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EFFECTS OF BUDGET DEFICITS ON THE CURRENT ACCOUNT BALANCE IN NIGERIA: A SIMULATION EXERCISE

FESTUS O. EGWAIKHIDE

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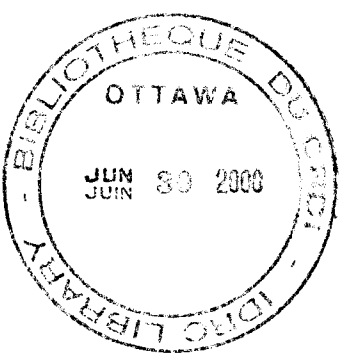
Effects of budget deficits on the current account balance in Nigeria: A simulation exercise



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Effects of budget deficits on the current account balance in Nigeria: A simulation exercise

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Abstract

This paper examines the effect of budget deficit on the current account balance in Nigeria, covering the period from 1973 to 1993. This is motivated by the fact that the magnitude of government has increased with amazing rapidity since the early 1980s. Simultaneously, the current account balance recorded deficits, to the extent that there is a high correspondence between these variables. A macroeconometric model that captures the salient interrelationships between government budgetary developments, credit creation and the current account balance is constructed. Quantitative evidence suggests that budget policy affects the current account balance in Nigeria. In particular, simulation experiments show that budget deficit, engendered by increased expenditure, leads to a deterioration of the current account, whether it is financed through bank credit or external borrowing. It is argued that budget discipline is necessary for the achievement of external balance in Nigeria.

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I. Introduction

A striking feature of Nigeria's fiscal operations since the second half of the 1970s is persistent and rising budget deficits. The ever-rising government deficit, particularly since 1986 has attracted the attention of economists, policy makers, the World Bank and the International Monetary Fund (IMF). Concerns about the magnitude and management of budget deficits will probably be greater when it is recognized that a recent credible empirical enquiry has demonstrated that this fiscal disease is unsustainable.[1]

The development of budget deficit is often traced to the Keynesian inspired public expenditure led growth of the 1970s. Statistics show that the magnitude of nominal expenditure of the federal government, which recorded ₦839 million in 1970, leapt dramatically to about ₦5 billion in 1970 and thereafter rose further to over ₦14.0 billion in 1980. Indeed, expenditure grew at a compound annual growth rate of about 7% during 1970—1980. This rapid growth was enhanced by the huge increases in oil revenue. Quantitatively, the federally collected revenue, which registered barely ₦633 million in 1970, surged through ₦4.5 billion in 1974 to slightly above ₦15.0 billion in 1980. The disparity between government revenue and expenditure generated enlarged deficits from the second half of the 1970s, except in 1979. In 1975–1978, for example, the cumulative budget deficit of the central government was ₦4.8 billion. Relative to gross domestic product (GDP), budget deficit oscillated between 2% and 7% in the period.

Evidence suggests that government deficit, notably in the last 15 years, has been financed largely through money creation by the central bank. Consequently, monetary policy has been vastly expansionary, with direct implications for price inflation and exchange rate. Findings from various comprehensive studies have generally indicated that countries with successful trade reforms tend to pursue tight monetary and fiscal policies.[2] It follows that the expansionary macroeconomic policy, triggered by budget deficit, is hardly compatible with the trade liberalization currently being implemented, but has simultaneously complicated the task of economically rational restructuring and stabilization.[3]

Developments in the external sector also reveal that periodic deficits in the current account have characterized Nigeria's balance of payments profile. Statistically, the current account deficit deteriorated from ₦259 million in 1976 to ₦5.2 billion in 1982, though relatively large surpluses were recorded in the two years, 1979–1980. A close inspection of the available data demonstrates some degree of association between budget deficit and the current account deficit, a reflection of the expansion in domestic absorption that could not be satisfied from domestic supply.

Although a number of authors have acknowledged this observed sequence (e.g., Fajana, 1993; Egwaikhide, 1989), specific investigations into the effects of government deficit on the current account balance in Nigeria are sketchy at best.[4] It is the intention of this study to examine this phenomenon, covering the period between 1973 and 1993. The methodology of rendition is the development of an empirically testable structural model that captures the salient interrelationships between budget deficit, domestic credit, aggregate demand, price level and the balance of payments. This is followed by counterfactual simulation exercises of the impact of budget deficits on the current account balance. In this regard, specific attention is focused on the effects of alternative financing of fiscal deficits on the current account balance, bearing in mind the principal policy implications of results.

The rest of the paper is organized into six sections. Discussed in Section II are the profiles of fiscal operations, monetary and balance of payments developments in Nigeria. Section III sketches the relevant literature, and the theoretical framework and the model specification are the main themes of Section IV. Section V presents estimates of the behavioural equations, together with the model evaluation. Policy simulation results are compiled in Section VI. Section VII concludes.

II. Fiscal, monetary and balance of payments developments

Following the Middle East crisis in 1973/74, the average export price of Nigeria's crude oil leapt from US$4.13 a barrel in 1973 to US$14.74 in 1977 and thereafter increased to US$35.2 in 1980. In consequence, the federally collected revenue surged from ₦633.3 million in 1970 to ₦5.5 billion in 1975; by 1980, it had exceeded ₦15 billion, representing 11.3%, 25.3% and 30.0% of gross domestic product (GDP), respectively. There was a rapid expansion in aggregate demand, led by growth in government expenditure. Expressed as a percentage of GDP, expenditure of the federal government fluctuated between 9.7% and 28% during 1970–1980.

The structural weaknesses of the Nigerian economy became exposed when the prices of crude oil slumped in the world market from about US$41 a barrel in 1981 to around US$11 in July 1986. Since the government had developed a high propensity to spend during the oil boom, it became exceedingly difficult to align expenditure with revenue. Thus, the magnitude of the federal government deficit, which was only ₦2.0 billion in 1980, has risen through ₦12.2 billion in 1988 to ₦101 billion in 1993. During this period, the budget deficit-GDP ratio fluctuated between 2% and 12.5%; in particular, since 1986 this ratio has deviated substantially from the target of 3% proposed under the economic reform programme.

The growing fiscal deficit has been increasingly financed from central bank credit. As a result, monetary policy has been expasionary. Table 1 contains statistics on monetary survey from 1975 through 1993. The huge annual changes in aggregate credit evident during this period are particularly striking between 1986 and 1993, rising from about ₦4 billion to ₦107.6 billion, except in 1989 when a negative value of ₦8 billion was reported. A decomposition of the total credit suggests that cumulatively the net claims by government dominated. The increased reliance on bank credit to balance government budget has accelerated the growth of money supply. In the 14 years from 1980 to 1993, for example, the mean annual growth rate of money supply (M2) was 25%, with a yearly average for the second half of this period recording some 35.4%. The rapid growth in money supply has been inflationary, as demonstrated in Figure 1.

Concurrently, periodic deficits have characterized the major elements of Nigeria's balance of payments table (see Appendix Table A1).

The current account registered substantial deficits in 1981–1983, surpluses in 1984–1985 and continuous deficits from then on. Since 1985, there has been no single year in which the capital account did not record a deficit, but with large variations from year to year. In 1981– 1983, the balance of payments position was in a crisis and it alternated between deficits and surpluses thereafter. A deeper interpretation indicates that excluding

Table 1: Indicators of monetary developments in Nigeria, 1975—1993

Year	Annual change in aggregate credit (₦ million)	Annual change in credit to government (₦ million)	Annual change in credit to private sector (₦ million)	Annual growth in money supply (M1)	Annual growth in money supply (M2)
1975	1,337	679	629	52.1	55.7
1976	1,907	1,260	616	51.4	88.5
1977	2,920	1,828	996	45.4	0.9
1978	1,783	829	787	-5.9	-2.0
1979	9,220	170	495	20.5	30.9
1980	2,040	226	1,689	59.1	46.1
1981	5,481.3	3,018	2,463.3	5.6	7.9
1982	5,638.3	3921	1,717.3	3.1	8.7
1983	6,278.7	5,296.3	982.4	12.3	14.7
1984	2,963.2	2,375.1	588.1	8.2	11.5
1985	15,387	780.5	758.2	8.7	10.3
1986	4,139.9	475	3,664.7	-1.2	3.2
1987	10,106.2	1,995	8,111.2	13.7	22.04
1988	10,399.9	6,102.4	4,297.5	41.9	42.6
1989	-8,067.2	-9,236.4	1,169.2	21.5	8.0
1990	8,415.8	2,727.6	5,688.2	44.9	40.4
1991	26,148.8	17,454.6	8,694.2	32.6	32.7
1992	57,912.0	42,216.9	15,695.1	52.8	49.2
1993	107,618.6	97,460.3	10,158.3	54.6	52.8

Sources: Credit and money supply data for the period 1975–1980 were obtained from the IMF, *International Financial Statistics Yearbook* 1993; data for the remaining period are from the Central Bank of Nigeria, *Annual Report and Statement of Accounts.*

the exceptional financing (deferred/rescheduled debt services) component, which began to feature from 1986, the overall balance of payments position recorded annual deficits.

