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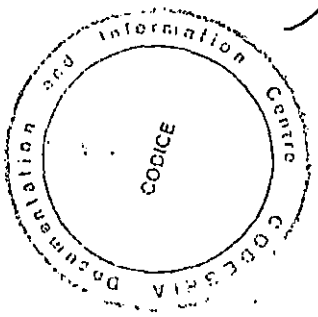
Exchange rate disequilibrium and inflation in Nigeria 1970-1995: an empirical study

AUGUST, 1998

EXCHANGE RATE DISEQUILIBRIUM AND INFLATION IN NIGERIA 1970 - 1995. AN EMPIRICAL STUDY



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PG/M.Sc./93/14284

A PROJECT REPORT SUBMITTED TO THE
DEPARTMENT OF ECONOMICS
UNIVERSITY OF NIGERIA,
NSUKKA

IN PARTIAL FULFILMENT OF THE REQUIREMENT
FOR THE AWARD OF THE DEGREE OF
MASTER OF SCIENCE IN
ECONOMICS

AUGUST, 1998

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DEDICATION

This thesis is dedicated to my mother - Deborah Okeh (Nee Abugu) for her love, inspiration and general support in the course of my intellectual pursuit.

ACKNOWLEDGEMENT

I do hereby acknowledge with profound gratitude, the special grace of God that made possible the realization of this empirical enquiry. To God be the glory through Jesus Christ Our Lord for providing the needed good health, wisdom and understanding that culminated into this work. Special thanks to my project supervisors - Dr. F.E. Onah and Dr. C.C. Agu for their guidance and ultimate fine-tuning of this research report.

Secondly, my profound gratitude also goes to the council for the Development of social Science Research in Africa (CODESRIA), for their research grant that made this work to see the light of the day. I am forever grateful for such an honour and privilege. And I do pray that God will continue to make the fund available for the sustenance of this all important organisation for the interest of fellow scholars in our continent.

Many thanks to my brothers - Augustine, Peter and Matthew Okeh for their support during the problematic period of this research effort. To all those who contributed in one way or the other towards the success of this work, I am most grateful.

Okeh, James Ikechukwu
August, 1998.

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EXCHANGE RATE DISEQUILIBRIUM AND INFLATION IN NIGERIA 1970 - 95 AN EMPIRICAL STUDY

ABSTRACT

This research probes into the relative roles of exchange rates fluctuation in general and the specific regimes in particular as causes of inflation in Nigeria. Two distinct exchange rate regimes are identified; the pre-1980 period (1970-1980) when the country enjoyed economic prosperity as a result of the oil boom, the supply of foreign currency was not an issue of great concern, and administered exchange rate regime existed. From the 1980s as part of the reform process designed to restor the economy on a growth path including access to international capital, a new foreign exchange thrust was evident. The second regime started specially from september 19986. It was characterized by a floating rate mechanism linked to market forces called second Their Foreign Exchange Market (SFEM)" A more serious inflationary pressure, expansionary macroeconomic policies and a strong parallel market for foreign exchange were noted during the second regime than in the first administered exchange rate period.

It is proved that both the official and parallel (black) market exchange rates has a direct relationship with domestic inflation, the relationship being more prominent in the second than in the first regime. At the same time, overall macroeconomic policy was "expansionary" and has been positively related to inflation.

A two sector model, incorporating dual exchange rate system is used to analyse the role of exchange rates and macroeconomic instability. How Test is used to estimate the relationship between exchange rates and inflation over the two exchange rate regimes.

CHAPTER ONE

INTRODUCTION

1.1 Background

Inflation has consistently been a problem of macroeconomic management in Nigeria. Monetary and structuralist causes have been variously analysed. However, the relative role of exchange rate fluctuations in the inflationary process is a subject of controversy, not only in Nigeria, but also in other sub-saharam African countries.

To discuss the relationship between inflation and exchange rate in the context of overall macroeconomic policy in Nigeria, two major exchange regimes can be identified. First is the pre-1980 period characterised by relatively fixed, "passive". exchange rate policy, and the second from 1986 onwards with an "active" more flexible exchange rate regime.

i) Period before 1986

Over much of the period 1970-85, and mainly since the oil boom of the 70s' fears of inflation (and attendant income distribution) effects dominated reluctance on the part of government to use exchange rate devaluation for adjustment.

Also given the inelastic demand for most of Nigeria's imports, it was considered that devaluation could not automatically reduce the import bill and was likely to lead to cost push inflation. One would therefore ascribe the exchange rate policy during this period to the anti-inflationary objective. The exchange rate regime was, relatively speaking "fixed", in that, few and small discrete devaluations were carried out.

ii) Post-1986 Period

Between 1986 and February 1992, the monetary authorities were unable to reverse the continuous depreciation of the nations currency as reflected in the almost monotonically

increasing parallel market premium. As a final effort to remedy what to them was a disturbing trend, the authorities opted for a complete deregulation of the system of foreign exchange trading in March 1992.

In the new system, rates were determined by market forces. Consequently, the parallel market premium reduced to what was probably transaction-cost differential. Unfortunately, the convergence between official and parallel rates was transient because the interbank foreign exchange market continued to be characterised by excess demand for foreign currencies.

The central Bank of Nigeria reports that excess demand for foreign currencies by Banks amounted to 36.9 and 33.8 billion dollars for 1993 and 1994 respectively. The rate differentials continued to widen, and has worsened especially after January 1994 when the government in the 1994/95 budget policy statement arrested deregulation and pegged the official exchange rate of the naira arbitrarily at ₦22.0 per us dollar.

As at November, 1994, the parallel market premium was 400%, although parallel market rates were no longer published since the parallel market was proscribed in January 1994.

In this background report, it is necessary to ex-ray the earliest history of transactions in the parallel foreign exchange market in Nigeria. The parallel market stated at the outbreak of the World War II mainly in the united states dollar, and swiss francs; Switzerland being for Nigerians a favourite haven for money laundering. The development of the market is rooted in foreign exchange controls in respect of payments for imports, payment for, and proceeds from invisibles, treatment of proceeds from exports (cocoa, rubber, palm produce, hides and skins, cotton, groundnut, and tin ore were major exports at the time), as well as capital controls in respect of both direct and portfolio investments. Initially the participants were mainly expatriate entrepreneurs (Lebanese traders were prominent), exporters, politicians, and certain importers.

During the Nigerian civil war (1966-70) and after, the stratagem of over - involving of imports and under-invoicing of exports transactions becomes widespread in reducing the burden of exchange control restrictions. After the civil war, senior government officials of all types (civil and military) had joined politicians as participants in the market.

However, the prominence of the parallel market in the scheme of economic activities trace to early 1980 when the economy swung into a distress. The oil boom was over, debt payments were in arrears, and the international business community suspended trade credits to Nigeria. The government reacted by imposing stringent exchange control measures. Those measures plus the scarcity of foreign currencies boosted the informal market in foreign currencies.

The parallel market was legitimised (more tolerated) in 1989) with the introduction of bureaux de change. Bureaux de change were established in 1989 to accord legal recognition to small dealers in foreign exchange. The idea was that in allowing a free hand to small dealers, demand pressure on the official market may be attenuated. Further more, it is believed that this would increase the size of the formal foreign exchange market (by admitting the informal sector) and thus enhance macroeconomic management. These institutions were permitted to deal in currencies and to purchase travellers' cheque but could obtain foreign currency only from private sources other than resident banks and central bank.

When government reneged on its commitment to exchange rate liberalization, it explained away the act as an effort to contain speculative activities in the market. But for most Nigerians the parallel market is the only foreign currency market accessible. In recent times, the importance of this market has grown tremendously as transaction prices (both wholesale and retail) in the real and in the service sectors including embassies and foreign missions in Nigeria are implicitly indexed to the parallel rate.

In terms of market architecture, there is no formal organisation of the parallel market. It would be fair to characterize the site of the market as ubiquitous; on the curbs, under staircases, in business bureaux, inside restaurants, hotel lobbies, airport lounges, parking lots and so on and so forth. Many unimaginable places qualified as dealing spots so long as you felt confortable about not getting robbed. However, as the market gained in importance, and also became more lucrative, entry into the market by other established entrepreneurs who adapted their existing enterprises to accommodate the booming "money-changing business" improved the infrastructure of the business as well as the reputation.

Within a given area, an increasing number of the business began to occur in more fixed locations with a greater weight of reputational capital attached to transactions. The count-accuracy of notes exchanged and the genuineness of currencies traded became important dimensions of competition in the market.

This is a long way in a short span of time for a market that was hitherto operated by a collection of footloose agents ; some operating for own accounts and yet others as agents for politically-powerful principals. Perhaps this diversity coupled with the boom times that the market has continued to enjoy promoted the growth in the sample of trading posts from street corners to air-conditioned shacks with the bosses fully decked with business cards, cellular phones, digital phones, fax machines and desk top personal computers.

