

# ADJUSTMENT POLICIES AND CURRENT ACCOUNT BEHAVIOUR: EMPIRICAL EVIDENCE FROM NIGERIA

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## ABSTRACT

One important indicator of the health of a country is the current account balance. Movements in this important macroeconomic variable convey information about the actions and expectations of the domestic and foreign market participants. This paper attempts to investigate the macroeconomic policy, non policy and financial sector variables that influence current account movements. To do this, the paper uses three methodologies: the Granger Causality test, co-integration test and the variance decomposition and impulse response function. The variance decomposition and impulse response function follows the Cholesky ordering. The results showed that causality is bidirectional between current account balance and budget deficit, this support the 'twin deficit hypothesis'. The Granger Causality test also revealed the existence of a unidirectional causality of current account balance with exchange rate. The causality runs from exchange rate to current account balance. The paper also found a unidirectional causality that runs from current account to trade openness. The study found that exchange rate, monetary policy credibility and budget deficit are the important macroeconomic variables that influence current account movement. The non policy variables that influence current account behaviour are terms of trade and trade openness. The proxy for stage of development, the per capita income is also a significant factor in current account movement. The study found no causal link between measures of financial indicator variables and current account balance. The paper argues that to address the adverse changes in current account movement, policy should tackled the problem from the demand and supply sides.

## INTRODUCTION

Nigeria, like most developing countries, adopted stabilization and adjustment policies in the early 1980s. These programme of reforms, was an attempt to move the country away from regulated market to a more friendly market oriented economy. This is because of the perception of policy-makers that the adoption of the neoclassical economic doctrine is capable of propelling the economy to the path of sustained economic growth and development and therefore addresses the adverse changes in current account. In line with this conceptualization of reform, Nigeria like most developing economies has adopted various forms of policy and institutional reforms since independence.

These range from protectionism and excessive government control of economic activity to movement towards free market economy. The era of free market economy started in 1986 when there was a major policy shift. Prior to the introduction of economics of *laissez faire* in early 1986, which resulted to the adoption of Structural Adjustment Programme (SAP), the Nigerian economy was characterized by excessive government control of production, financial intermediation processes and foreign trade variables via the administrative determination of interest rates, prices and exchange rate of the naira vis-à-vis other currencies.

The adoption of Keynesian economic postulations was premised on the need to sustain the pace of economic growth and development within the environment of shallow and weak entrepreneurial class. However, the country's enthusiasm with this strategy

progressively lost momentum, principally because it failed to deliver its most import promise- sustained economic growth and development and the maintenance of a favourable current account balance (Ndebbio and Ekpo, 1991).

SAP was introduced to reduce the adverse effects interventionist policies had on domestic economic performance and the external account. In the new paradigm, faith in government was replaced with confidence in the free market economy and the creativity of the private sector. The positive direction of this new thinking was crystallized in SAP. SAP sets out to ensure that macroeconomic policies, structural parameters and non policy variables are determined more by the dictates of market forces and reduced government intervention in setting interest rates, exchange rate, allocation of credits and capital market activities.

To further boost the domestic economy, various economic and structural reforms were introduced in 2003 under a comprehensive economic blue print (the National Economic Empowerment and Development Strategy, NEEDS). NEEDS set out to build and promotes comprehensive macroeconomic policies and non policy factors that would support economic growth and development, a healthy external account position as well.

In spite of these various reforms in macroeconomic management the country has continued to run a considerable current account deficit. As a ratio to GDP, current account deficits have frequently

exceeded the five per cent benchmark. In particular, in 1977 the current account stood at three per cent of GDP and increased to 10 per cent in 1978, and peak at 15 per cent in 1982. Albeit most parts of the 1980s witnessed a favourable current account situation, this was short lived as the current account plunge back to deficit in 1993. Current account deficits reached 8 per cent in 1995 and 10 per cent in 1998.

External sector performance improved substantially in 2000 as the overall balance of payments swung from a deficit of over #32 million in 1999, to a surplus of over #31 million naira. The favourable development was attributed to the improvement in the current account. In 2002, the current account returns to the path of deficit before maintaining surplus from 2003 to 2008. This oscillation in current account balance has triggered question as to what macroeconomic, structural and non policy variables determines current account behaviour. This is the major objective of this study.

Following the introduction, the rest of the paper is organized into four sections. Section two reviews the relevant literature and conceptual frameworks of the paper. In Section three, the model is presented and the methodological issues of the paper are also articulated. Section four discusses the regression results and major findings. The paper concludes in Section five with concluding remarks.

## II. Literature Review and Conceptual Issues

They are plethora of literature on the determinants of current account behaviour. Baharumshah et al (2004) investigated the twin deficit hypothesis in Indonesia, Malaysia, the Philippines and Thailand. They found a long run relationship between budget deficit and current account. Their results also showed a unidirectional causality, which runs from budget deficit to current account deficit for Thailand. In Indonesia, current account targeting was detected, whereas in Malaysia and Philippines, the causality was bidirectional.

Chete, (2001) found a negative correlation between current account and variables such as square of relative income, inflation, the degree of openness in Nigeria. His study also showed the existence of a positive relationship between current account balance and net foreign assets, budget deficit and exports. Ozman (2004) empirically investigated the effects of institutional and macroeconomic policy stance variables on current account deficits. The results strongly suggest that better governance increases the ability of a country to control adverse changes in current account behaviour. In addition, the findings of the paper also indicated that a flexible exchange rate and openness imposes a discipline on current account behaviour. The net impacts of the financial deepening and monetary credibility on current account balance were found to be insignificant.

Henry and Longmore, (2003) investigated the current account dynamics and exchange rate behaviour in Jamaica. They found that changes in real exchange rate have significant impact on economic activity by altering the relative returns in the tradeable and non tradeable sectors. They however did not find any significant relationship between current account and exchange rate.

Bannaga (2004) examined the impact of adjustment policies on current account behaviour in Sudan. The study showed that both policy and non policy factors were responsible to some extent in explaining current account deficit in the long run.

The major points of departure of this paper from previous works especially for Nigeria are on two counts. First, the paper explicitly addresses the causality issue that was missing in previous study of this nature. Second, the data series are more robust.

The received theories have different predictions about the signs and magnitude of macroeconomic policy and other non policy variables on current account behaviour. Keynes demonstrated that an increase in budget deficit would induce upward pressure on interest rate, causing capital inflows and exchange rate to appreciate. As exchange rate appreciates exports become less attractive. This increases the attractiveness of imports, and subsequently worsens the current account under a flexible exchange rate system. Under a fixed exchange rate system, budget deficit rather than increasing interest rate, triggers higher real income or prices and this worsens the current account balance. Budget deficit under floating exchange rate or fixed exchange regimes leads to adverse changes in current account balance, albeit the transmission mechanism may differ.

The theoretical submissions of the Keynesians can be summarized as follows. First, they argued that a positive relationship exists between current account and budget deficit. Second, there exists a unidirectional causality that runs from budget deficit to current account deficit. Several scholars in their studies found strong evidence to confirm this Keynesians view. They include Vamvoukas (1999), Piersanti (2000), Leachman and Francis (2002) and Egwaikhide (1998). Authors such as Reisen (1998) and Summers (1988) found a causality that runs from current account to budget deficit. This outcome occurs when the deterioration in current account leads to a slower pace of economic growth and result to increased budget deficit. This suggests that the budgetary position of a country will be affected by large capital inflows or through debt accumulations and with that a country will eventually run into budget deficit. Thus, as noted by Summers (1988) fiscal policy could be used to address this adverse changes in the external account.

Kearney and Monadjemi (1990) and Normandin (1999) found a bi-directional causality between budget deficit and current account. In other words, current account Granger causes budget deficit and vice-versa.