Available historical data suggest that there is some degree of association between budget deficit and the current account deficit (see Figure 2). In order to indicate the direction of causation, the Granger causality test was conducted. Test statistics (based on the standard F statistic) show a unidirectional causality from fiscal deficit to the current account deficit that is significant at the 5% level. It can be inferred from this that government must maintain a reasonable balance between its revenue and expenditure in order to control budget deficit and prevent a deterioration of the current account balance.

To sum up, Nigeria has presenteds a clear picture of a twin problem of fiscal deficits and balance of payments disequilibrium since the second half of the 1970s. Historical data suggest that there is a link between these macroeconomic variables. Thus, it is basic to evaluate quantitatively the nature of this relationship in order to provide a deeper understanding and draw some policy lessons. What follows is a review of the literature on the subject and the theoretical framework on which the model for further enquiry is anchored.

Figure 1: Inflation and growth in money supply

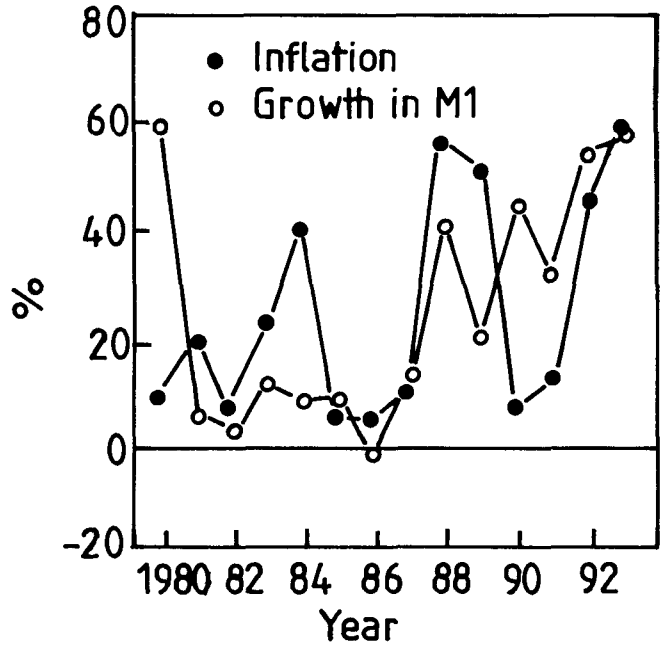
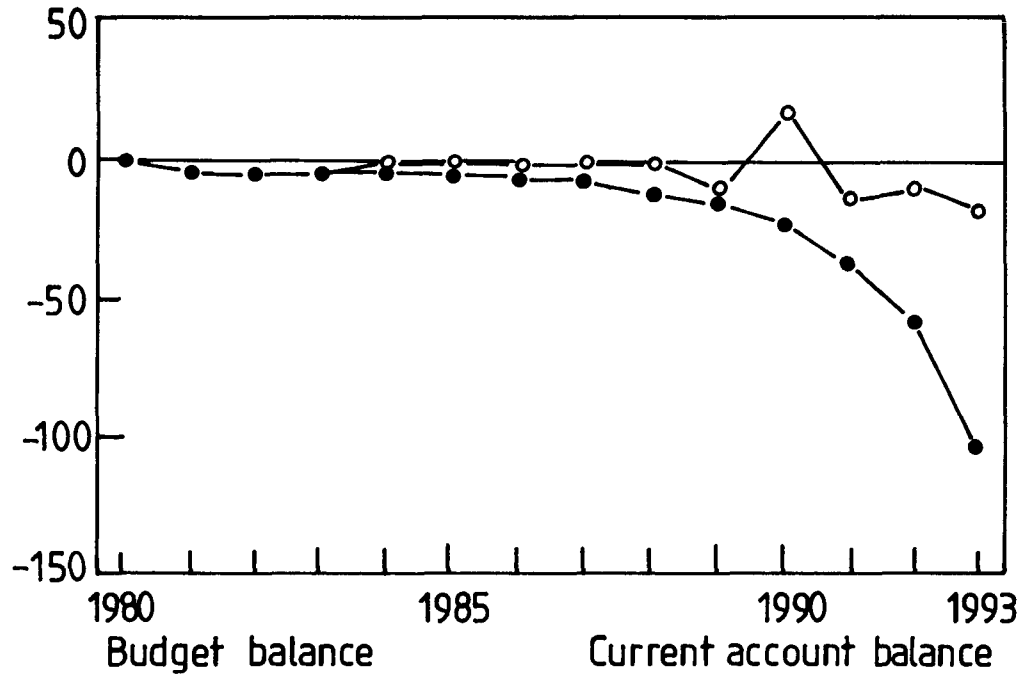


Figure 2: Budget balance and the current account balance in Nigeria



III. Review of previous literature

There are a few empirical studies that have specifically examined the impact of budget deficit on the current balance in developing countries. Only those that are directly relevant to the current study are discussed. Morgan (1979), for example, developed a framework using the concepts of domestic budget balance and foreign budget balance to demonstrate the interrelationships among budgetary development and domestic liquidity, aggregate demand, and the balance of payments. Findings from the 12 oil exporting countries considered show that there are strong relationships among fiscal operation, credit creation, inflation and the balance of payments.

In Nigeria, Olopoenia (1986) adopted Morgan's analytical framework to evaluate the implications of fiscal operations in Nigeria's balance of payments developments. On the basis of the theoretical relationships established, the argument was advanced that because the source of financing the domestic budget balance comes mainly from the foreign budget balance, increased aggregate demand enhanced through the monetization of foreign exchange earnings would propagate inflation and create a balance of payments problem. The policy relevance of this theoretical exposition is the recognition that adequate care must be taken in financing budget deficit through credit creation in order to achieve the macroeconomic objective of price stability with external balance.

Aghevli and Sassanpur (1982) developed a macroeconometric model to investigate the impact of a rise in crude oil prices in the Iranian economy, covering 1960 to 1977. Although the model is highly aggregative, it recognizes important structural relations between fiscal operations and the balance of payments in this country. Simulation results indicate that increased oil revenues stimulated the growth of the economy of Iran. There is also the finding that the expansion in government expenditure induced by the rise in oil revenues precipitated a deterioration of the balance of payments via increased expenditure on imports. These authors suggested that government expenditure should be related to the absorptive capacity of the economy so as to maintain external balance. This proposal should be relevant to other developing countries that consider government as the engine of growth, *a la* Keynes (1936).

Reference to the work by Zaidi (1985) becomes relevant here. Central to this study is the effect of savings, investment and fiscal deficits on the current account deficits of some developing countries. The Granger (1969) and Sims (1972) causality tests were explored to investigate the relationships between each of these macroeconomic variables and the current account deficit. Test results demonstrate that annual changes in both domestic investment and savings cause changes in the current account balance. Evidence of causal relationship between the current account balance and investment behaviour, an

indication that foreign exchange constraint may have inhibited the volume of investment, was found for some of the countries in the sample.

There is an aspect of the article by Zaidi (1985) that examined the relationship between fiscal deficit and the current account balance. This was conducted using cross-sectional time-series data drawn from 12 developing countries. Although the estimated results showed a direct association between these variables, the causality tests conducted for some countries were diverse. Bi-directional causality exists between fiscal deficits and the current account deficits for South Korea and the Philippines, but a unidirectional causality (from the current account deficit to budget deficit) was the case for Thailand and Greece. As for Brazil, the result showed that the two variables are statistically independent for the period between 1972 and 1980.

Perhaps the most comprehensive empirical research on the impact of budget deficit on the current balance is that of Mansur (1989). This study, which is based on the Philippines, covered the period between 1970 and 1982. The study used a structural model (containing price, revenue, import, income and private sector absorption equations, with relevant identities) explaining the inter-relationships between fiscal expansion and the current account balance, on the one hand, and government fiscal operations, domestic credit and money supply, on the other. Simulation results demonstrate that enlarged budget deficits (resulting from increased government expenditure) financed from both bank credit and external borrowing lead to a deterioration of the current account. It was proposed that the achievement of a sustained balance of payments position in the Philippines required fiscal restraint.

Concerned about the rapid expansion of budget deficit in developing countries, Bartoli (1989) developed a set of structural equations to evaluate the impact of this phenomenon on the current account balance. The results of the model, which were applied on ten Latin American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela), are easily discernible. Particularly revealing from this research is the finding that inflation tax and the method of financing budget deficit worsens the current account balance through its negative impact on domestic savings. The study submitted that short-run movement in the current account balance in the sampled countries is explained by government capital expenditure, which tended to crowd-in private investment as it raised domestic absorption, which aggravated the current account deficit. The need to control budget deficit in order to achieve a viable current account balance is obvious from this result.