Those who did not have telephones installed could easily access one and some of the curbs side dealers (especially those who traded on behalf of principals) could reach their principals on cellular phones. As more profits beget entry which promoted competition that cut into margins, dealers began to take advantage of economies of scope to offer complementary business services such as facsimile transmission, telephone out-going call services, and photocopying. Such is the ever changing view of the informal market in foreign

currencies in Nigeria. Although the volume of trading in the Nigerian parallel market is not known precisely, a large proportion of the private foreign exchange flow into the country passes through this market. Also, some of the foreign currencies from the official market invariable end up in the parallel market (arbitrated) thereby making the parallel market an important instrument for giving efforts to the wealth-distribution consequences of the exchange rate policy.

1.2 STATEMENT OF THE PROBLEM

The policy choice of a fixed or even flexible exchange rate policy has to be matched with appropriate macroeconomic policies if inflation has to be avoided. Given the inflationary experience in Nigeria, and the two major exchange rate regimes outlined above, there is a need to attempt to analyse the relative role of exchange rate regimes and macroeconomic instability in the inflationary process.

The main research questions can thus be stated as follows:

i. Has the flexible exchange rate regime been more prone to inflationary pressures than the fixed exchange rate period?

ii. How strong was the relationship between the exchange rate (official and parallel) and inflation during the period of officially adjusted exchange rate regime (1970-85) as compared with the period of floating exchange rate regime (1986-1995).

iii. What can be said about the macroeconomic stance of the government during each of these periods?

1.3 OBJECTIVE OF THE STUDY

The broad objective of this study is to make an empirical investigation of the relationship between the exchange rates (both official and parallel rates) and inflation during the period 1970-1995, and to establish the relative importance of these factors during the two distinct exchange rate regimes.

Thus, specifically, the study aims:

i. To determine whether changes in exchange rates positively imparted on the rate of inflation in Nigeria.

or TO investigate the relationship between the exchange rate and the rate of inflation.

ii. To establish which of the official and parallel exchange rates had a stronger influence on domestic inflation than the other.

iii. To facilitate policy recommendations in the light of the on-going attempt to foster stable prices and market based exchange rate.

1.4. HYPOTHESES

The following hypotheses will guide the study.

i. There has not been a significant influence of either official or parallel exchange rates on domestic inflation rates during both exchange rate regimes.

ii. Unofficial (parallel) exchange rate has had a less significant influence on domestic inflation than the official exchange rate.

iii. There is no difference in the magnitude and significance of the relationship between officially adjusted exchange rates and the rates of inflation on the one hand, and the market determined exchange rates and the rate of inflation on the other.

1.5 SIGNIFICANCE OF THE STUDY

Prominent bodies like united Nations Economics Commission for Africa (UNECA) and a god section of the political leadership in a number of sub-saharn African countries have expressed skepticism about the efficacy of exchange rate adjustment as prescribed by the international financial organisations and donor countries.

One of the reasons for resenting exchange rate adjustment (particularly currency devaluation) was the fear that it would trigger off inflation.

By probing, in broad macro-economic context, the impact of exchange rate adjustment on inflation, our study will contribute to the debate about the veracity of the fears placed on exchange rate adjustment.

CHAPTER TWO

LITERATURE REVIEW

2.1 Theoretical Literature

The monetarists emphasize domestic growth of money supply in excess of money demand as the cause of inflation. Assuming money supply is exogenous ($M^s = \bar{M}$), and given the standard money demand function, the general monetarist model can be epitomised as:

$P = f(M, Y, C)$ $fm > 0$, $f Y < 0$ and $fC > 0$ . . . . . [1]

Where P is domestic price level M is money stock, Y is real output and C is the cost of holding money.

Equation [1] indicates that an increase in the growth of money will, ceteris paribus, lead to an increase in inflation while an increase in real output will lead to a decrease in inflation.

These two postulates can also be derived from the Quantity Theory of money equation which leads to the following results: $\dot{P} = \dot{M} - \dot{Y}$ . . . . . [2]

where $P = \frac{\Delta P}{Y}$, $M = \frac{\Delta M}{Y}$ and

$Y = \frac{\Delta Y}{Y}$

(Hereafter, variables with a dot on top represent growth rates).

Further, in [1], C stands for interest rates. It has been noted that in developing countries (of which Nigeria is one) with repressed and underdeveloped financial structure interest rate (appearing as i or v) in the continual money demand function is not appropriate except as in a few economies. Some researchers, therefore use the expected rate of inflation pe to represent the cost of holding assets in form of money.

The monetarist position can also be drawn from studies by Blejer (1977, Agenor (1991), Chibber and Shafik (1992), and Atta, Jefferis, Mannathoko, and Siwawa, (1992).

In the two sector model, the price level of home goods (produced in the non-tradable sectors) is assumed to be determined by excess demand which can be proxied by money market disequilibrium.

$$\Delta P_N = e^{\delta} (Z) \qquad [3]$$

Where (Z) term stands for Macroeconomic balance (MAB) and δ stands for elasticity of the price of non-tradable with respect to monetary imbalance.

It ought to be noted, however, that the studies that put this notation to empirical test in relation to inflation actually use money supply (current and lagged), rather than a single composite measure of monetary disequilibrium, along with income, lagged inflation and/interest rates (where this applies eg Atta *et al* (1994) in the case of Botswana).

On the other hand, the monetarist perspective can be linked to the purchasing power parity so as to bring in the effect of "openness" of the economy on the domestic price level. Despite its well known shortcomings, the purchasing power parity, which is an extension of the law of one price from one commodity to a basket of commodities, determines the average price level across the domestic economy and the rest of the world. The domestic price level (P) in terms of domestic currency is a product of the world price (P^*) and the exchange rate(E), thus.

$$P = EP^* \qquad [4]$$

where E is defined as the number of domestic currency units per unit of foreign currency. Taking small changes on both sides of (4), we get.

$$\dot{P} = \dot{E} + \dot{P}^x \qquad [5]$$

Where $\dot{P}$ and $\dot{P}^*$ are domestic and foreign rates of inflation respectively, and $\dot{E}$ is the rate of currency depreciation.

Equation (5) implies that a change in the domestic prices is the sum of a change in exchange rate and a change in world prices. Both exchange rate depreciation and world inflation will vary directly with domestic inflation.

Two implications from results so far deserve mention. The first concerns the expansion of the original "monetarist" price function $\dot{P} = \dot{P}^*$, or the rate of domestic inflation should equal foreign rate of inflation. If the domestic rate of inflation happens to be greater than the foreign rate, and the national exchange rate is not commensurately depreciated (devalued), then we have a case of harmful exchange over valuation.

Thus, the main causes of domestic inflation that have been investigated in the various studies may be summed up as follows:

$$\dot{P} = P(M, Y, C, E_o, E_b, \dot{P}^*) \quad [6]$$

Where variables are defined as above.

2.2 Empirical Literature.

Examples of studies that empirically establish the link between inflation and budget deficits include Nddebio (1995) in the case of Nigeria and Kilindo (1990) in the Tanzania. The basic idea is the two pronged way by which the deficit can lead to inflation: first increasing money expansion, assuming (as is the case in most African countries) that the bulk of the deficit is financed by domestic bank borrowing, and second, through expanded aggregate demand generated by increased government spending.

In 1974, a national conference on inflation in Nigeria was organised by the Nigerian institute of social and Economic Research (NISER), Ibadan. Several aspects were addressed, but the papers prepared for Section Two of the conference focused on the proximate causes of inflation. In general, the findings of some of the key articles reveal that neither monetary nor structural factor alone explain the Nigerian inflation.

Striking evidence from this conference was that a combination of both factors precipitate the inflationary process.

Prior to the NISER conference on inflation, few studies had addressed the issue of inflation. The work of Oyejide (1972) is particularly appealing, as he takes the impact of deficit financing in the course of inflation as the focal point of his empirical enquiry. Having established the theoretical link between domestic money supply and inflation, Oyejide determined statistically the impact of alternative definitions of deficit financing on inflation. Evidence from this research demonstrates that there is a direct correspondence, though not on a one-to-one basis, between the general price level and measures of deficit financing over the 14 years from 1957-70. One point of importance from this is that less emphasis on deficit financing may limit the growth of price inflation in Nigeria.

The results of Ajayi and Awosika (1980) can be juxtaposed against this. An important conclusion from various econometric models employed by these authors indicates that inflation in Nigeria is determined largely by developments in the external sector, but complemented by internal influences. Specifically, their findings demonstrate that the openness of the economy is highly correlated with inflation.

For pinto (1987), the monetization of the foreign exchange earnings from crude oil export, that vastly expanded the growth of MI, constituted the single most important factor to explain movements in the general price levels in the 1970s to the early 1980s.

Elsewhere, the causes of inflation have been the preoccupation of several studies, particularly in recent years. It is important to document the findings of those related to the present study. In this respect, the work of Aghevli and Kahn (1978) is illuminating.

These authors developed structural equations to demonstrate the two-way causation between budget deficit and inflation in developing countries. Empirical estimates from their

studies indicate that government expenditures respond faster to inflation than revenue, thereby generating an enlarged budget deficit which further engenders inflation.

There is a unanimous conclusion from studies on groups of African countries by Greene (1989) and London (1989) that there are direct relationships between both monetary expansion and exchange rate depreciation and inflation. However, there are conflicting results with respect to the inflationary effect of (official) exchange rate depreciation in some individual countries. For instance, Chibber *et al.* (1992) do not find a direct relationship between official exchange rate changes and inflation in Ghana: They attribute this to the fact that official devaluations had positive effect on the budget and were, therefore, eventually anti-inflationary.

