capita income of Ghana and the trend drop sharply in the mid 1980s. From the mid 1980s to early 2000s, Ghana economy was better off on the basis of

per capita income when compared with the Nigerian. Since the beginning of 2000s, upward trend was observed for both countries till late 2000s when per capita income of nigerian was sharply increased when compared with Ghana trend.

Inflation which is the rising in the general prices of commodities and services in an economy and is usually use as tools to measure economy stability of any country. Stable or relative small increase in inflation rate is an evidence of better economy performance and unstable or higher inflation rate implies bad or poor economic indicator. The importance of inflation in study of this nature made it imperative to compare inflationary tend in Nigeria economy and Ghana economy.Observation of pattern of inflation in the two countries shown that generally inflation has been erratic over the period under review. Specificallly, it was obvious that Ghana economy experienced what could be termed as hyper-inflation with more than 100% inflation rate between mid-'70s and mid-'80s. This is an indication of poor economic performance for this period in Ghana economy when compare with Nigerian economy. Moreover, the economy trend in the two nations indicated better economic performance through reduced rate of inflation in the recent time.

Another cogent economic indicator of well being of a nation is amonut of goods and services export to another country through international trade. Country that is export oriented is assumed to be better than the country that is import oriented. Figure 1e show case the comparison trend of export pattern of goods and services of Nigeria and Ghana over the period under review. Generally, the magnititude of export of goods and services of Nigerian economy is greater than the Ghana economy. The disperity of export goods and services was relatively small until early 2000s when Nigerian export assumed geometrical speed while Ghana export was steadly increasing. This could be the reasons while Nigeria is refering to as biggest economy in the continent of Africa.

The resultant reflection of the economic power of a nation is the exchange rate. The exchange rate shows the economic potent that currency of a typical nation carries among other nations. The steady the exchange rate of currency of a country with other nations currency over time, the better her economy. Therefore, this study examined the trend of exchange rate of Nigeria and Ghana between 1960 and 2013.The over view of figure 1f, revealed that Ghana economy, since 1960 till 2013 had been maintaining relatively steady exchange rate. While Nigeria economy had a steady exchange rate up to mid-1980s, after which there had been unstable exchange rate and the power of naira as currency in Nigeria economy started loosing its purchasing power in international market. It could be inferred that in term value of currency in international market, Ghana currency (Cedis) has economic and purchasing Power more than Nigeria currency (Naira).

The import of goods and services as macroeconmics variable is very important to consider in measuring the well being of a nation. There are many factors that determine the level of import of goods and services into a country, these include; government policy, market opportunities, geographical and ecology factor, natural endowment and population, demographic structure, consumption pattern, production level and technological. The figure 1h presents the trend of value of goods and services imported into Nigeria and Ghana economy over the past 54years. The import value of goods and services into Nigerian economy has been generally greater than Ghana economy. But there was profund wider margin in the last 15years. The reasons for this disperty in the import value of Nigeria economy over the Ghana economy could be due to population difference. The influence of population on national consumption could be enormous especially when the depency ratio is higher.

4.2 Unit root test/ Stationarity Tests
For co-integration analysis, it is important to check the unit roots at the outset to ascertain whether modeled variables are I (0) at levels and I (1) at differences. Table 1 and 2   presents the results of the Unit Root Test using the Augmented Dickey- Fuller (ADF). Philip Perron test was also done to validate the ADF estimates. The tests were applied to each variable over the period of 1970-2012 with a time trend at the variables level and at their first difference. The test results are compared against the MacKinnon (1991) critical values for the rejection of the null hypothesis of no unit root. Results show that all variables are non-stationary in levels and stationary in first differences. This indicates that the variables are I(1) and any attempt to specify the dynamic function of the variable in the level of the series will be inappropriate and may lead to problems of spurious regression in line with Mesike et al. (2010). The econometric results of the model in that level of series will not be ideal for policy making (Yusuf and Falusi, 1999) and such results cannot be used for prediction in the long-run (Obayelu and Salau, 2010). Johansen cointegration test therefore becomes appropriate for assessing the existence of long-run relationships among variables.