Prior to these quantitative investigations, Kelly (1984) had examined the impact of fiscal deficit on the current account balance. The results of this comprehensive study, which focused on industrialized countries, suggest a strong positive association between budget deficit and the current account deficit. It will be recalled that Milne (1977) and Tahari (1978) had earlier reached similar conclusions, using single equation models.

IV. Theoretical foundation and model specification

This section presents the theoretical underpinning of the model and the detailed specification of the structural and definitional equations the model used.

Theoretical exposition

The framework on which the empirical model is erected draws largely on the theoretical strand of the literature on the fiscal approach to the balance of payments. Only the relevant aspects of this approach are sketched here, since this has been the pre occupation of several studies (e.g., Milne, 1977; Kelly, 1982; IMF, 1987; Bartoli, 1989). Under this theoretical approach, the current account balance is defined as the difference between monetary value of domestic production and aggregate demand (absorption). The current account is in surplus when absorption is less than income and in deficit when absorption exceeds income. Government expenditure is an important component of aggregate demand, a factor that has impact on imports. An increase in government outlay that is not met by the available revenue usually triggers a series of developments in the economy, due to the resultant budget deficit.

This discussion can be simplified from the national income identity, which states that:

$$M_t - X_t = (I-S)_t + (G-T)_t \tag{1}$$

where M stands for imports, X is exports, I represents investment, S is savings, and G and T denote government expenditures and taxes (revenue), respectively. The balance of trade in goods represented by (X-M) is what is often referred to as the current account balance (CAB). Thus, Equation 1 can be rewritten as:

$$CAB_t = (I-S)_t + (G-T)_t \tag{2}$$
$$\text{where, } CAB_t = (M-X)_t$$

A direct interpretation of this equation is that the current account deficit is the sum of excess investment over savings and the fiscal deficit.

In general, it has been argued that there is little problem if the deficit in the current account corresponds with the saving-investment gap, provided external resources can be mobilized and used productively, since it will facilitate the growth process. However, if the current account deficit deteriorates due to increased consumption relative to income,

there will be a rise in indebtedness, with a fall in future consumption levels as the inevitable concomitant. This occurs because the debt has to be serviced from a level of output that may not have witnessed any substantial increase. This reasoning is central to the growth cum debt model associated with the works of Avramovic (1964) and Solomon (1977).

When the fiscal deficit (excess of government spending over revenues) generates the current account deficit, domestic absorption exceeds domestic output. Two fiscal policy options are generally available to reduce the budget deficit: reducing government expenditures or raising taxes. Governments of most developing countries find it difficult to reduce their outlays because of their degree of participation in the economy. There is limited scope for increased taxes because of low per capita income; in addition, the large size of the informal sector in these economies is often very difficult to tax.

Thus, it is common for most developing countries to finance their budget deficits through bank credit. This is how the fiscal operation affects domestic liquidity in the economy. But the use of bank credit has two important direct effects. First, credit to the public sector expands aggregate demand via its impact on government expenditure. The increase in aggregate demand, engendered by growth in public expenditure, tends to raise private sector income and, therefore, the demand for goods and services through the multiplier process.

The second immediate effect is easily understood and domestic money supply is central to it. The growth of bank credit directly influences the money base (high powered money), which, in turn, expands the growth of money supply the direct correspondence between money supply and price inflation is well exposed in the monetarist theory of inflation.[5] This discussion can be represented schematically as:[6]

$$\sum_{i=1}^{t-1} BD_i \rightarrow MB_t \rightarrow MS_t \rightarrow \begin{matrix} r \searrow \\ P_t \\ Y_t \nearrow \end{matrix} \rightarrow BD_t \rightarrow \sum_{i=1}^{t} BD_i \rightarrow MB_{t+1} \rightarrow MS_{t+1}$$

where BD defines government budget deficit, MB is the money base, P is the general price level, MS represents money supply, Y denotes real output and r is interest rate. Even within the monetary framework, excess supply of real money balances directly stimulates real private expenditure. For most developing countries, an increase in both public and private expenditures for domestically produced goods, which are generally in short supply, often pushes up the prices of non-tradeables. This tends to increase the demand for imports.

The basic logic of this argument is easily appreciated. Under a fixed exchange rate, increases in the prices of non-tradeable goods relative to those of tradeable goods often create distortions in resource allocation, with the over-valuation of the real exchange rate. Expenditure may have to be switched to the relatively cheap goods — tradeable goods — so resources can be used in the production of non-tradeables. Over time, this generates balance of payments difficulties and a gradual erosion of international competitiveness.

The model

Our model recognizes the main channels of interactions among such variables as imports, consumption, revenue, domestic money supply, inflation and the balance of payments. It also takes account of the historical relationships among fiscal policy, domestic liquidity, inflation and the balance of payments in Nigeria.

Price equation

A modification of the pure monetarist model of inflation, basically of the Harberger-type, is attempted. In this specification, the movement in the price level is hypothesized to depend on money supply, real output, expected rate of inflation and exchange rate, so that:

$$\text{InP}_t = a_o + a_1 \text{InMS}_t + a_2 \text{InY}_t + a_3 \prod_{t-1} + a_4 \text{InEP}_t \quad (3)$$

$$a_1, a_3, a_4 > 0; a_2 < 0$$

where P, MS and Y are as defined previously; $\prod_t$ and EP are the expected rate of inflation and the parallel market exchange rate, respectively. The inclusion of exchange rate is influenced by the fact that a recent study has shown that this variable has a significant influence on the price level (see Egwaikhide et al., 1994; more importantly, it serves as a cost element on the general price level. Overall, the specification of the price equation takes into account both monetary and structural influences.

Government revenues and expenditures

The determination of the revenue equations acknowledges the different sources of government revenue. For convenience, total government revenue is decomposed into four. These are petroleum revenue (PR); income from import taxes (MR); receipts generated domestically other than petroleum revenue (OR); and export tax revenue (ER). Thus:

$$TR_t = PR_t + MR_t + ER_t + OR_t \quad (4)$$

Revenue from import duties is functionally related to the value of imports.

$$InMR_t = b_o + b_1 InM_t \quad (5)$$

where, M represents real imports.

Other revenues that are domestically generated consist of income from excise duties, personal and company income taxes, and non-tax revenue; they are determined by the performance of the economy measured by aggregate income.

$$InOR_t = c_o + c_1 InY_t \quad (6)$$

By the result of this equation, it may be possible to have insights into the response of domestic revenue to the growth of the economy. It should be noted that the specification of the revenue equations is influenced by the tax handle literature, which generally relates revenue from taxes to economic variables that proxy the base on which the tax rates are imposed.

Revenue from export taxes is treated as exogenous to the model. This is because the income from this source has been negligible, particularly since the early 1970s. Indeed, since 1987, the federal government has abolished export duties as part of the generous incentives to boost non-oil exports. Oil revenue is also exogenous in the system. This is so treated, largely because the official prices of Nigeria's crude oil export and production levels are determined by the Organization of Petroleum Exporting Countries (OPEC).

Next is government expenditure (GE). This is divided into transfer expenditure (GT) and other government expenditures (GO).

$$GE_t = GT_t + GO_t \quad (7)$$

Government transfer expenditure (interest plus capital repayment on internal and external debt) is exogenous in the model. Other expenditures are related to total government revenue; the lagged value of other expenditures is also included in this model to capture lag in adjustment.

$$InGO_t = d_o + d_1 InTR_t + d_2 InGO_{t-1} \quad (8)$$

This specification is based on the notion that government tends to keep expenditure in line with revenue. The lag value of other expenditures helps to assess the responsivesiness of this group of expenditures to inflation, thereby providing an empirical test of the Tanzi effect (Tanzi, 1977).

Export supply and import demand equations

For simplicity, total export (X) is disaggregated into oil and non-oil exports, so that:

$$X_t = OX_t + NOX_t, \quad (9)$$

where OX is oil export and NOX stands for non-oil exports. It has been indicated that neither the price nor the output of crude oil is within the control of the Nigerian government; they are regulated by OPEC. Consequently, oil export is treated as an exogenous variable in the model.

Non-oil exports are expressed as a function of domestic capacity constraint measured by trend output of agriculture (AO) and relative prices (i.e., ratio of export price to domestic price).

$$In\ NOX_t = e_o + e_1\ InAO_t + e_2\ In\ (Px/p)_t \quad (10)$$

It is envisaged that as the capacity to produce increases, exports are expected to rise and hence, the parameter e_1 is hypothesized to be positive. Following the small country assumption, export prices in the world market are exogenously determined. When there is an increase in the price of exports relative to domestic prices, the magnitude of exports is expected to rise.