Two broad approaches are typically used in the received theory to explain the impact of exchange rate on the current account behaviour. The first is the elasticity approach. This theory argues that an appreciation or depreciation in the real exchange rate should result in higher or lower levels of imported goods and services, and lower or higher exports. The extent to which these changes may be realized will depend on the relative elasticities associated with export and import commodities. Suppose a country depends to a large

extend on imported intermediate commodities that have no close substitute, depreciation in the nominal exchange rate may not stimulate changes in imports, as the price elasticity of demand is low.

This reasoning is summarized in the Marshall-Lerner condition, which states that devaluation will have a positive effect on a country's balance of payments if the sum of the elasticities of demand for its exports and imports is greater than unity. The converse holds if it is less than unity. Donbusch (1988) had argued that the relative impact of using exchange rate as adjustment policy to address current account imbalance depends on the extent to which domestic demand can switch from tradables to non tradables, and the domestic economy's ability to generate additional output to meet export demand.

The absorption approach to the relationship between exchange rate and current account balance is based on the reasoning that current account is equivalent to the difference between national income and domestic absorption, arising from private and public consumption and investment. Devaluation affects the current account directly through its effects on real income and absorption and indirectly on the income elasticity of absorption.

The growth rate of GDP (GDPgr) can be perceived as an indicator of internal macroeconomic performance, which reflects macroeconomic variable and therefore a good proxy to investigate consistency between internal and external policies. The received theory does not provide a clear a priori expectation of gdpgr on current account in terms of sign and magnitude of its coefficient.

The effect of growth rate of real GDP on current account has important implication for both savings and investment. As observed by Chinn and Prasad (2000), the direction of influence depends on the perception of households regarding their permanent income. If economic agents perceived high growth rate of GDP as a signal that their permanent income will increase, the savings rate as a proportion of current income could, according to the life cycle permanent income hypothesis, decline. Conversely, increases in GDP growth rate that are interpreted as transitory, will induce a rise in the savings rate. Calderon et al (2000) in Chete, (2001), found that an increase in the growth of domestic output (GDP) had the effect of increasing current account deficit for sample of developing countries used in their analysis.

High growth rate of GDP reflect the tempo of economic activity and high level of investment. This may result to an increase in inflow of foreign capital and higher rate of returns. Temporary improvement in productivity is expected to trigger surpluses in the current account balance.

In addition, the greater the value of a country's real GDP, the greater the current account imbalance it can sustain without increasing the size of its external debt to GDP ratio. Equally, high expected and actual real GDP growth rate may reflect sustained accumulation rates driven by expectations of high profitability. In terms of growth rate of GDP, if the growth rate of GDP is greater than the interest rate on external

debt, then, economic growth is an important variable in assessing the external position of a country's economy (Alamedin, 2004; Adedeji, 2001; Chin and Prasad, 2000).

From the above theory and literature, it is appropriate to assume that the higher the value of gdpgr the more likely the current account will be sustained without creating external crisis. Thus, a priori, we expect a positive relationship between GDP growth rate and current account.

The level of financial development (msgdp) is important both in savings and investment and current account as well. The net effect on the current account balance is ambiguous. As observed by McKinnon (1973) and Shaw (1973), financial deepening can increase both savings and investment through efficiency in resource allocation. Blanchard and Giavazzi (2002) argued that financial development and integration leads to higher current account balance. This is because it increases consumption by loosening liquidity constraints and allowing for consumption smoothing.

The net effect of trade openness (traopen) on the current account balance is ambiguous. Countries that are more open to international trade are expected to have large export sectors that enable them to service external debt easily and therefore sustaining a higher level of CAD. However, as observed by Milesi-Ferretti and Razin (1996) albeit opening an economy to external transaction could also expose that economy to external shocks, it can equally allow the economy adjust to these shocks, thereby making it less painful.

Terms of trade volatility is a proxy for external non-policy variable that affect current account balance. The a priori expectation of this variable with CAD (cadgdp) is ambiguous. Adverse transitory terms of trade can induce either deterioration or improvement in the current account balance.

This paper uses the standard deviation of inflation as a proxy for monetary policy credibility (inflat). A credible monetary policy framework promotes stable inflation; reduces the volatility of exchange rate; reduces the degree of exchange rate misalignment and thus addresses adverse changes in current account balance (cadgdp). Credible monetary frameworks reduce the tendency of aggregate demand to deviate substantially from the level consistent with inflation target. It follows that inflat can act as a discipline device on cadgdp by responding appropriately to aggregate demand shocks. The a priori expectation between inflat and cadgdp is ambiguous; it can be positive or negative, as it can result in higher domestic and foreign investment and savings through reducing the level of uncertainty and inefficiency in resource management (Ozman, 2004)

Current account behaviour can be analyzed within the context of stages of development hypothesis. This hypothesis argues that as countries move from a low to an intermediate stage of development, they import capital, and run current account deficit (Roldos, 1996). With the passage of time, such countries reached an advanced stage of development, and they begin to run current account surplus. As they run surpluses in the external account, all external liabilities are paid off and begin to export capital to advanced economies. This hypothesis is partly similarly to the permanent income life-cycle construct from a country rather than from an

individual perspective (Chin and Prasad, 2000). The proxy for the stage of development is the per capita GDP.

### III. The Model

The national income identity provides a useful framework to establish the link between current account and variables of interest. The identity can be written as

$$Y = C + I + G + X - M \text{ ----- (1)}$$

Where

Y= Gross Domestic Product

C= consumption

I= investment

X= export

M= import

Assume that government derives most of its revenue from tax (T), equation 1 becomes

$$Y = C + I + (G - T) + X - M \text{ ----- (2)}$$

Where

G-T = net expenditure of government or (FB)

X-M = current account surplus or deficit (CAD)

From equation 2 one can argue that CAD is a function of Y, C, I, FB and other factors like, M2/GDP, MS, and exchange rate.

If we represent I and C as absorption (A), equation 2 becomes

$$Y = A + (G - T) + (X - M) \text{ ----- (3)}$$

G-T can be represented as net fiscal balance of government (FB)

Equation 3 becomes

$$Y = A + FB + (X - M) \text{ ----- (4)}$$

Introducing other determinants of CAD such as MS/GDP, TTRADE and inflat, gdpgr, gdpcapita and representing these other determinants as GS in equation 5, and deferred external payment arrears (AR), equation 4 becomes

$$Y = A + FB + GS + (X - M) + AR \text{ ----- (5)}$$

Rearranging equation 5

$$X - M = Y - FB - GS - AR \text{ ----- (6)}$$

Adding unrequited transfers (U) to equation 6 yields

$$X - M + U = Y - FB - GS - AR \text{ ----- (7)}$$

X-M+U = CAD

$$\text{Therefore CAD} = Y - FB - GS - AR \text{ ----- (8)}$$

In most developing countries like Nigeria, Central Banks accommodates fiscal operation of government, thus FB can be represented as the money stock (MS), equation 8 becomes

$$\text{CAD} = Y - MS - GS - AR \text{ ----- (9)}$$

Exchange rate is a macroeconomic policy variable used in addressing adverse changes in the external balance, therefore one can incorporate exchange rate (exchtr) as follows

$$\text{CAD} = Y - MS - AR - \text{Exchtr} - \text{GSt} \text{ ----- (10)}$$

Where

CAD = Current account balance

GSt are other macroeconomic policy variables that influence current account behaviour

In behavioural form

$$\text{cadgdp} = a_0 + a_1 \log(\text{gdpcapita}) + a_2 \text{msgdp} + a_3 \text{exchtr} + a_4 \text{inflat} + a_5 \text{fedeficit} + a_6 \text{ttrade} + a_7 \text{Traopen} + a_8 \text{gdpgr} + U_t \text{ ---- (11)}$$

$$a_1 \geq 0, a_2 \geq 0 \text{ or } \leq, a_3 \leq 0, a_4 \leq 0, a_5 \geq 0, a_6 \leq 0, a_7 \geq 0 \text{ or } \leq, a_8 \geq$$