4.3 Johansen Co-integration test
The Akaike Information Criterion (AIC) is used to select the optimal truncation lag length to ensure the errors are white noise in ADF. In this study, the Akaike Criterion (AIC) suggested an optimal lag length of 3 which is the appropriate specification for the order of VAR model.Table 3 and 4 shows the summary results of the Johansen's Maximum Likelihood co-integration test for Nigeria and Ghana. The results, based on the both the trace test and maximum Eigen value test showed the existence of three cointegrating vectors and the rejection of the null

hypothesis of r = 0. Thus, there is a unique long-run equilibrium relationship between the variable concerned in line with Hallam and Zanoli (1992) that state that where only one co-integrating equation exists, its parameters can be interpreted as estimate of long-run co-integrating relationship between the variables concerned. Since all variables are co-integrated, then the VECM was estimated.

4.4 Error Correction Model Estimates

Long run estimates

The existence of co-integration among the dependent variable and their fundamentals necessitated the specification of ECM for this study. Table 5 shows the results of the ECM estimates for the relationship of budget balance and selected macro economic variables in Nigeria and Ghana. It is observed that exports, exchange rate, imports and inflation are significant at 1% for Nigeria and Ghana. However, positive significant relationship exist among the export, exchange rate, import and inflation variables with budget balance in Nigeria and Ghana.

4.5 Short-run estimates

Another issue discussed in this study is to determine whether there is a short-run causality running from the independent variables to budget balance. An error correction term (ECT) model for short-run behaviour is established and the results are presented in Table 7 and 8 for Nigeria and Ghana. The coefficient of the error correction term which measures the speed of adjustment towards long-run equilibrium is negative, significant at 1% level which is appropriate (ECM is 0.6576 for Nigeria and 0.0213 for Ghana). One important finding is the statistical significance of the ECM suggesting that budget balance adjust to correct long run disequilibrium between itself and its determinants. This coefficient of the ECM revealed that the speed with which budget balance adjust to selected macro economic variables. For Nigeria, the estimation results reveals that increase in export has a negative impact on budget balance in the short run. Also, gross national income has a negative impact on budget balance in the short run while import and GDP has the expected positive significant impact on budget balance in the short run. While for Ghana the estimation results reveals that increase in import has a negative impact on budget balance in the short run, while export, import, inflation and gross national expenditure has the expected positive significant impact on budget balance in the short run.

5.0 Conclusion and recommendation

This study investigated the relationship between budget balance and selected macro economic variables in Nigeria and Ghana over a period of 1970-2012 through the co integration and the ECM approach. The co integration test showed that there is a long run relationship between the variables. Evidence suggests that in the long run exports, exchange rate, imports and inflation are significant at 1% for Nigeria and Ghana For Nigeria, the estimation results reveals that increase in export and gross national income has a negative impact on budget balance in the short run, while import and GDP has positive significant impact on budget balance in the short run. While for Ghana the estimation results reveals that increase in import has a negative impact on budget balance in the short run, while export, import and gross national expenditure has positive significant impact on budget balance in the short run. It can be concluded that export is an important variable affecting budget balance in Nigeria and Ghana. It is recommended that efforts should be directed at maintaining a stable and good exportation.

References

Adeyeye, E.A. and T.O.Fakiyesi (1980) "Productivity price and incomes Board and Anti inflationary policy in Nigeria in the Nigerian economy under the military. Proceedings of the 1980, Annual Conference of Nigerian Economic Society, Ibadan.

Akinbobola,T.O(2012)"The dynamics of money supply, exchange rate and inflation in Nigeria" Journal of Finance and banking,vol.2 no.4, pp117-141Akinnifesi, E.O (1984)"Inflation in Nigeria: Causes Consequences and Control" The Bullion.Vol.I (July).

Ariyo, A and Raheem M.I (1991): Effect of Fiscal Deficit on some macroeconomic aggregates in Nigeria, Nairobi, African Economic Research Consortium (AERC)

Asogu, J. O. (1991): An econometric Analysis of the nature and causes of Inflation in Nigeria" Economic and Financial Review,Vol.29,no.2.