It would have been fascinating to estimate two separate import demand equations, one for the government and the second for the private sector. Unfortunately, import statistics in Nigeria are not disaggregated in this fashion and consequently only the demand for aggregate import is explained. This specification draws on the work of Mansur (1989: 318), with the demand for aggregate import being related to domestic absorption and import prices relative to domestic prices.

$$InM_t = f_o + f_1\ InAD_t + f_2\ In(PM/P)_t + f_3\ InM_{t-1} + f_4\ DU$$
$$f_1 > o;\ f_2 < o;\quad o \leq f_3 \leq 1. \quad (11)$$

where AD stands for domestic absorption and PM and P are import and domestic prices, respectively. This equation is slightly different from the traditional import demand model that considers income and relative prices as the explanatory variables. A dummy variable (DU) is introduced to capture the period when the government imposed quantitative restrictions on import. The estimation of Equation 11 in natural logarithmic form suggests that the parameters f_1 and f_2 can be read directly as short-run aggregate demand and price elasticities of import demand, respectively; $f_1 / (1\text{-}f_3)$ and $f_2/(1\text{-}f_3)$ are the corresponding long-run elasticities.

Domestic absorption is defined as the sum of private sector consumption and investment, and government expenditure. Due to lack of adequate and reliable data on private sector investment in Nigeria, aggregate investment is used instead. Thus:

$$AD_t = PC_t + I_t + GE_t \quad (12)$$

where:

PC = private consumption
I = aggregate investment
GE = government expenditure

From this equation, it is possible to trace the direct impact on imports by an enlarged budget deficit, brought about by increased government expenditure via its effect on aggregate demand. The difference between aggregate exports and imports defines the balance of trade (TB) and the literature on this generally refers to it as the current account balance.

$$TB_t = X_t - M_t \quad (13)$$

Real income

Real income is endogenous in the model and is defined as:

$$Y_t = PC_t + I_t + GO_t + X_t\text{-}M_t \tag{14}$$

By Equation 14, it is possible to evaluate changes in income brought about by movements in total demand for local goods, precipitated by demand management policies (see Mansur, 1993: 319).

Investment function

Lack of data does not permit the bifurcation of investment into public and private components. Thus, aggregate investment function is instead used in the model. Gross investment in the economy is related to changes in aggregate income as:

$$I_t = f(Y_t - Y_{t-1}) \tag{15}$$

Relating investment to changes in total output introduces the concept of the accelerator principle. The estimated equation is of the form:

$$InI_t = g_o + g_1 In(Y_t - Y_{t-1}) + g_2 InI_{t-1} \tag{16}$$

Private consumption

Private consumption is explained by disposable income (DY) in a Koyck distributed lag scheme:

$$InPC_t = h_o + h_1 InDY_t + h_2 InPC_{t-1} + h_3 \Pi_t \tag{17}$$
$$o < h_1 < 1,\ 0 \leq h_2 \leq 1$$

This specification is consistent with the conventional consumption function (Friedman, 1957; Brown, 1970). However, the estimated model is further simplified to take account of the impact of inflation (Π) on consumption, an exercise that is well justified in Deaton (1977) and Davidson et al. (1978).

Budget deficit, credit creation and money supply relationships

A discussion of the fiscal-monetary links is easily understood with the use of the balance sheet relationship of the central bank. Under this framework, total domestic credit is the sum of changes in credit to the private sector by the banking system and net claims by

the government.

$$DC_t = DC_{t-1} + (GE_t - TR_t - NEB_t) + \partial CP_t \quad (18)$$

where DC is aggregate domestic credit, NEB stands for net external borrowing and CP denotes credit to the private sector. The parameter ∂ indicates change. The change in money supply is defined as the change in domestic credit plus the changes in net foreign assets and other assets.

$$MS_t = MS_{t-1} + \partial DC_t + \partial NFA_t + \partial OA_t \quad (19)$$

where NFA is net foreign assets and OA are other assets. From these equations, it is clear that budgetary developments directly influence credit creation of the central bank, which, in turn, affects domestic money supply.

To facilitate understanding, the full model specification is indicated in Table 2. A comment on the complete model is basic. While the components of government revenue respond to total imports and GDP, part of government expenditure is exogenous to the system. But government outlay is an important part of aggregate demand and affects both imports and output (proxied by GDP). Investment, an element of domestic absorption, is influenced by annual changes in GDP.

There is a link between fiscal operations and money supply. This arises from the use of bank credit to finance government deficit. Because bank credit is a principal component of high-powered money, its movement affects domestic money supply. The influence of money supply on the general price level is direct; total imports and exports and, therefore, trade balance are affected by the movements in the general price level. Private consumption, which is a part of aggregate demand, is affected by disposable income and the general price level.

Data sources

The model uses annual time-series data that are obtained from several sources. Statistics such as budgetary developments are collected from the following Central Bank of Nigeria publications: *Annual Report and Statement of Accounts* for various years and *Economic and Financial Review*, various issues. Financial figures on monetary survey and inflation are extracted from the same sources and complemented by the International Monetary Fund (IMF), *International Financial Yearbook* 1994.

Exports and imports, and other relevant external trade data are obtained from the Central Bank of Nigeria, *Annual Report and Statement of Accounts*, various years, Lagos. Such variables as GDP, disposable income, consumption, investment and their relevant deflators are extracted from *Annual Abstract of Statistics* (various issues) and *National Accounts of Nigeria, 1981 to 1993*; both are publications of the Federal Office of Statistics (FOS), Lagos.

The parallel market exchange rate for 1973—1989 is obtained from *World Currency Yearbook* and from the Central Bank of Nigeria for the rest of the period. The *UNCTAD Handbook on Trade and Development Statistics* represents the source of export and import price indexes.

Table 2: The model specification

1. $\ln P_t = a_0 + a_1 \ln MS_t + a_2 \ln Y_t + a_3 \Pi_{t-1} + a_4 \ln EP_t$
2. $\ln MR_t = b_0 + b_1 \ln M_t$
3. $\ln OR_t = c_0 + c_1 \ln Y_t$
4. $\ln GO_t = d_0 + d_1 \ln TR_t + d_2 \ln Go_{t-1}$
5. $\ln NOX_t = e_0 + e_1 \ln AO_t + e_2 \ln (Px/P)_t$
6. $\ln M_t = f_0 + f_1 \ln AD_t + f_2 \ln (Pm/P)_t + f_f \ln M_{t-1}$
7. $\ln I_t = g_0 + g_1 \ln (Y_t - Y_{t-1}) + g_2 \ln I_{t-1}$
8. $\ln PC_t = h_0 + h_1 \ln DY_t + h_2 \ln PC_{t-1} + h_3 \Pi_t$
9. $Y_t = PC_t + I_t + GO_t + X_t - M_t$
10. $TR_t = PR_t + MR_t + ER_t + OR_t$
11. $GE_t = GT_t + GO_t$
12. $X_t = OX_t + NOX_t$
13. $AD_t = PC_t + I_t + GE_t$
14. $TB_t = X_t - M_t$
15. $DC_t = DC_{t-1} + (GE_t - GR_t - NEB_t) + \partial CP_t$
16. $MS_t = MS_{t-1} + \partial DC_t + \partial NFA_t + \partial OA_t$
17. $\Pi_t = (P_t - P_{t-1}/P_{t-1}) * 100$

Endogenous variables

P	=	consumer price index (1990 = 100)
MR	=	revenue from import duties, norminal
OR	=	other government revenue from domestic economy, nominal
GO	=	other government expenditure, nominal
NOX	=	non-oil exports, nominal
M	=	total import, nominal
I	=	aggregate investment, nominal
PC	=	private consumption, nominal
Y	=	aggregate income (GDP), nominal
DY	=	disposable income (GDP less taxes), nominal
TR	=	total government revenue, nominal
GE	=	total government expenditure, nominal
X	=	total export, nominal
AD	=	domestic absorption, nominal
TR	=	trade balance
DC	=	domestic credit
MS	=	money supply
Π	=	inflation

Exogenous variables

EP	=	parallel market exchange rate
AO	=	output of agriculture
Px	=	export price index (1990 = 100)
Pm	=	import price index (1990 = 100)
PR	=	revenue from oil, nominal
ER	=	revenue from export taxes, nominal
GT	=	government transfer expenditure, nominal
OX	=	oil export, nominal
NEB	=	net foreign borrowing
NFA	=	net foreign assets
OA	=	other assets

Note: The parameter ∂ denotes change.

V. Model estimation and validation through dynamic simulation

The behavioural equations are estimated drawing on time-series data covering 1973 to 1993. A simple estimation method — ordinary least squares (OLS) — is explored. The behavioural equations could have been estimated by the two-stage least squares method to minimize the problem of simultaneous equations bias, but the relatively small number of observations precludes the use of this method. Each of the estimated equations is evaluated using descriptive statistics such as t-values, F-test, Durbin-Watson (DW) test, R^2 (coefficient of determination) and the standard error of the regression. Thereafter, the internal consistency of the model is tested, based on some well known performance criteria.

