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THE EFFECTS OF MONETARY AND FISCAL POLICIES UNDER RATIONAL EXPECTATIONS: THE NIGERIAN CASE, 1970-1988

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DEDICATED

- to the memory of my late father, Pa Damian Anyanwu (whose death occurred during the course of this work);

- to my mother, Ma Benedicta Anyanwu whose idea and insistence my initial education was;

- to my darling wife, Mrs. Joy Obiageli Anyanwu, and our twin children, John Chukwudi Anyanwu, Jr., and Joy Chinazom Anyanwu, who were born during the period of my studies and did not enjoy paternal care as long as the programme lasted;

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ABSTRACT

THE EFFECTS OF MONETARY AND FISCAL POLICIES UNDER RATIONAL EXPECTATIONS: THE NIGERIAN CASE, 1970-1988

JOHN CHUKWUDI ANYANWU

The proposition of the rational expectations school is that systematic aggregate demand policy does not affect real economic variables (output and unemployment) in the short-run, (the policy ineffectiveness proposition or PIP), but affects prices, while only random changes in aggregate demand affects the level of real economic variables.

In other words, no government macroeconomic policy whether monetary or fiscal, no matter how ingeniously formulated and how effectively implemented, can have any systematic or lasting impact upon real economic variables. This seriously questions the Keynesian interventionist demand management philosophy, thus asserting that the attempt at stabilization policy by systematic demand management strategy will become predictable and once predictable will be negated in their impact by rational utility maximizing agents. Only

random policy shifts in aggregate demand will affect real variables and such random actions are unlikely to move the economy closer to declared policy goals. The proposition has been extensively tested using overseas data but, with the exception of the Uba (1989) and Odedokun (1988a, 1989) studies, has received little empirical attention in Nigeria. In addition, none of these Nigerian studies incorporates effects on unemployment as well as the importance of an open economy. In this study, given the persistence of inflation with recession (and high unemployment) in Nigeria, we subjected the proposition to econometric tests using Nigerian annual data from 1970 to 1988.

Indeed, the new classical macroeconomics provides an attractive theoretical underpinning for the notion that the short-run output (and unemployment) effects of restrictive demand-management policies associated with stabilization programmes in developing countries are less adverse than is commonly supposed. This provided an added fillip for the study, to establish the empirical relevance in a developing economy of the policy ineffectiveness proposition associated with this school of thought.

Apart from analyzing the various Nigerian Federal Government monetary and fiscal measures over the period 1970 to 1988, we presented a theoretically simple macro-economic model with rational expectations that incorporated important features of the Nigerian monetary and fiscal policies.

We went ahead to estimate the money growth and the expenditure growth prediction equations. The variables found to be important determinants of money growth/change over the data period, 1970-1988, are the dependent variable lagged from one to two periods, one to two period lags of the log of real external reserves, one to two period lags of the log of real domestic public debt, and the second period lag of the log of real external debt outstanding. On the other hand, the variables found to be important determinants of government expenditure growth/change over the same period are the dependent variable lagged from one to two periods, one-period lag of the log of real external reserves, and one-period lag of the log of real external debt outstanding.

To test and analyze the effects of main monetary (broad money supply) and fiscal (federal government

expenditure) variables upon selected economic indicators (output, unemployment and the price level or inflation and its growth rate), we proceeded to decompose the policy variables into their anticipated and unanticipated components.

Using annual data for Nigeria over the 1972 to 1988 period, we examined the separate and simultaneous impacts of the systematic or deterministic and known (anticipated) and surprise or stochastic and unknown (unanticipated) components of monetary and fiscal policies on real GDP (output) and the inflation rate (and its rate of growth). The same was carried out for urban unemployment for the period 1975 to 1988 for which data were available.

Our empirical results can be summarized as follows: a) In the closed (though practically unrealistic, since the economy is externally dependent) Nigerian economy, anticipated monetary growth exerts a significantly positive impact on output while its unanticipated component does not. On the other hand, both the anticipated and unanticipated components of fiscal policy do not significantly affect output in the closed Nigerian economy. Also, monetary policy (both anticipated and

unanticipated) dominates fiscal policy in influencing domestic output.

(b) In an open (more realistic) Nigerian economy, anticipated monetary and fiscal growths significantly have positive impact on output while their unanticipated components do not significantly affect output. However, generally, fiscal impulse (anticipated and unanticipated) dominates monetary impulse in shaping the broad contours of output in an open Nigerian economy - a more realisitc and relevant aspect of the economy given our external dependence.