The study found that parallel market exchange rate had a stronger influence in inflation than the official exchange rate. This study like that of Hyaha and Ndulu (1990) for Tanzania points out first, that domestic prices already has adjusted to the parallel exchange rate and second, that additional external resource flows in support of the reform programme enhanced budgetary resources, thus reducing inflationary financing. Hyaha (1992) examines the relationship between the parallel and official exchange rates and inflation in Uganda via regression analysis using 1985 - 1991 data. It is concluded that the devaluations of the official exchange rate have not been neutral in the determination of domestic prices. A conclusion similar to this is arrived at in another study on Ugdanda by Kasekende and Samogerer (1994). Their regression results for periods 1987-92 using monthly data, however, show lager coefficients to the elasticity of domestic rate of inflation with respect to the parallel market exchange rate than with respect to the official rate.

Macroeconomic instability variable incorporated in the present study connotes overall macroeconomic policy stance. As noted by Agheuli, Khani, and Montiel (1991) and Ndulu (1993) the objective of the inclusion is to have both some target rate of domestic credit expansion (or growth rate of money supply) equal to some target rate of real output growth, while making sure that the nominal exchange rate is adjusted such as to narrow the gap between domestic and foreign inflation.

Except as ex ante disequilibrium of the money market proxying excess demand (eg Blejer (1977), Agenor (1991), and Chibben *et al.* (1992). "Macroeconomic instabilities does not appear in literature on the domestic price functions. It is encountered in Ndulu (1993), but then as one of the determinants of real exchange rate (misalignment), and not as determinant of inflation rate.

Most of the studies cited employ regression analysis using either or both cross-section and time series. However, canalti *et al.* (1992) point out that the traditional econometric techniques prove existence of the relationship between the different variables and inflation but they do not establish causation. Also important is their suggestion that perhaps this failure may be due to a shortcoming in the structural factors or a measure of overall macroeconomic policy stance incorporating both monetary and exchange rate policy may be more important as a determinant of inflation. The study does not after all totally dismiss the traditional econometric techniques.

The above (presentation) does not resolve the question as to which of the monetary or structural explanation is dominant as a cause of inflation. It suffices to note that different studies emphasise different factors at a time, but the majority emphasise policy failure due mainly to monetised fiscal deficit.

Structural factors exert significant cost-inflation, However, the role of exchange rate regimes remains controversial, while that of the overall macroeconomic instability has not

been widely investigated except as an ex ante disequilibrium in the money market (to proxy excess demand).

The studies on Nigeria do not emphasize these two aspects as well-hence the need for this study to fill the gap.

This study, does not take a monetarist perspective, but relates the domestic price formation to exchange rates and the excess demand as represented by the overall macroeconomic policy stance. The model used in this analysis is presented in chapter two. It must be noted here that the nature of the model makes it necessary to include the foreign prices, but not much more than necessary is highlighted on this variable.

CHAPTER THREE

METHODOLOGY

3.1 The proposed Model

Given the present focus on exchange rates and macroeconomic balance in Nigeria, the Blejer (1977) and Agenor (1991) approach is adopted in this research. This study assume a small open economy with two sectors one producing non-tradable (home) goods, and the other producing tradable goods. The regression analysis using time series approach is employed in this report. This econometric method of research is essential to this study because it not only provides the best technique for the verification or refutation of theories, but also provides us with the quantitative estimates of the magnitude of the relationship among variables without much of subjective judgement Maddala (1992).

The respective price level of these goods are P_N and P_T. The domestic price level (P) is assumed to be a geometrically weighted average of the prices of non-tradable goods (PN) and tradable goods (P_T).

$$P = P_N^{\&} . P_T^{1-\&} \ldots 0 < \alpha < 1 \quad [7]$$

Where & is the proportion of non-tradable in total expenditure.

The assumption of small and open economy implies that the prices of traded goods (P_T) depends on the foreign price obtaining in the world market (P^*) P^* is exogenously determined and so the terms of trade for this economy is given.

A dual exchange rate system is also assumed. There is an official exchange market, in which transactions take place at an official exchange rate (E_o), and a parallel market where foreign trade transactions take place at a parallel (black) market exchange rate (E_b).

Thus, the domestic currency price of tradable goods (P_T) is given as a product of foreign price (P^*) and the ruling exchange rate. Since trade is taking place at two different exchange rates, then,

$$P_T = E_o^{\beta} . E_b^{1-\beta} . P^* \quad 0 \leq \beta \leq 1 \quad \text{[8]}$$

Where β is the proportion of trade carried out through official channels. The price of non-tradable is determined by domestic policy. As seen above, it is commonly assumed to be a function of excess demand in the economy.

A monetary disequilibrium, mainly an excess money supply implies excess demand for both classes of goods. Excess demand for non-tradable will raise their prices. The prices of tradable are left unchanged since foreign prices are exogenously determined.

Expressing the change in the price level of non-tradable from equation(1) above, and defining the macro-economic balance to take the place of (Z) term as

$$MAB = \left(\frac{\Delta DCE}{M_{2-1}} - Y - P^* - E_o\right) \quad \text{[9]}$$

Where DCE = Domestic credit Expansion.

Changes in the price level of non-tradable are given by

$$\Delta P = e^{\sigma} \left(\frac{\Delta DCE}{M_{2-1}} - Y - P^* - E_o\right) \ldots \quad \text{[10]}$$

Then, the change in the overall domestic price level (8) can be written out in logarithmic form as a function of foreign price, both official and unofficial market exchange rates and a measure of macro-economic instability (MAB).

$$\Delta \log P_t = (1-\alpha)\, \Delta \log P^*_t + (1-\alpha)\, \beta\, \Delta \log E_{ot} +$$
$$(1-\alpha)(1-\beta)\, \Delta \log E_{bt} + \alpha^{\sigma} \left(\frac{\Delta DCE}{M_{2-1}} - \frac{\Delta Y}{Y-1} - \frac{P^*}{P^*_{-1}} - \frac{\Delta E_o}{E_{o-1}}\right) \ldots \quad \text{[11]}$$

Here $\Delta \log P_t = (\log P_t - \log P_{t-1})$,

$\Delta \log P^* = (\log P^*_t - \log P^*_{t-1})$

$\Delta \log E_{ot} = (\log E_{ot} - \log Eo_{t-1})$

$\Delta \log E_{bt} = (\log E_{bt} - \log E_{bt-1})$

The Z term is in semilogarithimic form because it can take negative values. Equation 4 can also be written more simply with lower case for logarithms as

$$\Delta P_t = a_1 \Delta P^*_t + a_2 \Delta e_{ot} + a_3 \Delta eb_t + a_4 (Z) + U \quad \ldots\ldots\ldots\ldots\ldots\ldots [11^1]$$

Where $\Delta P_t = \Delta \log P_t$, $\Delta p^*_t = \Delta \log P^*_t$

$\Delta e_{ot} = \Delta \log E_{ot}$

and $\Delta_{ebt} = \Delta \log E_{bt}$, and

Z is $\dfrac{(\Delta DCE}{M_{2-1}} - Y - P^* - E_o)$

The coefficients, $a_1 = (1-\alpha)$,

$a_2 = (1-\alpha)\,\beta$, $a_3 = (1-\alpha)\,(1-\beta)$,

$a_4 = \alpha\sigma$

All coefficients are expected to be positive.

Thus, equation (8) relates changes in the domestic price level to changes in the official and parallel exchange rates, foreign prices and macroeconomic imbalance. It is similar to the one derived by Agonor (1991).

3.2 Implication of the proposed model and Estimation procedures

i) To investiage the differences in the significance of the relationship between exchange rates and inflation over the two exchange rate regimes, chow tests is used. The chow test made it possible to determined if there was significant shift in the function between the two regimes 1970-85 and 1986-95. This simply tested for unspecified changes in the parameters.

ii) It is noted that equation (11) is over paramaterized: there are four parameters associated with the structural equations a, a_2 a_3, a_4, while only three must be obtained α, β, and δ in [11] and [11^1]. At lest a_2, a_3 and a_4 are non-linear restrictions.

method of estimation employed for this over parameterized equations and with non-linear restriction is Maximum Likelihood Estimation.

This is because overparameterized model has some inherent weaknesses as not all the parameters can be tested. Thus, one can not assume to know the model apriori from the outset Maddala (1992)

iii) The specified equation is in log with first differences in the price and exchange rate variables, while the Z term is a growth rate. First differencing overcomes the problem of spurious correlation when estimation is done in absolute levels, since many non-stationary economic time series becomes stationary when first differenced. However, first differencing may lead to loss of information (loss of constant) and, since the difference relationship is short-run in nature, it may provide poor forecasts if a long-run relationship does exist and is ignored (Thomas, 1994).

To avoid high standard error and for the t-test to show significant influence in the estimation, test for multicollinearity was carried out. A study of this nature may also entail the omission of some explanatory variables, mis-specifical of the mathematical form of the model and interpolation of statistical observation; so a test for Auto-correlation and heteroscedasticity was carried out. This eliminated non-constancy of variance of error.