Ariyo and Raheem M.I. (1991): Effect of Fiscal Deficit in Nigeria" (1991). Report of a Research study Sponsored by AERC, Nairobi.

Bank of Ghana (2007): Bank of Ghana Monetary Policy Report. Vol. 1, No. 6/2007. Accra, Bank of Ghana Research Department.

Easterly, W. and Rebelo, S. (1993), 'Fiscal Policy and Economic Growth: An Empirical Investigation', Journal of Monetary Economics, 32: 417-458.

Easterly, W.R., C.A. Rodriguez and K. Schmidt-Hebbel (1994): Public sector, deficits and macroeconomic analysis. Washington, D.C: Oxford University Press.

Ebiringa, T.O. (1998). "The Macroeconomic Impact of Public Sector Deficits: An Empirical Study of Nigeria (1988 –1997)", Unpublished M.Sc. Research Work, Owerri, FUTO.

Egwaikhide, F.O. et al (1992): Exchange Rate Depreciation, Budget and Deficit and Inflation: the Nigeria Experiences" the AERC, Nairobi.

Ezeabasili V.N., J. N. Mojekwu and W.E Herbert (2012): An Empirical Analysis Of Fiscal Deficits And Inflation In Nigeria. International Business and Management Vol. 4, No. 1, 2012, pp. 105-120.

Granger, 1983, Co-integrated Variables and Error-Correcting Models, Unpublished discussion paper, 83-13, University of California, San Diego.

Granger, C.W.J. and A.A. Weiss, 1983, Time series analysis of error-correcting models, in:S. Karlln et al., eds., Studies in econometrics, time series, and multivariate analysis (Academic Press, New York) 255-278.

Greene, W., 1993, "The Econometric Approach to Efficiency Analysis," in The Measurement of Productive Efficiency, H. Fried, K. Lovell, and S. Schmidt, eds., Oxford University Press, Oxford.

Gujarati, D.N. (2003). Basic Econometrics. 4th Edition. McGraw-Hill Companies, Inc, New York; ISBN 0-07-112342-3.

Hallam D and Zanoli R (1992). Error correction models and agricultural supply response. Eur Rev Agric Econ, 2: 111-120.

Islam, R. and Wetzel D. (1991): The Macroeconomics of Public Sector Deficits: The case of Ghana. Working Papers (wps) no. 672, Washington DC. The World Bank Policy Research and External Affairs Department.

Kustepeli, Y. and G.Onel (2004). Fiscal Deficit Sustainability with a Structural Break: An Application to Turkey. İzmir-Turkey, Dokuz Eylül University.

Hallam D and Zanoli R (1992). Error correction models and agricultural supply response. Eur Rev Agric Econ, 2: 111-120.

MacKinnon, J.G (1991). Critical Values for Cointegration Tests, Chapter 13. In: RF Engle, CWJ Granger (Eds.): Long-run Economic Relationships: Readings in Cointegration, Oxford: Oxford University Press.

Mesike, C.S, Okoh, R.N and Inoni, O.E (2010). Supply Response of Rubber Farmers in Nigeria: An Application of Vector Error Correction Model. Agricultural Journal, 5(3):146-150

Obayelu, A. E. and Salau S. A. (2010). Agricultural Response to Prices and Exchange Rate in Nigeria: Application of Co-integration and Vector Error Correction Model (VECM). Journal of Agricultural Science, vol. 1(2):pp73-81

Odusunya, I. A. and A. A. Atanda (2010): Analysis of inflation and its determinants in Nigeria, Pakistan Journal of Social Sciences, volume 7, No.2 Pp97-100.

Okpara and Nwoaha (2010): Government Expenditure, Money supply, Prices and output Relationship in Nigeria: An Econometric Analysis" International Research Journal of Finance and Economic Issues54.

Ogunleye E. O and O Simon-Oke: The Impact of Public Sector Growth of Socio-Economic Welfare in Nigeria 1982-2002) The Nigeria Journal of the Social Sciences, 2004;3:1:73- 88.

Okoruwa V.O, G.O. Ogundare and S.A. Yusuf (2003): Determinants of traditional agricultural exports in Nigeria: an application of cointegration and correction model. Quarterly Journal of International Agriculture 42(4): 427-438.

