Cost of Governance and Fiscal Deficit in Nigeria: Evidence from State Government Data

P. Ekeocha
Central Bank of Nigeria, pcekeocha@cbn.gov.ng

A. Ikenna-Ononugbo
Central Bank of Nigeria, aaikenna-ononugbo@cbn.gov.ng

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Ekeocha, P. and A. Ikenna-Ononugbo*

Abstract

Fiscal deficit has remained a predominant occurrence at both the Federal and state government levels, and this has become a source of concern for economic managers. At the individual state level, a quarter of the state governments consistently ran deficit for more than six consecutive years, from the period 2007 to 2014. More importantly, the combined overall fiscal balance of the state governments has resulted frequently in deficit in the past two decades. Fiscal deficit is not bad in itself, but most of the state governments are running fiscal deficit to sustain recurrent expenses, rather than infrastructure development. Available studies on the determinants of fiscal deficit have not considered cost of governance as an important determinant. Thus, the authors investigated the effect of cost of governance and other determinants, on fiscal deficit across the Nigerian states for the period 2008-2015. Using the dynamic panel of the Arellano-Bond (Difference) GMM Estimators in the Keynesian framework, the results revealed that cost of governance had fueled fiscal deficit at the state level in Nigeria. It also showed that inflation, population size and economic growth had significant impact on fiscal deficit across the Nigerian states. The authors underscored the need for strengthening public financial management reforms, particularly, the Fiscal Responsibility Act, the Medium Term Expenditure Framework, and the treasury single account, at the sub-national level to ensure fiscal discipline. This will enable the state governments to be more prudent and ensure that fiscal deficit is geared towards infrastructure development.

I.   Introduction

In Nigeria, fiscal deficit[1] has remained a predominant occurrence at both the Federal and state government levels, even during economic boom, and this is becoming a source of concern for economic managers. At the

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* *The authors are staff of the Research Department, Central Bank of Nigeria. The usual disclaimer applies.*
[1] *De La Dehesa (2010) defined fiscal deficits as a situation where governments spend more than they collect as revenue.*

individual state level, a quarter of the state governments have consistently been in deficit for more than six years, from 2007-2014. Over the past two decades, the combined overall fiscal balance of the state governments has, more often than not resulted in deficits. The fiscal deficits of the state governments averaged N176.20 billion during the period 2008 and 2013. It increased from N86.80 billion in 2008 to N272.50 billion in 2012, dropped to N141.40 billion in 2013, and thereafter rose to N311.0 billion in 2014, because of the drastic drop in international crude oil prices, which affected the share from the Federation account.

Fiscal deficit in itself is neither good nor bad. However, it can be assessed in relation to the economic situation. A country experiencing budget deficit, due to building infrastructure or making profitable investments that will generate higher revenue or taxes in the future, is often considered healthier than countries experiencing deficit, due to unsustainable expenses. Incidentally, state government expenditures have been geared mostly towards (unsustainable) recurrent spending, with little resources for capital outlay. Consequently, infrastructure and socio-economic conditions in most of the states have remained in deplorable condition. Though budget deficits are always a warning signal for analysts and investors, it is important to understand why any country or state is experiencing a deficit.

The crash in international crude oil prices, which started in November 2014, did put government finances in Nigeria, particularly, state governments finances, in a precarious condition; such that the accumulation of salary and contractor arrears becomes prominent. Despite the bail-out by the Federal government to enable some of the state governments pay salary arrears, the unabated downward pressure in crude oil prices continued to exert negative impact on the revenue and finances of the state governments. Consequently, states are forced to run fiscal deficit that could undermine their fiscal sustainability in the medium-to-long-term. Aside the dwindling federation revenue, the undue concentration of the bulk of financial resources at the states on recurrent outlay (the cost of governance is seen as another major cause of the perennial fiscal deficit observed at this level of government. Evidence indicates that productive government expenditure improves economic growth, while high administrative cost (high operating cost) dampens economic growth and increases poverty (Adeolu and Osabuohien, 2007) and, by extension, increases fiscal deficit. Other determinants of fiscal deficits from the literature have also been put forward, including high unemployment rates, economic

crisis, expansion opportunities, and economic performance. While there seem to be empirical studies, regarding the determinants of fiscal deficit, the role, cost of governance plays has not been properly investigated in the literature.

Available studies on the determinants of fiscal deficit have undermined the cost of governance as an important determinant (Onafowora and Owoye, 2006; Rangarajan and Srivastava, 2005; Krause, 2000; Ijah, 2014; Fluvian, 2006; Darrat, 1988; Barro, 1979; Attiya, et al., 2011; Adeolu and Osabuohien, 2007; and Woo, 2003). This study, therefore, attempts to fill the gap by ascertaining the role of cost of governance on the fiscal balance of State government in Nigeria, using panel data econometric approach. The thrust of this paper, therefore, is to empirically ascertain the determinants and, particularly, the effect of cost of governance on states' fiscal deficit. The research questions this paper seeks to answer are: what are the determinants of fiscal deficit across states in Nigeria? What is the effect of cost of governance on fiscal deficit across States in Nigeria? The import of the paper is the ability to draw the attention of the state governments to the fact that prudent and effective application of the budget is sine-qua-non to minimising fiscal deficit, if empirical evidence is established for the cost of governance.

The rest of the paper is structured as follows. Following the introduction is Section 2, which deals stylised facts on state government and fiscal deficit in Nigeria. Section 3 focused on the literature review and theoretical framework, while Section 4 was on methodology. Section 5 presented the analysis of results on fiscal deficit and cost of governance in Nigeria, while Section 6 concluded the paper.

