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PROFILES AND DETERMINANTS OF NIGERIA'S BALANCE OF PAYMENTS: THE CURRENT ACCOUNT COMPONENT, 1950-88

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Profiles and determinants of Nigeria's balance of payments: The current account component, 1950-88

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Contents

List of figures

I. Introduction

Nigeria, like most other African nations, has faced an unprecedented economic crisis since the beginning of the 1980s despite her much-vaunted resource endowments. The country's economic predicament can briefly be illustrated by the following indicators:

- The annual growth rate was -3.1% between 1977 and 1980; by 1981-1985 this had deteriorated to -5.8% per annum.
- During the two periods above, the country's food self-sufficiency ratio moved from -0.3 to 0.3%. This means that the country could not on its own feed its population, now estimated at 112 million (1990).
- The annual growth of imports was about 17% between 1977 and 1981, but the country's ability to import has fallen drastically at an annual rate of 19.2% since 1984.
- With the exception of a few years, such as the oil-boom years of the mid-1970s, the balance of payments for most of the last 38 years (1950-1988) has been in chronic disequilibrium.
- In recent years the performance of the external economic sector has deteriorated almost irreversibly. The external debt grew from $220 million in 1979 to about $32 billion in 1990, representing an incredible 14,445% increase in one decade.
- On the domestic scene, the crisis of arrested development has been reflected in a double- digit inflation rate estimated at 51% in 1989 and over 3.7 million unemployed people (1989).

Attempts to stem the tide of economic decline, especially through the World Bank-IMF-supported structural adjustment programme (SAP) since 1986, are yet to register substantial gains. In its 1989 half-year report of developments in the economy, the Central Bank of Nigeria (CBN) concluded that the "cheer induced by the growth of major economic sectors was, however, dampened by galloping domestic prices, implying an inflation rate of 51.1%".

The genesis of the crisis can be traced to both internal and external causes. These factors are not only structurally endemic but have been cumulative over the years.

The balance of payments (BOP) account constitutes, in analytical terms, perhaps the single most revealing reflection of the health of an open economy. The balance of payments crisis facing the economy can be seen as a mirror image of its structural crisis. Contemporary creditors, for instance, use the balance of payments crisis as a warning indicator for deep-seated economic crises before contemplating any intervention in the economy (Helleiner, 1989).

The problem

Since David Hume's seminal work in 1752 on specie price flow mechanism, a plethora of studies have elaborated and refined the concept of balance of payments, especially in Western economic literature. Although further studies might seem to bring diminishing returns in insights into the subject, this is largely invalid for developing economies, where unique balance of payments problems are now confronting each economy.

Nigeria's chronic balance of payments problem constitutes an ever-recurring challenge on the development agenda, although its technicalities are hardly highlighted in any popular discussion of the country's economic problems.

Since the early 1960s, Nigerian scholars have addressed the problem of balance of payments. Examples include Onitiri (1965), Olayide (1968), Osagie (1973), Ojo (1973), Enuenwosu (1984), Umo (1982, 1988, 1990) and Olofin (1985). The various contributions these studies made were either in some specific area of the balance of payments component, like import and export demand, or, in cases where the foreign-trade sector was addressed, a block in an overall economy-wide model. Thus, in spite of the undisputed specific contribution of these studies, none focused on the key component blocks of balance of payments and their strategic linkages with the wider economy.

In specific terms, the questions that need to be addressed with regard to Nigeria's balance of payments include the following: what has been the profile of Nigeria's balance of payments from 1950 up to the end of the 1980s? How can this profile be broken down historically in meaningful economic terms? What have been the stable features of the balance of payments profile? What in particular has been the behaviour of the different accounting blocks within the balance of payments frame? What are the key determinants of the export and import blocks? How robust are the different import models and their variants, including the general model, the Hemphill models and the orthodox model, within the Nigerian context? What are the short-term and long-term trade elasticities of the relevant trade variables? What operational policy implications can be derived from the insights obtained from these questions?

It seems fair to note that since the balance of payments problems of the economy will only vanish when its structural problems have been dealt with, the questions raised above will continue to need investigation. Answers to these and related questions are therefore only likely to emerge from a formal study that examines each issue in detail. Ad hoc policy responses to balance of payments problems and associated costly mistakes can only be reduced if solutions emerge through a formal and rigorous study.

Objectives

Although we have posed a comprehensive set of questions on Nigeria's balance of payments issues above, constraints on research and other resources dictate that we must limit ourselves to addressing one set of key issues at a time, while keeping the overall

thrust in focus. This phase of the study will therefore concentrate on the current account components addressed in some of those questions. Associated issues will form the subject of the next phase of the study.

In specific terms, this study attempts to do the following:

- Profile the key components of Nigeria's balance of payments covering the period 1950-1988, with the profiles presented both graphically and statistically using standard growth estimation models;
- Develop relevant variants of export and import models of Nigeria's balance of payments, taking into account the questions posed on the current account segment and the unique features of the Nigerian economy;
- Estimate the parameters of the various models with appropriate econometric techniques;
- Assess the robustness of the models with relevant statistical diagnostic tests, and compare these with the empirical evidence;
- Make some estimate of both short-run and long-run trade and domestic feedback elasticities and assess the implications for the balance of payments;
- Examine the sensitivity of the relevant trade parameters to some conventional fiscal/monetary policy variables in the Nigerian context;
- Explore the overall policy implications of the findings of this study for balance of payments management in Nigeria in particular, and African economies more generally; and
- Identify areas of further research into Nigeria's balance of payment management.

II. The analytical model

The study of balance of payments has been subject to many different theories. These include: 1). the so-called elasticity approach, which relies on the use of devaluation as the instrument of dealing with balance of payments disequilibrium (Plister and Rothwell, 1967); 2). the absorption approach with emphasis on the balance between domestic expenditure and income, and the use of expenditure switching/reducing policies to deal with balance of payments problems (Meade, 1951); 3). the monetary approach, underscoring the monetary origin of the balance of payments problems (Frenkel, 1975) and the need to address it by monetary policies; and 4). the eclectic approach, which attempts to draw relevant elements from the conventional balance of payments theories and adapting them to deal with particular parameters within the economic system. We intend to adopt this eclectic approach because Nigeria is a developing economy with structurally unique characteristics that are often not addressed in conventional theories.

Model structure of current account within balance of payments

The current account components of Nigeria's balance of payments are presented in three blocks comprising 13 equations, of which six are identities and seven are behavioural.[1]

The summary of the model is as follows. The definitions of the variables are in Appendix A.

- Current Account Identity (Block I)

(1.1) CUB = EXS + Z + SI + UT
(1.2) EXS = NPS + XNP
(1.3) XNP = XAG + XMG + XOT
(1.4) Z = ZCAP + ZCON
(1.5) ZCAP = ZMAN + ZRAW
(1.6) ZCON = ZFD + ZDUR + ZOT

- Export (Block 2)

$$\underset{(2.1)}{NPS} = f_1[\underset{(+)}{POI}, \underset{(\pm)}{NPS(-1)}, \underset{(+)}{NOSRA}, \underset{(+)}{NOSRA-1}]$$

$$(2.2) \quad XAG = f_2[RER, RER\text{-}1, DEC, DEC\text{-}1, XAG(-1)] \quad \begin{matrix} (+) & (+) & (\pm) & (+) & (\pm) \end{matrix}$$

$$(2.3) \quad XMG = f_3[RER, DEC, XMG(-1), RER\text{-}1, LREDP\text{-}1] \quad \begin{matrix} (\pm) & (+) & (+) & (+) & (\pm) \end{matrix}$$

- Imports (Block 3)

$$(3.1) \quad Z_{it} = f[Z_{t-1} REP_t, PEY_t, FOREX_t INTERS, POP] \quad \begin{matrix} (+) & (-) & (+) & (+) & (+) & + \end{matrix}$$
...General model with exogenous prices

$$(3.2) \quad Z_{it} = f[Zt\text{-}1, REP, REY] \quad \begin{matrix} (+) & (-) & (+) \end{matrix}$$
... Orthodox model

$$(3.3) \quad Z_{it} = f[Z_{it-1}, FOREX, INTERS] \quad \begin{matrix} (+) & (+) & (+) \end{matrix}$$
... Hemphill model

$$(3.4) \quad Z_{it} = f[Z_{t-1}, REP_t, PEY_t, INTERS, FOREX_t] \quad \begin{matrix} (\pm) & (\pm) & (+) & (\pm) & (+) \end{matrix}$$
...General model with endogenous price

Where *ith* import category includes in real terms the following:

ZMAN	=	import of manufacturing
ZRAW	=	import of raw materials
ZFD	=	import of food
ZDUR	=	import of durable good
ZSI	=	import of invisibles (services)
POP	=	population

Current account identities

Current account balance (CUB) in balance of payments is the algebraic sum of net exports (EXS), imports (Z), invisible trade (SI) and unrequited transfers (UT).

In Nigerian balance of payments convention, net exports (EXS) are broken down as oil exports (NPS) and non-oil exports (XNP). Exports are further disaggregated into agricultural exports (XAG), manufacturing exports (XMG) and others (XOT). Imports (Z) are made up of capital imports (ZCAP) and consumer goods imports (ZCON). The components of capital imports are manufacturing (ZMAN) and raw materials (ZRAW). The consumer imports are made up of food (ZFD), durable consumer items (ZDUR) and other miscellaneous imports (ZOT).

Exports

In the export block there are three stochastic equations of key interest. These are the oil supply equation (NPS), the agricultural export equation (XAG), and the manufacturing export equation (XMG).

The export supply Equation (2.1) relates Nigeria's petroleum supply (NPS) to the international price of petroleum (POI), its lagged value (NPS-1) and Nigeria's oil supply ratio (NOSRA).

The oil export function has been estimated for some oil-exporting economies, although in different contexts (e.g., Khan, 1976; Morgan, 1979; Aghevli, 1975; Sassanpour and Sheen, 1976; and Olopoenia, 1986 for Nigeria).

Apart from the use of a lagged dependent variable as a regressor to track the lag supply behaviour, the price variable POI, is expected to reflect the impact of international prices of oil on Nigeria's domestic supply for the export market.

Nigeria's response to this price is to some extent attenuated by her membership of the Organization of Petroleum Exporting Countries (OPEC). NOSRA, a ratio of Nigerian to global oil supply, is therefore introduced to capture Nigeria's (market share) influence on her oil export. As Goldstein and Khan (1985, p. 1048) have argued:

> Even if a country is "small" .... it can still affect its export volume to the extent that it can affect internal profitability of producing and selling.

NOSRA is expected to be positively related to oil exports.

The agricultural export supply (XAG) is made a function of real rate of exchange (RER), domestic export supply capacity (DEC) and its lagged value. The real exchange rate is a price variable that can directly reflect the response of domestic producers to real price variables within the economy. Its sign would be expected to depend on the official price policy on agricultural products. If strict domestic price control is imposed, given an over-valuation of exchange rate, XAG can vary positively with nominal price and inversely with real exchange rate.

Domestic export supply capacity reflects the domestic technical constraints facing the supply response of agricultural exports. DEC's comparatively static sign is expected to be ambiguous, because of its minimum critical requirement before generating a positive influence on export production. The index of domestic manufacturing can be used as a proxy for DEC, successfully shown in Umo (1988), but because of the lengthy span of this study the real GDP growth rate and, in some cases, the index of export production, will be used as DEC proxy. The measure is also justified on the grounds that a reasonable degree of factor mobility across sectors exists in the economy (Bond, 1985; Moran, 1988, p. 123).

Export manufactured goods (XMG) is made a function of RER, DEC and its lagged value. The reasoning in respect of XAG above applies *mutatis mutandis* to the export supply of manufacturing.

Imports

The estimating equations specified in the import block are motivated by recent works on import trade models where the foreign exchange constraint figures prominently (Moran, 1989; and Hemphill, 1974). Following Moran's (1989) approach, four import functions are specified on the assumption that these will encompass all plausible cases in Nigeria's import experience in the 38 years covered by this study. The four functions are described below.

The general import model with exogenous prices

The regression in this model is shown in the lagged value of the endogenous variable Z_t, the relative prices (REP) per capita real income (PEY), foreign exchange (FOREX), international reserves (INTERS) and population (POP).

The expected signs of the parameters are placed over of each regressor (block 3 above). The negative and positive signs associated with relative price and income variables, respectively, follow *a priori* from the price and income behaviour in conventional price theory. In the same way, it is expected that foreign exchange (FOREX) and, international reserves (INTERS) would influence import propensity by posing as constraints. Import demand behaviour is therefore expected to vary in direct proportion to the availability of foreign exchange and international resources.

The orthodox model

This model posits import as a function of relative prices and real income. Both variables are deflated by the domestic price index, CPI.

In the context of a less-developed country like Nigeria, it is important to assess the robustness of the orthodox model by an explicit estimation of it. The standard argument that a neo-classical economic structure, and hence variables, hardly applies to developing country can be explored empirically with this equation.

The Hemphill model

Hemphill (1974), whose work has been extended by Chu, Hwa and Krishnamurty (1983), Winters and Yu (1985), Sundarajan (1986) and Moran (1989), explicitly incorporates indicators of import capacity – that is foreign exchange and international reserves in the import equation.

This is motivated by the consideration that while the orthodox import model works well for the industrialized economies, the neglect of import capacity in an import trade equation of a typical developing country would ignore the import strangulating effects of external resource constraints experienced by these countries (Moran, 1989).

The necessity to estimate the Hemphill model for Nigeria further arises from the following observed growth profile of Nigeria's imports:[2]

Period	Trade Growth Rate
1950-59	9.2%
1960-69	0.09%
1970-79	29.0%
1980-88	6.9%

It is clear that during the foreign exchange and international reserve boom the import trade grew by 29% annually. Growth was hardly up to 1% in the pre-oil boom, and slumped to about 7% during the post-oil boom or recession era of the 1980s.

General model with endogenous price

It is clear that the price variable in the import equation is only weakly exogenous, hence the estimate parameter is likely to be biased and inconsistent. To deal with this problem, the endogeneity of REP is recognized and treated by the use of the instrumental variable estimation method. Whether or not the difference in the resulting estimate is significant can be determined empirically.

III. Methodology and data

The stochastic equations in both the export and import blocks were estimated by ordinary least squares (OLS) except for the general import model with endogenous price. In that case, the instrumental variable estimation (IVS) method was used. All variables are deflated by appropriate index so that we have them in real terms.

Appropriate adjustments were carried out for each variable so that a more realistic parameter estimate would be obtained. Real exchange rate (RER) in the export equations, for instance, is defined as the price in real terms of a real dollar (Helmers, 1986). Thus RER = EN.USWPI/CPI where EN, USWPI and CPI, respectively, stand for nominal Nigerian naira price, United States wholesale price index and Nigeria's domestic price index. As correctly noted by Helmers (1986, p. 529), this exchange rate concept allows us to analyse the resource reallocation effects of the real exchange rate, since the numerator of the rate can be interpreted as the price of tradeables and the denominator as the price of home goods.

Given the importance of population (POP) in Nigeria in terms of both size (120 million) and growth rate (3.4%) it was necessary either to include it explicitly in nearly all the equations, or through normalization.

The estimations are all in double log forms except in the case of invisibles trade (services rather than goods) with negative data points.

The parameters of lagged estimates are short-run elasticities. The long-run elasticities of the relevant endogenous variables are calculated by plugging the parameters of lagged endogenous regressors into Koyck's lag adjustment formula for long-run elasticity (Goldstein and Khan, 1985, p. 1066).

Periods of the study

The test for the whole series for 38 years (see Section IV) reveals clearly the existence of structural breaks, and therefore the possibility of instability in the system. In the light of this, estimates of both the export and import functions are given that cover well-defined periods of Nigeria's socio-economic history. These are the pre-oil and post-oil boom eras.