Where

cadgdp = the ratio of current account to GDP

gdpcapita = per capita GDP

msgdp = the ratio of broad money supply

exchtr = the exchange rate of naira to one US dollar

inflat = the standard deviation of inflation

fedeficit = fiscal balance

ttrade = terms of trade

Traopen = trade openness

Gdpgr = growth rate of real GDP

As can be seen in equation 11, a number of factors affect the current account in the short run and long run. These factors could be split into macroeconomic variables such as fiscal balance (fedeficit), exchange rate (exchtr), monetary variable such as the ratio monetary liabilities to GDP (msgdp) and monetary credibility (inflat); structural features of the economy such as GDP per capita and GDP growth rate

(gdpcapita and gdpgr) and external factors such terms of trade and trade openness (ttrade and traopen)

### III.I Methodological Issues

In order to investigate the impact of economic reforms on the external balance this study will employ three methodologies. The methodologies are the co-integration technique, the Granger Causality test and the

vector auto-regression (VAR) techniques. In most time series analysis, the employment of co-integration and error correction is now fairly standard. Equally, the use of VAR in most empirical analysis is also widespread.

Given data instability in Nigeria occasioned by policy instability, political cum economic disruptions etc, it becomes increasingly useful to test the time series property of the variables for meaningful economic results. It is clear that OLS regression estimates with non stationary time series data often produce unacceptable results, even though the overall results may indicate a high degree of fit (as measured by coefficient of multiple correlation,  $R^2$  or adjusted coefficient of  $R^2$ , high auto correlated residuals and statistical significance as measured by the usual t-statistics (Gujarati, 2004).

Moreover, many economic variables have a strong tendency to trend over time, such that the levels of these variables can be characterize as non stationary, since they do not have a constant mean over time. Difficulties may arise while performing regression with clearly non stationary series, thus leading to the so called 'spurious' regression (Granger and Newbold, 1974). Given two completely unrelated but integrated series, regression of one on the other will tend to produce an apparently significant relationship when, in fact, they are not related.

This study therefore, adopts the co-integration/error correction methodology. This selection is based on the premise that if the variables are non stationary, the desirable properties of consistency, efficiency, and unbiased ness will be lost if Ordinary Least Squares (OLS) technique is used to estimate the equation, which could lead to spurious results and inference, hence, inaccurate predictions. Co-integration and error correction is usually used in empirical analysis because it adds richness, flexibility and versatility to the econometric modelling and integrates short-run dynamics with long equilibrium. Hence accurate predictions can be more confidently made on the economic relationship between the variables.

Apart from the examination of the long-run co-movement of the variables of interest, we will explore the short-run dynamics by performing Granger causality tests for co-integrating systems. Such an exercise will provide an understanding of the interactions among the variables in the system and will shed light on the directions of the causality.

The emergence of VAR methodology in econometric analysis can be traced to the path breaking article of Sims (1980). In that article, Sims argued that decision among competing macroeconomic theories should be given by appeal to data. He further argued that prior to the development of vector auto-regression methodology; the dominant method of analysis used in modelling large-scale macroeconomic systems was primarily constructed for policy analysis and forecasting and not for data analysis. For this reason, it suffers from inherent defects when employed for data analysis.

Sims (1980) proposed an alternative methodology VAR. It begins with the estimation of unrestricted reduced form and then proceeds to test economic hypotheses by testing the implied restrictions on the reduced form (Patterson 1990). VAR is formulated as a unified system and variables are chosen

based on how they fit into the system as a whole rather than how they contribute to a particular subsystem.

Exogeneity problem is taken care of by treating all variables as endogenous. VAR methodology takes care of expectations by allowing lags of every variable to enter the equation explaining each variable. In this way, the effects of the sequence of past states of the entire system on expectations and on the current value of a given variable are accounted for in a reduced form.

In VAR methodology, the researcher is not interested in the coefficients of VAR, because they do not make much meaning in economics; rather the focus is on the variance decomposition and the impulse response functions. What VAR does is to invert the system and then innovations are generated after decomposition, which have direct economic interpretations. The interesting thing about VAR analysis is that it allows us to decompose the variance into parts attributed to each set of the innovation or shock process.

The impulse response functions describe the response of an endogenous variable to one of the innovations. In other words, the impulse response function traces the effects on present and future values of the endogenous variable of one standard deviation shock to one of the innovations. While the impulse response function trace the effects of a shock to one endogenous variable on to the other variables in the VAR, variance decomposition separates the variation in an endogenous variable into component shocks to the VAR. Thus, variance decomposition provides information about the relative importance of each random innovation in affecting the variables in the VAR.

We will compute forecast error variance decomposition of current account to see what proxy measures of macroeconomic policy variables, structural features (stage of development) and external factors influence current account behaviour in Nigeria.

#### IV. Empirical Result

We proceed by running preliminary tests using OLS and the result is reported in table IV.2. The diagnostic statistics indicate that there is no first order serial auto correlation. The adjusted  $R^2$  of 0.55 gives a good fit to the regression line. In particular, it shows that the explanatory variables explain 55 per cent of variation in current account around its mean.

The OLS results show that fiscal balance has the correct a priori sign and is statistically significant. The terms of trade variable though statistically significant at 5 per cent levels, it has the wrong a priori sign. All other explanatory variables are not statistically significant but theoretically, have the correct signs. The negative association of exchange rate and current account suggests that the Mundell-Fleming condition holds and a rejection of the Marshall-Lerner condition. This interpretation is made with caution because the coefficient of exchange rate is not statistically significant.

The result of the unit test is reported in table IV.1 in the appendix. The result indicates that three variables- *cadgdp*, *ttrade*, *traopen*- are stationary at levels, whereas *msgdp*, *gdpcapita*, *gdpgpr*, *fedeficit* and *exchtr* were stationary at first difference. The stationarity of current account at levels is consistent with theory. The residual of current account should be stationary for long run relationship to exist between it and the explanatory variables.

The non existence of unit in the current account variable is an indication that the deficit may have been temporary in nature and policy reforms may have been useful in addressing adverse changes in the current account balance. The stationarity terms of trade (ttrade) and trade openness (traopen) variables suggest that these shocks to current account are of temporary in nature and are significant in the short run. This appears to confirm previous theoretical and empirical study, which showed that terms of trade and trade openness shocks are of a temporary nature in most developing countries (Cashin et al 1998).

In summary, the unit root results show that three variables follow the I(0) process, six variables are I(1). Given the reasoning behind co-integration tests which requires that all the variables entering the co-integration **test must** be of the same order of integration, that is, I(1) process, it is therefore not necessary to proceed with the co-integration test since most of the variables are stationary at different levels.

Intuitively it is clear that we should reject the presence of co-integrating relationship among the variables. Rejecting the presence of co-integrating relationship among variables implies that there is no long-run relationship between the dependent variables and its determinants; and therefore no need to set up an error correction model. Thus, we modelled the determinants of current account behaviour using the Variance Decomposition approach and impulse response function.

### III.2 Granger Causality Test

The Granger Causality approach to the problem of whether x causes y is to see how much of the current y can be explained by past values of y and then to see whether adding lagged values of x can improve the explanation. Y is said to Granger-Caused by x if x helps in the prediction of y or equivalently, if the coefficients on the lagged x's are statistically significant.

The result of the Granger Causality test is revealing. The null hypothesis of non causality between budget deficit and current account is easily rejected at 5 per cent significant. There exists a bidirectional relationship between budget deficit and current account balance in Nigeria (Fedeficit $\leftrightarrow$ Cadgdp). This two way causality confirms the findings of Anaoruo and Ramchander (1998) and Khalid and Teo (1999).