CHAPTER 4
REGRESSION AND ANALYSIS OF DATA

```
*-* LIMDEP *-* File created 07/13/98 / 11:45:43


      Reading file : GOOD.WKS
Current sample     :       26 observs.
Total variables now :  10
Missing values read :                0


 MODEL COMMAND:
 REGRESS;LHS=PRICE;RHS=ONE,FPRICE,EXOFF,EXBLACK,GDP,DCREDIT,M
 ONEY$

Ordinary    least squares regression.     Dep. Variable     =  PRICE
Observations        =            26       Weights           =  ONE
Mean of LHS         =   .1305308D+03      Std.Dev of LHS    =   .1861613D+03
StdDev of residuals=   .1627259D+03       Sum of squares    =   .5031145D+06
R-squared           =   .4193053D+00      Adjusted R-squared=   .2359280D+00
F[  6,     19]      =   .2286572D+01      Prob value        =   .7868268D-01
Log-likelihood      =  -.1652086D+03      Restr.(á=0) Log-l =  -.1722745D+03
Amemiya Pr. Criter.=   .3360887D+05       Akaike Info.Crit. =   .1324682D+02
ANOVA  Source          Variation     Degrees of Freedom       Mean Square
       Regression      .3632866D+06          6.                .6054776D+05
       Residual        .5031145D+06         19.                .2647971D+05
       Total           .8664011D+06         25.                .3465604D+05
Durbin-Watson stat.=  2.2158670          Autocorrelation   =   -.1079335
Variable  Coefficient  Std. Error  t-ratio Prob|t|òx   Mean of X  Std.Dev.of X
---------------------------------------------------------------------------
Constant   19.630        54.47       .360    .72255
FPRICE    -.86064E-01     .2293      -.375    .71161   39.681        152.71
EXOFF      25.783        23.23       1.110    .28084   6.3215        9.1022
EXBLACK    5.3461        4.468       1.196    .24625   11.350        22.025
GDP       -8.1087        27.25       -.298    .76923   .56177        1.2383
DCREDIT    .96398E-02    .3523E-02   2.736    .01311   24647.        21515.
MONEY     -.89127E-02    .6528E-02  -1.365    .18808   38416.        47985.
    Error      Count
    Logminus       8
 CREATE: Errors occurred which prevented transformations.


 MODEL COMMAND:
 REGRESS;LHS=PRICE;RHS=ONE,FPRICE,EXOFF,EXBLACK,GDP,DCREDIT,M
 ONEY$

Ordinary    least squares regression.     Dep. Variable     =  PRICE
Observations        =            26       Weights           =  ONE
Mean of LHS         =   .4058425D+01      Std.Dev of LHS    =   .1371023D+01
StdDev of residuals=   .6229891D+00       Sum of squares    =   .7374193D+01
R-squared           =   .8430777D+00      Adjusted R-squared=   .7935232D+00
F[  6,     19]      =   .1701317D+02      Prob value        =   .1016175D-05
Log-likelihood      =  -.2051097D+02      Restr.(á=0) Log-l =  -.4458703D+02
Amemiya Pr. Criter.=   .4926080D+00       Akaike Info.Crit. =   .2116229D+01
ANOVA  Source          Variation     Degrees of Freedom       Mean Square
```

Regression	.3961844D+02	6.	.6603073D+01
Residual	.7374193D+01	19.	.3881154D+00
Total	.4699263D+02	25.	.1879705D+01

Durbin-Watson stat.= 1.7815698 Autocorrelation = .1092151

Variable	Coefficient	Std. Error	t-ratio	Prob|t|ôx	Mean of X	Std.Dev.of X
Constant	-2.1972	1.304	-1.685	.10830		
FPRICE	.16319E-01	.1265	.129	.89873	2.2578	1.1551
EXOFF	.51313E-01	.4771	.108	.91549	.79019	1.4648
EXBLACK	.11372	.4079	.279	.78342	1.0035	1.6441
GDP	.12684E-01	.1198	.106	.91679	-.34548	1.0976
DCREDIT	.39787E-01	.5440E-01	.731	.47348	8.6167	3.1429
MONEY	.59540	.1687	3.530	.00224	9.6165	1.5940

```
utput for okey2.OUT
Begun at
:22: 8 on  1st July       1998

ata came from the Input Files:   and okey.DAT

odel OUTPUT from P C - G I V E

The Sample is 1970 to 1995 less 13 Forecasts

                          M E A N S   O F   V A R I A B L E S

P             Eo            Eb
   23.6923       4.5385     56.0769

                          STANDARD DEVIATIONS OF VARIABLES

P             Eo            Eb
   16.0072       2.7573    202.1882

                          D U R B I N - W A T S O N   TESTS

P             Eo            Eb
      .2755      1.9621       1.0833

                          CORRELATION MATRIX
        P          Eo         Eb
P      1.0000
Eo     -.1168     1.0000
Eb      .4187     -.4946     1.0000


EQ( 1) Modelling P          by OLS
The Sample is 1970 to 1995 less 13 Forecasts

 VARIABLE      COEFFICIENT     STD ERROR      H.C.S.E.      t-VALUE   PARTIAL r²
Eo              3.7214485        .91194        .73804       4.08079       .6022
Eb              .0631001         .02370        .00000       2.66221       .3918

R² = .6833644   σ =    17.2788490   F( 2, 11) =     11.87 [ .0018]  DW =  .886
* R² does NOT allow for the Mean *
 RSS =     3284.1448467967     for  2 Variables and  13 Observations
Information Criteria:  SC =         5.93;  HQ =         5.82;  FPE =      344.49
 R² Relative to DIFFERENCE+SEASONALS =  -3.73960

          SEASONAL MEANS of DIFFERENCES are
     3.58333

                        ANALYSIS of   1-step FORECASTS
  DATE         ACTUAL        FORECAST      Y - Yhat     FORECAST SE     t-value
1983         42.000000      26.050139     15.949861      18.420341      .865883
1984         56.000000      26.050139     29.949861      18.420341     1.625912
1985         85.000000       4.289350     80.710650      17.304212     4.664220
1986         89.000000      33.745437     55.254563      19.129308     2.888477
1987        100.000000      24.096954     75.903046      17.988936     4.219429
1988        154.000000      19.048943    134.951057      17.871126     7.551346
1989        232.000000      19.238244    212.761756      17.871927    11.904802
1990        249.000000      19.238244    229.761756      17.871927    12.856014
1991        282.000000       4.604850    277.395150      17.306079    16.028769
```

1992	163.000000	101.993512	61.006488	30.085669	2.027759
1993	250.000000	31.664592	218.335408	18.769368	11.632539
1994	275.000000	31.159791	243.840209	18.763141	12.995703
1995	288.000000	31.159791	256.840209	18.763141	13.688551

Tests of Parameter CONSTANCY over: 1983 - 1995
Forecast Chi²(13)/13 = 99.58
CHOW TEST(13, 11) = 76.21 [.0000] **

Testing for Serial Correlation from Lags 1 to 1

CHI²(1) = 3.596 and F-Form(1, 10) = 3.82 [.0790]

Error Autocorrelation Coefficients:

.5905

ARCH TEST
Residuals Scaled by .1728D+02

	CNST	1 LAG
COEFF.	.5206	.3579
S.E.'s	.5622	.3162

RSS = .25069D+02 σ = 1.66895
CHI²(1)= 3.931 with F(1, 9) = 4.38 [.0658]
CHI-SQUARED Test for NORMALITY :CHI²(2) = 2.037

RESET F-TEST for adding Yhat²
F(1, 10) = 1.214 [.2963]

RESIDUAL CORRELOGRAM
13*(Sum of 1 Squared Residual Autocorrelations) = 3.395
1
.5111

From the Limdep Version of the regression, the Durbin-Watson statistics of 2.2 shows that there is a significant statistical relationship between the domestic price level and the variables in question-official exchange rate, the black exchange rate, money stock and the foreign price level which are positively related to inflation and the growth in GDP which is negatively related to inflation.

The first difference was taken so as to eliminate any spurious correlation from the result obtained.

From the result on page 21, the official exchange rate showed a positive relationship to the domestic price level hence the value is statistically significant. However, the black market exchange rate displayed a much stronger positive relationship with inflation than the official exchange rate.

The t-ratio and the R^2 are also statistically significant.

Importantly, the Chow Test proved that there is a significant shift in the function between the two regimes 1970 - 85 and 1986-95 with 1986-95 showing a more positive correlation between exchange rates movement and inflationary trend.

CHAPTER FIVE

PROXIMATE CAUSES OF INFLATION IN NIGERIA

From the result of the data regressed, it is obvious that a clear comprehension of the determinants of inflation in Nigeria requires adequate analysis of the movements of the relevant variables over time. In response to this, we shall focus mainly on budget deficit, monetary growth, growth in real GDP, and exchange rates movements in the period between 1970 - 1995. The analysis is based on the data from table 1.