II.   Stylised Facts: State Governments and Fiscal Deficit in Nigeria

Nigeria operates a federal system of government, whereby both the Federal and the sub-national units derived their powers from the constitution. The Nigerian fiscal federalism is such that the sub-national governments have powers to expenditure, but not much power to revenue generation. Accordingly, states and local governments depend on statutory allocation for their sustenance, as the more lucrative revenues are collected and pooled into the Federation account and shared in accordance with the subsisting formula. However, the share of the Federal government, in the pooled revenue, remained slightly higher than the share of the 36 states of the

federation. Thus, the Federal government, to a large extent, is still saddled with the responsibility of providing social amenities in all parts of the federation.

Considering that the states are sovereign in their own right, they are expected to deliver public goods and services in order to achieve the fundamental objectives and directive principles of state policy, enshrined in Section 16 of the 1999 Constitution of the Federal Republic of Nigeria. To achieve this, the states obviously adopt a budgetary framework that sets the substantive policy priorities of the state government, the expected revenue and expenditure for the fiscal year. It also determines the sources of borrowing to finance approved expenditures in the case of a fiscal deficit. Incidentally, fiscal deficit have remained the general norm for the state governments over the years. Fiscal deficit of the state governments averaged N230.44 billion for the period 2008 to 2015. It increased from N86.80 billion in 2008 to N272.50 billion in 2012. It dropped to N141.40 billion in 2013, but resumed its upward trend and rose to N610.1 billion in 2015, due to the drastic drop in international crude oil prices that affected the share from the Federation account. As a ratio of GDP, fiscal deficit averaged 0.4 per cent during the review period. The trend in fiscal deficit could be explained by the increasing level of state governments' expenditure for most part of the review period. State governments' total expenditure grew on the average by 0.5 per cent per annum during the period. It increased from N3,021.60 billion in 2008 to N4,046.80 billion in 2013, but declined to N1,246.30 billion in 2015. As a ratio of GDP, state governments' total expenditure averaged 2.3 per cent in the review period (Figure 2.1).

Figure 2.1: State Governments' Expenditure and Fiscal deficit GDP Ratios (N' Billion)
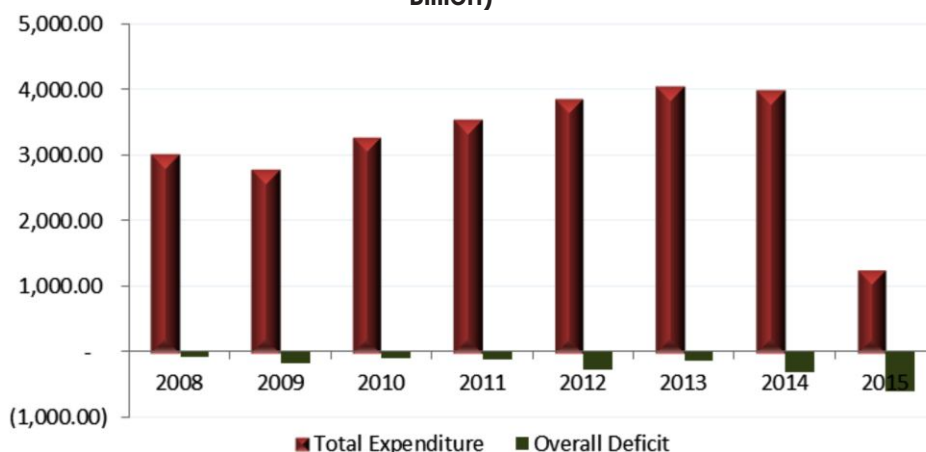
Source: Computed from data from the Central Bank of Nigeria

The increasing expenditure status of the states, in the review period, could be attributed to the growing cost of governance, including overhead cost; personnel cost; and other economic factors, such as inflation. Cost of governance increased by 53.2 per cent above the level in 2008 to N687.23 billion in 2014, but dropped to N507.70 billion in 2015. As a ratio of total states' recurrent expenditure for the period 2008 to 2015, cost of governance averaged 64.1 per cent, increasing from 55.0 per cent in 2008 to 77.5 per cent in 2015. Further breakdown of the cost of governance showed that personnel cost accounted, averagely, for 58.1 per cent of the total during the period. It trended upward for most part of the review period and rose from 45.9 per cent in 2008 to 65.8 per cent in 2012, dropped to 58.2 per cent in 2014, but increased to 63.7 per cent in 2015 (Figure 2.2).

Figure 2.2: Decomposition of State Governments' Cost of Governance (Per cent)
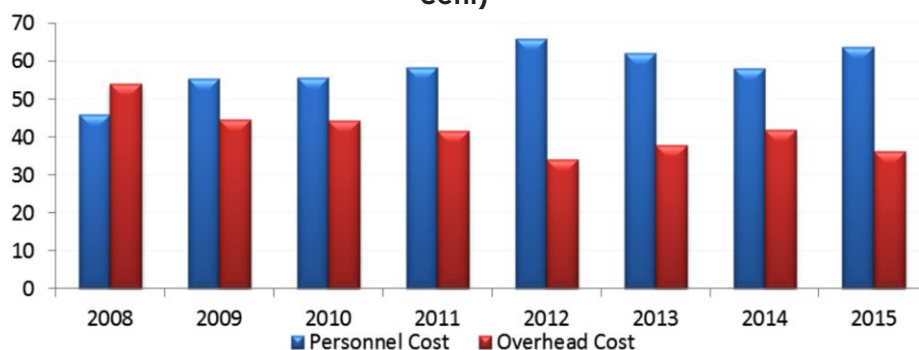
Source: Computed from Data from the Central Bank of Nigeria

Another factor attributed to the rising government expenditure and hence fiscal deficit is the pressure on domestic prices, as captured by the trend in the inflation rate. The inflation rate declined from 15.1 per cent in 2008 to 10.3 per cent in 2011. It rose again to 12.0 per cent in 2012, trended downward to 8.0 per cent in 2013, but rose by 100 basis points to 9.0 per cent in 2015 (Figure 2.3).