The causality between exchange rate and current account is unidirectional. The causality runs from exchange rate to current account. The study found no causal relationship between financial indicator variable (msgdp) and current account. This suggests that the financial sector reforms have no significant impact on the current account behaviour in the study period.

The relationship between current account and trade openness variable is unidirectional. It runs from current account to trade openness. This implies that policies that promote international trade and greater opening of the economy have a significant impact on the current account behaviour.

The proxy for monetary policy credibility (inflat) has unidirectional causality with current account. This means that the ability of the monetary authorities in Nigeria to control inflation would have effect on the current account behaviour. There exists a unidirectional causality running from current account to the proxy for stage of development (gdpcapita).

Implying current account behaviour affects per capita income in Nigeria.

### IV.3 Variance Decomposition and Impulse Response Function

Albeit the Granger causality test presented above provides a rich framework for which causality may be tested, the weak point is that they are within the sample test. To gauge the relative strength of the variables and the transmission mechanism responses, we shock the system and partition the forecast error variance decomposition for each of the variables in the system. However, it is well established that the results of the forecast error variance decomposition based on the Choleski's decomposition are generally sensitive to the ordering of the variables and the lag length.

To overcome this shortcoming, the generalized variance decomposition provided by Lee and Pesaran (1995) is used in this paper. In this paper, we also conducted the generalized impulse response functions. The innovation of the variance decomposition is presented in percentage form and the strength of each variable to their own shocks and others are measured up to the value of 100 per cent conducted using different horizon (1 to 10 years).

The results of the vector auto regression (VAR) model are not reported because the coefficients of VAR are of no importance in economics. What we are interested in is the variance decomposition and impulse response functions emanating from the VAR model. Table IV.4 shows the variance decomposition of the nine endogenous variables from the reduced form of the VAR. The variance decomposition tells us the proportion of forecast error attributed to its innovation and to innovations in the other endogenous variables.

Own shocks constitute the dominant source of variations in the forecast errors of current account. These variations of current account balance range from 100 per cent in the short term to 40 per cent in the medium term, and 34 per cent in the long term. From a contribution of 100 per cent to variations in their forecast errors, the contribution of current account balance fell from 40 per cent in the medium term to 34 per cent in the long term. A small fraction of the shocks were taken up by other variables, particularly the exchange rate, fiscal balance, terms of trade and the ratio of broad money supply to GDP over the ten year horizon.

A close examination of the forecast errors variance decompositions show that current account balance is not the only dominant source, other variables are equally important. Therefore, the forecast error is attributed to innovations in current account balance and innovations from other endogenous variables.

The result of the variance decomposition is quite revealing. It shows that the innovations of exchange rate, terms of trade, GDP per capita and budget balance account for the forecast error of themselves to a significant extent. In particular, the predominant source of variation in forecast error of exchange rate is the current account balance, stood at 99 per cent in the first year and declined sharply to 52 per cent in the fifth year, before further declining to 21 per cent in the ten year horizon. The results also show that the predominant source of variation in forecast error of terms of trade, GDP per capita, trade openness and budget balance is the current account. Standing at 71, 68, 67 and 59 per

cent in the first year, they gradually declined to 2, 0.9, 6 and 16 per cent over the ten year horizon, respectively.

A close examination of the forecast error variance decomposition of all the endogenous variables suggests that innovations to the current account balance are the dominant source of variations in the forecast error variation in all of the endogenous variables, and are therefore a strong predictor in each of them. Indeed, current account balance contribution to the variations in the forecast error variance of these variables, which average about 60.5 per cent, clearly outweighs their respective own shocks. This result strengthened the causality chain given earlier and that exchange rate, budget deficit, terms of trade, opening of the economy to foreign competition, GDP per capita do indeed have causal relationship with current account balance.

Tables IV.5 show the impulse response from one standard deviation in each of the endogenous variables. A cursory perusal of the respective tables indicate that unanticipated increase in current account balance has a strong positive effect on the actual current account balance but no effect on other variables in the first year. The effect of unanticipated increase in current account balance on exchtr, fedeficit, traopen, ttrade, msgdp, gdpcapita and inflat induce a mixture of contraction and expansion in remaining ten year horizon.

As shown in table IV.5 an unanticipated increase in exchange rate has a positive effect on the current account balance in the first year, positive effect on monetary policy credibility variable (inflat) in the first nine years. The exchange rate variable subsequently triggers a mixture of expansion and contraction over the ten year horizon for other variables.

Table IV.5 further indicates that a shock to budget deficit will have positive effect on the current account balance in the first year, negative effect in second, fifth and eight years, maintains positive effect in the remaining time horizon. For other variables, the effect is a mixture of contraction and expansion over the time horizon.

If there is an unexpected shock to trade openness variable, it triggers contraction to current account balance in the short term, medium term and long term. For other variables, the effect is that of contraction and expansion over the ten year period.

Unanticipated increase in terms of trade variable yields a positive effect on the current account balance throughout the time horizon except in the third and fourth years. Terms of trade variable yields positive effect on monetary credibility variable (inflat) in the first three years and subsequently produce negative effect over the remaining time horizon.

Msgdp, gdpcapita, inflat and gdpgr yield a mixture of contraction and expansion on the current account balance in the ten year period. An unexpected change in inflat variable yields positive effect on msgdp and negative effect on current account balance throughout the time horizon. Subsequently, it triggers a mixture of contraction and expansion on other variables.

## V. Concluding Remarks

In this paper, we have attempted to document empirically the macroeconomic, structural and external factors that determine current account behaviour in Nigeria. The results produce useful policy insights. The

Granger causality results show bidirectional causality between budget deficit and current account balance. This means that there is a direct causal link from budget deficit to current account balance and indirectly through exchange rate. The receive theory argues that a higher budget deficit leads to a higher interest rate, and higher interest rates lead to appreciation of the domestic currency and this in turn worsens the current account deficit. This causal chain assumes that the Marshall-Lerner condition holds. This result is at variant with the findings of Chete (2001), where he rejected the Marshall-Lerner condition for Nigeria.

The negative association between current account balance and exchange rate flexibility strongly supports the argument that flexible exchange rate regime imposes a discipline device on the current account balance by allowing exchange rate to adjust to current account equilibrium. This result confirms the findings of Edwards (2004) and Ozmen (2004). They argued that countries with floating exchange rate regimes are able to manage adverse changes in current behaviour.

The external sector variables, trade openness and terms of trade exhibit a mixture of contraction and expansion and causality runs from trade openness to current account. The negative association between trade openness and current account in the short term to long term confirms earlier views that economies open to international trade tend to have lower current account balance. They are therefore vulnerable to external crisis and shocks.

The paper found no causal link between measures of financial development and current account balance. This supports the view that financial deepening has positive impact both on savings and investment leading to a statistical neutral effect on the evolution of cadgdp. The monetary credibility variable (inflat) is supposed to act as disciplining device on the current account balance by responding to aggregate demand shocks, and help the current account balance not to deviate significantly from the level consistent with a stable inflation. The negative association of inflat with current account balance in the impulse response function supports this assertion.

The paper argues that exchange rate policy, fiscal discipline, monetary policy credibility, and growth rate of output are crucial in explaining the oscillation in current account in the period of the study. In addition, the findings of this study provide strong evidence to confirm that the reforms efforts of government have been successful so far in addressing adverse changes in current account behaviour. However, the success already achieved is still below the threshold needed to maintain a sustained and favourable current account balance. Therefore, policy direction should be fashion at deepening the supply side of the Nigerian economy.