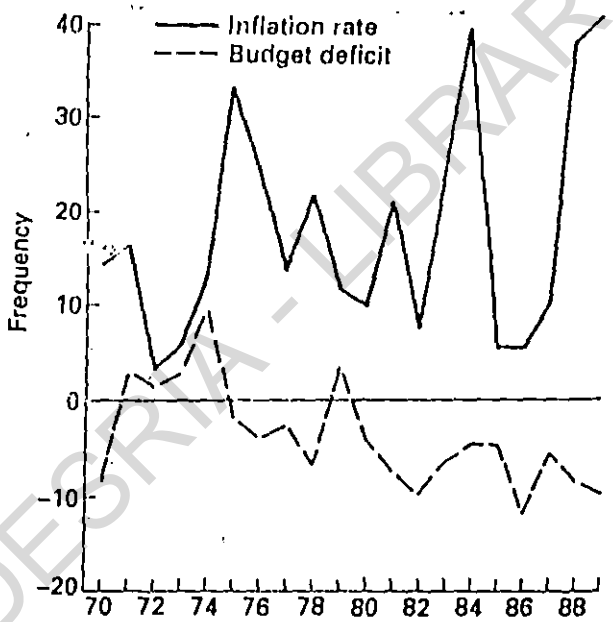
After the civil war in January, 1970, there was a need to restructure the war-vouaged economy under the Economic Second National Development Plan (1970 - 1974). A major constraint confronting the government was the inadequacy of funds to execute the plan's projects and programmes. Fortunately, the price of crude oil shot up in the world market due to the middle East crises (1973 - 74). The average export price per barrel of Nigerian crude oil rose from a tiny level of US$4.13 in 1973 to US$14.74 in 1977 and to US$35.18 in 1980. Combined with this were various petroleum tax reforms at the start of the oil boom. The aggregate effect of these was increased government revenue. Quantitatively, the federally collected revenue, which stood at ₦633.3 million in 1970, rose to ₦4.5 billion in 1974 and by 1980 had exceeded ₦15.0 billion.

Parallel to this was vast expansion in aggregate demand, led by growth of public expenditure. Indeed, in the decade 1973 - 83 the Keynesian public - expendure-led growth (enhanced by oil revenues) was pursued by government. So it was not surprising that the Federal Governments outlay, which was approximately ₦8.39 million in 1970, leapt to ₦4.9 billion in 1975 and stood at over ₦14.0 billion by 1980. During this period, central government expenditure grew at a compound annual growth rate of 6.9%. While it is

of the population benefited from the oil exploitation, this expenditure generated persistent budget deficits, as it exceeded revenues, in the second half of the 1970s (except in 1979). Between 1975 and 1978, the cumulative budget deficit was about ₦4.8 billion. As a percentage of GDP, budget deficit fluctuated between 2 and 6.7% in the period. However, as indicated in figure 1, there seems to be no correlation between fiscal deficit and inflation.

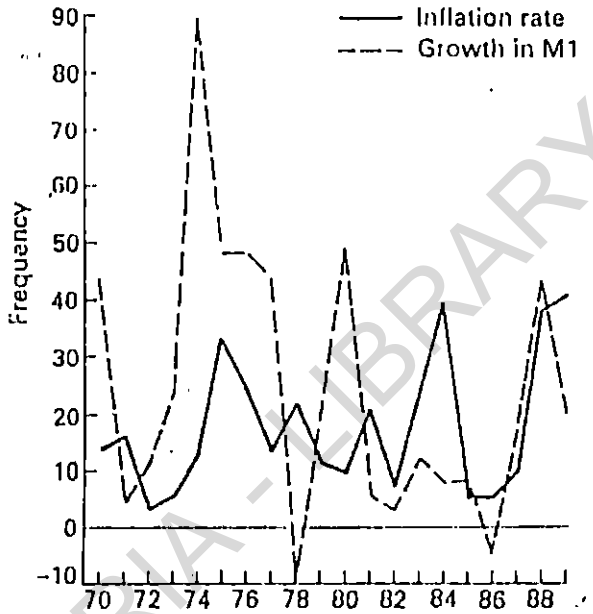
In part, the budget deficits were financed from bank credit and the balance come from external loans. Thus, monetary policy, like fiscal policy, was expansionary during the oil boom.. Table 1 shows Nigeria's financial data for the period 1970 through 1995. The table demonstrates that there were increases in domestic credit in the economy, especially from 1976. It is almost incredible that the average annual growth rate of domestic credit accelerated from ₦3.1 billion in 1980. Out of this, the share of net credit to the central government fluctuated between 20.2 and 40.8%.

Figure 1 Inflation rate and budget deficit



The growth of credit to government had two important direct effects. First, it vastly expanded aggregate demand and second, it accelerated the growth of domestic money supply. There was a rise in total imports as a result of the upsurge in aggregate demand that could not be met by the available supply in the economy. Available data shows that merchandise import registered an average annual growth rate of almost 23% in the five years from 1976 - 80. This was actually enhanced by the expansion in bank credit arising largely from fiscal deficit. Thus, the direct correspondence between budget deficit and the current, account deficit is easily appreciated. More important to the current discussion is the pressure which monetary expansion exerts on price inflation. Following the ebullient growth of domestic credit, it was not surprising that the mean annual growth rate of money supply (M_1) stood at 33.7%during 1975-80. This would probably have been higher, but for the negative growth rate of 8.2% recorded in 1978. On average, the period of high monetary growth coicides with a high inflationary trend, as demonstrated by the growth of the consumer price index, even though price inflation generally declined from 33.3% to almost 10% between 1975 and 1980. This is summarized in figure 2. In the 1970s, there does not seem to have been a strong contra-cyclical relationship, in line with the theoretical expectation, between the growth of output, proxied by the annual growth of real GDP, and inflation (see figure 3). Although real GDP recorded an impressive annual growth in 1970 - 72, double digit inflation was registered in 1970 - 71 and inflation fell sharply to approximately 3.3% by 1972 (Table 2). Between 1974 and 1980, the expected relationship seems validated, though very weak. This tends to support the argument by Schatz (1984) that a sizeable proportion of the increase in aggregate demand was dissipated through inflation. the decline in Nigeria's other-than-oil GDP in the 1970s to the early 1980s possibly reinforces this argument.

Figure 2 Inflation rate and growth in M1



Between 1974 and 1980, the mean yearly growth rate of nominal exchange rate (official) was -2.5%. This is an indication that the naira appreciated against the US dollar during the period. Juxtaposed with this was a high rate of inflation which stood at 18.2%. A statement on the type of exchange rate regime adopted during the period under review may provide a useful insight into the observed relationship. The local currency was fixed against the US dollar up to 1970, and in December 1971 the Nigerian pound was tied to the dollar. But a system of independent exchange rates (ie the naira exchange rate was independently fixed against the US dollar and the UK pound sterling) was pursued from 1974, although in practice the dollar/sterling cross rates actually determined the naira exchange rate against the US and UK currencies.

From February 1978, the naira exchange rate was based on a basket of currencies of Nigeria's major trading partners (UK, France, Japan, the Motherlanads, Switzerland, the US and the former Western Germany). One point is probably obvious from this sketchy presentation of Nigeria's exchange rate regime: the exchange rate policy was not employed as a principal instrument of economic management in Nigeria until the mid-1970s. The refusal to adopt an exchange rate policy to correct Nigeria's balance of payments difficulties of the 1960s is a graphic manifestation of this. Thus, official exchange rate movements bear little relationship to inflation, as shown in figure 4.