Interpretation of regression results

Contained in Table 3 are the estimates of the eight behavioural equations of the complete model. Figures in parentheses underneath each of the coefficients are the t-values. The estimation results are quite revealing.

Equation 1 is the results of the price model. All the explanatory variables, except real output proxied by real income, are statistically significant at the 95% confidence level. It is evident from this equation that the constant term is not significantly different from zero, an outcome confirming that the natural rate of price movement in the economy is zero. The significance of the money supply variable demonstrates that the movement in the general price level in Nigeria is partly a monetary phenomenon. Thus, the inference is drawn that the policy of financing the rapidly growing fiscal deficit through money creation by the Central Bank of Nigeria is necessarily inflationary; this is consistent with some earlier findings.[7]

Judged by its coefficient, inflationary expectation has a role to play in the movement of price levels, and once price movement gets built into public expectation, it is often difficult to control. This brings to mind the proposition that producers of goods and services generally believe that government anti-inflationary policies will not only be short-lived, but also ineffectual, and so they continue to increase prices based on initial inflation — "inertial inflation" (Corden, 1989). The significance of the coefficient of the parallel market exchange rate shows that domestic prices have adjusted to the shadow price of foreign exchange. From this result, the immediate conclusion is that a devaluation of the official exchange rate may not lead to an increase in the general price level. Since

government is the major earner of foreign exchange in the country, such a conclusion should be interpreted with caution. Further translation of this finding would suggest that during the reference period, there was a misalignment between exchange rate regimes and macroeconomic policies.

The revenue from import duties in real terms is related to the value of aggregate real imports (Equation 2). Estimation indicates that this revenue reacts significantly to real imports. Equation 3 determines other government revenue in terms of GDP and its own lagged value. About 93% of this government receipt is predicted by these variables. Thus, as the economy grows, more revenue is likely to be generated. A closer look at Equations 3 and 4 suggests the existence of the Tanzi effect, with the adjustment coefficient in other revenue (0.47) less than that of other expenditures (0.55). This implies that, within the year, revenue and expenditure adjust to inflation by 47% and 55%, respectively. Other government expenditures are reported in Equation 4 and they respond to increases in total revenue and to previous year's level of expenditures. The coefficient of total revenue represents the propensity to spend; due to its high value (0.923), it can be argued that the government was a "revenue follower" (see Morrison, 1982).

Presented in Equation 5 are the results of the non-oil exports. The coefficient of relative prices is positive, in conformity with theoretical specification. Though the parameter value of trend output of agriculture is high, it is not statistically significant even at the 10% level. Thus a major determinant of non-oil exports during the estimation period is relative prices. One important implication of this result is that sound macroeconomic management that contains domestic price increases will boost the production of export products.

Following this is the estimate of the aggregate imports[8] (Equation 6). Domestic absorption exerts a remarkable influence on the demand for imports, with its short-run elasticity recording 2.85, while the long-run demand elasticity is 3.35. The vast expansion of domestic absorption, engendered by earnings from crude oil, public-expenditure-led model of the 1970s precipitated the growth of total imports. The short-run price elasticity of demand for imports is large (-0.922), though less than unity, and the long-run price elasticity is about -1.1. These estimates are in striking conformity with the judgement of Harberger (1957) that the price elasticities of demand for imports are generally within the range of -0.5 to -1.0 or above this limit. With the value of the relative price, massive devaluation is probably required for the substitution effect of domestic price increase to reduce imports effectively. Otherwise, trade balance may deteriorate, especially under a situation where the price elasticity of demand for imports is higher than that for exports.[9]

The evidence emerges in Equation 7 that the growth of the economy in real terms (accelerator effect) is the sole determinant of aggregate investment in the Nigerian economy during the estimation period, with the accelerator parameter of 1.74. The descriptive statistics of this equation are within acceptable limits. With respect to real private consumption Equation 8, real disposable income explains the movement in the Koyck distributed lag scheme. The short-and long-run propensities to consume are 0.80 and 1.14, respectively. It is clear that a sizeable proportion of income after tax is expended on consumption. Although the coefficient of inflation variable has the hypothesized sign, it is not statistically significant even at the 10% level.

Table 3: The estimated model

1. $\ln P_t = -0.7377 - 0.0391 \ln Y_t + 0.3964 \ln MS_t + 0.3266 \Pi_{t-1} + 0.2734 \ln EP_t$
(0.2583) (0.1459) (3.8653) (2.3233) (4.6334)
$R^2 = 0.9954$ F(4,15) = 818.94 (0.000), S.E. = 0.6838, DW = 1.76

2. $\ln MR_t = 2.6977 + 0.0714 \ln M_t + 0.5666 \ln MR_{t-1}$
(1.8265) (0.9138) (2.8924)
$R^2 = 0.4128$, F(2,17) = 5.98 (0.11), S.E. = 0.3289, DW = 1.58

3. $\ln OR_t = -1.0079 + 0.4601 \ln Y_t + 0.4694 \ln OR_{t-1}$
(1.6080) (2.9480) (2.4480)
$R^2 = 0.9379$, F(2,17) = 128.43 (0.000), S.E. = 0.2382, DW = 2.48

4. $\ln GO_t = -4.9842 + 0.9226 \ln TR_t + 0.5482 \ln GO_{t-1}$
(2.1127) (3.6354) (4.2094)
$R^2 = 0.7437$, F(2,17) = 24.66 (0.000), S.E. = 0.3219, DW = 1.58

5. $\ln NOX_t = 11.6219 + 0.8634 \ln AO_t + 0.7358 \ln(Px/p)_t + 0.5818 \ln NOX_{t-1}$
(1.4955) (1.1863) (2.9198) (4.8485)
$R^2 = 0.9064$, F(3,16) = 51.63 (0.000), S.E. = 0.3831, DW = 1.66

6. $\ln M_t = -19.7893 + 2.8532 \ln AD_t - 0.9216 \ln (PM/P)_t + 0.1486 \ln M_{t-1}$
(2.8045) (3.6636) (4.4589) (0.7577)
$R^2 = 0.9469$, F(3,16) = 95.14 (0.000), S.E. = 0.2548, DW = 1.56

7. $\ln I_t = 0.1804 + 1.7412 \ln(YR_t - YR_{t-1})_t + 0.9737 \ln I_{t-1}$
(0.1876) (1.8681) (9.3008)
$R^2 = 0.8401$, F(2,17) = 44.67 (0.000), S.E. = 0.2273, DW = 1.76

8. $\ln PC_t = -1.2027 + 0.8003 \ln DY_t + 0.3012 \ln PC_{t-1} - 0.0300 \Pi_t$
(0.5913) (3.2697) (1.5015) (1.1341)
$R^2 = 0.8449$, F(3,16) = 29.04 (0.000), S.E. = 0.0587, DW = 1.26

All the equations, except Equation 1, are estimated in real form. This means that all the relevant variables were appropriately deflated. However, output variable (proxied by income) in Equation 1 is in real form, as prescribed by theory. The time-series processor (TSP) is the econometric soft used to estimate the equations.

Overall, the quantitative estimates are satisfactory. All the parameters of the model have the theoretically expected signs and, with the exception of real output, inflation, output of agriculture and imports, the explanatory variables are statistically significant. Given the relatively high value of the R^2 coefficient in each of the structural equations, it can be said that the endogenous variables have been predicted reasonably well.

Model predictive ability

Although the performance statistics of the estimated equations are generally acceptable, it is the overall behaviour of the entire model as a forecasting tool in dynamic simulation that is most important. To test for this reliability, the system of equations was solved through a dynamic simulation, covering the period between 1980 and 1993. This exercise involved the use of the parameter values of the behavioural equations as well as the actual values of the exogenous variables.

As there is no obvious best alternative among the criteria to gauge the efficiency of model performance, the Theil's inequality coefficient and tracking ability are explored for ease of interpretation. Table 4 presents the results of the Theil's inequality coefficient for the more important variables. Succinctly, this validity test suggests that most of the endogenous variables are predicted fairly accurately. In specific terms, the model is able to account for more than 70% of the variation in each of the principal variables.

Table 4: Theil's inequality coefficients

Variable	Theil's Inequality
Gross domestic product	0.270
Consumer price index	0.186
Imports	0.035
Money supply	0.113
Non-oil exports	0.230
Trade balance	0.013
Import duties	0.174
Total revenue	0.097
Other govt expenditure	0.98
Investment	0.210

Tracking experiments for some key endogenous variables (consumer price index, real GDP, imports and trade balance) produce satisfying results (see figures 3—6). On the whole, the graphics demonstrate that the simulated variables are able to capture the turning points of the actual data very well, implying that the model is able to replicate the behaviour of historical records.

Combining the performance of these evaluation criteria with the theoretical soundness of the specifications as well as the robustness of the parameter values, the model can be depended upon for short-run forecasting.