The pre-oil boom era (1950-72)

The pre-oil boom era spans roughly the last decade of the colonial era (1950-1960) and the first 12 years after independence (1961-1972). It constitutes a period when the economy was relatively undisturbed by external shocks. Trade commodity concentration and geographical location were still largely under colonial influence. Thus, the export commodity composition was made up of traditional export products like cocoa and palm oil, and the import basket was made up of goods needed for substitute industrialization. Trade flows were biased towards the West, with an increasingly heavy concentration in European markets.

The post-oil boom era (1973-88)

This is a period of approximately 15 years that saw Nigeria emerging as a mono-cultural economy relying on oil exports and increasingly import dependent. Exports of oil accounted for approximately 90% of total revenue and about 40% of the GDP. Agricultural production of traditional export commodities had drastically declined to around 2% annually and the import ratio shot up to an unprecedented height of about 60%, with food items staying around 70%.

However, the last eight years of this period saw a substantial slow-down in import activities because of the oil-induced recession that characterized the decade. The economy remained basically oil-driven in the post-oil-boom era.

Data

The data for the profiles and estimates of the three equation blocks were collected from several sources including the following:

- Central Bank of Nigeria (CBN) publications such as the *Annual Report and Statement of Accounts, and Economic* and *Financial Review* (various issues from 1960-1988);
- Trade statistics dating from 1950 were collected from the Federal Office of Statistics publications at Abuja and Lagos;
- Plan documents from Ministries of Economic Planning/Finance and Budget (Lagos) 1960-1985, various issues;
- IMF publications including *International Financial Statistics, Balance of Payments, and Supplements on Trade Statistics*;
- World Bank publications including World Tables (various issues) and *World Development Report* (various issues);
- Helleiner (1966) for Nigerian trade data from the 1950s.

IV. The results

The results of this study will be presented in three parts:

1. The revealed trade profiles,
2. The export block estimates, and
3. The import block estimates.

Profiles of key variables

Given the lengthy span of this study (38 years), the need to undertake the profiles of the key variables used rests on two considerations. First, an observation of the variable trend can reveal its behaviour not only through the various epochs but in terms of its reactions to some macro-policy landmarks or events in pre- and post-independence Nigerian history. Second, the revealed profiles can suggest, albeit roughly, the extent to which regression parameter estimates are credible given the pattern of macro-stability/ instability. In an attempt to enhance our insights on these issues, two approaches were adopted for the profiling exercise, the regression and the graphic. In the regression approach, the trend growth rates of each of the selected variables were estimated for the entire time-span of the variable, and in terms of pre-oil boom and post-oil boom epochs.

The major elements from the growth trends in Appendix B can be summarized in several points. First, the trend growth rate of oil export revenues between 1959 and 1988 was about 28%. This was almost double the volume growth rate (in millions of barrels) of 16%. In particular, the phenomenal growth of oil revenue of 31.3% in 1970-1979, swamped the modest growth of 5% in oil quantum. The main reason was due to the quadrupling of oil prices in the international market.

Second, the growth of non-oil export revenue averaged a mere 2% between 1950 and 1988, and in decennial terms increased gradually from 5% in the 1950s to about 13% in the 1970s.

Third, the export of agricultural commodities, which averaged about 1.7% per cent between 1950 and 1988 registered its highest growth rate (8%) in the 1980s and its lowest in the 1960s (a mere 0.8%). This suggests that Nigeria's traditional exports were already in trouble even before the era of the oil boom.

Fourth, the 1970s can easily be characterized as the "import boom era" in Nigeria. Not only was the growth in aggregate imports extremely high (29%), the increase in

some key categories of imported goods was even higher such as food items (35%), durable goods (33%) and machinery (33%).

Fifth, the rate of openness of the Nigerian economy moved from -7% in the 1960s to 5% in the 1970s.

Profiles in graphics

A few selected variables from the identity block were profiled graphically. A summary of each of the charts is given below.

Overall balance of payments and sub-aggregates

Figure 1 shows the combined profiles of the overall balance of payments, the current account balance (CUB) and the capital account balance (CAB) from 1950 and 1988. The balance of payments accounting aggregates and their component elements constitute the research problem of this study. It is interesting to note that in the context of a colonial economy and its first post-independence decade (1950-70), there was relative stability in the external sector. Problems and complications started in 1972 and have been increasing, as is shown by the fluctuations in the three graphs. The extreme in current account balance, which is the focus of this study, is particularly instructive, especially before and after Nigeria's oil - boom era.

Aggregate exports and imports

Figure 2 depicts Nigeria's aggregate imports (Z) and exports (EXS) during the study period. It shows that Nigeria's import dependence was stable through the colonial years but has been increasingly erratic and persistent since the oil-boom era. In particular, it is observed that until recently (1986), the trend of the country's imports was consistently insensitive to down-turns in the export profile, for instance 1977 and 1980.

Oil revenue and non-oil revenue

Nigeria's petroleum revenue (NPR) and non-oil revenue (XNP) are shown in Figure 3. Oil revenue started picking up from 1968 and has since been growing, even though erratically. Non-oil revenue, on the other hand, has not only been erratic, but at a very low level since crossing the critical threshold (with oil revenue) in 1973-74. This picture reflects the yawning policy gap that the current promotion of non-oil exports still needs

to fill.

Services (invisibles) trade profiles

The profile of net trade in services (SI) for the study period is shown in Figure 4. The profile has shown clearly that since Nigeria's political independence in 1960, its net services trade has increasingly been in deficit, reaching its highest point in 1983. A little improvement has been shown since 1984, however.

Unrequited transfers

Nigeria's net unrequited transfers (UTI - for example, money sent home by Nigerians working in other countries) are shown in Figure 5. The interesting revelation here is that, with the exception of the civil war years of 1967-1971 when Nigeria's UTI was positive, a negative UTI has been increasingly run in the balance of payments account. This implies that Nigeria has increasingly been 'exporting capital' officially. Such capital export reached its highest level in 1980, and then relaxed.

A comparison of the profiles emerging from the aggregated and disaggregated components of the identity block shows clearly that substantial differences exist between them (see Figures A3.1 - 9 in Appendix). This suggests the need for examining not only the structural stability of the profile but adapting the estimating periods to specific trends within the economy.

Test of stability of estimated profiles

We use the dummy variable test suggested by Gujarati (1970) to test for the structural stability of the regressors covering the years before and after the oil boom (1973). To test the shifts in both the intercept and the slope of each regression trend, the following general model was constructed with OLS.

$$\text{In } X = b_0 + b_1T_i + b_2D_i + b_3D_iT_i + u_i$$

where X = dependent variable
T_i = time trend
D_i = dummy variable

0 up to (but excluding) 1973 and 1 in subsequent years.

Figure 1: Nigeria: Overall balance of payment, current account balance and capital account balance

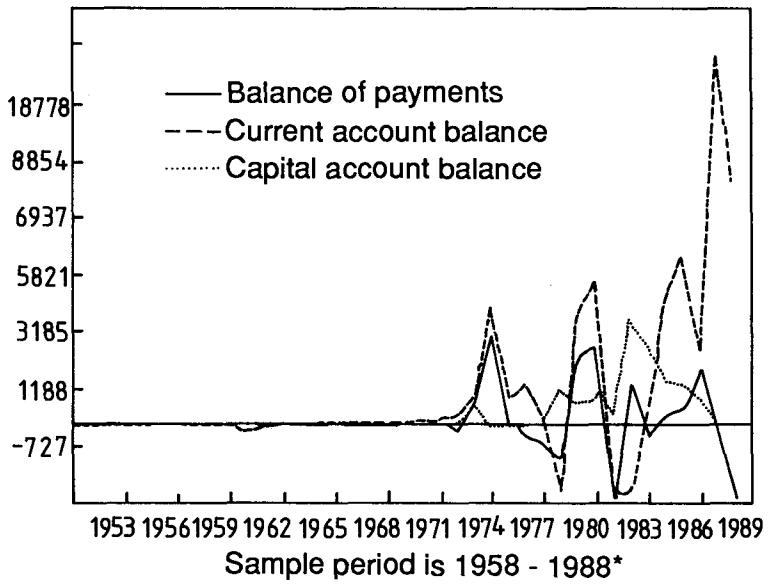


Figure 2: Nigeria: Aggregate import and export profiles

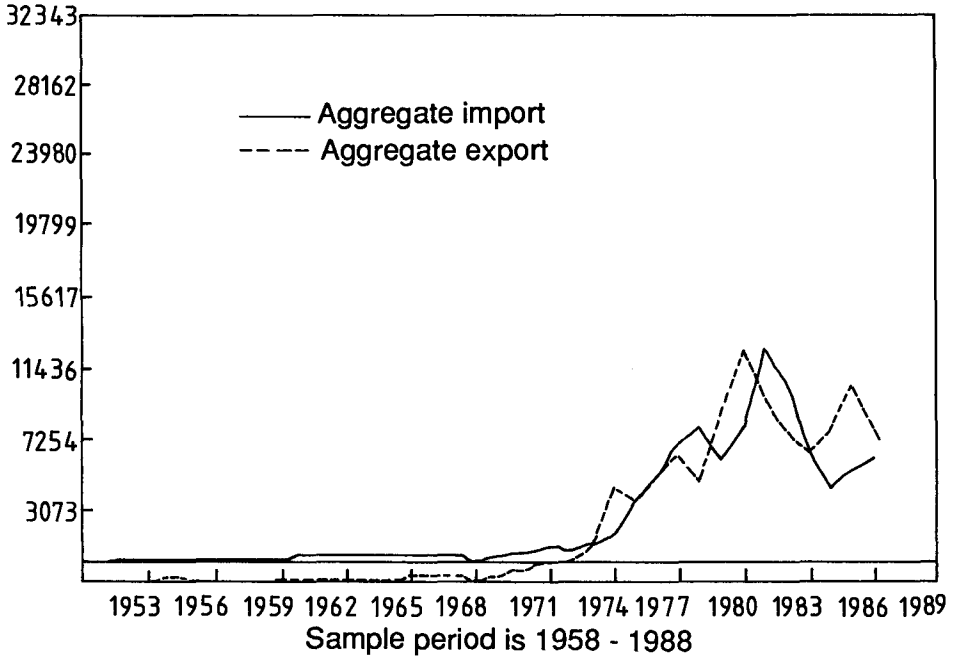


Figure 3: Nigeria: Petroleum export revenue and non-oil revenue

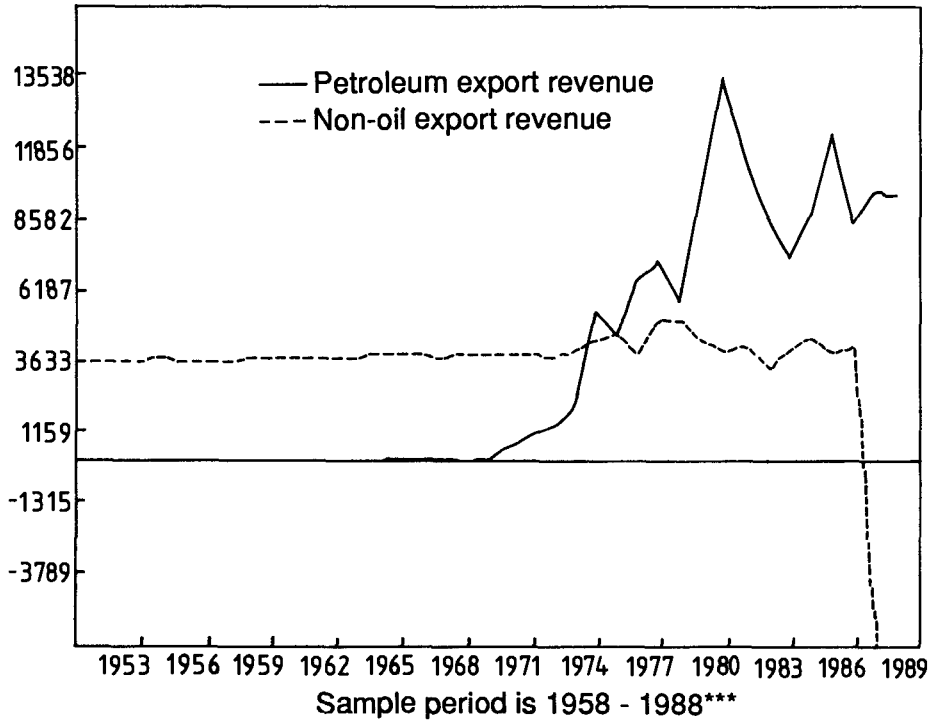


Figure 4: Profile of Nigeria's net invisibles trade

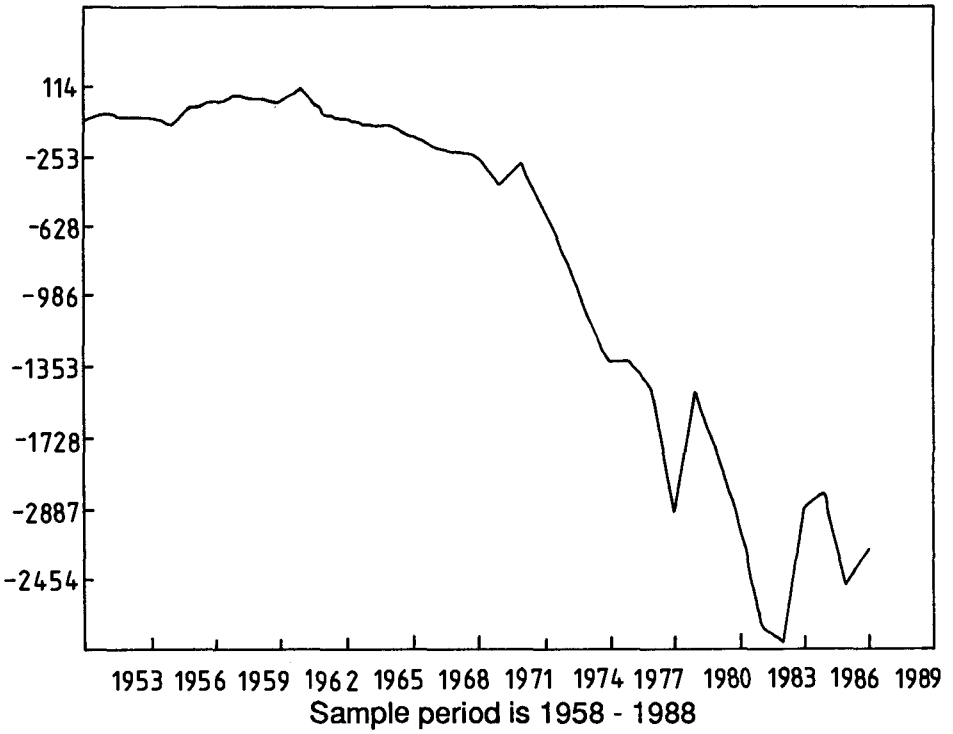
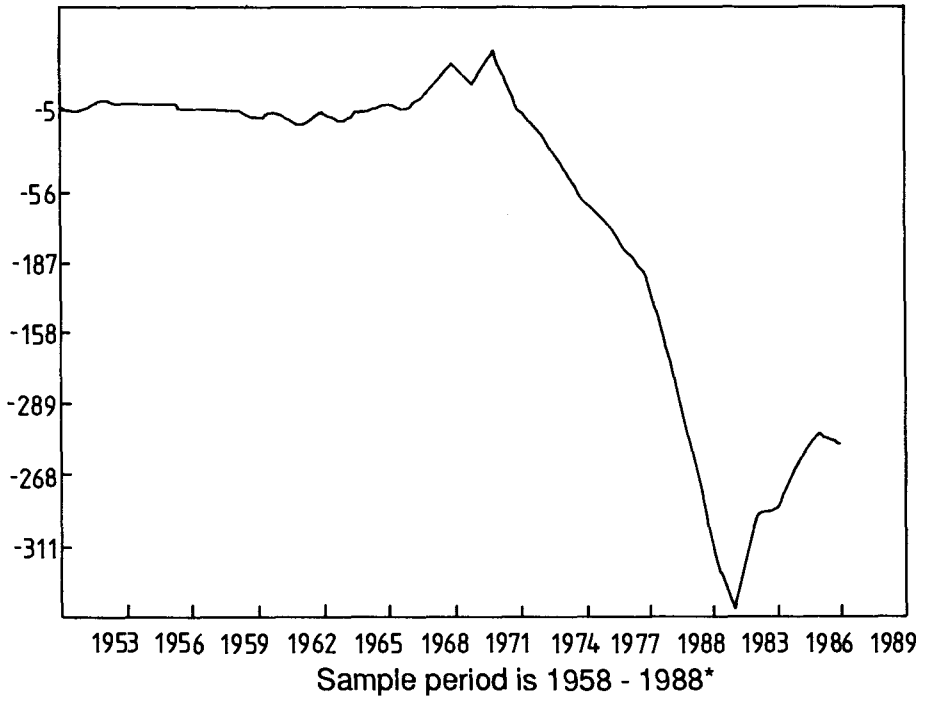


Figure 5: Nigeria's profile of net unrequited transfer



In the above model, b_1 and b_2 are the differential intercept and slope respectively. Evidence of parameter shifts is expected to be inferred from the statistical significance of the two associated variables in the equation.