Okoye EI, Akenbor. An Empirical Investigation of the Impact of Deficit Financing on Socio-Economic Activities in Nigeria (from 1997–2007), ABSU Journal of the Management Sciences. 2010;10(1):95-106

Ojong C.M, H.O Owui, and C. Effiong: Effect of Budget Deficit Financing on the Development of the Nigeria Economy: 1980-2008", International Institute for Science, Technology & Education. 2013;5(3):61 -84.

Ozurumba B.A (2012): Fiscal Deficits and Inflation In Nigeria. JORIND 10 (3), December, 2012. ISSN 1596 – 8308.

Pomeyie, P. (2001). Macroeconomics: An Introductory Textbook. Accra, Wade Laurel co.

Saleh, A. S. (2003): The Budget Deficit and Economic Performance: A Survey", University of Wollongong, Economic Working Paper Series.

Sowa, N.K. (1994), "Fiscal Deficits, Output Growth and Inflation Targets in Ghana", World Development, Vol. 22, Pp. 1105-1117.

Xiomara.A and K.Greenidge (2003): Debt and Fiscal Sustainability in Barbados. Bridgetown, Central Bank of Barbados.

Yusuf, S.A and Falusi, A.O (1999). Incidence analysis of the effects of liberalized trade and exchange rate policies on cocoa in Nigeria: An ECM approach. Rural Economic Development, 13: 3-14.
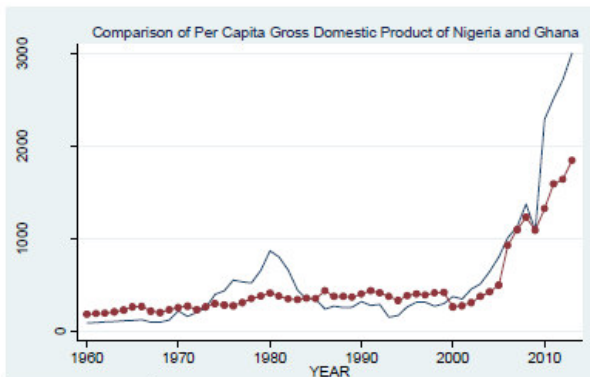
Figure 1a — Comparison of Per Capita Gross Domestic Product of Nigeria and Ghana (NGPERGDP, GHPERGDP)
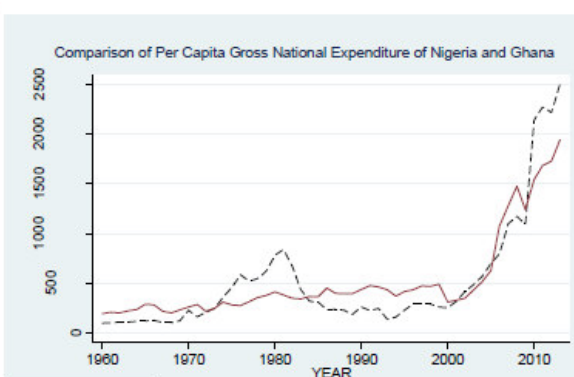
Figure 1b — Comparison of Per Capita Gross National Expenditure of Nigeria and Ghana (NGPERGNE, GHPERGNE)
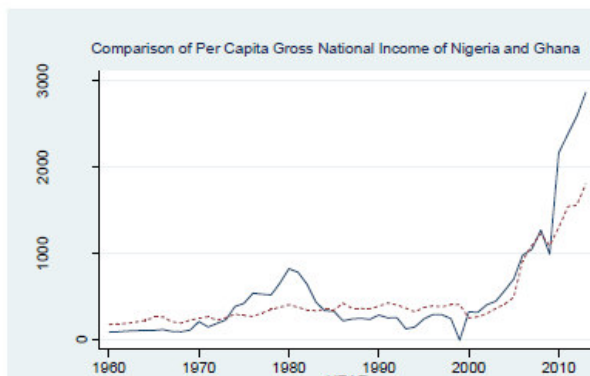
Figure 1c — Comparison of Per Capita Gross National Income of Nigeria and Ghana (NGPERGNI, GHPERGNI)
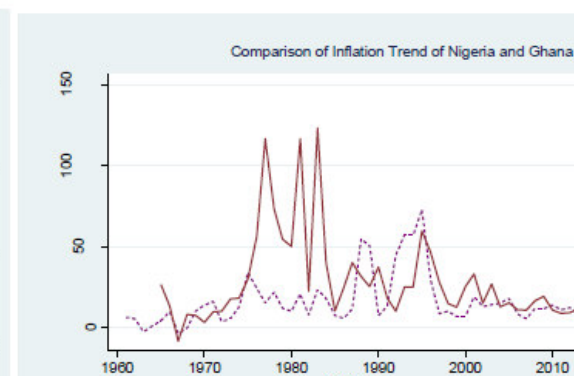
Figure 1d — Comparison of Inflation Trend of Nigeria and Ghana (NG-Inflation %, GH-Inflation %)