Figure 2.3: Movements in State Governments' Deficit, Expenditure, Cost of Governance and Inflation (Per cent)
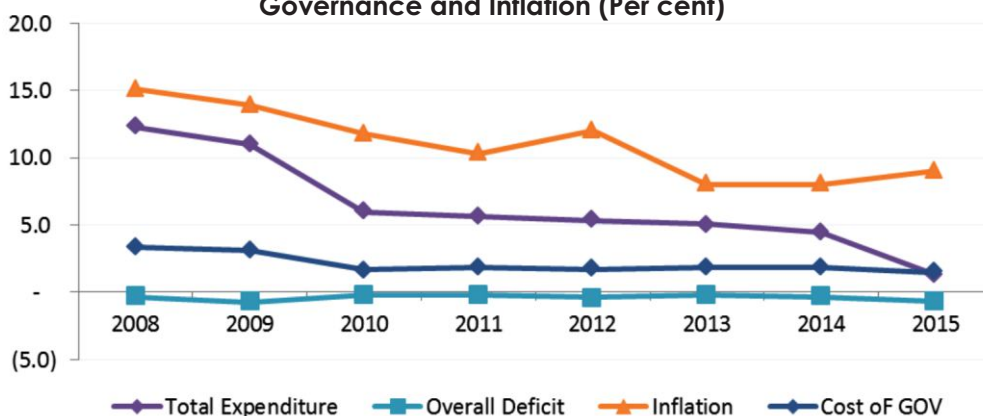
Source: Computed from Data from the Central Bank of Nigeria

Overall, the trend analysis showed some of the factors responsible for the persistent rise in state governments' fiscal deficit over the review period were to a large extent the rising cost of governance and inflation. However, it is important to carry out a further empirical investigation to give credence to the stylised facts, as we cannot rule out some other macroeconomic and demographic factors.

III.   Literature Review
III.1   An Overview of Theories on Fiscal Deficit

There are three schools of thoughts on deficit financing: the Classical, the Keynesian, and the Ricardian schools. According to the classical theory of deficit, budget deficit (fiscal deficit) has the effect of increasing current consumption by government or consumers, but this is counterbalanced by a fall in investment. Perry (2014) opined that, by definition, if consumption rises, savings must fall. A fall in savings raises interest rates, which then reduces investment. Thus, crowding-out occurs when the budget deficit brings about increase   interest rates and reduction in investment. This is explained with a graphical illustration in Figure 3.1 of the loanable fund theory, propounded by Robertson (1934). Savings is represented by the supply curve, while demand for investment funds is captured by the demand curve, which is downward sloping. As interest rates rise, individuals are more likely to save, but businesses tend to invest less, all things being equal, provided all other economic factors are held constant.

If government borrows money to run a budget deficit, the demand for loanable funds curve will shift out. This will raise interest rates and make investment more expensive. Point A in Figure 3.1 represents the initial equilibrium in the model, and Q1 is the quantity of loanable funds available to private business at the initial equilibrium. When government borrows from the money market to finance a deficit, the demand curve will move from demand1 to demand2, and this will push interest rates (the cost of borrowing) up. Invariably, businesses have to borrow at a higher interest rate, and will eventually borrow less. The reduction in business demand for investment, the difference between Q1 and Q3 in Figure 3.1 is the amount of crowding-out.

In a nutshell, government borrowing crowds out private business by increasing the interest rate from 1 to 2, and reducing the quantity that business will be willing to borrow from Q1 to Q3. The Classical economists, however, posited that the loanable funds market, if left to itself, would balance savings and investment, and keep the economy at or close to full employment. In that case, there would be no need for government deficit spending, which they believed is counter-productive in the sense that the crowding out effect implied that deficit spending shifts funds from investment to government consumption. For this reason, classical economists generally opposed government deficit spending.

The Keynesian postulates differ from the standard Classical paradigm, as they did not believe that an economy would experience full crowding out, if there are slack in the economy. First, they allowed for the possibility that some economic resources are unemployed and second, they presupposed the existence of a large number of myopic or liquidity-constrained individuals. Accordingly, they argued that the economy would experience only partial crowding out, with practically no crowding out at times of deep recession. There are several facets to this argument as the Keynesians believed that savings and investment decisions are not only dependent on the rate of interest. They argued that investment decision is a function of not only interest rates, but primarily expectations of future profit and such expectations are usually calculated by businesses, based on a number of factors, including the "animal spirits" or the state of mind or emotional psychology of the investors.

Figure 3.1: Supply and Demand for Loanable Funds meant for Government borrowing
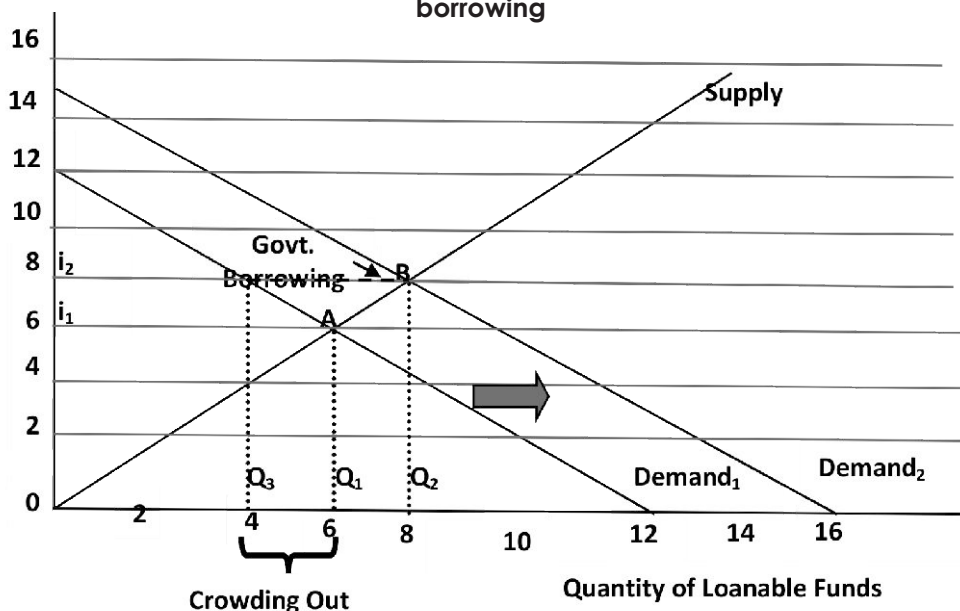
In the simplest Keynesian model, increasing the budget deficit by N1.00 causes output to increase by the inverse of the marginal propensity to save. Many traditional Keynesians, however, argued that deficits need not crowd out private investment because of unemployed resources. They opine that increase in aggregate demand enhances the profitability of private investments, leading to higher investments at any level of interest rate. Thus, deficits can stimulate aggregate savings and investments, despite the fact that they raise interest rates. Since increased consumption is gotten from otherwise un-utilised resources, interest rate cannot be assumed to be the only variable that drives investment. Thus, investment might not necessarily decrease if businesses have a positive view of economic prospects, despite the fact that government spending raises interest rates.