Table C1 in Appendix C shows the result of the dummy variable test. The estimated trend equation sets for both exports and imports show that the dummies are statistically significant in all but one case. There is, therefore, strong evidence of parameter shifts of both the intercepts and the slopes. The profiles of the actual fitted values associated with each of the estimated equations illustrate these shifts clearly (see Figures A3.1-9 in Appendix).

Although the issue of structural stability in this study needs to be addressed more rigorously with a battery of tests rather than just one, this preliminary finding seriously cautions against using the estimated parameters covering the entire period (1950-1988) as firm guides to policy. The need for breaking estimates into periods, based on well-known macroeconomic events affecting Nigerian development, seems clearly indicated (see Section III).

Trade block equations

Evidence of structural instability in the Nigerian economy uncovered in our study of profiles (above) necessitated the estimation of all the trade models in terms of economically identifiable periods. Such a time-frame allowed a comparison with estimates based on the 38 - year historical sweep, as well as suggesting a plausible interpretation for an observed parameter trend within each sub-period. Each of the disaggregated variables, therefore, was estimated for 1950-1988; some combination of pre- and post-colonial decades, 1950-1970; the post-independence pre-oil boom period 1960-1972; and post-independence oil boom or bust period, 1973-1988. Data availability systematically determined the specific number of years in each sample estimate. The export block estimates are shown in Table C-2 in Appendix C.

Oil exports (LNPS)

Three issues are of key interest in the oil export supply equations. First, the price of oil is consistently negatively signed in all statistically significant cases. This shows that a reduction in the global oil price would elicit more supply response. The inverse relationship between price and supply response simply confirms the applicability of the "small country" assumption in the trade theory to Nigeria. The price-supply elasticities, however, are consistently less than unity, indicating a weakness in response that is probably more related to the problems of oil marketing (Olorunfemi, 1987) than the lack of technological advantage. In fact, the supply problem does not arise, given the highly sophisticated technology of oil production. Oil is produced 24 hours a day for 365 days of the year in Nigeria.

Second, the global oil supply proxy, Nigeria/world supply ratio (NOSRAW), exhibits significantly positive signs in the current period and significantly negative signs when lagged one period. This suggests that while an increase in global production would immediately induce higher output from Nigeria, this response would be reduced after a short adjustment period. This behaviour is rational in the sense that Nigeria's level of production is affected by a combination of both the global supply and the OPEC factor. Thus, while the need to increase revenue may induce Nigeria to supply as much as the global market can take, involvement with OPEC actually leads to a reduction in supply after price alignment within the OPEC. It must be noted that the response rate as revealed by the various LNSRAW elasticities is quite high (over unity).

Third, the lagged dependent variable remains statistically significant in all cases, and the signs are consistent with *a priori* expectations.

Agricultural exports (LRXAG)

The agricultural export equation, which was estimated for four periods, reveals two interesting trends. First, it is noteworthy that the real exchange rate (RER), which was used as agricultural price proxy, is correctly (positively) signed in all the equations, but changes sign in its one-period lagged form (in Equation 2.2 in Section II). Given the robust performance of Equation 2.4 based on regression statistics, the negative parameter of the lagged RER can be seriously seen as a case where controlled agricultural export price had a negative effect on agricultural exports. It may be recalled that 1973-1988 was also a period of policy inconsistency in Nigeria's agricultural exports policies. Price policies under the control of commodity boards were so unstable in the face of rising inflation that producers also reflected the same instability. The sign change in RER and its lagged values can only be appreciated in this context.

The second point to note is that domestic capacity to export (DEC), proxied by the index of industrial production (LIDP) consistently shows a negative sign with respect to the dependent variable LRXAG. This can be interpreted to mean either that DEC was not adequately proxied, or that the import-substitution approach to post-independence industrialization tends to reduce agricultural exports. Since the oil factor is an important element of LIDP, this result is not unexpected. If import substitution were to be vertically linked up with agriculture, the result could also be expected.

Export of manufactures (LRSMG)

The three equations for LRXMG comprise one for the period 1959-1986, and two for 1973-1986. The post-oil boom Equation 3.2 in Section II shows that RER is negatively related to manufactured exports, while the domestic export capacity proxy – the real GDP – picks up unstable signs. The same can roughly be said of Equation 3.1. in Section II. The instability in the signs of current and lagged values of RER is not unconnected to the fact that the manufacturing export sector has been extremely fragile. The profile of non-oil exports reveals that there has been a steep decline in non-oil export performance, especially since the 1980s.

An attempt to use TREND as a proxy for DEC in Equation 2.2 reveals, however, that RER is consistently signed and the trend DEC is significantly negative. Again, the negative DEC is not unconnected to the extremely poor infrastructural basis for Nigerian manufactured exports. Domestic export capacity has probably yet to reach a threshold that would enable its improvement to contribute positively to exports.

Import block

The demand for each of the import groups has been estimated with the four main variants of the import model specified under this block for the periods defined earlier. These are the general model with exogenous variables, the orthodox model, the Hemphill model and the general model with endogenous prices. In some cases, the truncated versions of each of the models have been estimated by the withdrawal of certain variables. The results of all the estimates are shown in Appendix Table C3.

Import of machinery (LRZMAN)

Real per capita income (LRPEY) is consistently negatively related to the import of machinery. It is statistically significant for the general model, and the truncated general model, 1955-1972. This result would appear to suggest that and increase in per capita income is not spent on purchase of machinery or investment. This seems to be consistent with the slow growth of capital formation and manufacturing in Nigeria during this period: the reasons for this could be traced to the problems of ineffective planning and civil war.

Foreign exchange (FOREX) has emerged as the single most robust determinant of the import of machinery during the period under investigation. FOREX has therefore remained statistically significant and positive in all the models. This behaviour strongly supports the Hemphill (1974) hypothesis that foreign exchange is a key binding constraint to import in developing countries.

It is pertinent to observe that international reserves (LRINTERS), are negatively significant in 1955-1972 estimates for the Hemphill model. This implies that an increase in international reserves led to a reduction in Nigerian imports of machinery. The earlier interpretation relating to capital formation applies, that an increase in reserves had led Nigeria to import more food rather than machinery for domestic production.

Although population (POP) is expected to vary positively with machinery imports, this failed to come through strongly for the periods 1955-1986 and 1973-1988. However, for the relatively more stable period 1955-1972, population has in general been positively significant in both its current and lagged forms and for all the variants of the import models.

Import of invisibles (RSI)

Relative price (REP) has the expected negative sign and remains statistically significant for the general model, its truncated variant and the orthodox model. Its sign pattern changes, however although with insignificant parameters for the models during the 1955-1972 period, but later picks up the negative pattern for 1973-1986.

Real per capita income (RPEY)

Although RPEY has, in general, the correct (positive) sign for invisible imports, it is not statistically significant. This is probably caused by collinearity with the population, which has been explicitly entered in the equation.

It turns out that population figures show the expected (positively significant) sign in its current versions. Foreign exchange is negatively related to invisible imports and remains statistically significant in most of such cases. This would suggest that for invisible imports FOREX is more useful as a price, rather than income, proxy. This interpretation seems plausible when seen in the context of the Hemphill estimate where all international reserve variables remain positive, while FOREX is negative.

Population figures, in general, tend to have a positive initial impact on demand for invisibles in the current period, but show a negative impact after a one-period lag. This case obviously requires further statistical investigation given the observed long-run deficit profile in the Nigerian import of invisibles.

Food import (LRZFD)

The price of imported food is significantly consistent in both the truncated and orthodox models for 1955-1972. These are the models in which LRZFD probably matters most because in other models and periods, the unstable sign patterns remain insignificant.

s expected, per capita income is positively insignificant in most models/periods. This is probably due to the problem of collinearity. Foreign exchange inflow also proves to be the single most effective determinant of food imports. It is statistically significant in nearly all the models and sub-periods. International reserves (INTRES) show a weak statistical relationship, for obvious problems of multi-collinearity, wherever they are entered with FOREX in the equation.

In general, the impact of population on food imports has remained positive, as would be expected. Its lagged value tends to compress food import demand.

Import of durables (LRZDUR)

The relative price of durables is positively related to import quantum. This has been particularly so for the truncated general model, as well as the orthodox model, where the statistical coefficients are significant. This perverse behaviour can only be explained in terms of the distortions brought about by the import licensing regime that was in operation until 1986 when the trade sector was deregulated.

Per capita income remains insignificant throughout while foreign exchange inflows

are positively significant, especially for the full and truncated Hemphill models (1964-1988).

Population is negatively related to the import of durables and statistically significant. This is evident in both the full and the truncated Hemphill models. In Nigeria, population increase affects the import of food rather than the import of durables. Windfall income, however, tends to affect the import of durables; this fact was not examined in this study (see Umo, 1987).

Raw materials (LRZRAW)

Relative price shows inconsistent signs in nearly all the models of demand for raw materials. The sign inconsistency requires further statistical investigation, although it is not particularly significant. Per capita income also generates inconsistent signs, a few of which are weakly significant.

Foreign exchange flow, on the other hand, remains the most consistent predictor of raw materials import. It not only picks the correct sign (positive) but it is also statistically significant. It is obvious that the inclusion of international reserves (LRINTRES) creates a multi-collinearity problem. The population figure is significantly related to raw materials import only for the Hemphill model and its truncated version. Its lagged form and the current version in all other models are not consistent.

Import block conclusions

The main conclusions one can draw from the estimation of the import block can now be summarized: First, the Hemphill model, which posits imports as a function of foreign exchange, is highly robust. It was the only formulation that stood up to both economic and statistical problems associated with our estimation.

Second, almost all the lagged dependent variables were statistically significant and registered long-run elasticities that were consistently below unity. This would support the position that the long-term demand for imports in Nigeria is inelastic. The issue is discussed in the next section.

Third, the OLS performed reasonably well as an estimator as shown by the key regression statistics and the graphs of some of the actual and fitted values in the Appendix (figures A3.10 to A3.13). This was in sharp contrast to the performance of instrumental variable estimations (IVE), which were consistently poor (see relevant IVE equations in Table C-3 in Appendix C).

Fourth, estimates for the pre-oil boom era (1955-1972) seem to show much greater parameter consistency than those for the post-war era (1973-1988) or a combination of all period (1950-1988). As was shown earlier, this pre-oil boom period was characterized by structural and policy stability. The unstable parameter behaviour for either the whole period or the post-oil boom era is explicable in terms of the shocks that the economic

system experienced during this time.

Implications of elasticities for trade balance

An attempt was made to use the estimated trade parameters to probe the question of whether an expenditure-switching policy like devaluation can have a significant impact on Nigeria's trade balance. An examination of long-run elasticities[4] for some categories of commodities, as well as an estimation of pass-through equations[5] has shed considerable light on this issue. The following implications drawn from Table C-4 (Appendix C) are noteworthy.

With oil exports, a devaluation policy is shown to have a minimal effect on price in the short term (Equations 2 and 5) but a full impact in the long term (Equation 4). In the first two cases the oil price elasticities with respect to nominal exchange rate are -.75 and -.12, respectively, while in 1951-1985 they were -1.93. Given the magnitude of the elasticity, this suggests a quicker "pass through" in the long run than in the short run.

In respect of agricultural prices proxied by the real exchange rate, devaluation had a quicker price impact in years without price controls 1951-1971, (Equation 7) than in years with price controls, 1973-1988 (Equations 6 and 8).

With imports the elasticity has been high – 1.07 – for the long term, while the speed of pass through has been moderate with elasticity of +.74 in the short run.

The implication of the above result is that the trade-balance response to devaluation would tend to trace the expected J-curve whereby low elasticities in the short run ensure import and export price increases. This worsens the trade balance, but with time, the increased export elasticity values reverse the adverse trade balance effect (Goldstein and Khan, 1985, p. 1077). Since Nigeria embarked on an expenditure-switching policy regime in 1986, it would be interesting to confront the current experience with the econometric result based on historical data. This, however, lies outside the scope of the present study.

V. Summary of findings and policy implications

After examining the key components of Nigeria's balance of payments from 1950-1988, the structure of the current account has been modelled on various sources. The profiles of key variables in the current account, as well as the econometric estimates derived for the behavioural models together with their policy implications, can be summarized as below.

The profiles

The trend growth rate of Nigeria's oil export revenue, 28%, which was almost twice the quantum oil growth, is probably caused by the OPEC factor in international oil marketing.

Agricultural exports, whose growth averaged 1.7% during the study period (1950-1988), actually slumped drastically to 0.8% in the 1980s. This indicates that the problems of Nigerian agriculture had started before, but were exacerbated by, the oil boom of the 1970s and 1980s. The negative impact of oil on growth, for instance, operated through the adverse effect Nigeria's oil boom had on agricultural development since the late 70s. The emergence of oil as the dominant foreign exchange earner correspondingly dwarfed the role of agriculture in this respect. Indeed, the role was reversed such that agricultural dominance in both the GDP and foreign exchange earnings (about 70% before the 70s) had been reduced to under 40% after the oil boom. Investment in agriculture was neglected, because the overvalued foreign exchange turned the terms of trade against the sector. This was followed by problems of rural-urban drift, destruction of forest reserves and depletion of soil nutirents (mainly through oil pollution). The negative association between oil supply and growth are therefore largely traceable to the problems it posed for agriculture.

The 1970s were a decade of import boom in Nigeria. Aggregate import growth rate, which was 29% over the study period, had even more impressive growth components like food (35%) and durable goods and machinery (33%).

The extreme volatility of the current account balance after 1971 reflects the economic fundamentals of an oil-driven economy that was becoming increasingly open (-7% in the 1960s to 5% in the 1970s).

The invisibles trade account has been increasingly in deficit since Nigeria's

independence (1960), reaching its peak in 1983.

The increase in the negative growth of unrequited transfers since 1971 reflects the export of official capital caused mainly by government attempts to establish trade/ economic relations with countries in sub-Saharan Africa.

The dummy variable (statistical) tests of structural stability in the profiles show a strong evidence of instability in terms of parameter shifts in both the intercepts and slopes of estimated equations. The period 1973-1974 was found to be the statistical watershed separating the pre-oil boom era from the oil-boom era.

The trade equations

The oil-export equation shows that Nigeria was constrained by its membership in OPEC and that supply response was hampered by ineffective marketing (thereby confirming the robustness of the small-country assumption of standard tade theory for Nigeria's export trade). Thus finding questions the utility of Nigeria's continued membership in OPEC if the objective is to maximise its revenue from oil exports. A more detailed study of this policy implicatio is indicated.