Figure 1e — Comparison of Export of Goods and Services of Nigeria and Ghana (NG-EXP, GH-EXP)

Figure 1f — Comparison of Exchange Rate Trend of Nigeria and Ghana (NG-EXR, GH-EXR)
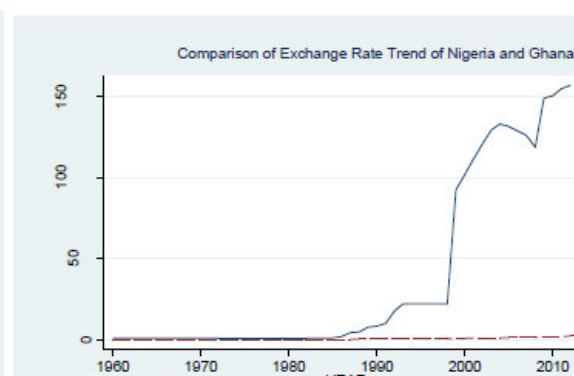
Figure 1h

Table 1: Augmented Dickey Fuller (ADF) test (Ghana)

Variable	ADF		PP		Order of integration
	Level	1st diff	Level	1st diff	
FD	0.0001	0.0000	0.0000	0.0000	I(1)
GH_EXP	0.9970	0.0001	0.9985	0.0003	I(1)
GH_EXR	0.9202	0.0028	0.9582	0.0039	I(1)
GH_IM	0.9914	0.0000	0.9944	0.0000	I(1)
GH_INFLATION	0.0148	0.0000	0.0249	0.0000	I(1)
GHPERGDP	0.9906	0.0000	0.9864	0.0000	I(1)
GHPERGNE	0.9858	0.0000	0.9849	0.0000	I(1)
GHPERGNI	0.9894	0.0000	0.9823	0.0000	I(1)

Note: Values in parenthesis are *5% Mackinnon critical values*
I (1): Integrated of order 1; I (0): Integrated of order zero

Table 2: Augmented Dickey Fuller (ADF) test (Nigeria)

Variable	ADF		PP		Order of integration
	Level	1st diff	Level	1st diff	
FD	0.0000	0.0000	0.0000	0.0001	I(1)
NG_EXP	0.8283	0.0000	0.8421	0.0000	I(1)
NG_EXR	0.6418	0.4768	0.6187	0.5101	I(0)
NG_IM	0.6763	0.0000	0.7870	0.0001	I(1)
NG_INFLATION	0.1538	0.0000	0.0029	0.0000	I(1)
NGPERGDP	0.9429	0.0000	0.9429	0.0000	I(1)
NGPERGNE	0.9436	0.0000	0.9341	0.0000	I(1)
NGPERGNI	0.2186	0.0000	0.0086	0.0000	I(1)

Note: Values in parenthesis are *5% Mackinnon critical values*
I (1): Integrated of order 1; I (0): Integrated of order zero

Table 3: Johansen Cointegration Test (Ghana)

Null Hypothesis	Alternative Hypothesis	Eigen value	Max-Eigen statistics(λ max)	5% critical value
r=0*	r≥1	0.9973	290.2127	52.3626
r≤1*	r≥2	0.9545	151.3931	46.2314
r≤2*	r≥3	0.9169	121.9432	40.0776
r≤3	r≥4	0.7425	66.4733	33.8769
r≤4	r≥5	0.6235	47.8715	27.5843
r≤5	r≥6	0.4660	30.7414	21.1316
r≤6	r≥7	0.2145	11.8319	14.2646
r≤7	r≥8	0.0221	1.0957	3.8415

Note: *denotes rejection of null hypothesis at 5% level. Both Trace test and max- eigen value tests indicate the presence of 3 cointegrating equations at the 0.05 level.