Figure 3 Inflation rate and growth in real GDP

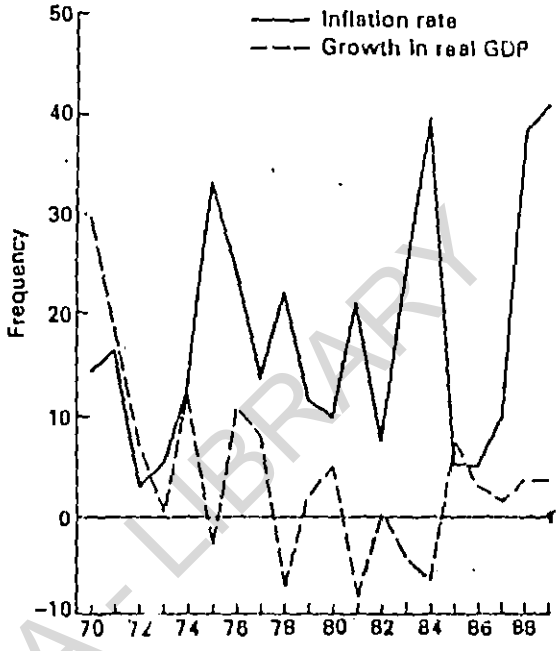
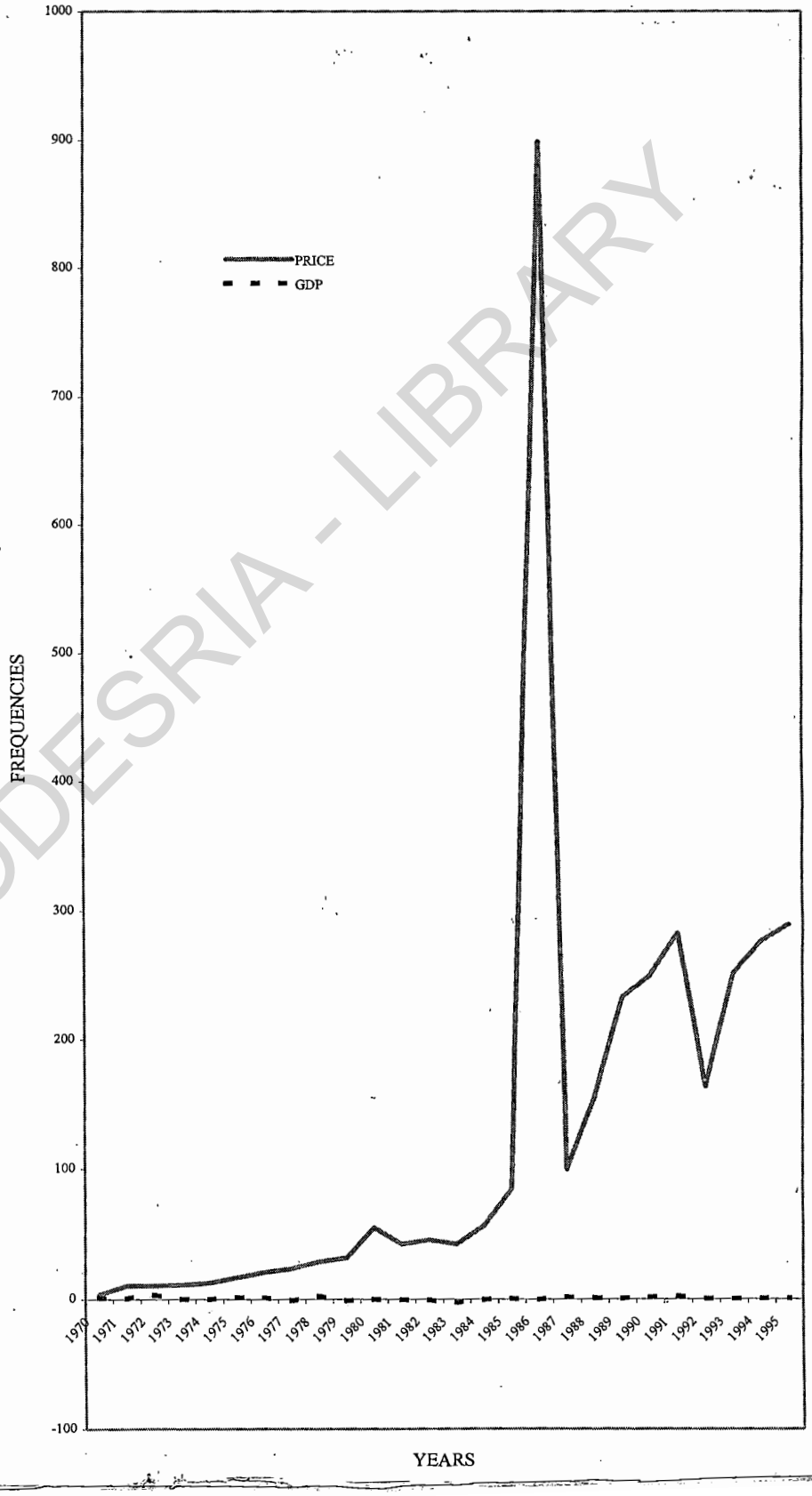


Fig. 3 : INFLATION RATE AND GROWTH IN REAL GDP



With respect to the parallel market exchange rate, the story seems to be quite different. There is a strong positive correspondence between inflation and the parallel market exchange rate (fig.5) relative to the official exchange rate identified in figure 4

Figure 4 Inflation rate and official exchange rate

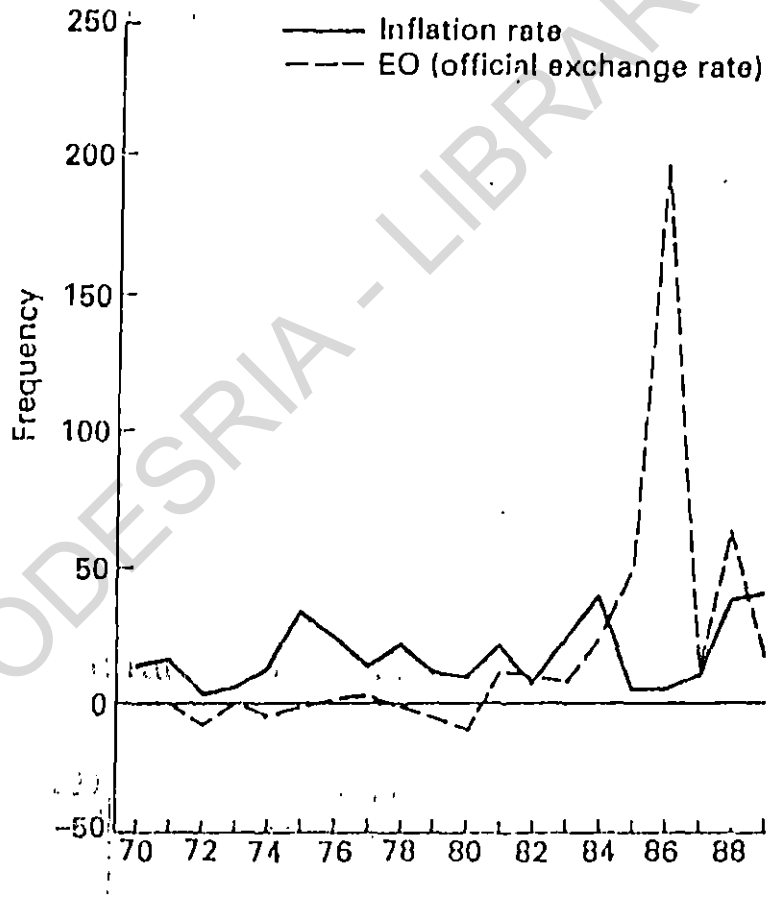
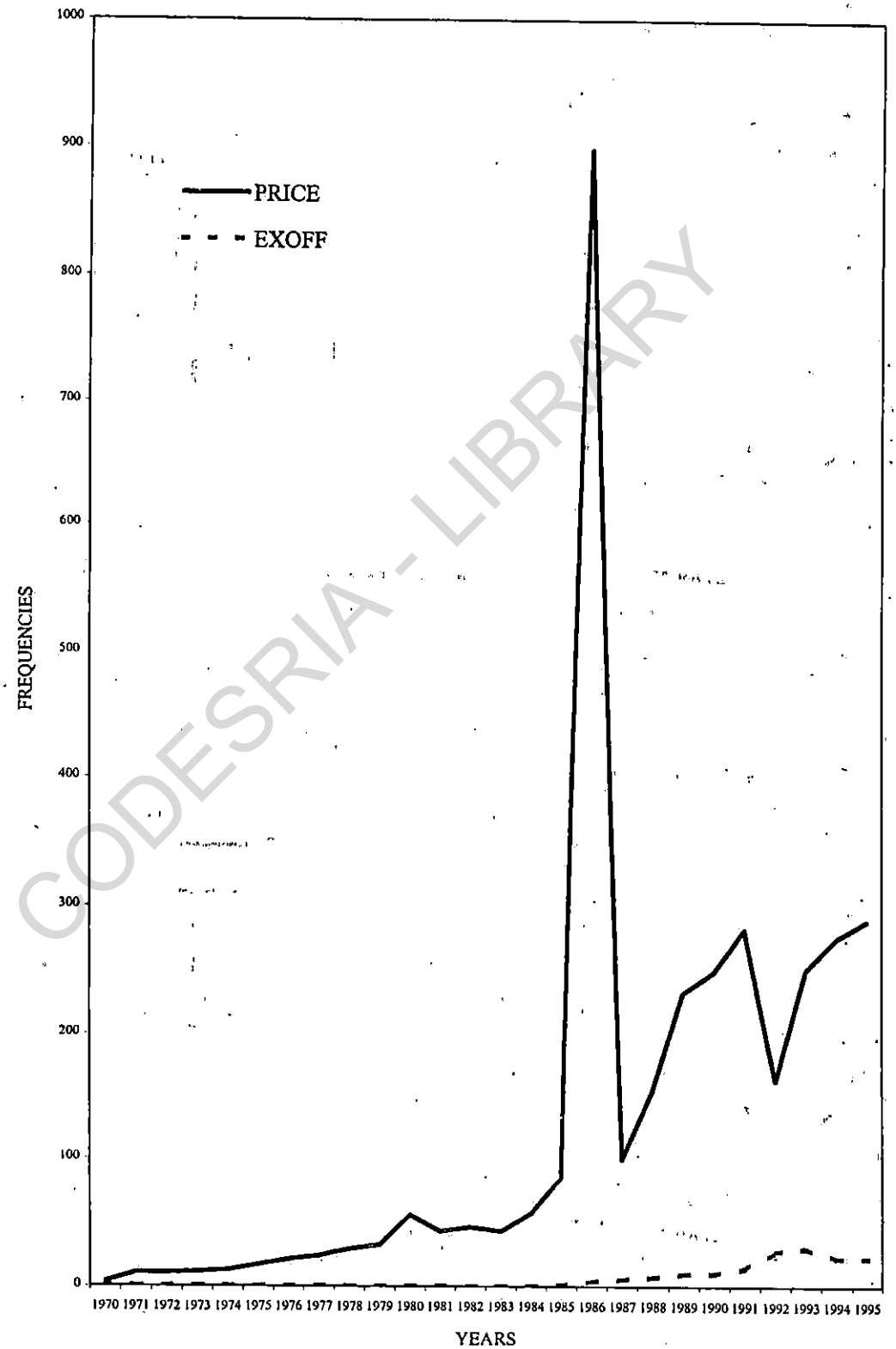


Fig. 4 : INFLATION RATE AND OFFICIAL EXCHANGE RATE



The appreciation of the official exchange rate artificially cheapened competitive imports in relation to locally produced goods and services. With the massive imports of consumer goods, raw materials and spare parts, the issue of imported inflation is easily appreciated when it is realised that in 1974 - 80 the mean yearly growth of the import price index registered 10.7% and inflation stood at 18.2%.