Reducing government fiscal deficit is not easy, at least, politically. Following the traditional Keynesian theory, if the policy maker manages to reduce the government deficit, the country can slide into recession. Budget deficit is not totally bad, despite its evil reputation. The good news about fiscal deficit, following McDermott and Wescott (1996), is that it indicates that the government is buying goods and services, paying wages to its employees, and

making transfers to its needy citizens. This helps to put money into the economy and raises the level of economic activity. Thus, a sudden break by the government, even when in pursuit of well-intentioned attempt to balance the budget, will lead to reduced business inventories, job cuts, and drastic reduction in the flow of money into the economy.

The central argument in the Ricardian observation is that fiscal deficit merely postpones taxes. Accordingly, rational agents tend to see beyond the inter-temporal veil and assume that the present discounted value of taxes is a function of real government spending, and not of the timing of taxes. This foresight, as argued by Bernheim (1989), gives rise to the "Say's Law" for deficits: the demand for bonds always rises to match government borrowing. Since the timing of taxes does not affect an individual's lifetime budget constraint, it cannot alter his consumption decisions. As a result, budget deficits (both temporary and permanent) have no real effects. This logic, however, does not depend on full employment of resources.

III.2   Theoretical Framework

The theoretical framework adapted is the Keynesian postulates on fiscal deficit.   The theory is closer to explaining quite well the behaviour of government deficit or why government experience fiscal deficit. The Keynesian theory provides a complete explanation of the recent phenomenon: the rapid accumulation of government deficit at the sub-national level, even in relatively boom and peaceful times.

Recall that under the Keynesian framework, fiscal deficits need not crowd out private investment, since there are lots of unemployed resources. Accordingly, the ensuing increase in aggregate demand boosts the profitability of private investments, and brings about higher investments at any level of interest rate. Thus, deficit may stimulate aggregate savings and investment, despite the fact that they raise interest rates. Again, fiscal deficit indicate that government is purchasing goods and services, paying employee's wages and making transfers to its needy citizens. This helps to put money into the economy and raises the level of economic activities, as such, most of the macroeconomic variables, like unemployment, cost of governance, population size, economic growth, and price level derive their existence therefrom.

The corollary to the foregoing is that governments also run persistent annual fiscal deficits when tax revenues are insufficient to fund government spending, meaning that the state must borrow from the public, using bonds. Other similar reasons, in tandem with the Keynesian postulates, are short-term, as well as deeper structural, issues facing the country.

Some of the short-term reasons include the business cycle (economic performance) effect in the country as earlier stated. Where countries experience recession or sustained period of slow growth, the economic downturn will produce minimal revenue inflow from the sources of revenue, particularly direct and indirect taxes, notwithstanding the fact that government is still expected to meet its statutory welfare spending. In other words, the tax and government spending changes that happen automatically at different stages of the business cycle will not be helpful. This means that part of the fiscal deficit may be the consequence of the automatic stabilisers.

Following the Keynesian postulate, a large and rising fiscal deficit may be a deliberate action by the government to employ expansionary fiscal policy to boost aggregate demand, output and employment, specifically when private and external sector demand are low, falling or stagnant. The Keynesians have long favoured the use of targeted and timely fiscal stimuli, like labour-intensive public works and investment in infrastructure projects, designed specifically to kick-start a chronic lack of inadequate demand in the economy. Typical factors that can contribute to fiscal deficit therefore include: slower economic growth, high public spending; high unemployment rates; economic crisis; high operating costs; expansion and business opportunities or a combination of these factors. Fiscal deficit therefore, evolve to accommodate changes in receipts (mainly taxes) and government expenditures. Surpluses increase during period of robust GDP growth, when receipts are up and public expenditures are down. Deficits, mostly occur and rise during economic slowdowns, because receipts drop (driven by the declines in income tax, arising from job losses), while expenditures rise (driven by increase in unemployment insurance claims due to job losses).

III.3   Empirical Literature

Although, there are few or no empirical studies on the cost of governance and fiscal deficits, empirical studies abound on other determinants of fiscal deficits. Krause (2000) showed that higher unemployment rates resulted in a rise in fiscal deficit. Barro (1986) estimated the tax-smoothing theory of deficit model using the United State data for two periods, 1920-40 and 1948-82, to determine if deficit during the period represented structural shift in government fiscal policy or usual reaction to other influences such as recession, inflation and government spending. He concluded that fiscal deficit and the near-term projections of deficit in the United States were mainly a reflection of the usual responses to recession and, turned to anticipated inflation. Woo (2003) discovered that in developed and developing countries, inflation, income, financial depth, and population exerted a positive impact on fiscal deficits.