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## APPENDIX

Table IV. 1 Unit Root Results  
Augmented Dickey Fuller

Variable	Philip Peron Test					
	Levels	1 <sup>st</sup> difference	Order of integration	Levels	1 <sup>st</sup> difference	2 <sup>nd</sup> difference
Cadgdp	- 4.357212		I(0)	- 4.302855		I(0)
Fedeficit	- 1.612096	- 5.444507	I(1)	- 1.479059	- 5.359881	I(1)
Msgdp	- 1.644404	- 5.318479	I(1)	- 1.954373	- 5.942593	I(1)
Ttrade	- 4.185040		(0)	- 4.080919		I(0)
Traopen	- 3.289584		I(0)	- 3.190317		I(0)
Gdpgr	- 1.804361	- 3.393401	I(1)	- 1.800243	- 3.24546	I(1)
Exchrt	0.156451	- 5.727498	I(1)	0.112010	- 5.732212	I(1)
Inflate	1.23675	- 4.76608	I(1)	- 1.465436	- 487658	I(1)
Gdpcapita	0.612531	- 5.227727	I(1)	0.612531	- 5.227927	I(1)
ECM-1	- 5.695243		I(0)	- 6.6252262		I(0)

Critical Values  
1% = -3.615588  
5% = -2.941145  
10% = -2.609066

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1% = -3.615588  
5% = -2.941145  
10% = -2.609066

Table IV.2 OLS Result

Variable	Coefficient	T-statistics	Probability
Constant	173.6182	0.549969	0.5871
Log(exchrt)	-0.651266	-0.087569	0.9308
Log(GDPCAPITA)	-23.60604	-0.562250	0.5783
Fedeficit	0.00146	3.753178	0.0008
Gdpgr	-1.527332	-0.881439	0.3853
Inflat	0.240758	0.465229	0.6452
TTrade	0.366090	2.057524	0.0487
Traopen	-80.98915	-0.968032	0.3410
Msgdp	-0.657871	-0.467681	0.6435

R<sup>2</sup> = 0.55  
D.W = 1.8

Table IV.3: Granger Causality Result

Null Hypothesis	F.statistic	Prob.	Decision	Causality
Fedeficit does not Granger cause cadgdp	20.99625	1.50E-05	Reject	Feedback
Cadgdp does not Granger cause fedeficit	14.84785	2.74E-05	Reject	
Exchtr does not Granger cause cadgdp	8.233504	0.001304	Reject	Unidirectional
Cadgdp does not Granger cause exchtr	0.013025	0.964065	Accept	
Msgdp does not Granger cause cadgdp	0.271123	0.764257	Accept	Independent
Cadgdp does not Granger cause msgdp	0.036639	0.964065	Accept	
Gdpgr does not Granger cause cadgdp	0.792154	0.461822	Accept	Independent
Cadgdp does not Granger cause gdpgr	0.481558	0.622365	Accept	
Ttrade does not Granger cause cadgdp	0.893909	0.419022	Accept	Independent
Cadgdp does not Granger cause ttrade	0.706395	0.500951	Accept	
Traopen does not Granger cause cadgdp	2.02655	0.14836	Accept	Unidirectional
Cadgdp does not Granger cause traopen	4.490264	0.019106	Reject	
Inflat does not Granger cause cadgdp	8.656848	0.000988	Reject	Unidirectional
Cadgdp does not Granger cause inflate	0.987149	0.3837	Accept	
Gdpcapita does not Granger cause cadgdp	0.055716	0.945899	Accept	Unidirectional
Cadgdp does not Granger cause gdpcapita	37.32107	4.32E-09	Reject	

Table IV.4 Variance Decomposition

Variance Decomposition of CADGDP:										
Hori	CAD	EXC	FEDE	TRAO	TTR	MS	GDPC	GD	INFL	
zon	GDP	HTR	FICIT	PEN	ADE	GDP	APITA	PGR	AT	
1	100	0	0	0	0	0	0	0	0	0
	72.8	1.98	8.2268	6.566	0.31	4.17		0.00		2.66
2	7	982	5	7	52	45	3.1944	01		207
	62.3	5.38	12.158	10.38	0.78	4.09	2.9065	0.06		1.87
3	45	315	4	9	32	72	2	21		597
	51.1	13.4	13.128	10.72	0.63	3.34		0.07		2.48
4	74	65	8	6	89	086	4.9691	21		516
	33.9	13.0	35.189	6.776	0.41	2.17	3.1704	3.60		1.65
5	88	29	8	2	2	356	2	86		258
	40.0	12.2	29.194	6.202	0.62	1.93	5.2207	2.29		2.25
6	35	325	9	7	66	609	6	8		341
	40.1	11.1	19.642	6.769	1.82	5.93		3.97		7.05
7	27	472	9	4	74	772	3.5189	83		078
	40.3	15.0	21.820	8.608	1.60	3.57	2.1054	2.61		4.29
8	01	763	1	9	24	195	7	61		761
	45.2	8.86	29.234	5.241	1.53	3.77	1.1154	1.82		3.18
9	18	77	5	8	37	898	1	91		121
10	34.3	7.45	35.502	6.329	3.12	4.85	1.2398	1.31		5.80

73      871                      4      32      195                      1      76      418

## Variance Decomposition of EXCHTR:

Hori zon	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
1	0.86	99.1	0	0	0	0	0	0	0
2	3.38	68.1	1.5479	6.534	0.32	0.86	11.270	0.04	7.87
3	6	45	3	8	1	904	9	55	979
4	2.95	66.4	3.8801	4.497	0.22	0.64	9.1249	0.60	11.6
5	43	358	1	9	53	349	5	55	327
6	4.10	56.1	17.068	3.029	0.24	0.85	8.5739	0.80	9.17
7	86	451	5	2	16	106	2	98	221
8	7.51	51.8	15.004	2.642	0.73	0.79	11.954	0.86	8.66
9	89	279	2	3	75	174	3	05	262
10	11.8	42.5	17.674	2.02	0.89	3.33	8.8072	0.57	12.3
1	56	097	6	3.193	56	717	7	25	271
2	15.5	32.0	27.581	3.193	0.99	2.32	8.5660	0.70	9.05
3	73	06	4	4	23	525	8	45	845
4	18.6	30.8	26.092	2.857	0.96	2.07		0.61	8.78
5	06	5	8	9	08	455	9.1577	22	816
6	22.3	14.9	40.717	1.647	1.66	2.97	4.5630	0.33	10.8
7	7	168	3	7	93	075	3	25	121
8	18.8	21.2	38.108	2.443	1.80	2.67	6.6914	0.27	7.84
9	81	842	2	6	42	507	4	08	174

## Variance Decomposition of FEDEFICIT:

Horizon	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
1	25.7	15.0	59.266	0	0	0	0	0	0
2	24	093	3	0	0	0	0	0	0
3	14.9	63.9	16.590	0.123	0.10	1.93	0.4731	0.01	1.89
4	13	5	5	5	7	741	2	43	076
5	9.03	70.6	10.355	3.103	1.51	1.53	0.2727	1.48	2.04
6	69	528	2	4	06	856	9	41	565
7	20.7	58.2	15.813	1.577	0.76	0.70	0.1288	1.09	0.95
8	35	209	8	5	71	729	6	89	119
9	11.4	71.8	11.724	1.530	0.43	1.31	0.0908	0.99	0.57
10	47	871	2	8	38	352	1	83	415
1	12.9	66.8	12.309	0.982	1.48	0.98	0.9766	1.08	2.39
2	62	184	7	1	44	602	1	38	688
3	11.1	68.7	13.588	1.257	0.95	1.20	0.6774	0.72	1.63
4	8	744	3	4	68	537	3	41	639
5	7.78	69.7	17.428		0.62	0.89	0.4076	1.24	1.14
6	36	182	2	0.76	5	449	7	26	022
7	23.9	47.1	18.794	0.535	1.58	1.51	0.9687	1.35	4.07
8	64	919	9	2	91	725	8	96	954
9	20.7	46.2	16.156	4.593	2.26	3.20		1.24	4.55
10	05	461	8	7	89	925	1.0112	92	996