This was basically the situation between 1970 and 1980. From 1981, the structural weaknesses of the oil-propelled economy were exposed with the collapse of crude oil prices in the world market. It is almost incredible that the price per barrel of Nigerian crude oil; marginally above US$41 in January 1981, declined steeply to less than US$9 by August 1986. This had a direct impact on government revenue, as federally collected revenue declined from ₦15.2 billion in 1980 to ₦10.5 billion in 1983. The unchecked expansion of public expenditure under the civilian administration, which could not be serviced adequately by the shrinking revenue, generated a persistent budget deficit of the period. Not surprisingly, between 1981 and 1984, the cumulative budget deficit of the Federal Government was approximately ₦15.4 billion. Yet the relationship between budget deficit and inflation in the reference period is practically non-existent.

A striking revelation in the first half of the 1980s was the increase in domestic credit, with a sizeable proportion of this attributable to net claims on the government. From all ₦5.7 billion in 1981, the total domestic credit to the economy leapt to more than ₦30.00 billion in 1984. Correspondingly, net credit to the government accelerated from ₦6.3 to ₦17.8 billion. Although the annual growth of M_1 was generally low in the first half of the 1980s relative to any period in the 1970s the inflation rate climbed phenomenally from 21% in 1981 to almost 40% in 1984, although there was a big dip in 1982. Figure 2 shows that inflation in the early 1980s may not have been explained by monetary factors alone. Rather, structural factors could have accounted for inflationary trends during this period.

It will be recalled that there were supply shortages, particularly in 1984, due to import restrictions to correct the chronic balance of payment difficulties. Indeed, figure 3 demonstrates that real GDP registered negative growth rates in 1981 and 1983 - 84, and the negative rates correspond to high rates of price inflation. The depreciation of official exchange rate could have exerted some pressure on prices, as shown in figure 4. But the picture that emerges in figure 5 demonstrates a strong positive, correspondence between inflation and the parallel market exchange rate relative to the official exchange rate identified in figure 4.

The persistence of both internal and external disequilibria led to the implementation of the Structural Adjustment Programme (SAP) in July, 1986. The adoption of the realistic exchange rate via the Second Tier Foreign Exchange Market (SFEM), begun in the late September 1986, is central to this. Available statistics reveal that the naira has depreciated steeply against the US dollar since then. On average, the naira, which before 1985 traded for almost ₦1.00 : $1.00, stood at approximately ₦3.32 : $1.00, a change of over 130%. The yearly percentage change of the official exchange rate has been very high indeed. Simultaneously, the rate of inflation accelerated from 5.4% in 1986 to about 41% by 1989. Figure 4 shows that there is some correspondence in the direction of movements between inflation and the normal official exchange rate since 1987. Overall, the parallel market rate appears to correlate with inflation more than the official rate.

Demand management aspects of SAP emphasize reduced public expenditures and, therefore, a fall in budget deficit. Although, budget deficit/GDP ratio peaked at 11.9% in 1986, it declined remarkably to 5.5% in 1987 and rose through 8.5% in 1988 to 9.0% in 1989. However, the magnitude of the fiscal deficit increased from almost ₦5.9 billion to ₦15.3 billion between 1987 and 1989. This partly financed from bank credit, with the rapid

gure 5 Inflation rate and parallel market exchange rate

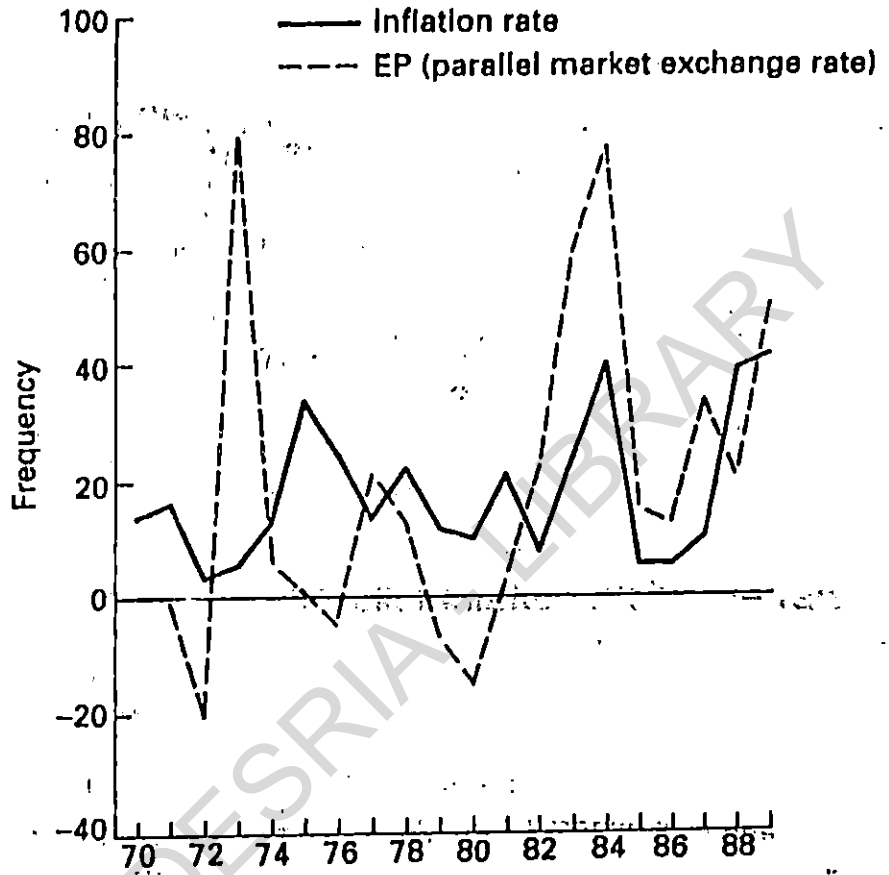
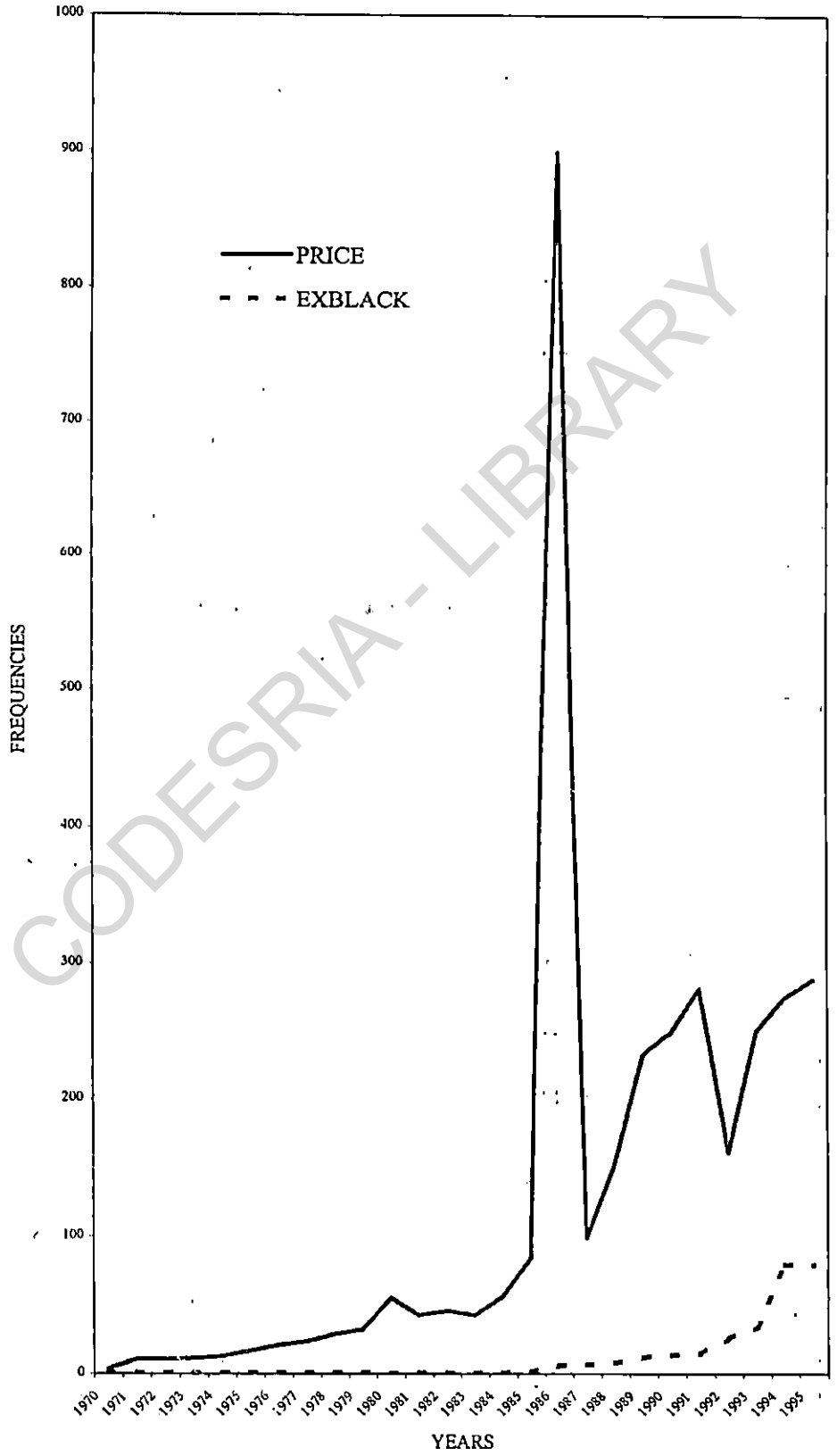