Attiya et. al. (2011) examined the economic, political and institutional sources of budgets deficit of South Asia and the ASEAN countries by applying the dynamic panel model and generalised method of moments of Blundell and Bond (1998) for the period 1984 to 2010. The results showed that high income, high inflation rate, trade openness and large budget to GDP ratio were the macroeconomic factors, associated with large budget instability. They also discovered that small countries with low population growth had more volatile budget deficit, indicating that budget deficit decreased as population increased, while high corruption, low institutional quality (legal and bureaucracy) and conflicts (internal, external, ethnic and religious) caused more variations in budget deficit. Also, Cameron (1978), Rodrik, (1998), and Sanz and Velázquez, (2003), found a positive relationship between trade openness and fiscal deficit. The major inference that could be drawn from these studies was that citizens demanded more redistribution via additional public expenditures, as trade openness increased in other to hedge against external risk.

Darrat (1988), investigated the relationship between federal budget deficit and trade deficit by applying the multivariate Granger-causality tests on the U.S. quarterly data, covering the period 1960: 1 to 1984: IV. He tested four hypotheses, namely: budget deficit cause trade deficit (the conventional view); trade deficit cause budget deficit; and both variables (although highly

correlated) were causally independent, and there was a bi-directional causality between the two variables. Although, his findings partially supported the conventional view, strong evidence was found for the causality from trade-to-budget deficit.

Murwirapachena et al., (2013) investigated the determinants of budget deficit in South Africa for the period 1980-2010, using the vector error correction model (VECM). Their results revealed that foreign reserves foreign debt, unemployment, economic growth and government investment explained the variations in fiscal deficits during the study period.

Generally, literatures on the determinants of fiscal deficit are sparse for Nigeria. Ijah (2014) showed that budget deficit was driven by trade deficit in Nigeria. Onafowora and Owoye (2006) also confirmed this. They applied co-integration and Granger-causality tests to data from 1970-2001 and found that budget deficit in Nigeria were driven by trade deficit. Udoh, et. al. (2012) examined the relationship between government-type and fiscal deficit in Nigeria by applying ordinary least square (OLS) on time series data for the period 1970-2010. They found that government-type did matter for fiscal operations in Nigeria. Specifically, the authors found that democratic regimes in Nigeria did accumulate fiscal deficit, contrary to earlier expectation. In addition, the findings showed that there was a strong inclination for fiscal deficit to decrease with financial liberalisation, while liberalisation of foreign trade led to increase in fiscal deficits.

Basically, the empirical evidences differ across countries, and even within countries because of the use of different methodologies for the same country data. Equally apparent is the fact that most of the studies concentrated on the experiences of industrialised countries. There are relatively few empirical studies on the determinants of fiscal deficits for the developing countries, particularly for Nigeria. This study intends to extend the literature in this area by establishing or otherwise, the relationship between cost of governance and fiscal deficit at the state governments level in Nigeria.

IV.   Methodology
IV.1   Model Specification

Based on the adapted theoretical framework for this study and previous related studies, the empirical model is presented in Equation (1) as:

$$Fdef_{it} = B_0 + \beta_1 cog_{it} + \beta_2 totrev_{it} + \beta_3 pop_{it} + \beta_4 \inf l_{it} + \beta_5 unemp_{it} + \beta_6 ecog_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

Where 'i' indexes states 't' indexes time, 'μ_i' is the error, arising from individual state heterogeneity or differences (as we assume that there are unobserved states' individual heterogeneity)[2]; and 'ε_{it}' is the error term across time and individual specific effects. 'Fdef' is fiscal deficit. Similarly, 'cog', 'totrev', 'pop', 'infl' 'unemp' and 'ecog' are cost of governance, state total revenue, state population size, inflation, state unemployment rate and economic growth rate, respectively.

The a priori expectations of the parameters in equation 1 are as follows:

- $\beta_1 > 0$; that is, an increase in the ratio of cost of governance (or government expenditure on overhead and personnel cost) is expected to increase fiscal deficit;
- $\beta_2 < 0$; that is, a decrease in the ratio of state total revenue to total shared federal collectible revenue will increase fiscal deficit;
- $\beta_3 > 0$; that is, an increase in the population (especially non-working population) of individual states, will raise the demand for public services, which will drain the state treasury, causing an increase in government spending and, in the absence of increase in revenue, lead to fiscal deficit;
- $\beta_4 > 0$; that is, an increase in the rate of inflation will lead to a drain of the treasury as the cost of borrowing will increase, leading to increase in fiscal deficit;
- $\beta_5 > 0$; that is, an increase in the rate of unemployment will raise the demand for social services and in the absence of increase in revenue, will drain the treasury, leading to increase in fiscal deficit; and

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[2] *The basic idea in the panel data analysis that the individual relationships will have the same parameters known as the pooling assumption is most times not correct*

- $\beta_6 < 0$: that is, a decrease in the rate of economic growth will mean decrease in government revenue, in the face of increase in expenditure, due to statutory and discretionary spending, probably to stimulate economic activities, thus leading to increase in fiscal deficit.

One of the characteristics of panel data is that it can provide information on individual state's behaviour. It can also capture features across states and over time; having both the cross-sectional and time series dimensions. However, endogeneity issues are usually of concern, especially in panel data analysis. To overcome this problem, variants of the dynamic panel data models in equation 2 i.e. the dynamic GMM, dynamic difference GMM and dynamic two stage GMM are estimated.

$$Fdef_{it} = B_0 Fdef_{it-1} + \beta_1 cog_{it} + \beta_2 totrev_{it} + \beta_3 pop_{it} + \beta_4 \inf l_{it} + \beta_5 unemp_{it} + \beta_6 ecog_{it} + \mu_i + \varepsilon_{it} \ .....(2)$$

This dynamic model is specified because the static panel estimates, as do the OLS models, omit dynamic effects causing the problem of dynamic bias (Bond, 2002; Baum, 2006) and, as such, do not allow for the study of dynamics of adjustment (Baltagi, 2008).