## Variance Decomposition of TRAOPEN:

Hori zon	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
1	16.0	15.7		67.42					
2	21	708	0.7792	9	0	0	0	0	0
3	28.1	19.8	0.7129	39.93	0.41	0.76	4.9354	0.07	5.16
4	1	822	3	2	85	555	3	96	339
5	26.4	19.9	0.8526	38.16	3.13	0.73	5.6334	0.26	4.80
6	48	563	3	3	55	43	2	85	826
7	29.1	12.0		30.07	1.84	4.57	3.8382	2.56	8.22
8	59	363	7.6825	8	08	401	9	82	261
9	18.3	15.8	31.380	19.24	1.20	4.37	2.6716	1.41	5.48

	84	391	5	4	84	625	9	62	038
6	14.1	44.5	17.697	11.36	0.78	2.73	4.2925	0.96	3.44
	76	382	7	8	06	783	3	39	521
	25.7	34.6	16.641	6.908	1.27	2.52	2.9965	1.53	7.75
7	21	397	3	9	65	433	6	86	341
	37.2	27.1	15.503	8.581	0.98	1.70	2.2252		5.42
8	82	419	4	2	27	815	7	1.15	558
	29.0	36.5	14.995	9.045	0.81	2.16	1.6746	0.88	4.79
9	92	362	2	5	41	749	5	16	314
	24.1	29.0	28.359	5.925	1.60	1.84	1.1483	0.58	7.34
10	43	51	8	1	08	179	5	26	801

## Variance Decomposition of TTRADE:

zon	Hori	CAD	EXC	FEDE	TRAO	TTR	MS	GDPC	GD	INFL
	GDP	HTR	FICIT	PEN	ADE	GDP	APITA	PGR	AT	
	19.9	4.50	4.3715	0.097	71.0					
1	66	492	6	7	6	0	0	0	0	
		5.22	5.3306	1.840	51.8	5.53	5.1187	9.17	0.57	
2	15.3	717	2	9	97	412	6	54	657	
	23.4	4.17	5.1880	4.326	35.2	3.93	8.3891	9.15	6.11	
3	97	199	6	9	16	32	4	83	953	
	21.5	4.30	7.0066	4.115	32.6	4.30	8.5985	10.9	6.50	
4	31	138	5	8	84	592	4	55	152	
	16.3	25.5	8.7065	3.098	23.3	3.89	6.1533	8.15	4.66	
5	53	786	4	4	92	842	4	94	068	
	10.3	49.8	9.0471	1.939	13.8	2.41	3.7611	5.20	3.57	
6	12	793	6	1	7	685	3	29	201	
	14.0	54.3	12.387	1.091	7.92	1.36	2.2881	3.26	3.26	
7	67	473	1	4	88	729	9	2	038	
	15.6	60.9	8.8576	1.862	4.80	1.15	1.5163	2.37	2.82	
8	57	483	7	8	52	356	4	72	204	
	14.8	64.5	7.4566	2.451	3.23	0.92	0.9963	1.82	3.78	
9	2	074	6	1	39	244	5	36	817	
	13.6	64.4	10.839	2.382	2.18	0.74	0.6823	1.28	3.75	
10	89	381	5	5	38	407	8	62	418	

## Variance Decomposition of MSGDP:

zon	Hori	CAD	EXC	FEDE	TRAO	TTR	MS	GDPC	GD	INFL
	GDP	HTR	FICIT	PEN	ADE	GDP	APITA	PGR	AT	
	1.20	14.5	5.3533	2.856	27.5	48.4				
1	33	558	7	9	41	9	0	0	0	
	5.32	11.8	5.4672		17.4	37.1	10.541	0.37	3.17	
2	79	242	5	8.646	93	476	4	73	524	
	6.83	10.7	6.2564	12.90	13.9	30.3	10.175	0.46	8.37	
3	19	551	8	5	13	315	6	03	097	
	11.2	8.52	19.604	11.74	11.2	20.8	8.6075	0.51	7.65	
4	52	829	9	2	5	433	8	38	795	
	12.7	8.73	16.191		12.2	20.2	11.506	0.69	6.58	
5	01	593	1	11.14	37	094	1	18	829	
	13.4	7.60	16.310	10.08	10.6	18.0	11.122	1.01	11.6	
6	46	196	5	7	47	936	3	81	726	
	23.1	6.57	21.880	8.243	8.21	12.9	9.6247	0.73	8.66	
7	55	201	5	5	4	064	8	64	697	
	23.5	4.86	34.854	6.510	6.68	9.57		0.52	6.16	
8	27	948	8	3	7	215	7.2897	59	418	
	21.2	12.0	31.489	5.074	5.97	9.44	6.0424	0.38	8.21	
9	87	84	8	6	73	15	9	84	47	
	18.2	11.8	31.662	5.119	6.51	8.66	6.3863	1.24	10.2	
10	5	576	3	1	89	713	3	83	898	

## Variance Decomposition of GDPCAPITA:

zon	Hori	CAD	EXC	FEDE	TRAO	TTR	MS	GDPC	GD	INFL
	GDP	HTR	FICIT	PEN	ADE	GDP	APITA	PGR	AT	

	0.00	0.45	12.641	9.501	0.06	8.76	68.570			
1	21	606	5	2	35	477	9	0	0	
	17.0	6.48	44.740	6.410	0.00	10.8		6.65	###	
2	82	518	1	3	72	491	7.7678	79	####	
	13.2	49.5	14.875	3.264	0.42	13.1	2.8221	2.30	0.28	
3	82	66	9	6	4	788	4	13	517	
	11.6	55.0	14.755	2.400	0.74	6.42	1.5392	2.46	5.01	
4	14	373	4	9	74	499	9	63	418	
	25.9	41.9	19.160	2.595	0.39	3.44	1.6607	1.37	3.47	
5	24	749	2	4	52	197	6	68	045	
	17.7	52.1	15.708	4.568	0.45	3.61	1.3176	1.26	3.11	
6	72	75	9	5	88	853	8	91	117	
	21.7	41.6	20.158	3.676	0.88	2.48	1.0903	0.99	7.36	
7	12	318	9	9	53	743	5	14	633	
	17.1	45.6	21.109	4.384	0.94	2.82	1.7647	0.75	5.40	
8	29	82	4	6	73	204	8	91	148	
	13.2	46.7	26.288	3.024	0.68	1.91	1.5206	1.40	5.18	
9	45	278	8	6	62	186	1	82	658	
	33.1	25.8		1.747	1.21	2.74	0.9421	1.09	7.83	
10	57	633	25.401	6	3	169	3	62	832	

## Variance Decomposition of GDPGR:

zon	Hori GDP	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
		0.37	1.67	2.6000		0.26	29.4	10.802	47.6	
1		02	929	8	7.141	51	425	4	99	0
		3.83	1.31	2.2782	7.701	2.88	22.9		48.8	1.20
2		56	609	7	5	91	555	9.0092	11	352
		3.58	1.35	2.7350	7.049	6.00	22.1	10.818	44.8	1.46
3		03	854	5	8	48	788	2	14	036
		14.8	7.85	11.856	4.965	4.09	15.2	8.4292	31.7	0.99
4		57	642	2	1	59	248	9	19	556
		16.3	32.4	7.1519	3.357		12.5	5.1403	19.5	0.98
5		22	99	1	8	2.51	044	6	31	318
		14.7	40.6	13.219	2.375	2.87	7.36		11.8	3.97
6		7	103	5	2	07	094	3.0102	09	34
		21.4	42.4	17.906	1.993	1.48	3.97	2.1143	6.32	2.30
7		54	423	4	4	16	707	1	56	497
		13.5	57.4	15.019	1.997	0.94	3.17	1.4500	4.48	2.00
8		12	159	4	3	24	386	4	1	824
		22.6	41.5	20.905		1.47	2.20	1.1391	2.93	5.72
9		53	196	3	1.453	77	013	6	07	174
		17.7	48.1	18.425	3.409	1.46	2.91	1.5048	2.13	4.20
10		46	858	8	5	53	668	8	88	726