Fig 5 : INFLATION RATE AND PARALLEL MARKET EXCHANGE RATE



growth of money supply as the inevitable concomitant. In general for this period, figure 1 and 2 demonstrate a strong association between budget deficit/GDP ratio, money supply and inflation.

In summary, two tentative conclusions emerge from trend analysis. First, the Nigerian inflation since 1970 can be explained by a combination of monetary and structural factors. This seems to confirm earlier empirical studies of inflation in Nigeria. Second, exchange rate movement engenders price inflation. The parallel market exchange rate appears more significant than the official exchange rate in this respect.

Table 1: Some Important Data

	P_c	P_*	E_o	E_b	Y	NFA	DC	M_2	EDT	INR
1970	3.5	4.62	.714	.78	1.29	154	1141	949.9	651	4.50
1971	10.5	4.41	.714	.77	0.79	280	1227	1005.3	732	4.50
1972	10.5	5.16	.714	.81	3.58	244	1274	1161.3	1205	4.50
1973	11.1	14.29	.714	.79	0.05	414	1399	1414.0	1274	4.50
1974	12.5	21.88	.754	.77	0.05	3500	-176	2156.2	1143	4.50
1975	16.7	10.58	.734	.78	1.40	3,665	1161	3622.4	906	3.50
1976	20.8	10.15	.733	.82	1.35	3396	3,073	5278.9	3146	3.50
1977	23.6	10.10	.791	.81	-1.01	2962	6,010	7057.5	5091	4.00
1978	28.8	7.66	.541	.88	2.62	1420	7706	7699.5	6259	5.00
1979	32.1	14.44	.738	.75	-0.92	3228	8662	9857.4	8934	5.00
1980	55.4	17.48	.694	.71	.066	5607	10689	14397.4	12,136	6.00
1981	42.7	13.06	.794	.82	-0.34	2556	15746	15548.1	12954	6.00
1982	46.0	10.82	.729	.77	-0.57	1057	21410	16894.0	18539	8.00
1983	42.7	11.21	.754	.91	-2.51	.808	27590	19368.9	18537	8.00
1984	56.7	9.96	.792	.81	-0.17	1428	30423	21600.5	19550	10.00
1985	85.0	788	1.09	1.5	0.54	1816	31900	23818.6	23473	10.00
1986	899	2.00	4.05	6.10	-0.09	4468	36409	24592.2	30656	10.00
1987	100	7.26	5.87	6.5	1.61	6865	40209	29994.0	31247	12.75
1988	154.5	12.25	7.24	8.00	0.84	7974	50680	42780.3	31977	12.75

1989	232.5	16.61	10.05	12.01	0.64	20044	36337	46222.7	34557	18.50
1990	249.0	15.78	10.50	13.5	1.38	21054	48804	64902.7	34497	18.50
1991	282.1	7.72	14.10	14.5	2.35	8875	52024	86152.5	35262	15.50
1992	163.	0.78	27.00	25.9	0.33	9865	45682	128283.5	35262	17.50.
1993	250.8	4.00	30.00	34.2	0.36	24561	56480	138383.6	42462	26.00
1994	275.5	5.00	22.00	80.5	0.45	8965	56640	139984.5	46225	28.00
1995	288.8	6.5	22.00	80.4	0.52	8875	57402	145687.6	52422	28.00

Notes and Sources

P = Percentage rate of change in the National consumer price index based on data from Federal Office of Statistics of Nigeria publications.

P_* = Percentage rate of change in world Wholesale Price Index from International Monetary Fund (IMF), International Financial Statistics Year Book (1995)

E_o = Official exchange rate as Nigerian naira (₦) per one United States dollar (US$) from International Monetary Fund (IMF, 1995), International Financial Statistics

E_b = Unofficial parallel exchange rate as number of Nigerian naira per one United States dollar (US$) from International currency analysis Incorporated (1995) and the world Currency Year Book (1996)

Y = Percentage rate of growth of real GDP from Federal Office of Statistics and Central Bank of Nigeria: Annual Reports (various issues)

M_2 = Broad money in million naira (composed of M_1 which is currency outside banks plus privately held demand deposits with Commercial Banks and Central Banks, and Quasi Money (QM) made up of savings and time deposits with Commercial Banks deposits with Commercial Banks plus total deposits liabilities of Merchant Banks. Taken from Central Bank of Nigeria annual Reports and Statement of Accounts (various issues).

NFA Net foreign asset in million US dollars from international Monetary Fund (IMF) International financial Statistics Year Book (1995)

DC = Domestic Credit from central Bank of Nigeria (CBN) Financial and Economic Review (various issues)

EDT External debt (millions of US dollar), outstanding at the end of year taken from the World Bank, World Bank Tables 1993

INR Interest Rates (as at the end of period, percent per annum). Taken from the International Monetary Fund (IMF) International Financial Statistics Year Book (1995)

Table 2: Inflationary Trend in Nigeria (inflation rate in percentage %)

1970	13.8
1975	33.9
1980	9.3
1985	5.5
1986	5.4
1987	10.2
1988	38.3
1989	40.9
1990	7.5
1991	13.0
1992	44.6
1993	57.2
1994	70.0
1995	85.0

Source: Nigerian Deposit Inservance Corporation Quarterly March 1995, Vol 5.1 P 31

CONCLUSION AND POLICY IMPLICATION

So far, our findings highlight several points of importance. Evidence from trend analysis suggests that domestic money supply, real output, the shadow price of exchange rate - the parallel market exchange rate and, more recently, official exchange rate, cannot be ignored in evaluating the proximate causes of inflation in Nigeria. With particular references to exchange rate, graphical representation reveals that the parallel market exchange rate appears to correlate with inflation more when compared with the official rate.

After testing for the internal consistency of the model, it was applied to evaluate the impact of exchange rate depreciation on such variables as money supply, revenues and expenditures, and inflation. Evidence from the model results, in which we assumed a

floating exchange rate that eventually lead to a depreciation of the naira, indicate that exchange rate depreciation can be inflationary. This works via its direct impact on inflation, and through budgetary and monetary effects. On average, the depreciation of the naira (by about 76%) seems to raise the growth of total expenditure more than total revenue.

One important policy lesson is therefore obvious from the analysis so far, namely that exchange rate depreciation significantly affects both, the revenue and expenditure sides of the budget in Nigeria and it could enlarge the existing budget deficit if not properly managed. A restrictive monetary policy may be implemented to complement the exchange rate policy adopted.

Finally, the policy makers in Nigeria should adopt a fixed exchange rate policy as was the case prior to the advent of Second Tier Foreign Exchange Market (SFEM) in 1986. The parallel (black) market for foreign currency should be stamped out and a death penalty imposed as a punishment for any offender thereof. In doing this, the authorities in Nigeria should pay deaf ears to the yeanings of the international communities as far as the nations financial market is concerned.

DATA AND SOURCE

In this final report, annual data were used. For domestic inflation, the National Consumer Price Index is taken (available on both quarterly and annual basis) from Federal Office of Statistics. Foreign prices are based on the Wholesale Price Index for the Industrial countries and for the rest of the world categories from the International Financial Statistics.

The nominal official and parallel exchange rate is defined as the number of Nigeria's naira to one U.S dollar. The US dollar is chosen because of its ease of convertibility in the foreign exchange market (both official and parallel).

Nominal official exchange rates are taken from the Central Bank of Nigeria, while the parallel (black market) rates are obtained from International Currency Analysis incorporated and the World Currency Yearbook (1996).

Money stock (M_2), and domestic credit expansion can be obtained on quarterly basis from Federal Office of Statistics, Ministry of Finance and the Central Bank of Nigeria.

In data collation, University and National libraries were accessed adequately.

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