With respect to agricultural exports, it has been shown that the price control exerted by the commodity boards created instability in parameter responses, especially as these relate to the real exchange rate. The removal of price and exchange rate controls would perhaps sustain stable and positive responses.

The relative insignificance of non-oil manufacturing exports and poor infrastructure has been shown to account for the unstable behaviour of RER. Policy instruments to stabilize RER as well as enhance infrastructural facilities would seem to be in order.

Import block models revealed:

1. That increase in per capita income does not necessarily lead to higher capital formation through investment in machinery; and
2. That the Hemphill hypothesis whereby foreign exchange is seen as posing the single most effective binding constraint to import has been consistently confirmed for Nigeria.

Values of both the short-run and long-run trade elasticities reveal weak "pass through" for import price processes, suggesting that the expected positive effect of expenditure-switching policies on Nigeria's balance of payments via the current account balance, trace an elongated J-effect. In this case, the initial cost of such policies can seriously endanger the sustainability of the long-run positive impact. An exploration of domestic policies to seek a method of providing a cushion for the possible costs of devaluation is indicated.

In conclusion, it should be emphasized that this examination of the determinants of Nigeria's balance of payments, as explained via the current account component, yields

an incomplete picture, since the real production and fiscal monetary sectors of the domestic economy have been assumed to be exogenous. When these sectors and the relevant variables are endogenized and brought into the picture (as we hope to do in the next phase of this project), a clearer image of the fundamental determinants of Nigeria's balance of payments should emerge. It is possible that some of our policy conclusions will be modified in the light of a better and fuller understanding of the specific economic forces at work.

Appendix A: Definitions of Variables

AGRA	=	Agricultural GDP Ratio
BAB	=	Basic Account Balance (Nm)
BOP	=	Balance of Payment (Nm)
BOPE	=	Exceptional Balance of Payment (Nm)
BOT	=	Balance of Trade (Nm)
CAB	=	Capital Account Balance (Nm)
CAL	=	Long-Term Capital (Nm)
CASNET	=	Short-Term Capital (NET) (Nm)
CPI	=	Consumer Price Index
CUB	=	Current Account Balance (Nm)
DA	=	Domestic Assets (Nm)
DDS	=	Deferred Debt Services (Nm)
DEBT/POP	=	Debt Population Ratio i.e. debt per capita
DEBTO	=	Debt Outstanding (Nm)
DEBSTER	=	Debt Service Ratio
DEC	=	Domestic Export Capacity
DGE	=	Domestic Government Expenditure (Nm)
DGR	=	Domestic Government Revenue (Nm)
DI	=	Direct Investment (Nm)
DINB	=	Net Capital flow of the Non-Banking Sector (Nm)
DOCR	=	Domestic Credit (Nm)
DOCRG	=	Domestic Credit to Government (Nm)
DOCRP	=	Domestic Credit to the Private Sector (Nm)
EF	=	Exceptional Finance (Nm)
EN	=	Nominal Exchange Rate (Nm/$)
EO	=	Errors and Omissions
EXS	=	Total Export (Nm)
FEA	=	Foreign Exchange Assets (Nm)
FGE	=	Foreign Government Expenditure (Nm)
FGR	=	Foreign Government Revenue (Nm)
FOREX	=	Foreign Exchange Inflow (Nm)
GDP	=	Gross Domestic Product (Nm)
GK	=	Growth of Gross Capital Formation
INAG	=	Agricultural Inputs (Nm)
INF	=	Inflation Rate
INFDP	=	Inputs for Food Production (Nm)

INMG	=	Inputs for Manufacturing (Nm)
INTOT	=	International Terms of Trade
INTERS	=	International Reserves
LIBI	=	Trade Liberalisation Index
	=	Demand for Real Balances (Nm)
MG	=	Monetary Gold (Nm)
MI	=	Currency Outside Banks Plus Privately Held Demand Deposits (Nm)
MS	=	Money Supply (Nm)
NFA	=	Net Foreign Assets (Nm)
NOSRA	=	Nigerian OPEC Supply Ratio
NPR	=	Nigerian Petroleum Revenue (Nm)
NPS	=	Nigerian Petroleum Supply (million barrels)
OBB	=	Overall Budget Balance (Nm)
OPIN	=	Trade GDP Ratio (Openness Index)
OT	=	Others
OTEE	=	Others Exceptional Financing (Nm)
PEX	=	Per Capita Expenditure (Nm)
PEY	=	Per Capita Income (Nm)
PDGP	=	GNP Deflator
PI	=	Portfolio Investment (Nm)
PNB	=	Promissory Notes (Nm)
POI	=	Price of Oil Per Barrel ($)
PUS	=	Public Sector Services = Size of PUS Budget/GDP
QAG	=	Output of Agriculture
QM	=	Manufacturing Output Index
QMAN	=	Manufacturing Output Index
QMIN	=	Minerals (Output)
QNP	=	Non-Petroleum Outputs
QNXAG	=	Output of Non-Agricultural Exports
QNXP	=	Non=Petroleum Exports (Quantity)
GP	=	Petroleum in Barrels
QSER	=	Output of Services (Nm)
QXAG	=	Output of Non Exports of Agriculture (Nm)
REEP	=	Relative Export Price (Nm)
REM	=	Reserve Movements (Nm)
REP	=	Relative Price
RER	=	Real Rate of Exchange
ROI	=	Rate of Return to Investment
RPF	=	Reserve Position in the Fund (Nm)
RRI	=	Real Rate of Interest = Nominal Rate/CPI
SDR	=	Special Drawing Rights
SGDP	=	Service - GDP Ratio

SI	=	Net Services (Nm)
RPEX	=	Real Per Capita Expenditure (Nm)
TAX	=	Tax (Nm)
TOT	=	Terms of Trade
TREND	=	Time Trend
UFC	=	Use of Fund Credit
UT	=	Unrequited Transfers (Nm)
XAG	=	Export of Agricultural Products (Nm)
XMG	=	Export of Manufacturing (Nm)
XNP	=	Non-Petroleum Exports (Nm)
XOT	=	Other Exports (Nm)
XUP	=	Export Unit Price of Petroleum
TG	=	Growth in Per Capita GDP
Z	=	Total Trade Imports (Nm)
ZCAP	=	Import of Capital Goods (Nm)
ZCON	=	Consumer Goods Import (Nm)
ZDUR	=	Durable Goods Import (Nm)
ZFD	=	Food Imports (Nm)
ZMAN	=	Import of Machinery (Nm)
ZOT	=	Import of Other Commodities (Nm)
ZRAW	=	Raw Materials Imports (Nm)

Figure A3.1: Dummy variable test for log of export revenue (INPR)

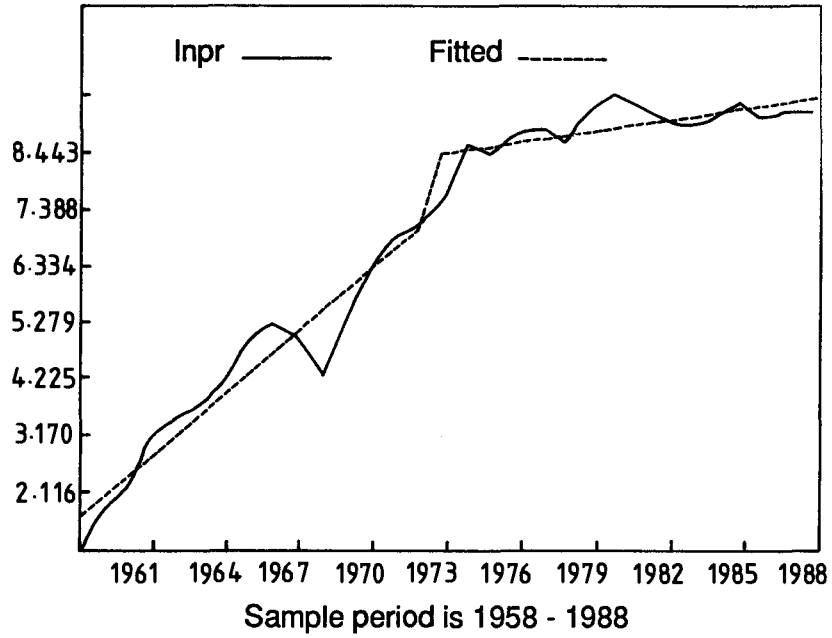


Figure A3.2: Dummary variable test for log of Nigeria's petroleum supply (LNPS)

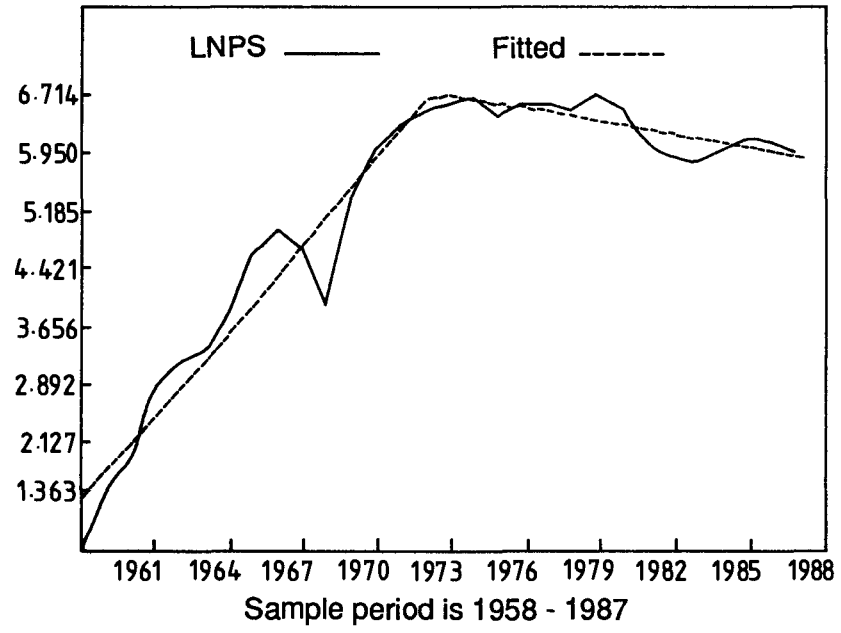


Figure A3.3: Dummy variable test for log of agriculture export (LRXAG)

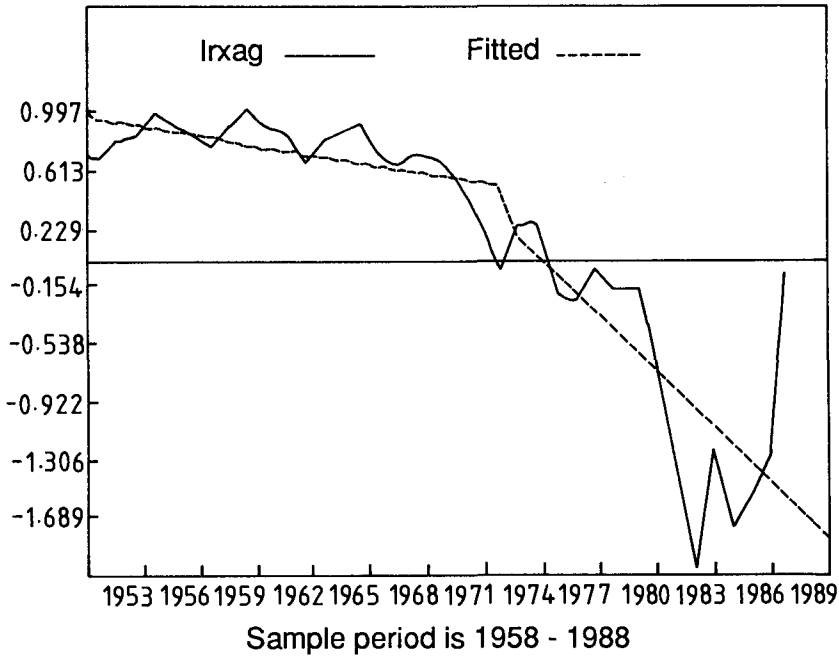


Figure A3.4: Dummy variable test for log of export of manufactures (LXMG)

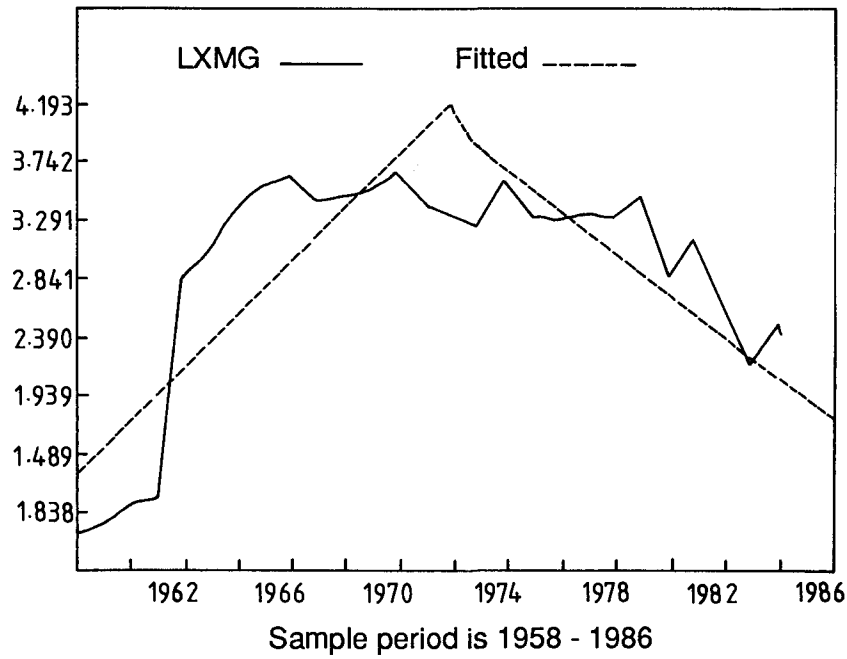


Figure A3.5: Dummy variable test for log of real import of machinery (LRZMAN)

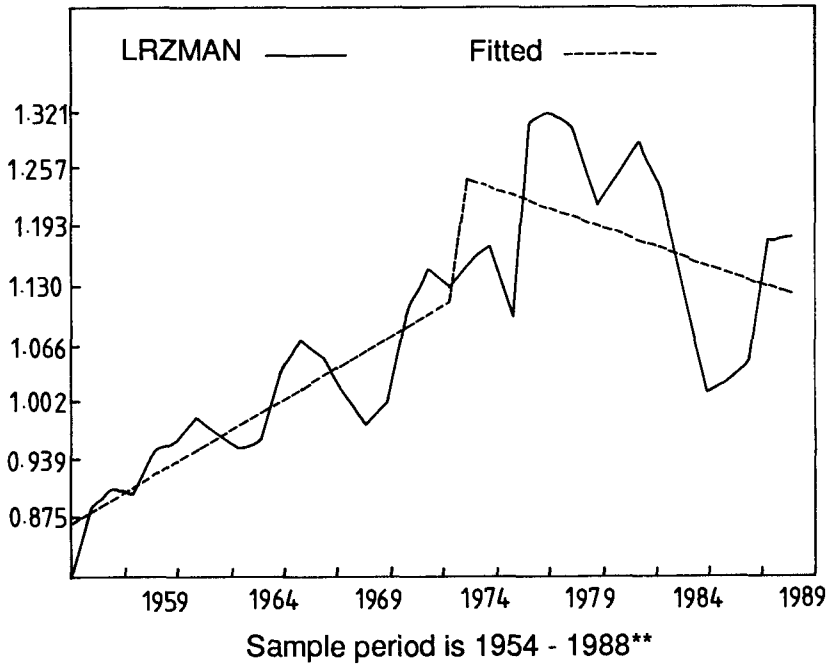


Figure A3.6: Dummy variable test for log of real import of raw materials (LRZRAW)