## Variance Decomposition of INFLAT:

	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
	23.4	19.5	14.556	1.215	0.09	1.42	11.757	2.16	25.8
1	24	158	3	7	9	194	8	01	489
	16.7	16.1	18.643	6.036	0.02	1.37	15.528	0.68	24.7
2	41	72	2	3	88	171	6	01	986
	16.6	18.1	16.966	5.194	0.07	1.39	15.245	0.52	25.8
3	87	092	6	6	23	855	3	62	005
	17.5	18.4	21.269	4.905	0.06	1.32	12.651	0.53	23.1
4	84	859	8	8	06	439	2	48	834
	14.7	17.1	23.205	5.124	0.21	1.24	14.295	0.59	23.4
5	47	304	2	3	7	811	3	9	335
	13.4	14.2	24.976	3.943	0.19	2.00	14.804	0.46	25.9
6	06	837	1	4	4	434	2	84	196
7	18.6	10.3	29.609	3.050	0.12	2.05	13.066	0.30	22.8

	8	025		1	92	874	9	02	037
	18.9	8.54		4.091	0.17	1.84	14.635	0.24	23.9
8	14	997	27.575	9	4	025	7	95	7
	20.0	6.04	29.749	3.606	0.28	2.03	12.092	0.17	25.9
9	73	802	8	8	02	601	2	66	37
	20.2	4.70	37.633	3.543	0.18	1.42	10.822	0.17	21.2
10	18	233	4	3	33	633	8	63	944

Cholesky Ordering: CADGDP EXCHTR FEDEFICIT TRAOPEN TTRADE MSGDP GDPCAPITA GDPGR INFLAT

Table IV.5 Impulse response function

Response of CADGDP:

Horizon	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
1	39.2	59	0	0	0	0	0	0	0
	-	7.80	-	14.18	-	11.3	-	-	9.03
2	26.294	801	15.876	4	3.108	093	-9.893	0.0567	114
	-	13.1	16.653	-	4.94	-	-	-	-
3	21.954	692	6	15.848	42	7.1063	-5.3558	1.6437	0.3492
	7.98	22.2	13.542	-	0.76	1.72	-	-	7.29
4	82	861	8	11.402	42	828	11.968	1.0987	688
	12.0	19.7	-	-	0.86	-	-	17.5	-
5	1	312	48.096	-0.587	3	2.3496	-1.6852	04	2.6796
	50.2	-	30.805	16.18	7.06	-	-	1.60	-
6	82	23.348	1	1	25	8.7577	-20.933	16	12.834
	-	24.3	1.2771	22.93	-	30.6	1.2497	-	33.4
7	51.698	145	8	3	16.87	343	3	22.193	752
	-	53.7	-	-	13.3	-	-	9.36	-
8	75.073	645	58.934	39.608	09	4.1796	-2.5418	97	6.3158
	126.	-	108.33	-	21.4	-	-	17.5	-
9	16	25.933	6	22.381	36	35.505	-3.6325	29	24.911
	-	31.4	-	48.32	-	44.1	19.982	-	56.6
10	41.104	049	114.93	6	42.93	282	4	1.3537	438

Response of EXCHTR:

Horizon	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
1	0.84	9.10	95	438	0	0	0	0	0
	-	7.49	-	-	0.80	1.33	-	0.30	4.01
2	2.4881	831	1.7776	3.6525	95	196	-4.7968	47	076
	-	9.98	-	-	0.39	0.73	-	1.44	5.07
3	1.9255	533	3.2845	1.6817	3	422	-3.1294	36	256
	-	9.48	-	-	0.77	1.63	-	1.60	3.44
4	3.6652	025	9.2724	1.2511	77	379	-4.1705	13	687
	5.15	4.52	1.0745	0.258	1.88	0.59	-	1.02	2.15
5	76	336	3	1	53	279	-5.5081	76	891
	-	9.51	-	1.758	-	5.40	-	-	8.31
6	8.4837	396	9.0402	3	2.072	205	-3.2494	0.3528	497
	-	6.00	-	-	2.34	0.22	-	2.13	2.67
7	10.434	877	15.073	5.1554	27	264	-6.0204	35	562
	-	-	6.5222	-	1.38	-	-	0.38	4.21
8	9.55	7.6989	1	1.4474	3	1.1894	-5.6117	03	453
	-	-	-	3.122	-	8.42	-	-	15.3
9	21.968	1.3848	-31.83	2	6.59	373	-2.3301	1.1629	88
	-	-	-	-	5.43	-	-	1.21	-
10	11.523	22.815	-20.68	7.8801	62	5.096	-12.969	92	0.6336

Response of FEDEFICIT:

Hori zon	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
1	4389 3	3352 7.6	66623. 2	0	0	0	0	0	0
2	- 45756	1269 45	5806.2 3	- 5770.9	- 5371	228 53.3	11293. 4	196 6.1	225 76.5
3	3688 2	1575 66	41146. 6	- 42596	2950 5	- 19844	- -5905.9	296 61	- 26613
4	1475 01	1847 50	12054 7	14726	1022 3	310 4.71	2496.8 6	235 49	- 5190.5
5	- 10301	3080 31	- 84883	39730	- 5334	469 07.6	- -6888.6	306 20	110 22.8
6	1445 26	2775 37	13343 9	-1862	6692 9	- 23136	- -58397	406 04	- 86797
7	1296 32	3890 36	18225 3	60470	- 6745	577 90.7	17559 17559	134 57	245 86
8	- 101208	5233 72	- 299010	6133.2	2188 3	404 76.7	1681.8 8	882 98	- 38837
9	5283 04	1559 25	33096 0	23913	1321 23	- 117438	- 101907	899 90	- 222035
10	4747 4	3141 09	- 18804	26681 5	- 1E+05	181 195	55589. 2	- 37557	134 944

## Response of TRAOPEN:

Hori zon	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
1	- 0.0332	- 0.0329	0.0073 1	0.068	0	0	0	0	0
2	0.04 65	0.03 496	- 0.0054	0.000 9	- 0.007	- 0.0094	0.0239 2	- 0.003	- 0.0245
3	- 0.0069	0.01 378	0.0048 9	- 0.0119	0.01 85	0.00 175	- -0.0115	0.00 49	0.00 159
4	- 0.0539	0.00 826	- 0.0391	0.0404	#### ##	- 0.0297	- -0.0106	0.02 27	0.03 391
5	0.0298 0.05	0.0596 -	0.1024 -	-0.032 0.022	86 0.00	0.0268 -	-0.0146 -	0.0001 -	912 0.01
6	3 -	0.1581 -	0.0157 -	6 0.024	89 -	0.0149 0.03	-0.0444 -	0.0113 -	706 0.08
7	0.1477 -	0.1078 -	0.0904 -	1 -	0.032 0.02	466 -	-0.0264 -	0.035 -	461 0.03
8	0.2083 0.05	0.1093 -	0.1035 0.0945	0.0936 -	01 0.01	0.0181 -	-0.0281 -	0.0205 -	697 0.04
9	3 -	0.2078 -	1 -	0.0833 0.005	42 -	0.0486 0.04	-0.0015 0.0146	0.0067 -	368 0.13
10	0.1446	0.1452	0.2756	3	0.066	165	9	0.0049	133