Figure 3: Consumer price index

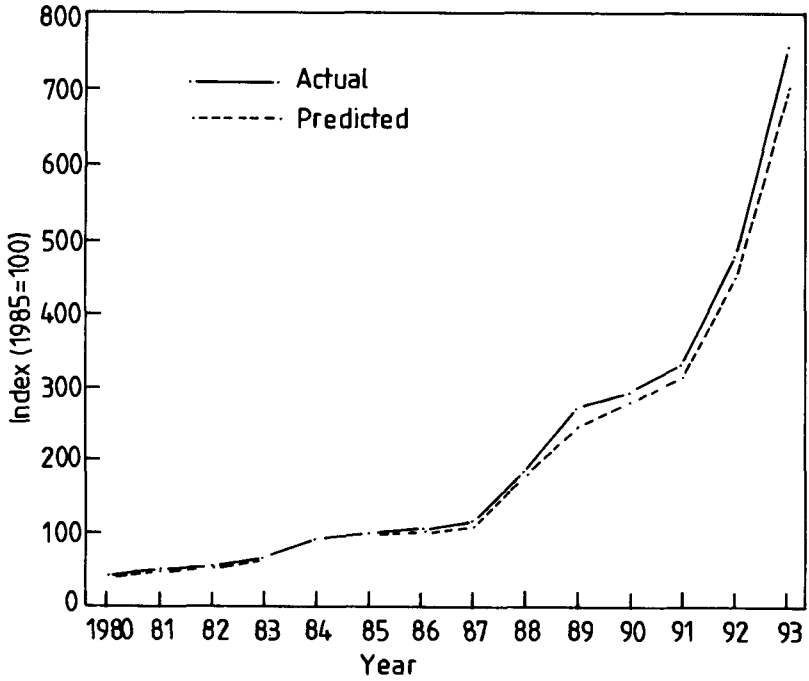


Figure 4: Real gross domestic product

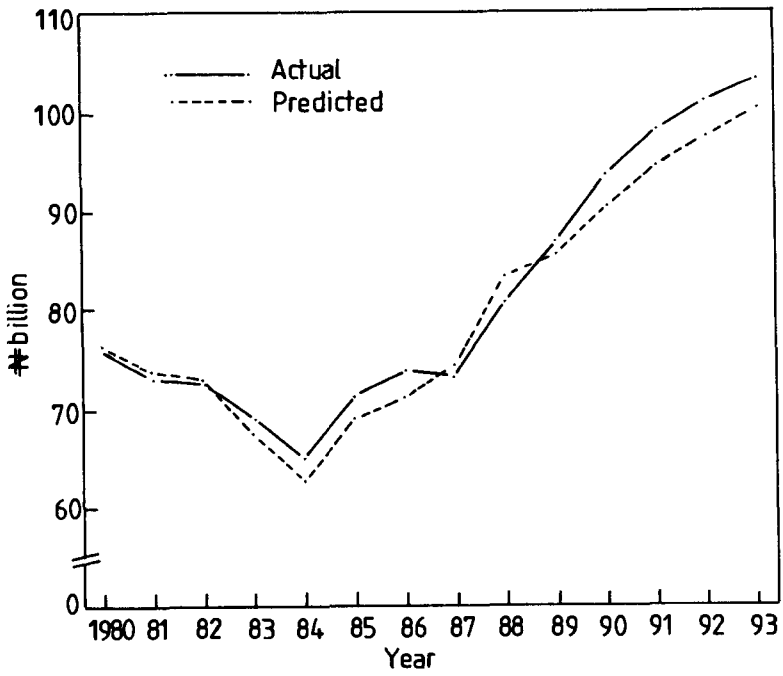


Figure 5: Merchandise imports

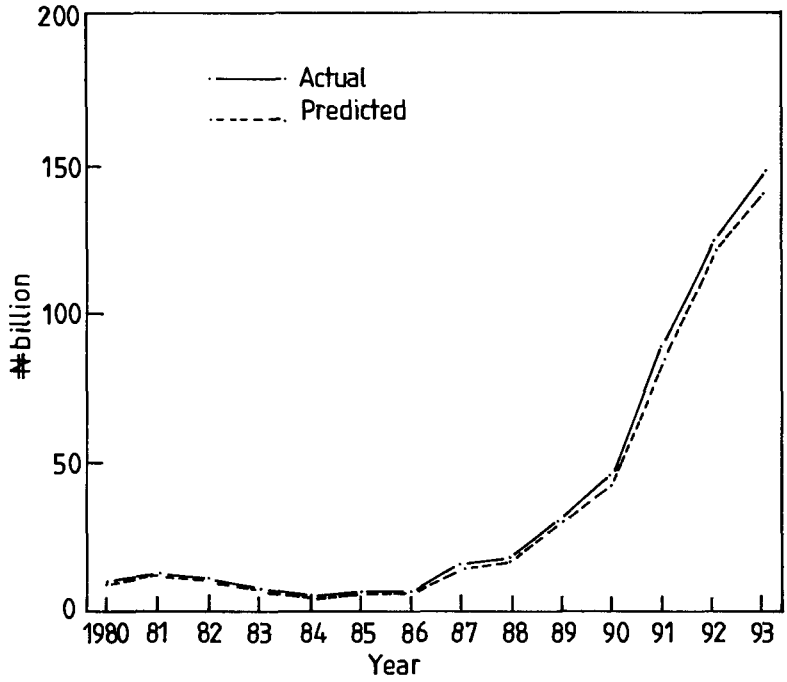
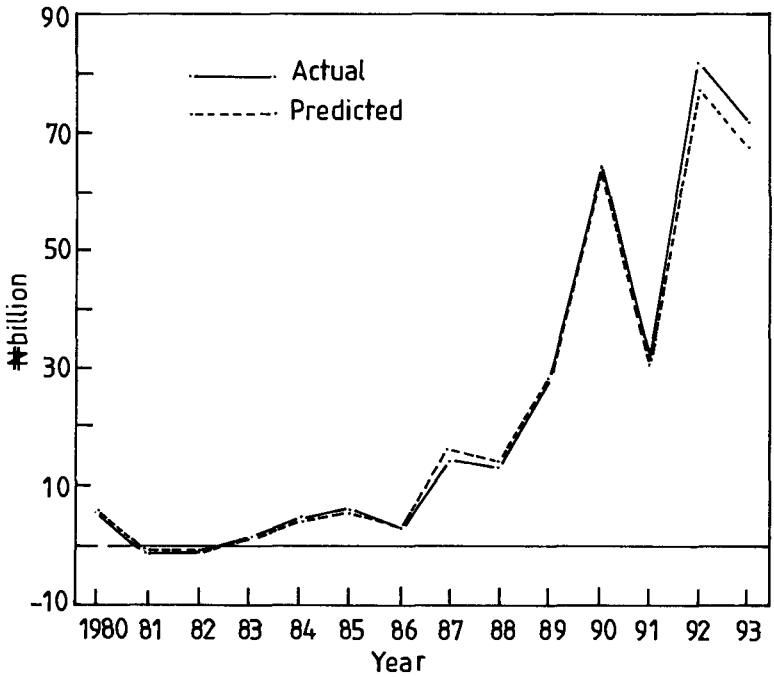


Figure. 6: Trade balance



VI. Counterfactual simulation exercises

Three policy simulation exercises are considered. The probable impact of each of the hypothesized scenarios on the price level, output, imports and external trade are discussed.

Constant budget deficit ratio

A scenario in which the government deficit/GDP ratio is kept at a particular level during a specified period is assumed. In the structural adjustment document of 1986, it was the intention of government to engage in austere budgetary management that considered revenue constraints. The intent was to limit the fiscal deficit as a proportion of GDP to 3% (Federal Republic of Nigeria, 1986: 10). Guided by this policy statement, the question is asked, Had this decision been made earlier and the target achieved from the year 1980, what would have been the effects on trade balance? To evaluate the impact of this development, government expenditure is adjusted to achieve the 3% government deficit/ GDP ratio during the 1980–1993 period. Based on the inherent logic of the model, the effects are easily appreciated. In discussing the effects of this experiment (designated as Case I), it is further assumed that the fiscal gap is financed entirely from bank credit.

Before discussing the principal outcomes of this hypothetical situation, it should be recognized that this scenario can be likened to a reduction in government spending. Findings show that relative to the baseline solution, this policy regime has a deflationary effect on the general price level, as demonstrated in Figure 7. Given the model structure, this result may not be surprising since the reduction in budget deficit necessarily suggests a correlative reduction in central bank credit to government. Following the reduced price level, real output increased (Figure 8).