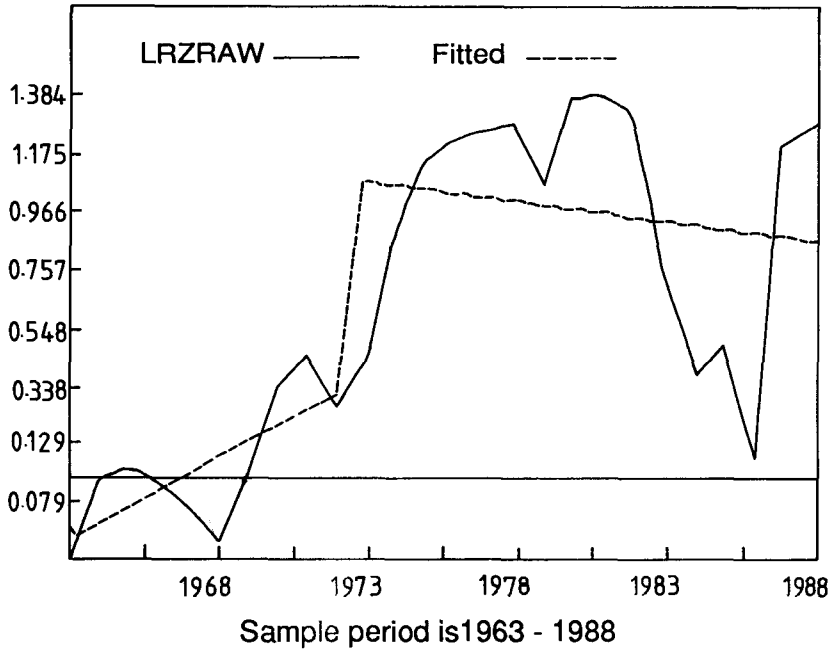


Figure A3.7: Dummy variable test for log of real import of food (LRZFD)

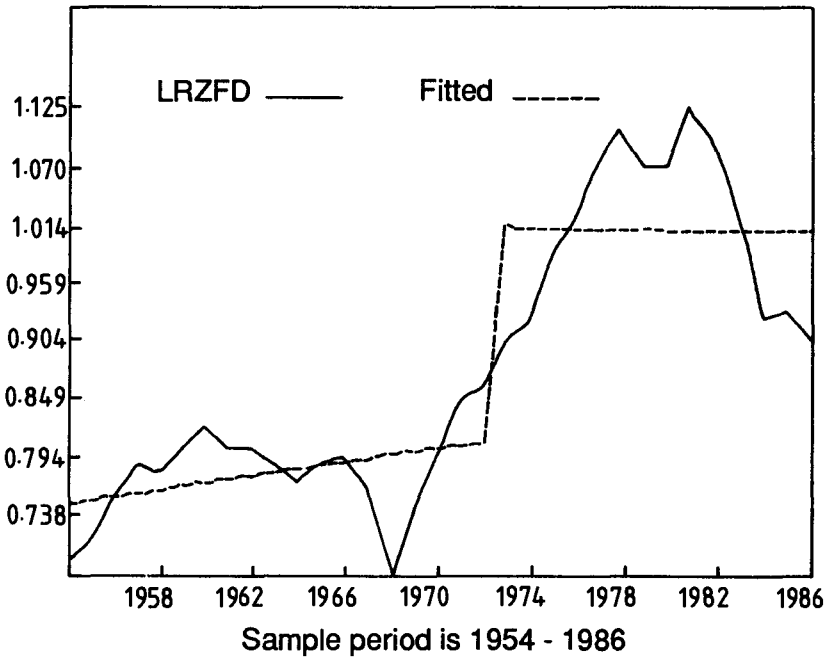


Figure A3.8: Dummy variable test for real value of net import of services (RSI)

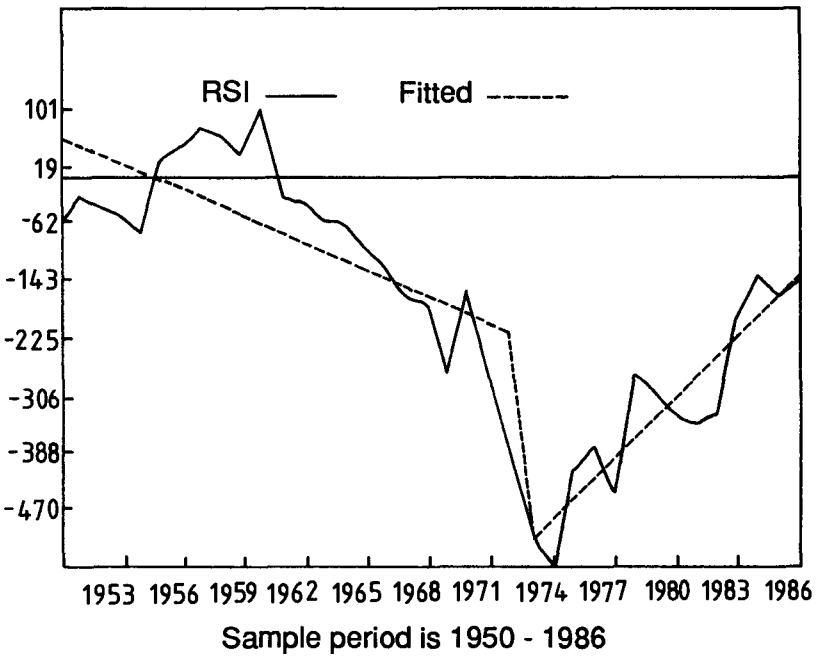
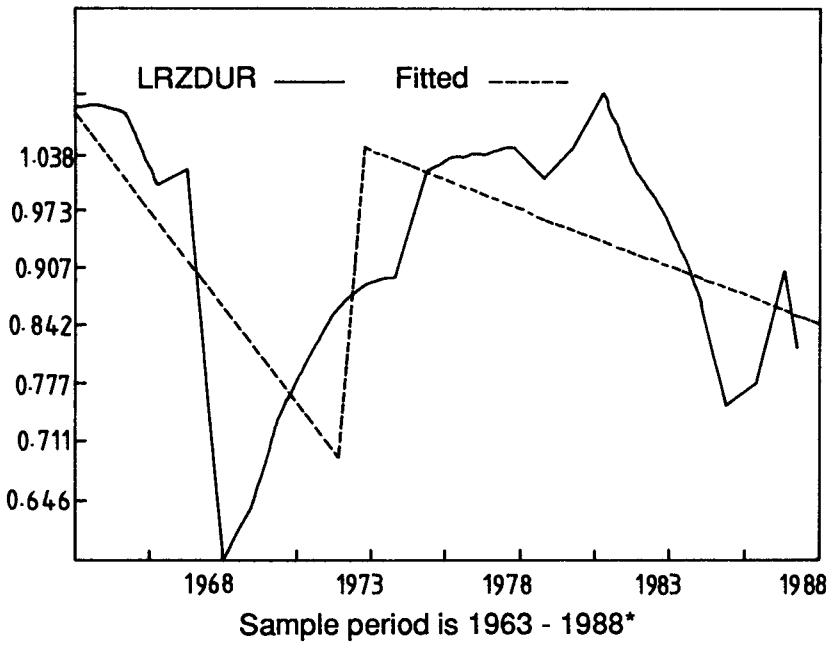


Figure A3.9: Dummy variable test for log fo real import of durable (LRZDUR).



Appendix B

OLS Trend Growth Rates of Selected Variables in Nigeria's Balance of Payment (BOP) Model 1950-88

	Constant	Trend	Mean	Standard Deviation	Regression Statistics R^2	D.W.
1. Log of Nigerian Petroleum Export LNPS (M. Barrels)						
1958-1987	1.378	0.159 (7.2148)	5.126	1.741	0.65023	0.18
1960-1969	-1.067	0.316 (5.617)	3.838	1.073	0.79775	1.53
1970-1979	5.132	0.053 (2.908)	6.486	0.224	0.51390	1.16
1980-1987	7.442	-0.040	6.071	0.219	0.19693	0.99
2. Log of Nigerian Petroleum Revenue LNPR						
1958-1988	0.0766 (15.168)	0.275	6.681	2.655	0.88807	0.23
1960-1969	-0.424	0.295 (5.375)	4.151	1.010	0.78317	1.20
1970-1979	0.043	0.313 (7.608)	8.021	1.011	0.87856	1.14
1980-1988	9.961	-0.023 (-0.976)	9.167	0.180	0.119751	1.38
3.Log of Non-Petroleum Exports (LXNP) (M. Barrels)						
1950-1986	5.641	0.021	6.037	1.002	0.050843	1.89
1950-1959	5.332	0.052 (4.641)	5.620	0.186	0.72914	1.45
1960-1969	5.460	0.037 (4.960)	6.038	0.130	0.075463	1.55
1970-1979	3.347	0.131 (3.193)	6.683	0.529	0.56027	2.46
1980-1986	-1.506	0.212 (0.50)	5.710	2.102	0.04763	2.44

Appendix B.....continued

4.Log of Agricultural Export (LXAG)						
1950-1988	5.310	0.017 (3.235)	5.640	0.401	0.22044	1.49
1950-1959	5.198	0.038 (3.449)	5.406	0.148	0.59796	1.52
1960-1969	5.493	0.008 (0.908)	5.521	0.081	0.09341	1.60
1970-1979	3.773	0.77 (3.60)	5.744	0.298	0.61232	1.44
1980-1986	2.775	0.083 (0.949)	5.589	0.458	0.15263	1.80
5.Log of Exports of Others (LXOT)						
1950-1988	2.414	0.105 (4.67)	4.506	1.959	0.37084	0.96
1950-1959	3.502	-0.017 (0.463)	3.408	0.321	0.02606	1.81
1960-1969	3.255	0.033 (0.826)	3.759	0.351	0.07851	1.74
1970-1979	-6.481	0.433 (2.518)	4.564	1.973	0.44205	1.20
6.Log of Total Imports (LZ)						
1950-1988	4.514	0.129 (18.301)	7.084	1.544	0.90052	0.35
1950-1959	4.941	0.092 (6.977)	5.446	0.299	0.858853	1.18
1960-1969	5.988	0.009 (0.665)	6.125	0.117	0.05231	1.42
1970-1979	0.417	0.291 (9.338)	7.843	0.921	0.91597	1.13
1980-1988	6.696	0.069 (0.929)	9.127	0.574	0.10972	0.78
7.Log of Food Imports (LZFD)						
1954-1988	-3.307	0.346	5.086	1.584	0.97010	1.33
1960-1969	4.177	-0.027 (-1.640)	3.763	0.161		
1970-1979	-3.307	0.346 (16.109)	5.515	1.063	0.97010	1.33
1980-1988	6.6856	0.014 (0.273)	7.157	0.360	0.01056	1.27
8.Log of Durable Imports (LZDUR)						
1963-1988	2.965	0.096 (3.985)	5.505	1.162	0.398161	0.54
1970-1979	-3.029	0.329	5.359	1.024	0.94629	1.32

Appendix B.....continued

		(11.872)				
1980-1988	12.531	-0.175	6.412	0.671	0.50982	2.23
		(-2.698)				
9.Log of Openness Index (LOPIN)						
1950-1988	-1.198	0.004	-1.128	0.3147	0.016113	0.66
		(0.778)				
1950-1959	-1.046	-0.014	-1.124	0.099	0.18722	1.29
		(-1.357)				
1960-1969	-1.198	-0.071	-1.306	0.293	0.54450	0.99
		(-3.092)				
1970-1979	-1.198	-0.071	-0.968	0.204	0.59388	1.40
		(3.42)				
1980-1988	-2.152	0.030	-1.113	0.494	0.02713	0.84
		(0.442)				
10. Log of Import of Machinery (LZMAN)						
1954-1988	2.740	0.155	6.160	1.677	0.090240	0.55
		(17.467)				
1960-1969	4.074	0.051	4.866	0.256	0.36470	0.93
		(2.143)				
1970-1979	-0.804	0.300	6.853	0.994	0.83708	1.54
		(6.411)				
1980-1988	6.039	0.061	8.175	0.630	0.07042	0.72
		(0.728)				
11.Log of Import of Raw Materials (LZRAW)						
1963-1988	1.589	0.178	6.601	1.419	0.91734	0.64
		(16.320)				
1970-1979	-0.388	0.272	6.538	0.855	0.925861	1.04
		(9.996)				
1980-1988	4.721	0.095	8.05	0.518	0.25247	1.11
		(1.538)				
12.Log of Total Exports (LEXS)						
1950-1988	4.468	0.140	7.259	1.671	0.90657	0.34
		(18.947)				
1950-1959	5.352	0.035	5.544	0.149	0.501383	1.72
		(2.836)				
1960-1969	5.078	0.063	6.060	0.232	0.68317	1.72
		(4.153)				
1970-1979	1.245	0.272	8.183	0.873	0.89146	1.34
		(8.106)				
1980-1988	5.379	0.117	9.468	0.356	0.35631	1.11
		(1.968)				

Figures in parentheses are t-statistics

Appendix C:

Table C1: Dummy variable analysis of trends in selected Nigeria's balance of payments variables (1950-88)

Equation: $\ln X = bo + b_1 Ti + b_2 Di + b_3 Dili + ui$

		Regressors				Regression statistics		
	Dependent Variable	Constant	Ti (Trend)	Intercept Dummy (Di)	Slope Dummy (DiTi)	R2	RSS	F
1.	LNPR (1958-1988)	-1.820 (-4.373)	0.383 (15.242)	8.627 (10.316)	-0.316 (-9.319)	0.97747	4.766	390.37
2.	LNPS (1958-1987)	-2.195 (-5.992)	0.383 (17.34)	10.285 (13.135)	-0.441 (-14.094)	0.95953	3.5585	205.48
3.	LRXAG (1950-1988)	0.977 (5.809)	-0.020 (-1.632)	2.223 (3.201)	-0.016 (-4.335)	0.83647	5.3288	59.67
4.	LXMG (1958-1986)	-0.498 (0.866)	0.204 (5.876)	8.229 (6.248)	-0.365 (7.044)	0.67578	8.4348	17.37
5.	LRZMAN (1954-1988)	0.799 (17.692)	0.014 (4.553)	0.646 (4.898)	-0.022 (-4.475)	0.7386	0.15953	29.20
6.	LRZRAW (1963-1988)	-1.024 (-1.402)	0.058 (1.483)	2.440 (2.561)	-0.072 (-1.655)	0.6700	2.76300	14.89
7.	LRZFD (1954-1986)	0.735 (18.339)	0.003 (1.165)	0.290 (2.134)	-0.004 (-0.707)	0.79111	0.11760	36.61
8.	RSI (1950-1986)	77.496 (2.343)	-12.734 (-5.279)	-1281.671 (-8.012)	41.644 (7.397)	0.82010	194285.29	50.51
9.	LRZDUR (1963-1958)	1.715 (6.867)	-0.045 (-3.336)	-0.346 (-1.062)	0.031 (2.082)	0.42779	0.32289	5.48

Notes: t-statistics are in parenthesis

Table C2: OLS estimates of Nigerian commodity exports for 1950-88

		Constant	LNPS(-1)	LPOI	LPOI(-1)	LNOSRAW	LNOSRAW(-1)	RSS	R2	F	DW	LM Test
1.1	LNPS 1965-86	7.2387	0.3030	0.0165	-0.0918	0.96147	-0.0404	0.3136	0.98	123.36	1.38	3.31
		(13.0797)	(5.0389)	(0.2824)	(-1.6460)	(11.3323)	(-1.13778)			(2.85)		(4.54)
1.2	LNPS 1973-86	-1.2060	1.1225	-0.1330	0.0510	1.3448	-1.5694	0.0277	0.98	71.54	2.50	0.565
		(-0.4794)	(5.2442)	(3.1962)	(1.1009)	(7.5406)	(-0.3650)			(3.69)		5.14
1.3	LNPS 1965-86	7.2162	0.2993	-0.0587		0.9592	-0.0411	0.3667	0.97	142.91	1.13	5.44
		(12.4328)	(4.7479)	(-1.5470)		(10.7792)	(-1.3351)			(2.96)		(4.49)
	LNPS 1973-86	0.2434	0.9744	-0.0993		1.2411	-1.3038	0.0319	0.97	87.08	2.21	1.061
		(0.1122)	(5.7846)	(-3.4813)		(8.1016)	(-3.6207)			(3.63)		(4.74)