## Response of TTRADE:

Hori zon	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
1	19.9 92	- 9.4964	- 9.3548	1.398 7	37.7 16	0	0	0	0
2	5.98 89	7.65 684	- 8.0151	-7.103	7.41 01	- 12.552	-12.072	16.1 62	4.05 14
3	- 23.636	- 5.2648	- -8.232	- 11.431	3.55 49	- 2.9793	- -14.465	- 11.239	15.5 73
4	- 2.7865	4.86 254	10.322 1	2.908	5.56 32	5.82 743	-6.7217	- 11.058	6.60 495
5	7.84 77	38.2 552	15.498 7	3.159 4	0.64 88	7.29 188	-0.262	4.57 13	- 0.7576
6	9.63 22	62.6 881	21.172 3	3.9909	5.82 51	4.17 982	4.6429 4	7.26 34	- 9.8708
7	41.1	73.6	38.693	1.963	7.23	2.49	6.4962	8.83	-



	84	645	2	2	57	371	6	08	16.141
	48.8	96.8	21.260	20.04	0.28	10.4	6.5867	11.5	-
8	5	142	5	9	62	273	9	74	16.827
	48.5	112.	29.328	25.17	7.11	9.33		11.8	-
9	94	64	9	4	36	115	-1.8942	23	31.598
	56.3	132.	68.637	24.87	7.81	10.6	5.1338	8.80	-
10	81	882	4	9	63	223	6	92	31.834

## Response of MSGDP:

zon	Hori	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
		-	-	0.9860	0.720	-	2.96			
1		0.4675	1.626	6	3	2.237	768	0	0	0
		1.24	-	0.9185	1.533	-	1.87		-	-
2		55	1.133	2	9	0.899	929	1.8712	0.354	1.027
		1.37	-	1.2436		-	1.99	1.4027	-	-
3		92	1.3613	8	2.016	1.291	091	8	0.3494	1.856
		2.44	-	3.6640		-	1.24		-	-
4		2	1.2338	6	1.766	1.468	337	1.379	0.4388	1.4347
		-	1.32	-	1.223	-	1.76	2.1353	-	-
5		1.8799	486	0.0169	1	1.748	247	5	0.5266	0.5231
		1.69	-	1.6303	-	0.07	-	1.1533	0.70	-
6		18	0.0731	4	0.6899	89	0.7858	1	47	2.6619
		4.76	-	4.1444	1.330	-	-		0.13	-
7		71	1.3916	7	8	1.027	0.1736	1.6879	65	0.7679
		-	0.74		1.284	-	1.05	1.0892	0.12	0.34
8		4.1309	413	-6.788	1	1.455	323	7	33	516
		3.62	-	4.3926	-	1.86	-		0.10	-
9		33	5.2523	7	0.9948	93	2.8052	-1.5084	12	3.4615
		-	-	4.2771	1.735	-	1.53	2.1658	-	3.53
10		0.6217	2.4308	3	4	2.325	186	5	1.8667	341

## Response of GDPCAPITA:

zon	Hori	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
		-	3.92		-	-	-	48.105		
1		0.2638	316	20.655	17.907	1.464	17.199	7	0	0
		-	-	-	-	-	-	16.021	46.9	0.01
2		75.19	46.162	119.92	42.437	0.481	57.401	2	41	904
		87.8	-			20.6	-		10.7	-
3		95	218.59	-13.32	-34.16	1	98.41	-16.49	07	16.949
		-	-	-	-	-	7.19		-	100.
4		103.5	253.44	124.99	41.13	33.51	756	-18.711	52.892	565
		-	-	-	-	12.9	-		-	68.4
5		297.74	261.49	-229.6	79.412	73	40.511	-63.476	29.521	933
		-	-	-	-	35.6	-		-	71.9
6		55.318	396.76	137.95	135.94	51	92.783	-36.923	47.764	663
		-	-	-	-	-	30.6	46.490	-	228.
7		313.37	265.31	310.39	80.466	75.74	64	7	38.77	767
		-	-	-	-	63.3	-		20.9	6.32
8		127.97	451.71	291.91	150.76	58	115.92	-113.96	29	419
		181.	-		33.75	-	-		-	174.
9		25	560.57	488.4	6	29.92	6.3719	-80.526	133.33	436
		-	208.	-	-	-	255.	72.057	-	437.
10		991.48	543	-657.5	74.685	178.8	062	5	114.97	657

## Response of GDPGR:

zon	Hori	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
		0.32	0.70	-	-	-	-		3.73	
1		89	045	0.8716	1.4444	0.278	2.9329	-1.7765	31	0
2		-	0.05	0.3083	-	1.00	0.10	0.4732	-	0.67

	1.1536	6	9	0.8961	32	148	5	2.0921	196
	0.17	0.25	-	-	1.17	0.70	-	-	0.38
3	49	272	0.5176	0.0656	51	091	-1.0298	0.286	457
	2.74	2.04	2.4585	0.328	-	-	-	0.88	0.04
4	08	735	6	2	0.106	0.3161	-0.8094	32	899
	-	5.31	-	0.637	-	1.86	0.3494	-	0.62
5	2.7543	4	0.3038	9	0.268	788	2	0.8064	939
	3.01	6.12	3.9599	-	1.56	-	-	0.81	-
6	07	262	7	0.8447	01	0.2855	-0.0785	78	2.4285
	6.91	8.65	6.1967	1.645	-	0.92	1.4208	1.08	-
7	82	538	2	2	0.306	183	9	4	1.0003
	-	12.9	-	2.008	-	1.90	0.8030	1.64	-
8	0.0745	202	4.5122	9	0.226	807	4	5	1.7402
	11.5	8.11	-	1.539	2.88	-	-	1.52	-
9	25	378	10.426	3	65	1.6655	-1.5772	23	6.4178
	4.03	15.0	6.3792	-	-	4.06	2.9153	-	0.80
10	19	398	8	5.434	2.218	729	1	0.3638	938

## Response of INFLAT:

zon	Hori GDP	CAD GDP	EXC HTR	FEDE FICIT	TRAO PEN	TTR ADE	MS GDP	GDPC APITA	GD PGR	INFL AT
	-	-	1.79	-	-	-	0.48	-	-	2.06
1	1.9612	-	011	-1.546	0.4468	0.127	32	-1.3895	0.5956	02
	-	-	2.43	-	-	0.00	0.73	-	-	3.12
2	2.3703	-	692	2.8548	1.7925	17	623	-2.617	0.1726	664
	-	-	3.05	-	-	0.23	0.80	-	0.38	3.50
3	2.7457	-	118	2.5978	1.3713	97	596	-2.5991	95	283
	-	-	3.64	-	-	0.17	0.92	-	0.61	3.67
4	3.6335	-	715	4.3873	1.7703	42	19	-2.4894	85	883
	-	-	2.31	-	-	0.60	0.65	-	0.61	3.31
5	1.3268	-	888	3.7098	1.6372	53	605	-3.0421	62	214
	-	-	1.98	-	-	-	1.74	-	0.22	4.87
6	2.5681	-	821	4.6411	0.4849	0.296	921	-3.4052	06	435
	-	-	2.36	-	-	-	1.88	-	0.11	5.36
7	6.7903	-	921	7.8974	1.5756	0.167	851	-4.08	56	735
	-	-	-	-	-	0.60	0.84	-	0.04	5.24
8	4.3166	0.0152	-	4.0498	2.9196	4	82	-4.5507	76	948
	-	0.20	-	-	-	-	2.38	-	0.04	8.33
9	7.1996	-	976	8.9057	2.3508	1.102	416	-3.6766	35	876
	-	-	-	-	-	0.07	1.07	-	0.85	7.19
10	9.1839	2.9928	-	14.692	3.7543	77	685	-5.8942	05	564

Cholesky Ordering: CADGDP EXCHTR FEDEFICIT TRAOPEN TTRADE MSGDP GDPCAPITA GDPGR INFLAT