Omitted dynamics means that such models are mis-specified, because they omit the entire history of the explanatory variables (Greene, 2008; Bond, 2002). Second, many authors posit that the dynamic panel model is designed specially for a situation where "T" is smaller than "N" to control for dynamic panel bias (Bond, 2002; Baum, 2006; Roodman, 2006; Roodman, 2009, and Baltagi, 2008)[3]. The problem of potential endogeneity is also much easier to address in the dynamic panel models than in the static and OLS models that do not allow the use of internally-generating instruments. An underlying advantage of the dynamic GMM estimation is that all variables from the regression that are not correlated with the error term (including lagged and differenced variables) can be potentially used as valid instruments (Greene, 2008). It also gives room for the choice of the most appropriate GMM, whether it is "difference-GMM", developed by Arrelano and Bond (1991); or the "System-GMM, established by Arrelano and Bover (1995) and Blundel and Bond (1998).

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[3] *There are generally three panel data types; namely, short panel with many individuals and few time periods which is our case in this study. Others are long panel comprising many periods and few individuals, and large panel comprising many time periods and many individuals.*

The study, however, chose the difference GMM of Arellano and Bond (1998), because the estimated equation gave the best result and fulfilled the underlying assumptions for dynamic panel methodology. The objectives of the study were, therefore, investigated by estimating variants of the dynamic panel data model in Equation (2). Dynamic models are very important, especially in economics, because many economic relationships are dynamic in nature and should be modeled, as such (Asteriou and Hall, 2011).

IV.2   Data and Measurement

The data for the study were sourced from the National Bureau of Statistics (NBS), and the Central Bank of Nigeria (CBN) Annual Report and Statistical Bulletin. The data covered the 36 states of Nigeria including the Federal Capital Territory, between the period 2007 and 2014. The period is justified by availability of data. Data on fiscal deficit of the states and total revenue were sourced from the CBN Annual Report for the period of study, while inflation was sourced from the CBN Statistical Bulletin. Data on unemployment rates were obtained from the NBS Publication, while population data were sourced from the 2006 population census report. However, the population figures for the 2007 to 2014 were estimated by the authors on the assumption that annual population growth rate for Nigeria would be 2,8 per cent.

Cost of governance was defined as the recurrent expenditure, associated with personnel and overhead costs. It was believed that this category of cost represented the administrative cost of running government at this level, whose data were not available on individual state basis. The cost of governance was taken as a ratio of the state total expenditure and multiplied by 100 to normalise the data along the other data on consumer price index, unemployment rate and population rate, which were all in percentage. Similarly, to bring the other variables to the same unit of measurement, total revenue was taken as a ratio of federally collectible-revenue (the net amount designated for sharing amongst the three-tiers of government) and multiplied by 100, while fiscal deficit was taken as a ratio of total state revenue, multiplied by 100.

IV.3   Estimation Issues and Procedures

This study focused on investigating the role of the explanatory variables, particularly the cost of governance on fiscal deficit across states in Nigeria, using the dynamic panel data approach. Ordinarily, the number of states (37) and the period make it practically impossible to go for pooled regression so that we do not lose the states' individual differences. Since the time dimension is less than 30, the more robust estimation model turned out to be the dynamic panel GMM approach. The dynamic panel Generalised Method of Moments (GMM) estimation employs the appropriate lags of the instrumental variables to generate internal instruments, while employing the pooled dimension of the panel data. In other words, it does not impose restrictions, regarding the length of each individual time dimension in the panel. There is, therefore, the use of suitable lag structure to exploit the dynamic specification of the data. The study estimated the variants of the dynamic GMM; differenced GMM and system GMM. Sometimes the lagged levels of the regressors are poor instruments for the first-differenced regressors. In such case, one augments with "system GMM". The system GMM estimator uses the levels equation to obtain a system of two equations: one differenced and one on levels. By adding the second equation, additional instruments can be obtained.

Thus, the variables in levels in the second equation are instruments with their own first differences and this usually increases efficiency (Mileva, 2007). However, two important points to note is that first, because system GMM uses more instrument than the difference GMM, it may not be appropriate to use system GMM with a dataset with a small number of states or countries. When the number of instruments is greater than the number of states or countries, the Sargan test may be weak.

The system GMM was also estimated because the difference GMM had been found to have poor finite sample properties, in terms of bias and imprecision, particularly when the lagged levels of the series were only weakly-correlated with the subsequent first differences (weak instruments). Difference GMM may be subject to a large downward finite-sample bias, especially when the number of time periods available is very small. Hsiao (1986) argues that OLS levels will give an estimate of the coefficient of and AR(1) model that is bias upwards in the presence of individual-specific effects, and that within groups

estimate will give an estimate of the coefficient that is seriously biased downwards in short panels (Nickel, 1981). Thus, a consistent estimate can be expected to lie between the OLS level and within the groups estimates. In other words, a difference GMM estimate that has coefficient close to that of within group estimates is downward bias. Difference GMM with weak instruments will also be downward bias. Despite all these, the difference GMM turned out to be the best in all the variants of the dynamic GMM estimated.

To investigate the specific objectives, various models (one-step and two-step difference GMM estimators) were estimated for Equation (2). The objective of examining the effect of cost of governance on fiscal deficit was duly carried out. Other explanatory variables, namely: total revenue, population size, inflation, and unemployment rates were also incorporated to ascertain their respective effects. The dependent variable was the change in fiscal deficit, divided by its lag which, taken to be the change in fiscal deficit as a function of the growth in the explanatory variables in this study.

In investigating the specific objective of the study, reference is made to 'β1' in Equation (2). The heterogeneity of the cost of governance across the states was taken into consideration. Xtabond2 was used in the estimation of the one-step and two-step difference GMM estimation because of its usefulness in fitting two closely related dynamic panel data models, that is, the Arellano-Bond (Difference) GMM estimator and the Blundell-Bond (System) GMM estimator.

In the first set of models for the one-step difference GMM estimator, the first option model had no lag interval specified for the instruments. However, in the second option model, lag interval for the instruments and with collapse was included. Different lag intervals (1 5) and (2 4) were employed, with the best result reported with lag interval (1 5).