The country's trade balance would improve (Figure 9). The reason for this is clear: government expenditure is an important component of domestic absorption, and thus, its reduction accordingly depresses aggregate demand and, therefore, imports (Figure 10). There is another plausible explanation for the improvement in the trade balance account. Though not quite explicit from the model configuration, the reduced price level may have enhanced the international competitiveness of non-oil exports, thereby boosting their production and earnings. It is implied that this budgetary adjustment would raise real investment in the economy since it is directly linked to the performance of real income. Based on these results, it is apparent that budgetary developments affect the current account balance in Nigeria.

Figure 7: Consumer price index (1985 = 100)

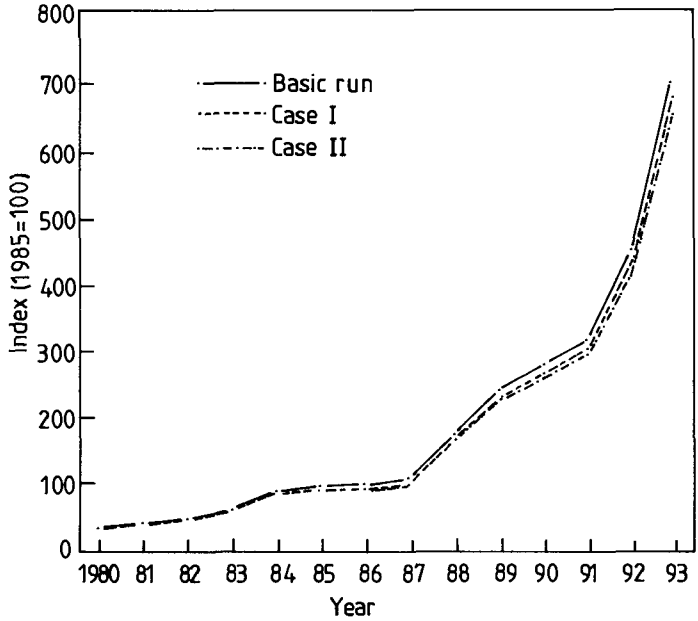


Figure 8 : Gross domestic product (real)

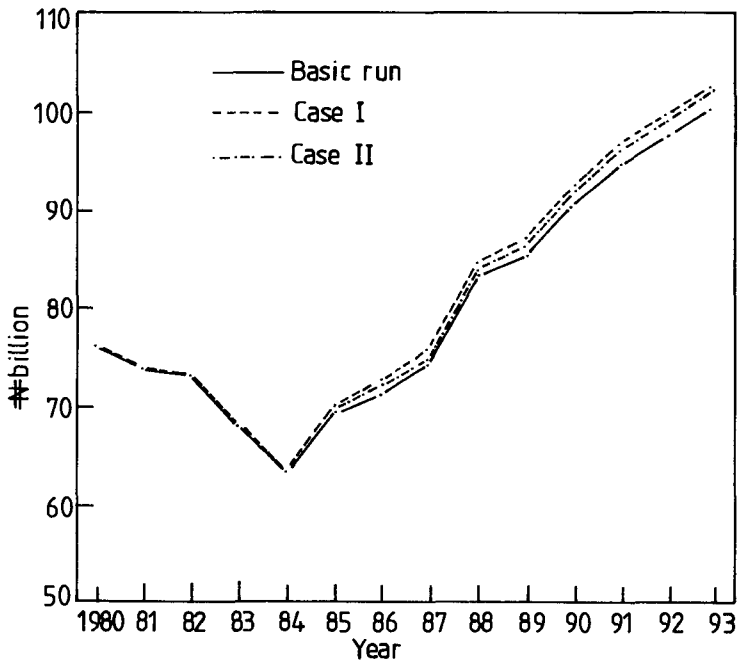


Figure 9: Trade balance

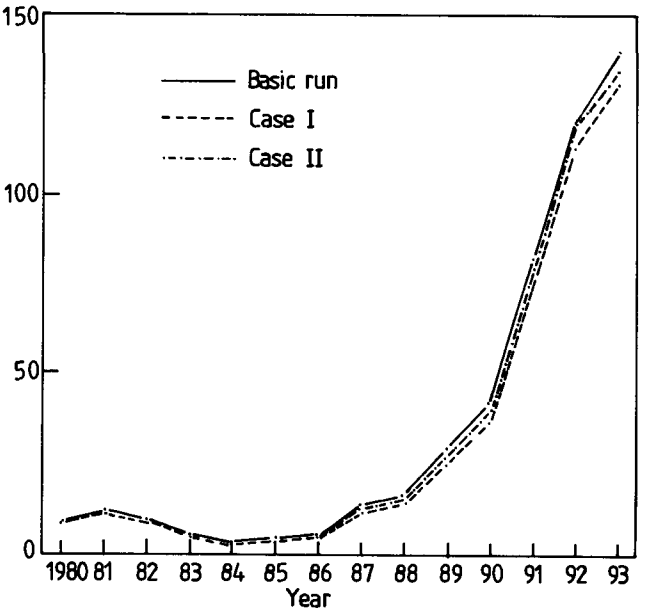
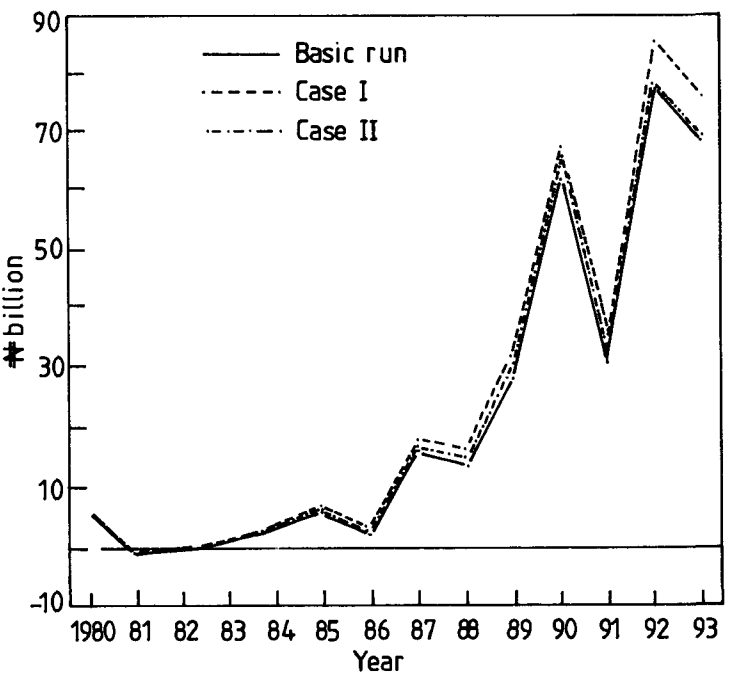


Figure 10: Merchandise Import



External borrowing to finance government deficit

The second experiment retains the 3% budget deficit-GDP ratio, but postulates that this sustainable deficit is fully financed from external borrowing. The quantitative impact of this conjectural situation (labelled Case II) on the variables of interest are also presented in Figures 7–10. The results suggest that this method of financing would cause less movement in the general price level.

Real output would expand, however, possibly suggesting that the externally borrowed funds could have been expended on productive activity. In this sense, the use of external resources may bring into employment some of those factors of production that were previously idle. The policy lesson here is that government may engage in external borrowing to finance budget deficit so as to raise economic growth. For this to occur, however, there must be strict adherence to budget discipline. Otherwise, when the borrowed funds are used to finance consumption expenditure, the results would certainly be different from what may be desirable.

There would be an increase in total revenue of the government (since external borrowing adds to total revenue). Revenue increase may also occur through the expansion in aggregate income, a major determinant of government receipts. In regard to external trade, the simulation results indicate an improvement in the trade balance. This is probably because the decrease in domestic absorption has reduced the demand for imports. This result confirms the strong influence of enlarged budget deficits on the current account deficit in Nigeria.

A comparison of Case I and Case II results provides useful insights. Evidence shows that the financing of the 3% budget deficit-GDP ratio via central bank credit would expand the money base and raise the general price level, but not as much as the case without the budgetary adjustment. Relying on external borrowing to finance the same size of budget deficit would not cause rapid expansion in money supply and the movement in the general price level is much less when compared with Case I. It is suggested from these exercises that if the aim of government is to pursue the goal of price stability and output expansion, external borrowing rather than bank credit to finance fiscal deficit should be favoured. This presupposes that there is budget discipline on the part of government to ensure that the externally borrowed funds are channeled to projects and programmes for which they were budgeted. Both types of financing lead to a deterioration of the trade balance, though, from the model results, the impact of credit financing on this variable is relatively greater. This is probably because the spending effects of the borrowed funds did not permit domestic absorption, and therefore imports, to fall remarkably.