								RSS	R2	F	DW	LM Test
(2.1)	LRXAG	= - 0.291	+ 1.070LRXAG(-1)	+ 1.319LRER	- 1.458LRER(-1)	- 0.021LIDP	+ 0.038LIDP(-1)	5.61712	0.8297	31.19	1.51	0.73
	1951-88	(-0.666)	(5.112)	(3.532)	(-2.643)	(-0.383)	(0.699)			(2.52)		(3.32)
(2.2)	LRAG	= 0.562	+ 0.567LRXAG(-1)	+ 0.963LRER	+ 0.446LRER(-1)	- 0.029LIDP	+ 0.009LIDP(-1)	0.09657	0.9040	30.14	2.01	0.16
	1951-72	(1.475)	(3.382)	(3.332)	(1.295)	(-2.729)	(0.639)			(2.85)		(4.54)
(2.3)	LRXAG	= 0.904	+ 0.389LRXAG(-1)	+ 0.764LRER	+ 1.026LRER(-1)	- 0.029LIDP	+ 0.007LIDP(-1)	0.02348	0.9730	50.52	2.13	3.690
	1960-72	(1.437)	(1.593)	(2.863)	(2.000)	(-3.010)	(0.745)			(3.97)		
(2.4)	LRXAG	= 10.444	+ 0.899LRXAG(-1)	+ 1.582LRER	- 2.272LRER(-1)	- 2.675LIDP	+ 0.259LDP(-1)	1.66646	0.8424	10.69	2.05	1.942
		(3.643)	(3.361)	(3.541)	(-3.521)	(-2.368)	(0.216)			(3.33)		(4.46)
(3.1)	LRXMG	= 2.432	+ 0.936LRXMG(-1)	- 2.269LRER	+ 2.462LRER(-1)	+ 0.882LRGDP	- 1.367LRGDP(-1)	3.6959	0.9352	63.51	2.31	1.13
	1959-86	(1.08)	(8.461)	(-1.907)	(2.402)	(1.533)	(-1.910)			(2.66)		(4.32)
(3.2)	LRXMG	= 1.980	+ 1.167LRXMG(-1)	- 1.850LRER	+ 1.441RER(-1)	+ 0.698LRGDP	- 1.087LRGDP(-1)	1.3609	0.9491	29.84	3.09	1.75
	1973-86	(0.426)	(4.185)	(-1.40)	(0.971)	(0.759)	(-1.294)			(3.69)		(5.14)
(3.3)	LRXMG	= 11.051	+ 0.269LRXMG(-1)	- 1.668LRER	+ 1.665LRER(-1)	- 0.438TREND		0.77923	0.9709	74.98	2.53	14.01
	1973-86	(0.788)	(3.117)	(-2.219)	(-0.875)	(-3.165)				(3.63)		(4.74)

Note: t-statistics are in parenthesis.

Table C3: Estimates of import models for Nigeria, 1950-88

	Constant	LRZMAN-1	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP-D	RSS	R2	F	DW	LM Test
LRZMAN 1985-1988													
General model (GM)	-1.4563	0.444	0.1404	-94.9292	0.6313	94.6705	-93.5562	-0.9717	2.8874	0.8567	22.20	1.43	2.61
	(-0.45753)	(3.2917)	(0.5240)	(-1.6949)	(3.0236)	(1.692)	(-1.6610)	(-0.1308)			(2.39)		(3.40)
	-1.1314	0.4458	0.1229	-94.8177	0.6332	94.5542	-94.4821		2.8893	0.8566	26.87	1.43	2.68
	(-0.5794)	(3.3719)	(0.5390)	(-1.7248)	(3.0963)	(1.7218)	(-1.7225)				(2.46)		(3.39)
GM (truncated)	-0.9710	0.4952	0.0701	-0.1644	0.5927		0.7840	-0.7719	3.2053	0.8409	23.78	1.47	2.61
	(-0.2963)	(3.6320)	(0.2561)	(-0.4676)	(2.7670)		(0.0949)	(-0.1005)			(2.45)		(3.39)
	-0.7133	0.4966	0.6563	-0.1679	0.5942		-0.0438		3.2065	0.8408	29.58	1.46	2.74
	(-0.3559)	(3.7248)	(0.2421)	(-0.4889)	(2.8261)		(-0.0758)				(2.56)		(3.32)
	-3.4402	0.5656	0.1326	-75.8270		76.1656	-72.7959	-2.4896	3.9027	0.3063	18.73	1.43	3.07
	(-0.8783)	(3.8323)	(0.4338)	(-1.1934)		(1.2004)	(-1.1423)	(-0.2944)			(2.56)		(3.39)
	-2.3165	0.5708	0.0876	-75.3952			-75.0227		3.9152	0.8056	23.21	1.42	3.71
	(-1.0583)	(3.9829)	(0.3365)	(-1.2077)			(-1.2040)				(2.56)		(3.37)
Orthodox model	-2.66103	0.6008	0.0757	0.3856			2.9883	-2.2514	4.1109	0.7959	21.84	1.46	2.65
	(-0.7431)	(4.1270)	(0.2489)	(1.1970)			(0.3269)	(-0.2642)			(2.56)		(3.37)
	-1.9180	0.6054	0.0353	0.3793			0.5788		4.1212	0.7957	28.19	1.45	2.99
	(-0.8792)	(4.2580)	(0.1365)	(1.2001)			(0.9737)				(2.70)		(3.35)
Hemphill model (HM)	0.2844	0.5506			0.59186	-0.1275	-0.2213	0.1225	3.2139	0.8405	29.5	1.45	2.81
	(-0.1579)	(3.7777)			(2.5061)	(-0.3983)	(-0.0331)	(0.0295)			(2.56)		(3.37)
	-0.3246	0.5006			0.5914	-0.1241	-0.0248		3.2140	0.8405	38.19	1.45	2.87
	(-0.7811)	(3.8487)			(2.8617)	(-0.4231)	(0.0716)				(2.70)		(3.35)
HM (truncated)	-0.6807	0.4909			0.5403		0.6914	-0.7464	3.2322	0.84	37.94	1.47	2.65
	(-0.4601)	(3.8268)			(3.2937)		(0.1119)	(-0.1243)			(2.70)		(3.35)
	-0.5485	0.4901			0.5362		0.0760		3.2339	0.8395	52.29	1.43	2.78
	(-0.542)	(3.890)			(3.3917)		(-0.2376)				(2.92)		(3.34)
	-1.9143	0.6062				0.4240	1.3273	-1.1975	4.1178	0.80	28.22	1.46	2.86
	(-1.010)	(4.2979)				(1.5093)	(0.1793)	(-0.1653)			(2.70)		(3.35)
	-1.6708	0.6073				0.4054	0.1058		4.1217	0.80	38.87	1.47	3.09
	(-1.4231)	(4.3736)				(1.6004)	(0.2764)				(2.92)		(3.34)

Table 3.....continued

	Constant	LRZMAN-1	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP-D	RSS	R2	F	DW	LM Test
Instrumental variable estimates (IVE)	0.4963	0.4674	-0.1106	-85.0947	0.6227	85.0075	-85.3767		3.0015			1.37	
	(0.1707)	(3.3954)	(-0.2891)	(-1.4814)	(2.9812)	(-1.4826)	(-1.4939)						
LRZMAN 1955-1972)													
General model (GM)	-2.4725	0.2335	-0.0983	146.7017	0.7704	147.5531	144.1671	4.2443	0.1322	0.95	30.28	1.95	1.548
	(-1.1259)	(-1.0185)	(-0.1176)	(1.3842)	(3.7958)	(-1.3932)	(1.3470)	(1.2723)			(3.14)		(4.46)
	-4.2749	-0.1742	0.3594	188.9787	0.8514	189.7114	190.7947		0.1536	0.95	33.19	2.06	3.775
	(-2.4788)	(-0.7550)	(0.4633)	(1.8270	(4.2985)	(-1.8350)	(1.8462)				(3.09)		(4.26)
(Truncated)													
GM 1.	-1.4349	-0.3130	-0.7268	-0.9545	0.6803		-4.8655	5.6984	0.1578	0.95	32.25	1.97	1.140
	(-0.6667)	(-1.3525)	(0.9912)	(-3.3041)	(3.3940)		(-1.3866)	(1.7262)			(3.09)		(4.26)
2.	-3.6760	-0.2584	-0.3130	-0.8258	0.7625		1.1527		0.2006	0.93	32.71	1.91	3.588
	(-1.9839)	(-0.0446)	(-0.4185)	(-2.7413)	(3.6285)		(2.2957)				(3.11)		(4.10)
	3.4221	0.1282	-2.1214	18.9235		-19.4059	11.2380	8.2158	0.3226	0.89	14.84	1.89	1.052
	(1.4796)	(0.4127)	(2.2112)	(0.1264)		(-0.130)	(0.0746)	(2.7412)			(3.09)		(4.26)
	0.8832	0.3372	-1.5955	80.8485		-80.9987	81.3407		0.4115	0.86	14.71	1.68	1.362
	(0.4549)	(1.0884)	(-1.6204)	(0.5142)		(-0.5155)	(0.5182)				(3.11)		(4.10)
Othodox model	3.4731	0.1104	-2.1787	-0.5038			-8.3026	8.3606	0.3231	0.89	19.39	1.84	0.992
	(1.5903)	(0.4134)	(-2.6705)	(-1.4335)			(-1.8040)	(1.9033)			(3.11)		(4.10)
	0.9105	0.2747	-1.8081	-0.2190			0.4098		0.4098	0.86	19.42	1.61	0.910
	(0.4803)	(0.9920)	(-2.0819)	(0.6281)			(0.7846)				(3.18)		(3.98)
Hemphill model (HM)	-3.0927	-0.3027			0.7967	-0.9322	-2.6561	4.6293	0.1714	0.94	38.67	1.92	0.773
	(-2.2886)	(-1.3128)			(4.9044)	(-3.2465)	(-0.8252)	(1.4872)			(3.11)		(4.10)
	-4.2732	-0.2587			0.8115	-0.8273	2.0517		0.2030	0.93	43.71	1.95	2.054
	(-3.7374)	(-1.0823)			(4.7870)	(-2.8428)	(3.3657)				(3.18)		(3.98)

Table 3.....continued

	Constant	LRZMAN-1	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP-D	RSS	R2	F	DW	LM Test
HM truncated	-1.6126	0.2422			0.4665		-1.7494	2.1472	0.3220	0.89	26.36	1.36	0.513
	(-0.9627)	(1.1635)			(2.7970)		(0.4143)	(0.5404)			(3.18)		(3.98)
	-2.2775	0.2336			0.49212		0.5241		0.3293	0.89	36.92	1.44	0.722
	(-2.0566)	(1.1351)			(3.1591)		(1.4840)				(3.34)		(3.89)
	-0.2620	0.4865				-0.0504	-5.1111	5.5658	0.5151	0.82	15.26	1.18	0.874
	(-0.1287)	(1.7693)				(-0.1353)	(-0.9652)	(1.0757)			(3.18)		(3.89)
	-1.6232	0.5572				0.0959	0.5155		5610	0.81	19.74	1.23	0.942
	(-1.0130)	(2.0755)				(0.2748)	(0.6210)				(3.34)		(3.89)
IVE	-4.7790	-0.2295	-0.1102	58.7621	0.7365	-59.6136	61.0422		0.2642			1.714	
	(-2.7434)	(-0.8475)	(-0.1057)	(0.4529)	(2.9603)	(-0.4596)	(0.4707)						
LRZMAN 1973-1988													
General model	19.0342	0.4984	-1.6919	-162.1540	1.1286	163.1850	106.3596	62.6514	1.6597	0.74	3.18	1.95	0.238
GM	(0.7568)	(2.3623)	(-1.0628)	(-1.6536)	(1.4517)	(1.6597)	(-1.2465)	(1.0220)			(3.50)		(5.14)
	12.7268	0.53798	-1.5687	109.2159	1.5729	109.6329	114.0827		1.8764	0.70	3.52	1.86	0.449
	(0.5207)	(2.6105)	(-0.9858)	(-1.3085)	(2.4344)	(1.3147)	(-1.3390)				(3.37)		(4.74)
GM (truncated)	3.8654	0.5715	-1.180	0.5867	1.4268		6.0955	-8.4925	2.2312	0.64	2.72	1.93	0.310
	(0.1509)	(2.5565)	(-0.6911)	(0.5502)	(1.7255)		(0.1075)	(-0.1497)			(3.37)		(4.74)
	3.6128	0.5745	-1.1884	0.5109	1.4923		-2.3365		2.2367	0.64	3.62	1.91	0.382
	(0.1488)	(2.7160)	(-0.2332)	(0.5732)	(2.240)		(-0.3868)				(3.33)		(4.46)
	12.5860	0.4465	0.6202	194.9708		198.0458	87.1476	112.4192	2.0969	0.67	2.99	2.31	0.592
	(0.4797)	(2.0442)	(-0.4149)	(-1.9281)		(1.9350)	(-0.9756)	(-2.0873)			(3.37)		(4.74)
	-10.5092	0.4967	0.8031	-90.4887		90.3704	-87.5646		3.1120	0.50	2.03	1.46	0.135
	(-0.3823)	(1.9794)	(0.5224)	(-0.8912)		(0.8910)	(-0.8482)				(3.33)		(4.46)
Orthodox model	-8.8404	0.5220	0.3895	0.6961			62.1058	-60.3384	2.9693	0.53	2.23	1.91	0.059
	(-0.3792)	(2.1515)	(0.2463)	(0.5887)			(1.2211)	(-1.1457)			(3.33)		(4.46)
	-17.10	0.5288	1.0184	-0.0181			4.2536		3.3591	0.46	2.39	1.51	0.207
	(-0.6520)	(2.1496)	(0.6771)	(-0.0180)			(0.690)				(3.36)		(4.26)