The Sargan's test (1958, 1988) and Hansen's J test (1982) were used to verify the validity of the instruments. This was to ensure the validity of the instruments and that the number of instruments produced by the lag interval did not exceed the number of groups (states) in the model. The third option model modified the second option model by allowing for the computation of Difference-in-Hansen tests for exogeneity of instrument subsets. This involved suppressing the nomata

option from the option 2. In the second set of models on two-step difference GMM estimator, the first option model was the inclusion of 'two-step' option in the former model without a lag. However, in the second option, we specified lag interval for the two-step GMM estimator with collapse and in the third option we included both the lag interval and 'mata' options with collapse.

V. Analysis of Results

Table 4.1 presented the descriptive statistics of the variables that went into the empirical estimations. This was crucial to ensure that the data met the assumptions that were required for a more robust statistical test.

Table 4.1: Summary Statistics
Sample: 2007 - 2014

	FDEF	COG	UNEMP	TREVR	INFL	POP	GR
Mean	-4.146655	44.83203	19.82368	1.354595	10.71250	4.306588	7.573750
Median	-2.750000	44.05500	18.88000	0.980000	11.05000	3.960000	7.670000
Maximum	78.70000	97.56000	67.40000	10.58000	15.10000	11.73000	8.600000
Minimum	-354.1900	0.000000	1.300000	0.000000	6.600000	1.450000	6.940000
Std. Dev.	30.47979	18.79096	9.602577	1.345940	2.834296	1.955311	0.519915
Skewness	-5.401482	0.314214	0.923641	3.601022	0.059192	1.688125	0.494133
Kurtosis	61.90728	2.784251	5.725409	19.01166	1.701081	6.434003	2.488965
Jarque-Bera	44236.85	5.444791	133.6971	3801.660	20.98153	286.0278	15.26652
Probability	0.000000	0.065717	0.000000	0.000000	0.000028	0.000000	0.000484
Sum	-1227.410	13270.28	5867.810	400.9600	3170.900	1274.750	2241.830
Sum Sq. Dev.	274060.2	104164.6	27201.80	534.4084	2369.804	1127.856	79.74194
Observations	296	296	296	296	296	296	296

Source: Computed by the Authors

The description of the data was shown in Table 4.1. Fiscal deficit (FDEF) averaged at negative 4.1 per cent, indicating that the fiscal deficit across the states was moderately low. The low range was indicative of the years of surplus across some states. The cost of governance (COG) recorded an average of 44.8 per cent, while the unemployment rate, across the states was 19.8 per cent. Inflation (INFL) was also relatively high at 10.7 per cent, while the average GDP growth rate, population (POP) and ratio of state total revenue to total

shared federal collectible revenue were 7.6, 4.3, and 1.4 per cent, respectively. The distribution of the variables showed that they were leptokurtic and positively-skewed. The probability of the Jarque-Bera showed that the variables were normally-distributed at 1 and 5 per cent respectively, except cost of governance that was normally-distributed at 10 per cent. The number of observations was the same across all the variables, indicating that the panel variable was strongly balanced.

Table 4.2 displayed the correlation matrix of all the variables. The apriori expectation of the variables was also depicted with the correlation matrix. All the variables maintained their apriori expectations, except GDP growth rate, which posted a positive correlation with the dependent variable. From Table 4.2, cost of governance (COG), and economic growth, had positive correlation with fiscal deficit (FDEF). However, only the cost of governance was significant. Other variables, including unemployment, ratio of state total revenue to total shared federal collectible revenue, inflation, and population, all had negative relationship with the dependent variable. Ratio of state total revenue to total shared federal collectible revenue and population was significant, while unemployment and inflation were not.

Table 4:2 Covariance Analysis: Ordinary
Sample: 2007 - 2014

Correlation Probability	FDEF	COG	UNEMP	TREVR	INFL	POP	GR
FDEF	1.000000						

COG	0.134550	1.000000					
	0.0206	-----					
UNEMP	-0.014472	0.014564	1.000000				
	0.8042	0.8030	-----				
TREVR	-0.156866	-0.097240	0.060088	1.000000			
	0.0068	0.0949	0.3028	-----			
INFL	-0.011445	0.029106	-0.139598	0.227614	1.000000		
	0.8445	0.6180	0.0162	0.0001	-----		
POP	-0.165997	0.047871	-0.030308	0.254960	0.046520	1.000000	
	0.0042	0.4119	0.6035	0.0000	0.4252	-----	
GR	0.028395	0.118318	0.046776	0.022437	-0.102424	-0.048950	1.000000
	0.6266	0.0419	0.4227	0.7007	0.0785	0.4014	-----

Source: Computed by the authors

V.1   Empirical Analysis

The results of the models (one-step and two-step difference GMM estimators) were shown in Table 1.3. For all the models estimated, the Hansen diagnostics tests showed that the models were suitable. The Hansen J-test statistic indicated that the instruments were appropriately uncorrelated with the disturbance process. Thus, this made the instruments valid and satisfied the orthogonality conditions. Also, autocorrelation tests (AR1and AR2) indicated that there was no problem of serial correlation in the models.

V.2   Fiscal Deficit and Cost of Governance

Table 1.3 presented the three models each for one-step and two-step Arellano-Bond (Difference) and system GMM, respectively. In each of the models, the number of instruments did not exceed the number of states (groups). The diagnostics were also satisfactory, but the DGMM2 option was preferred to other options. Since diagnostics were also confirmed to be satisfactory, any statistical inference drawn from the regression results was assumed to be valid. The interpretation focused on the significance, sign and size of the estimated coefficients.