Favourable oil shock

The third counterfactual simulation examines the probable impact of fiscal operation on trade balance with increased government revenue. It is assumed that this outcome is triggered by a rise in the price of crude oil in the international market that subsequently

Table 5: Nigeria - Effect of oil shock on macroeconomic variables

Variable	Baseline solution (Mean value) ₦ million	Oil shock (Mean value) ₦ million
Gross dom. product, real	79907.1	82384.1
Consumer price index*	197.7	187.4
Money supply	44873.5	42360.6
Imports	35008.0	38067.7
Non - oil exports	1892.2	1914.6
Trade balance	22186.9	34039.5
Investment, real	11669.1	12679.1
Other govt expenditure	18647.8	21333.1

* This variable is an index.

raises total revenue. Historically, the mean annual growth rate of government revenue was 25.2% during 1980–1993; it is taken for granted that the increase in the export price of crude oil eventually raised this average annual growth rate by 20% to 30.24%.

Under this situation, the increase in government revenue would result in a slower growth in expenditure (Table 5). This may be explained by the fact that based on the framework, only a component of total expenditure is directly influenced by government receipts. As government spending tends to raise domestic absorption, imports are increased from a mean annual value of ₦35 billion under the baseline solution to about ₦38.1 billion following the oil shock. Under this trial, a lower budget deficit is recorded, averaging about ₦17 billion annually, compared with the actual figure of ₦19.8 billion during 1980–1993. This phenomenon points to a reduction in the price level, as shown by the fall in the consumer price index from 198 to 187 (with 1985 as the base year).

There would be an expansion in real output (the average increase in the growth of real GDP is 3.1%), a result generated by a fall in the price level and increased domestic absorption enhanced by government spending. By this occurrence, the improvement in aggregate real investment is expected. Non-oil exports witnessed a relatively slower average annual growth rate of about 2%. This observed trend merely demonstrates the asymmetrical relationship between increased earnings from oil export and non-oil exports in Nigeria.[10] Quantitative estimates reveal that trade balance would record a marked improvement. This is largely attributable to the growth of oil exports. Concurrently, there was a slower growth in aggregate imports. Were it not for the generally weak transmission mechanism between favourable developments in the world oil market and domestic production, the figure registered by trade balance would probably have been higher.[11]

These results apparently stress fiscal discipline and sound monetary management when there is a favourable oil shock in the world market that increases government receipts. For example, government spending should be related to the absorptive capacity of the economy; in this way, the inflationary pressures of government spending may be contained. It may also raise the growth of real output and improve the current account balance. However, the observed statistical results highlight the significant effect of budgetary policy, enhanced by oil revenue, on credit and monetary aggregates and on the current account balance in Nigeria.

VII. Conclusions and implications for policy

This study examined the effects of budget deficit on the current account balance in Nigeria during the period 1973 through 1993. Evidence from historical data reveals that the Nigerian central government has registered persistent and rising fiscal deficit since 1975. Particularly from the early 1980s, the government deficit has been financed largely from central bank credit. Consequently, monetary policy has been expansionary, with accelerating inflation as the inevitable concomitant. This expansive macroeconomic policy, which is not in consonance with the exchange rate policy, has precipitated a growing market premium and domestic inflation has mirrored the shadow price of foreign exchange.

Juxtaposed against these are substantial deficits in the current account, particularly from 1981. There is thus a strong correlation between the budget deficit and the current account balance in the reference period. This is an indication of the increase in aggregate demand that could not be satisfied from domestic supply.

A brief historical development of Nigeria's fiscal operations and the balance of payments position was provided. Thereafter, an econometric model that captures the principal interactions between budgetary developments, money supply, price level, domestic absorption and the current account balance was explored. A scenario in which the government maintained a 3% budget deficit/GDP ratio between 1980 and 1993 was assumed. Findings indicate that *financing the magnitude of such a deficit* through central bank credit would generate fewer movements in the general price level since there is reduced expansion in the money base, when compared with the actual situation. Under this experiment, real output expanded, suggesting that deficit financing via credit creation tends to stimulate non-inflationary growth. It is clear that the current account balance would improve. This is due to the reduced domestic absorption, led by government expenditure, which directly exerts pressure on aggregate imports. The policy inference from all this is evident: austere budgetary management during this time would have improved the current account balance and reduced the rapid movement in the general price level.

The financing of the 3% budget deficit as a proportion of GDP from external borrowing represents the second simulation that was conducted. The results of this exercise showed that the general price level would fall. There would be an increase in real output, but the improvement in the trade balance would not be as much as that achieved under credit financing. All this suggests that rising government deficit causes a deterioration of the current account balance during the reference period.

The policy lesson of this finding is easily appreciated: The financing of the budget deficit through external borrowing must be supported by appropriate macroeconomic

policies if the goal of government is to raise domestic output and maintain external balance. It is implicit from this lesson that the borrowed funds must be committed to those projects and programmes for which they are allocated in the budget. The adherence to budget discipline is basic in this situation.

It is found that higher government revenues, engendered by increases in crude oil prices, have a stimulative effect on macroeconomic variables. This phenomenon tends to raise the level of government spending and, therefore, induces a rise in domestic absorption. Statistical evidence indicates that output would improve, and with a remarkable increase in the trade balance when compared with the situation without this occurrence. The price level would fall, but relatively slowly. Thus, to moderate the impact of oil price increases on the price level and achieve a favourable current account balance, it is essential for government to exercise greater control over its expenditures and not necessarily be a "revenue follower". However, a reassessment of the incremental budgeting system currently in use, which hardly relates input to output is basic to budgetary control and management, as this budgetary framework unjustifiably raises government expenditures annually.

In this way, the budget can serve as an effective instrument of economic management. Due to the rising fiscal deficit, the focus of budget has shifted from the objectives of achieving price stability and favourable balance of payments to that of how to generate receipts to bring about fiscal balance. This makes it all the more imperative for the government to consider the need to use the budget as a potent tool for macroeconomic management when appropriately designed and implemented.

While the empirical evaluation in this study has provided considerable insights into the understanding of the relationship between budget deficit and the current account balance in Nigeria, the approach adopted is basically demand driven. Consequently, two useful extensions are proposed for future research efforts. The first is to consider the relationship between oil revenue and government capital formation, and the implication of this for output growth within a general equilibrium model. Second, it has been argued that in an oil economy even if the government operates a balanced budget, domestic liquidity could still increase due to the inflow of oil revenue. A comprehensive modelling strategy that adequately takes account of this will certainly shed considerable light on the relationship between budget policy and the balance of payments in Nigeria.

Notes

1. On this study, see Ariyo (1993).

2. Studies acknowledging this fact are many, but reference to more recent works on this issue can be found in Alam and Rajapatirana (1993) and Papageorgiou et al. (1990).

3. This is one of the conclusions reached in a very recent paper by Egwaikhide (1995).

4. A somewhat related research on this theme is, however, conducted by Olopoenia (1991).

5. The relationship between money supply and inflation has been discussed in a number of articles. For example, see Aghevli and Khan (1978), Canetti and Greene (1991), Tegene (1989), and Ajayi and Teriba (1974).

6. This is obtained from Park (1985: 843).

7. For example, see Oyejide (1972).

8. The coefficient of the dummy used to capture periods of trade restriction was highly insignificant and so it was dropped.

9. This idea is well exposed in Goldstein and Khan (1985).

10. This was actually the situation during the oil boom; it is a phenomenon that now finds explanation in some aspects of the Dutch disease model (see, for example, Oyejide, 1986).

11. The weak linkage between oil production and the rest of the economy has been acknowledged (see Egwaikhide, 1989).

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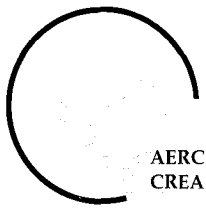
Appendix

Table A1: Nigeria's balance of payments 1980 – 1993 (₦-million)

Category	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Current account balance	2355.3	-3998.4	-5211.2	-31317.9	44.1	2215.4	-2999.1	-295.3	-965.7	-9244.1	19882.3	14357.9	-8337.9	-16490.1
Trade balance	6132.7	703.5	-2712.1	-781.6	2299.8	5065.1	3443.9	1396.1	11435	30770.3	70114.5	44678.0	80998.5	71809.8
Capital account	97.4	833.1	1026.8	-2735.7	171.9	-1772.0	-1900.9	-16743.3	18447.3	12746.2	24396.3	-469.7	-90997.0	-23060.6
Errors and ommisions	50.5	48.1	49.0	100.9	139.9	-94.3	-767.7	-1226.3	-1382.0	-1003.9	-1247.5	-969.1	-2072.4	-2509.7
Exceptional financing	-	-	-	-	-	-	4883.4	18424.4	18500.9	31721.2	24259.7	21756.3	36133.1	55676.3
Overall BOP	2404.2	-3020.8	-1398.3	-301.3	354.9	349.1	-784.3	-159.2	-2294.1	8727.0	18498.2	5959.6	-65274.2	13615.9

Source: Central Bank of Nigeria: Annual Report and Statement of Accounts, various issues. Lagos.



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