Table 3.....continued

	Constant	LRZMAN-1	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP-D	RSS	R2	F	DW	LM Test
Hemphill model	-12.1325	0.5333			1.1178	0.1835	11.8086	-10.2311	2.3485	0.63	3.34	1.81	0.464
	(-1.1278)	(2.5243)			(1.6386)	(0.2134)	(0.2175)	(0.1848)			(3.33)		(4.46)
	-12.5734	0.5361			1.1944	0.0881	1.7812		2.3565	0.62	4.57	1.77	0.503
	(-1.2550)	(2.6693)			(2.3068)	(0.1341)	(1.1589)				(3.36)		(4.26)
HM truncated	-11.3878	0.5471			1.1915		4.7530	-3.1422	2.3592	0.62	4.57	1.77	0.404
	(-1.1710)	(2.8467)			(2.1190)		(0.1155)	(-0.0743)			(3.36)		(4.26)
	-11.7853	0.5452			1.2099		1.7003		2.3603	0.63	6.64	1.76	0.399
	(-1.5158)	(2.9875)			(2.5016)		(1.2554)				(3.49)		(4.10)
	-2.8147	0.5328				0.8967	64.6814	-65.3010	2.9790	0.53	3.04	1.90	0.015
	(-0.2870)	(2.3486)				(1.1257)	(1.380)	(-1.3823)			(3.36)		(4.26)
	-0.8223	0.5662				0.4261	-0.0813		3.4965	1.44	3.18	1.44	0.330
	(-0.0817)	(2.420)				(0.5704)	(-0.0533)				(3.49)		(4.10)
RSI 1951-1986													
General model (GM)	32.0488	0.4285	-7.4944	-4.4890	-0.1407	0.0828	2.8701	-3.3537	417.876	0.92	45.01	2.09	0.46
	(2.2992)	(2.8267)	(-1.6451)	(-0.8121)	(-3.7673)	(1.1348)	(2.2180)	(-2.5242)			(2.36)		(3.37)
GM (truncated)	20.8986	0.4559	-10.5914	1.6213	-0.1227		3.0797	-3.3698	437.093	0.916	51.78	2.02	0.21
	(2.1033)	(3.0310)	(-2.8893)	(1.2906)	(-3.6103)		(2.3928)	(-2.5240)			(2.43)		(3.35)
	26.0906	0.6015	-13.2832	1.9883		-0.0334	2.9086	-3.1973	629.68	0.889	34.47	2.01	0.04
	(1.5618)	(3.4523)	(-2.5678)	(0.3138)		(-0.4221)	(1.8636)	(-1.9961)			(2.43)		(3.35)
Orthodox model	31.2371	0.5989	-12.1151	-0.6089			2.8072	-3.1795	633.55	0.888	42.49	2.02	0.07
	(2.7736)	(3.4876)	(-2.8107)	(-0.4871)			(1.8458)	(-2.0134)			(2.53)		(3.34)
Hemphill model (HM)	-0.7583	0.5534			-0.150	0.0282	2.0505	-2.1561	534.36	0.903	51.50	1.62	1.22
	(-0.2576)	(3.5673)			(-3.9470)	(1.5689)	(1.5145)	(-1.5741)			(2.53)		(3.34)
HM (truncated)	-1.6667	0.4424			-0.1166		2.4264	-2.4625	578.10	0.896	60.89	1.44	2.57
	(0.5643)	(3.1315)			(-3.6192)		(1.7794)	(-1.7749)			(2.68)		(3.33)
	-1.52143	0.7379				-0.0115	1.6041	-1.6322	811.719	0.849	41.13	1.74	0.85
	(0.4272)	(4.1146)				(-0.6378)	(0.9806)	(-0.9874)			(2.68)		(3.33)

Table 3.....continued

	Constant	LRZMAN-1	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP-D	RSS	R2	F	DW	LM Test
IVE	26.7357	0.6130	-3.5152	-5.7357	-0.1411	0.0963	-0.370		513.95			1.87	
	(1.7682)	(4.1550)	(-0.3343)	(-0.5283)	(-2.8526)	(0.7763)	(-1.6097)						
RSI (1951-1972)													
General model (GM)	-1.2272	0.3947	10.0111	-3.8399	-0.1236	0.0549	1.4717	-1.7644	211.385	0.87	12.87	2.38	3.52
	(-0.0397)	(1.3794)	(0.6902)	(-0.2588)	(-1.3253)	(0.2314)	(0.8750)	(-1.0260)			(2.76)		(4.67)
GM (truncated)	-6.7130	0.4039	7.6832	-0.4375	-0.1316		1.5671	-1.7041	212.193	0.87	16.02	2.34	3.16
	(-0.3488)	(1.4726)	(0.7595)	(-0.2245)	(-1.5690)		(0.9929)	(-1.0357)			(2.79)		(4.60)
	0.0321	0.4756	20.2510	-10.8937		0.1713	0.8054	-1.4470	257.91	0.85	14.02	2.55	0.045
	(0.0010)	(1.6598)	(1.6095)	(-0.7673)		(0.7580)	(0.4896)	(-0.8291)			(2.79)		(3.81)
Orthodox model	-19.4960	0.5276	14.2298	-0.2460			0.9945	-1.1550	247.02	0.84	17.16	2.42	5.08
	(-1.0701)	(1.9226)	(1.4781)	(-0.1211)			(0.620)	(-0.6877)			(2.85)		(3.74)
Hemphill model	6.8131	0.4293			-0.1588	-0.0038	1.9372	-2.1077	220.19	0.86	19.65	2.34	1.59
	(1.885)	(1.6156)			(-2.1072)	(-0.1230)	(1.3022)	(-1.3891)			(2.65)		(3.74)
	7.5970	0.6694			-0.1498	0.0046	(-0.1197)		246.74	0.84	22.83	2.39	1.45
	(2.0382)	(3.2293)			(-1.9429)	(0.1485)	(-0.8138)				(2.96)		(3.68)
HM (truncated)	6.9068	0.4471			-0.1572		1.8881	-2.0711	220.40	0.86	26.06	2.36	1.84
	(1.9805)	(2.0671)			(-2.1817)		(1.3574)	(-1.4342)			(2.96)		(3.68)
	7.4448	0.6510				0.0073	1.5381	-1.8334	281.29	0.82	19.50	2.36	3.86
	(1.8547)	(2.4330)				(0.2213)	(0.9506)	(-1.1060)			(2.96)		(3.68)
IVE	-17.9414	0.6939	-10.3165	15.4940	-0.1846	-0.2404	0.5679		262.720			2.372	
	(-0.5622)	(2.5540)	(-0.4180)	(0.7235)	(-1.5560)	(-0.7143)	(0.6120)						
RSI (1973-1986)													
General model (GM)	-44.7743	0.2104	-1.2049	0.9075	-0.1358	0.0090	3.3106	-2.9571	95.40	0.92	9.94	1.97	2.365
	(-0.6946)	(0.4198)	(-0.0340)	(0.0907)	(-0.8770)	(0.0703)	(0.5527)	(-0.4657)			(4.21)		(6.94)
GM (truncated) (GM)	-45.9366	0.2040	-1.8730	1.5730	-1.1324		3.2235	-2.8480	95.486	0.92	13.52	1.96	0.471
	(-0.7960)	(0.4470)	(-0.1001)	(0.5237)	(-0.9729)		(0.5932)	(-0.4993)			(3.87)		(5.79)
	-30.5378	-0.1429	17.9440	1.1524		-0.0264	2.2831	-2.0103	107.633	0.91	11.86	1.87	3.186
	(-0.4978)	(0.4873)	(1.5769)	(0.1172)		(-0.2222)	(0.3953)	(-0.3267)			(3.87)		(5.79)

Table 3.....continued

	Constant	LRZMAN-1	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP-D	RSS	R2	F	DW	LM Test
Orthodox model	-25.5470 (-0.4767)	-0.1513 (-0.5544)	-17.1481 (-1.6913)	-1.0068 (-0.7161)			2.4831 (0.4636)	-2.2889 (-0.4047)	108.39	0.91	16.14 (3.69)	1.87	0.173 (5.14)
Hemphill model	-44.3692 (-1.1087)	0.2179 (0.6835)			-0.1410 (-2.1255)	0.0209 (0.8316)	3.3913 (0.6596)	-3.0540 (-0.5630)	95.55	0.92	18.52 (3.69)	1.98	0.287 (5.14)
HM (truncated)	-67.0575 (-2.3566)	0.0188 (0.0910)			-0.0962 (-2.5743)		0.6719 (2.5407)		104.67	0.91	34.93 (3.71)	1.70	0.307 (4.46)
	-111.0636 (-4.1460)	-0.1883 (-0.6847)				-0.0213 (-1.2693)	1.1164 (4.2880)		149.89	0.88	23.39 (3.71)	1.49	2.84 (5.12)
IVE	-36.16593 (-0.541)	-0.0097 (-0.0178)	-12.9898 (-0.4429)	2.7523 (0.2849)	-0.0561 (-0.2977)	-0.0328 (-0.2562)	0.3814 (0.5776)		103.039			1.915	

Table C4: Food imports (CRZFD)

LRZFD 1955-1988	Constant	LRZMAN(-1)	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP(-1)	RSS	R2	F	DW	LM Test
General model	-1.3129	0.62871	0.0425	-85.0069	0.4297	85.0383	-78.5880	-6.4913	1.1779	0.92	41.25	2.15	0.24
GM	(0.6462)	(6.5878)	(0.2517)	(-2.3784)	(3.3512)	(2.3809)	(-2.1985)	(-1.3007)			(2.39)		(3.40)
GM (truncated)	-0.8828	0.6790	0.0040	0.0862	0.4083		5.5632	-5.7087	1.4348	0.906	40.22	2.18	0.38
	(-0.4028)	(6.7358)	(0.0219)	(0.3462)	(2.9475)		(0.9612)	(-1.0585)			(2.46)		(3.39)
Orthodox model	-2.5070	0.7089	0.0388	0.4895			7.2049	-6.7175	1.8964	0.87	36.50	1.98	0.03
	(-1.0468)	(6.2611)	(0.1895)	(2.0847)			(1.1077)	(-1.1055)			(2.56)		(3.37)
Hemphill model	-0.8578	0.6782			0.4074	0.0913	5.4431	-5.4431	1.4342	0.90	50.07	2.17	0.34
(HM)	(-0.6059)	(6.8933)			(3.0027)	(0.4102)	(1.1089)	(-1.1902)			(2.56)		(3.37)
	0.5308	0.7259			0.4137	-0.0273			1.5068	0.89	6.36	2.08	0.13
	(0.6572)	(8.2667)			(3.0301)	(-1.6357)					(2.70)		(3.35)
HM (truncated)	-0.5101	0.6916			0.4427		4.5722	-4.5722	1.4429	0.90	64.40	2.16	0.26
	(-0.4564)	(7.5556)			(4.2797)		(1.0483)	(-1.1422)			(2.70)		(3.35)
	0.4809	0.7237			0.4009		-0.4033		1.5078	0.89	84.57	2.07	0.08
	(0.6793)	(8.2667)			(4.1226)		(-1.8175)				-2.92		(3.34)
	-2.1684	0.7086				0.5150	6.1383	-6.2491	1.8961	0.87	47.27	1.97	0.03
	(-1.4251)	(6.3777)				(2.0469)	(1.1081)	(-1.1587)			(2.70)		(3.35)
	-0.6623	0.7588				0.3916	-0.7727		1.9839	0.86	61.87	1.87	0.29
	(-0.8325)	(7.4857)				(2.3912)	(-1.0221)				(2.92)		(3.34)
IVE	-0.7596	0.6257	-0.0184	-83.7381	0.4324	83.8043	-78.2732	-5.7089	1.1838			2.132	
	(-0.3677)	(6.5388)	(-0.1060)	(-2.3365)	(3.3634)	(2.340)	(-1.1357)						
LRZFD 1955-1972													
General model	-2.8213	-0.07611	0.3309	123.1515	0.5564	-123.9673	134.3526	-9.8247	0.1029	0.84	7.73	2.21	8.561
	(-1.320)	(-0.2733)	(0.4457)	(1.3526)	(3.1908)	(-1.3623)	(1.4650)	(-2.8260)			(3.14)		(4.46)
GM (truncated)	-1.8863	-0.1156	-0.1599	-0.8769	0.4595		9.5230	-9.0204	0.1220	0.82	8.08	2.00	5.736
	(-0.8976)	(-0.4019)	(-0.2372)	(-0.8318)	(2.7801)		(2.4356)	(-2.5361)			(3.09)		(4.26)
	2.1987	0.2415	-1.5579	5.0095		-5.516	9.1929	-3.7675	0.2076	0.69	3.99	2.04	0.389
	(1.1219)	(0.6851)	(-2.5655)	(0.0445)		(-0.049)	(0.0819)	(-0.9550)			(3.09)		(4.26)
Orthodox model	2.2019	0.2364	-1.5665	-0.5131			3.6932	-3.7809	0.2077	0.69	5.22	2.03	0.421
	(1.1741)	(0.7326)	(-2.5655)	(-1.4634)			(0.8959)	(-1.0033)			(3.11)		(4.10)
Hemphill model	-2.3055	-0.1361			0.4892	-0.8927	10.8425	-9.3810	0.1223	0.81	10.54	2.00	6.865
	(-2.1248)	(-0.5169)			(4.6720)	(-3.0772)	(3.1442)	(-3.0382)			(3.11)		(4.10)
	0.6531	0.2924			0.3768	-0.6015	0.4451		0.2164	0.67	6.65	1.40	0.793
	(1.0679)	(1.0290)			(3.010)	(-1.7187)	(0.8260)				(3.18)		(3.98)

Table 4.....continued

LRZFD 1955-1972	Constant	LRZMAN(-1)	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP(-1)	RSS	R2	F	DW	LM Test
HM (truncated)	-1.0985	0.5278			0.3563		6.2487	-6.2413	0.2188	0.6682	6.54	1.98	0.834
	(-0.8449)	(2.7216)			(2.9065)		(1.5644)	(-1.6665)			(3.18)		(3.98)
	0.8171	0.6860			0.3047		-0.3973		0.2656	0.60	6.92	1.88	1.914
	(1.2670)	(3.8215)			(2.420)		(-1.6616)				(3.34)		(3.89)
	-1.3468	0.2892				-0.3334	5.1715	-4.2836	0.3448	0.48	2.97	1.13	0.997
	(-0.7830	(0.7258)				(-0.7822)	(0.9933)	(-0.9193)			(3.18)		(3.98)
IVE	-2.8878	-0.0782	0.3580	124.7606	0.5615	-125.5776	136.0290	-9.8815	0.1029			2.287	
	(-1.2928)	(-0.280)	(0.4543)	(1.3503)	(3.0977)	(-1.3598)	(1.4601	(-2.8067)					
LRZFD 1973-1988													
General model	-4.6747	0.5893	0.0140	-90.3291	0.4973	90.6105	-81.7905	-8.2566	0.8419	0.77	3.88	2.37	0.42
GM	(-0.2514)	(2.9754)	(0.0122)	(-1.3168)	(0.8692)	(1.3182)	(-1.3519)	(-0.1817)			(3.50)		(5.14)
GM (truncated)	-13.4868	0.6147	0.3334	0.870	0.6644		-18.15	21.1245	1.0248	0.7230	3.92	2.12	0.293
	(-0.7472)	(2.9980)	(0.2854)	(0.1170)	(1.1449)		(-0.4831)	(0.5511)			(3.37)		(4.74)
	-8.4296	0.5374	0.5001	-103.471		103.8475	-73.4021	-28.6115	0.9214	0.75	4.52	2.51	1.537
	(-0.4725)	(2.8852)	(0.5051)	(-1.5678)		(1.5707)	(-1.3460)	(-0.8025)			(3.37)		(4.74)
Orthodox model	-20.5708	0.5471	1.0820	0.1820			6.2753	-1.4419	1.1740	0.68	4.30	2.15	1.665
	(-1.1948)	(2.7440)	(1.1003)	(0.2476)			(0.1956)	(-0.0432)			(3.33)		(4.46)
Hemphill model	-8.8706	0.6297			0.75434	0.1998	-19.8373	21.0619	1.0332	0.72	5.16	2.19	0.068
	(-1.1955)	(3.3532)			(1.6410)	(0.3241)	(-0.5524)	(0.5752)			(3.33)		(4.26)
	-7.9729	0.6253			0.5931	0.3955	0.8084		1.0674	0.71	6.78	2.41	0.154
	(-1.1341)	(3.4388)			(1.6773)	(0.7942)	(0.7578)				(3.36)		(4.26)
HM (truncated)	-7.9114	0.6585			0.8340		-26.3965	27.6146	1.0441	0.72	7.00	2.09	0.81
	(-1.2131)	(4.1516)			(2.7540)		(-0.9284)	(0.9438)			(3.36)		(4.26)
	-3.3674	0.5776				0.7472	15.2560	-15.4010	1.3114	0.65	5.01	2.18	3.221
	(-1.4736)	(2.9051)				(1.3423)	(0.4923)	(-0.4926)			(3.36)		(4.26)
GM with endogenous price (IVE)	14.4452	0.6458	-1.3013	-106.49	0.8160	107.2019	-98.8871	-12.6763	0.9798			2.551	
	(0.3649)	(2.7335)	(-0.4902)	(-1.3408)	(0.9722)	(1.3725)	(-0.2690)						
General model	-10.6200	0.6225	1.3348	-105.077	0.4050	104.2631	-127.3006	25.6217	6.4152	0.66	4.80	1.98	0.34
(GM)	(-0.4419)	(3.7938)	(0.7312)	(-0.9092)	(0.6596)	(0.9006)	(-1.1456)	(0.4105)			(2.61)		(4.49)
GM (truncated)	-23.1572	0.6202	2.2341	-92.4544		91.4813	-106.6476	21.0849	6.5794	0.66	5.71	1.86	0.53
	(-1.5965)	(3.8410)	(1.8698)	(-0.8242)		(0.8144)	(-1.0164)				(2.70)		(3.35)