Table 4: Johansen Cointegration Test (Nigeria)

Null Hypothesis	Alternative Hypothesis	Eigen value	Trace statistics(λ trace)	5% critical value
r=0*	r≥1	0.9973	721.5628	159.5297
r≤1*	r≥2	0.9544	431.3500	125.6154
r≤2*	r≥3	0.9169	279.95689	95.7537
r≤3	r≥4	0.7425	158.0138	69.8189
r≤4	r≥5	0.6235	91.5405	47.8561
r≤5	r≥6	0.4660	43.6690	29.7971
r≤6	r≥7	0.2145	12.9276	15.4947
r≤7	r≥8	0.0221	1.0957	3.8415

Note: *denotes rejection of null hypothesis at 5% level. Both Trace test and max- eigen value tests indicate the presence of 3 cointegrating equations at the 0.05 level.

Table 5: Results of Error Correction Model showing long run effects (Nigeria)

Variables	Coefficient	Standard error	t-statistics
EXP	0.0000***	0.0000	0.0000
EXRATE	0.0000***	0.0000	0.0000
IMP	0.0000***	0.0000	0.0000
INF	0.0000***	0.0000	0.0000
GDP	8.5769	30.3572	0.2825
GNE	-4.3615	31.7715	-0.1372
GNI	-15.5007	5.9062	-2.6245
C	28.8938	7.2444	3.9884

***, **,* denotes 1%, 5% and 10% significant levels respectively

Table 6: Results of Error Correction Model showing long run effects (Ghana)

Variables	Coefficient	Standard error	t-statistics
EXP	0.0000***	0.0000	0.0000
EXR	0.0000***	0.0000	0.0000
IM	0.0000***	0.0000	0.0000
INF	0.0000***	0.0000	0.0000
GDP	55.3356	18.4446	3.0000
GNE	-13.1769	2.1079	-6.2511
GNI	-43.6973	17.1794	-2.5436

***, **,* denotes 1%, 5% and 10% significant levels respectively

Table 7: Results of Error Correction Model showing short run effects (Nigeria)

Variables	Coefficient	Std. Error	t-Statistic
D(EXP)	-72.6296**	36.4703	-1.9915
D(EXR)	-7.3721	18.0671	-0.4080
D(IM)	43.1579*	28.3136	1.5243
D(INF)	-2.2052	3.6297	-0.6075
D(GDP)	203.4794*	146.729	1.3868
D(GNE)	-131.9450	128.419	-1.0275
D(GNI)	-9.6767**	3.9533	-2.4478
U-1	0.6576*	0.2497	1.6463
R-squared	0.7803	Akaike info criterion	7.0146
Adjusted R-squared	0.6338	Schwarz criterion	5.3503

***, **,* denotes 1%, 5% and 10% significant levels respectively

Table 8: Results of Error Correction Model showing short run effects (Ghana)

Variables	Coefficient	Std. Error	t-Statistic
D(EXP)	1.5125*	0.8021	1.8858
D(EXR)	0.8956***	0.3163	2.8318
D(IM)	-2.3364***	0.9066	-2.5772
D(INF)	0.0671*	0.0560	1.1971
D(GDP)	2.4823	10.0019	0.2482
D(GNE)	6.4985**	3.2611	1.9927
D(GNI)	1.8157	9.4262	0.1926
U-1	-0.0213**	0.0101	-2.1029
C	-0.0819	0.0404	-1.0027
R-squared	0.7377	Akaike info criterion	-20.6054
Adjusted R-squared	0.5478	Schwarz criterion	-12.4236

***, **,* denotes 1%, 5% and 10% significant levels respectively