The DGMM2 model showed the relationship among fiscal deficit, cost of governance and other explanatory variables. The findings indicated that cost of governance had a significant and positive influence on fiscal deficit and portended an important driver in the variation of fiscal deficit across states in Nigeria. In other words, cost of governance contributed to the variation in fiscal deficit across states in Nigeria. From Table 4.3, it explained 59.5 per cent of the variation in fiscal deficit across states in Nigeria. Unemployment, state total revenue, population, economic growth and inflation, all maintained their respective a priori expectations. However, while inflation, population and economic growth significantly affected fiscal deficit across States in Nigerian, unemployment, and state total revenue as a ratio of federally-collectible revenue do not affected fiscal deficit across State in Nigeria, significantly.

In terms of size and explanatory power, population and cost of governance explained more than 50. 0 per cent of the variation in fiscal deficit across states in Nigeria and found to be significant at 1.0 per cent. Unemployment rate and

state total revenue as a ratio of federally-collectible revenue explained less than 12.0 per cent of the variation in fiscal deficit across states and were found not to be significant. Overall, cost of governance could explain a substantial variation in fiscal deficits across State in Nigerian during the study period.

Table 4:3 One-Step and Two-Step Arellano-Bond (Difference); and System GMM Regression for Fiscal Deficit and Cost of governance (2007-2014)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	DGMM1-CL-a	DGMM2	DGMM2-CL-a	SGMM1	SGMM1-CL-a	SGMM2	SGMM2-CL-a	SGMM2-END-CL-a	SGMM2-END-CL-b
L.fdef	-0.231	-0.00115	-0.231	0.185**	0.169***	0.183**	0.216***	-0.211	-0.286
	(0.229)	(0.0965)	(0.229)	(0.0729)	(0.0627)	(0.0757)	(0.0513)	(0.536)	(1.227)
L2.fdef								-0.0485	0.0482
								(0.247)	(0.515)
Cog	0.487***	0.595***	0.487***	0.321**	0.341***	0.354***	0.331**	0.371	0.0920
	(0.165)	(0.178)	(0.165)	(0.129)	(0.128)	(0.125)	(0.130)	(0.418)	(0.368)
unemp	-0.0667	-0.0811	-0.0667	-0.0294	-0.0553	-0.0313	-0.0854	-1.097	1.951
	(0.244)	(0.218)	(0.244)	(0.211)	(0.185)	(0.227)	(0.154)	(4.002)	(10.51)
Trevr	-11.59	-12.04	-11.59	-7.425	-7.743	-7.511	-7.653	0.340	13.02
	(9.883)	(8.507)	(9.883)	(6.563)	(6.657)	(5.982)	(4.984)	(12.23)	(21.41)
Infl	-3.514**	-4.984***	-3.514**	1.171	0.991	1.001	-0.205	-4.292*	-1.249
	(1.512)	(1.667)	(1.512)	(1.910)	(1.907)	(1.514)	(1.092)	(2.336)	(8.674)
Pop	-66.80***	-83.85**	-66.80**	-1.510	-1.551	-1.268	-0.0723	-42.06	29.97
	(25.72)	(35.06)	(25.72)	(1.348)	(1.278)	(1.344)	(0.986)	(31.20)	(85.09)
Gr	-11.93**	-12.48**	-11.93**	0.392	-0.918	-0.295	0.242	-7.178	9.759
	(5.088)	(5.240)	(5.088)	(2.418)	(2.940)	(1.734)	(1.899)	(6.427)	(24.49)
Constant				-18.09	-6.043	-14.33	-6.571	276.7	-258.6
				(12.45)	(10.63)	(14.10)	(12.15)	(186.7)	(770.9)
Observations	222	222	222	259	259	259	259	222	222
Number of sid	37	37	37	37	37	37	37	37	37
state effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
year effect	NO	NO	NO	NO	NO	NO	NO	NO	NO
Hansen_test	3.513	22.35	3.513	29.08	5.020	29.08	5.020	4.537	0.158
Hansen Prob	0.476	0.322	0.476	0.308	0.414	0.308	0.414	0.475	0.691
Sargan_test	7.587	60.72	7.587	84.11	11.78	84.11	11.78	5.534	0.605
Sargan Prob	0.108	5.50e-06	0.108	4.80e-08	0.0379	4.80e-08	0.0379	0.354	0.437
AR(1)_test	-1.494	-1.489	-1.494	-1.846	-1.883	-1.642	-1.681	-1.037	-0.331
AR(1)_P-value	0.135	0.136	0.135	0.0650	0.0596	0.101	0.0927	0.300	0.740
AR(2)_test	0.357	0.769	0.357	1.047	1.123	1.030	1.049	0.713	-0.875
AR(2)_P-value	0.721	0.442	0.721	0.295	0.261	0.303	0.294	0.476	0.382
No. of Instruments	11	27	11	34	13	34	13	14	10

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

V.3   Post Estimation Results

The post estimation results verified the validity of the instruments, as well as the heterogeneity test. Also confirmed were the AR(1) and AR(2) tests. The results in table 4.3 presented strong evidence against the null hypothesis that the over-identifying restrictions were valid. Again, the number of instruments was not more than the number of groups (the states). The result for AR(1) process was rejected, while the result for AR(2) in the first difference for DGMM2, was not rejected. This is more important as it detected the autocorrelation in levels.

VI.   Conclusion and Policy Recommendation

This study was able to establish that cost of governance has significant effect on fiscal deficit across the Nigerian states. This empirical evidence alluded to the structuralists' theoretical view that governments, most times, are inefficient and this leads to fiscal deficit. One of the major concerns in fiscal management is the manner in which public resources are managed. From the empirical results, we can infer that undue concentration of the bulk of the financial resources at the state level of government towards recurrent outlay, and particularly cost of governance, contributes to the perennial fiscal deficit observed at this level of government. This underscores the need for strengthening public financial management reforms (like Fiscal Responsibility Act, the Medium-Term Expenditure Framework, and the Treasury Single Account) in states where such reforms are in operation and domesticate where it has not. This will engender fiscal discipline and, thus, propel states to cut down on fiscal deficit over time, as they channel more resources to infrastructure development.

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