Table 4.....continued

LRZFD 1973-1988	Constant	LRZMAN(-1)	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP(-1)	RSS	R2	F	DW	LM Test
Orthodox model	-25.5718	0.6337	2.3829	-1.1084			-33.9298	40.5661	6.8218	0.62	6.84	1.91	1.06
	(-1.9172)	(3.9809)	(2.0362)	(-1.1597)			(0.6212)	(0.7287)			(2.74)		(3.59)
Hemphill model	5.8296	0.6538			0.7389	-0.2876	-46.3894	45.0493	7.0702	0.63	6.46	2.17	5.75
(HM)	(1.6003)	(4.0547)			(1.8223)	(-0.4278)	(-0.8107)	(0.7801			(2.74)		(3.59)
	5.1676	0.6850			0.6449	0.0021	-1.7533		7.2967	0.62	8.08	2.17	6.81
	(1.4732)	(4.4299)			(1.6823)	(0.0038)	(-2.0959)				(2.87		(3.55)
HM (truncated)	5.0877	0.6559			0.6112		-32.9042	31.3997	7.1383	0.63	8.37	2.16	
	(11.6216)	(4.1557)			(2.2744)		(-0.7034)	(0.6661)			(2.87)		
	5.1733	0.6851			0.6460		-1.7529		7.2967	0.62	11.32	2.17	2.43
	(1.6726)	(4.5797)			(2.4838)		(2.1655)				(3.07)		(3.52)
LRZFD 1964-1988													
GM with	48.3211	0.6558	-3.1960	-167.906	1.5431	168.9943	-192.3738	10.4393	8.7399			2.391	
Endogenous price	(1.0213)	(3.4027)	(0.8826)	(-1.1919)	(1.5027)	(1.1946)	(1.4109)	(0.1420)					
(IVE)													
LRZDUR 1973-1988													
General model	-27.3519	0.4339	2.2977	-126.712	-0.820	127.4089	-76.1566	-44.4077	1.7589	0.85	6.36	2.66	0.305
	(-1.0698)	(1.9847)	(1.4269)	(-1.2779)	(-1.0366)	(1.2821)	(0.8596)	(-0.7143)			(3.50)		(5.14)
GM (truncated)	-41.0480	0.4592	2.8057	0.3812	-0.5765		10.0710		2.1217	0.82	8.89	2.51	0.577
	(-1.8019)	(2.1701)	(1.8305)	(0.4021)	(-0.8821)		(1.7819)				(3.33)		(4.46)
Orthodox model	-36.0086	0.4718	2.1706	0.3678			-8.8418	17.2299	2.2562	0.80	8.24	2.51	1.482
	(-1.5830)	(2.1442)	(1.6066)	(0.3457)			(-0.1955)	(0.3680)			(3.33)		(4.46)
Hemphill model	-3.5152	0.4497			0.1324	1.5045	-1.1942		2.8214	0.76	8.51	2.50	0.155
	(-0.3229)	(1.9318)			(0.2292)	(1.8889)	(-0.7037)				(3.36)		(4.96)
HM (truncated)	2.4957	0.5980			0.7264		-46.0069	45.0662	3.5301	0.69	6.25	2.18	1.331
	(0.2095)	(2.4526)			(1.0643)		(-0.8382)	(0.8019)			(3.36)		(4.26)
	-2.3016	0.4387				1.5633	-1.4032		2.8349	0.75	12.30	2.44	0.61
	(-0.2521)	(2.0066)				(2.1602)	(-1.0213)				(3.49)		(4.10)
IVE	-40.6691	0.4397	3.2382	-112.758	-1.0234	113.0753	-62.4521	-40.3524	1.8339			2.534	
	(-1.1297)	(1.9672)	(1.3483)	(-1.0787)	(-1.1472)	(1.0777)	(-0.6644)	(-0.6312)					
LRZRAW 1974-1988													
General model	13.4969	0.4442	-1.1079	-82.8424	0.7153	83.4994	-41.0036	-46.4963	0.9182	0.87	16.04	2.59	4.70
GM	(1.4749)	(3.2391)	(-1.6083)	(-1.8781)	(3.0567)	(1.8893)	(-0.9760)	(-2.0032)			(2.61)		(4.49)
	12.0872	0.4252	-0.9886	-49.8418	0.7734	50.1824	-53.5252		1.1350	0.84	15.45	1.85	0.11
	(1.2261)	(2.8764)	(-1.3331)	(-1.1274)	(3.0828	(1.1343)	(-1.1925)				(2.66)		(4.45)

Table 4.....continued

LRZFD 1974-1988	Constant	LRZMAN(-1)	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP(-1)	RSS	R2	F	DW	LM Test
GM (Truncated)	9.4053	0.4869	-0.8152	0.4907	0.6326		27.1555	-29.9948	1.1110	0.84	15.85	2.08	0.17
	(0.9895)	(3.3676)	(-1.1361)	(1.2127)	(2.5744)		(1.1801)	(-1.3048)			(2.66)		(4.45)
	9.5728	0.4598	-0.8133	0.3027	0.7011		(-2.6931)		1.2161	0.83	18.02	1.68	0.85
	(0.9891)	(3.1557)	(-1.1130)	(0.7862)	(2.8679)		(-1.0624)				(2.74)		(4.41)
Orthodox Model	-9.0652	0.5221	0.5248	0.2692			44.6814	-42.6319	1.5201	0.78	13.65	2.29	2.08
	(-1.2772)	(3.1862)	(0.9332)	(0.5891)			(1.7854)	(-1.6673)			(2.74)		(2.59)
	-11.7926	0.4874	0.7636	-0.0464			3.0550		1.7425	0.75	15.03	1.73	0.26
	(-1.6361)	(2.8735)	(1.3032)	(-0.1088)			(1.6870)				(2.87)		(3.55)
Hemphill Model	-1.2399	0.4731			0.4291	0.1611	29.8627	-30.0774	1.190	0.83	18.49	2.10	0.43
	(-0.7546)	(3.2585			(2.5189)	(0.5714)	(1.3020)	(-1.2972)			(2.74)		(3.59)
	-1.0451	(0.4462			0.4984	-0.0271	0.1128		1.2954	0.81	21.95	1.68	0.45
	(-0.6821)	(3.0535)			(3.0296)	(-0.1103)	(0.3072)				(2.87)		(3.55)
HM (Truncated)	-0.7556	0.4905			0.4929		23.1132	-23.2593	1.2104	0.83	23.84	2.02	0.16
	(-0.5461)	(3.5146)			(3.8933)		(1.1959)	(-1.1902)			(2.87)		(3.55)
	-1.1459	0.4409			0.4874		0.1141		1.2962	0.81	30.70	1.67	0.42
	(-0.8440)	(2.2778)			(3.8152)		(0.3184)				(3.07)		(3.52)
	-2.6475	0.5549				0.6260	48.1528	-48.3868	1.5874	0.77	16.99	2.27	6.78
	(-1.5220)	(3.4833)				(2.6095)	(1.9661)	(-1.9523)			(2.87)		(3.55)
	-2.7054	0.5305				0.4241	0.3450		1.890	0.73	18.86	1.63	1.29
	(0.2246)	(0.2067)				(1.840)	(0.8147)				(3.07)		(3.52)
IVE	21.0099	0.430	-1.6694	-58.0349	0.9474	58.6470	-64.3235		1.1881			1.981	
	(1.2956)	(2.8404)	(-1.3566)	(-1.2424)	(2.6560)	(1.2520)	(-1.3282)						
LRZRAN 1973-1988													
General Model	1.010	0.5262	-0.7405	-42.7584	1.5064	43.0896	-29.2934	-15.1747	0.5848	0.78	3.99	3.05	2.145
	(0.0684)	(2.6845)	(-0.7980)	(-0.7094)	(2.4050)	(0.7127)	(-0.5740)	(-0.4015)			(3.50)		(5.14)
	-0.6873	0.5517	-0.6964	-26.1672	1.2641	29.3522	-30.3423		0.5965	0.77	5.11	2.90	2.80
	(-0.0510)	(3.1242)	(-0.7937)	(-0.6142)	(3.4387)	(0.6183)	(-0.6252)				(3.37)		(4.74)
GM (Truncated)	-3.2664	0.5727	-0.5821	0.1918	1.2479		-0.4665	0.0687	0.6219	0.76	4.84	2.87	3.079
	(-0.2492)	(3.1868)	(-0.6646)	(0.3177)	(2.7987)		(-0.0154)	(0.0027)			(3.37)		(4.74)
	-3.2642	0.5727	-0.5821	0.1924	1.2473		-0.3982		0.6219	0.76	6.45	2.87	3.338
	(-0.2632)	(3.4110)	(-0.7006)	(0.3867)	(3.5125)		(-0.1290)				(3.33)		(4.46)
	-3.5268	0.3796	0.1847	-83.8998		84.5457	-15.0894	-68.8715	1.0075	0.62	2.41	2.95	1.686
	(0.1947)	(1.6463)	(0.1731)	(-1.1731)		(1.1788)	(-0.2405)	(-1.8247)			(3.37)		(4.74)
	-18.4764	0.4565	1.1277	-17.4364		17.2801	-12.6378		1.3803	0.47	1.81	1.89	0.648
	(-1.0299)	(1.8136)	(1.1182)	(-0.2551)		(0.2529)	(-0.1815)				(3.33)		(4.46)

Table 4.....continued

LRZFD 1973-1988	Constant	LRZMAN(-1)	LREP	LRPEY	LRFOREX	LRINTRES	LPOP	LPOP(-1)	RSS	R2	F	DW	LM Test
Orthodox	-13.4782	0.4524	0.6897	0.4049			49.0382	-46.0043	1.1631	0.56	2.52	2.61	0.648
	(-0.8250)	(1.9982)	(0.7099)	(0.5212)			(1.5401)	(-1.3940)			(3.33)		(4.46)
	-19.8618	0.4696	1.1810	-0.1493			4.9483		1.3891	0.47	2.45	1.90	0.592
	(-1.21545)	(1.9936)	(1.2519)	(-0.2146)			(1.2928)				(3.36)		(4.26)
Hemphill model	-11.0781	0.5657			1.0931	-0.0235	2.1068	-0.4463	0.6524	0.75	6.05	2.69	1.376
(HM)	(-1.9555)	(3.2319)			(2.9442)	(-0.0476)	(0.0727)	(-0.0151)			(3.33)		(4.26)
HM (truncated)	-11.1628	0.5616			1.0830		2.9556	-1.2994	0.6526	0.75	8.32	2.70	1.511
	(-2.1766)	(3.8571)			(3.7254)		(0.1358)	(-0.0580)			(3.36)		(4.26)
	-11.3214	0.5602			1.0902		1.6927		0.6528	0.75	12.10	2.69	1.548
	(-2.7247)	(4.0760)			(4.3304)		(2.3653)				(3.49)		(4.10)
	-2.9089	0.4375				0.8058	54.5157	54.7910	1.2180	0.54	3.18	2.50	0.361
	(-0.4521)	(1.9895)				(1.5264)	(1.8251)	(-1.8236)			(3.36)		(4.26)
	-1.2808	0.4491				0.4301	0.0724		1.5862	0.3962	2.62	1.63	4.001
	(-0.1840)	(1.8663)				(0.8098)	(0.0689)				(3.49)		(4.10)
IVE	-20.5792	0.5487	0.7413	-13.2973	0.8999	12.9624	-8.8157		0.7745			2.336	
	(-0.6396)	(2.7263)	(0.3258)	(-0.2268)	(1.3512)	(0.2201)	(-0.1395)						

Table C5: Domestic feed back price elasticities (pass-through) for Nigeria

						Progression Statistics				
						RSS	R2	F	D.W.	LM-Test
1.	LPOI =	0.186	+ 0.279LPOI(-1)	- 3.337LnEN		84.470	0.1359	2.52	2.14	2.68
	1951-1985	(0.177)	(1.661)	(-1.206)						
2.	LPOI =	0.34	+ 0.727LPOI(-1)	- 0.756LnEN		0.01381	0.7479	28.18	2.00	0.04
	1959-1972	(0.249)	(5.323)	(-2.883)						(3.32)
3.	LPOI =	4.088	- 0.235LPOI(-1)	- 0.309LnEn		48.736	0.0613	0.33	2.29	1.196
	1973-1985	(2.008)	(0.799)	(-0.078)						(4.46)
4.	LPOI =	2.232	+ 0.00005LPOI(-1)	- 1.930LRER		70.086	0.2915	6.58	2.04	0.68
	1951-1985	(4.669)	(1.00027)	(-2.966)						(3.32)
5.	LPOI =	0.357	+ 0.720LPOI(-1)	- 0.119LRER		0.01566	0.7142	23.73	1.72	0.14
	1959-1972	(2.103)	(4.761)	(-2.255)				(3.52)		(4.41)
6.	LRER =	0.064	+ 0.930LRER(-1)	+ 0.241LNEn		0.9107	0.8907	142.56	2.10	3.28
	1951-1988	(2.05)	(16.764)	(3.947)				(3.27)		(3.29)
7.	LRER =	0.881	+ 0.658LRER(-1)	+ 2.140LnEn		0.0640	0.8297	46.30	1.35	1.87
	1951-1972	(2.385)	(3.689)	(2.497)				(3.52)		(4.41)
8.	LRER =	0.038	+ 0.705LRER(-1)	+ 0.280LnEn		0.67155	0.7415	18.65	1.95	18.26
	1973-1988	(-0.523)	(4.674)	(3.137)				(3.81)		(3.98)
9.	LRER =	-0.073	+ 1.078LREP(-1)	+ 0.048LRER		0.42187	0.96411	470.23	1.61	4.89
	1951-1988	(-3.810)	(23.465)	(0.989)				(3.27)		(3.29)
10	LRER =	0.113	+ 0.19LREP(-1)	+ 0.749LRER		0.03492	0.8618	59.24	1.60	0.18
	1951-1972	(2.320)	(0.096)	(5.116)				(3.52)		(4.41)
11.	LRER =	-0.080	+ 0.081REP(-1)	+ 0.031LRER		0.33271	0.9391	100.23	1.37	0.810
	1973-1988	(-1.556)	(14.117)	(0.310)				(3.81)		(3.98)

Notes: t-statistics are in parentheses.

Notes

1. This is in fact a truncated segment of an earlier balance of payments model (Umo and Fakiyesi, 1990).

2. See Appendix B for the growth rate of key trade variables in Nigeria between 1950 and 1988.

3. The statistical package used in the estimation was David F. Hendry's (1987) *PC-GIVE Version 4.2*.

4. The mean time-lag is calculated as (1-ß)/ß where ß is the parameter of endogenous regressor (see Goldstein and Khan, 1985, p. 1066).

5. Pass-through elasticities are estimated by regressing import or export prices on nominal exchange rate (see Goldstein and Khan, 1985, p. 1089).

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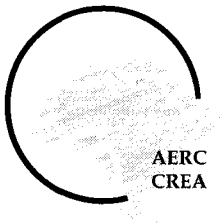

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