(c) Anticipated monetary and fiscal growth exert significant negative impact on urban unemployment in Nigeria while their unanticipated components do not.

However, while the anticipated part of monetary policy dominates the anticipated part of fiscal policy in influencing urban unemployment, the unanticipated part of fiscal policy dominates the unanticipated part of monetary policy in insignificantly affecting urban unemployment.

(d) While anticipated monetary policy exerts significantly positive impact on the price level (inflation and its growth rate), the anticipated part of fiscal policy does not.

On the other hand, while unanticipated fiscal policy exerts significantly positive impact on the price level (inflation and its growth rate), the unanticipated part of monetary policy does not. In addition, anticipated monetary policy dominates anticipated fiscal policy in influencing the price level (inflation and its growth rate), while unanticipated fiscal policy dominates unanticipated monetary policy in influencing the price level (inflation and its growth rate).

Thus, from our results, rational expectations hypothesis receives support only for anticipated fiscal policy with respect to output in the closed (unrealistic) Nigerian economy, and for anticipated monetary policy with respect to the price level (inflation and its growth rate).

But generally, our results contradict the monetary and fiscal neutrality hypothesis as well as the implied policy-ineffectiveness proposition (PIP) of the rational expectations school. This may be attributed to the invalidation of many fundamental rational expectations assumptions in a developing Nigeria economy, especially with respect to the existence of costly information, gradual wage and price adjustments, the political business cycle, and asymmetric information between the

private sector and the monetary authorities (or the public sector). While the policy implication of this is that monetary and fiscal policies can still be used to influence the cyclical movements of real variables in the short-run, a dilemma (and indeed a trade-off) results with respect to monetary policy given the high opportunity cost of increase in inflation rates and the theoretically unattractive and empirically infeasible "deceptive" ("trickery") fiscal policy imperative for fighting inflation.

We, therefore, recommend for policy purposes, the use of activist fiscal policy in influencing real economic variables while adopting a modified constant monetary growth rate rule that prescribes expected conduct for the Central Bank of Nigeria but leaves it with sufficient discretion to take quick action if that is necessary (such as in a financial panic) but explaining ex post to a federal legislative review panel.

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CERTIFICATION

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND - TOWARDS THE NEW CLASSICAL MACROECONOMICS

Over the years, Nigeria has been making conscious and determined efforts to attain the accepted macro-economic goals of high output growth rates, full employment, price stability, and balance of payments equilibrium, so as to achieve a rapid socio-economic transformation of the economy. In the process, she has been combining the tools of fiscal and monetary policies with exchange rate measures, productivity, incomes and price policies.

However, macroeconomics is prone to "revolutions" - intellectual upheaval in which some new idea or ideas claiming to establish fresh and valid insights into the workings of the economic system sweep away a prevailing orthodoxy (Laidler, 1986). Thus, the last fifty-five years have seen the "Keynesian Revolution" overwhelm "Classical Economics", to be succeeded in turn by a "Monetarist Revolution" which seemed to over-throw "Keynesian Economics". In the last twenty years or so "Monetarism" has in turn yielded to a "New-Classical Revolution" which self-consciously has sought to re-establish macroeconomics on foundations that bear a

close resemblance to those of certain strands in pre-Keynesian economics.

This new classical economists opine that, if expectations are formed rationally, systematic (deterministic and known) monetary (and fiscal) stabilization policy will be entirely ineffective. The analysis yielding this result presumes that the economy is entirely free of money illusion and that the public possesses the same information as the monetary (and fiscal) authority concerning the structure of the economy, the past values of relevant variables, and the policy rule in effect. This proposition provides important intellectual support for Milton Friedman's contention that the monetary authority should abandon attempts to pursue an activist stablization policy (Sargent and Wallace, 1976).

This study subjects this new classical economics or rational expectations propostion to econometric tests in the Nigerian context. Such is a useful exercise for understanding the Nigerian experience itself as well as for examining the robustness of the theory across countries with different economic and institutional

frameworks. As a developing country, Nigeria represents a mixed economy with economic set-ups different from most industrialized European and American economies to which these tests had been applied. It is against this background that this study makes a model specification that is as close as possible to the realities suggested by the structure and behaviour of the Nigerian economy, for the purpose of analyzing the effects of monetary and fiscal policies, on real economic activity (output and unemployment) and prices under rational expectations.

1.2 STATEMENT OF THE PROBLEM

Macroeconomic policy goals, the world over, have been recognized as the attainment of full employment, high output growth rates, price stability, and balance of payments equilibrium. Basically, the macroeconomic policies for the attainment of these goals can be broadly classified into two, namely: monetary and fiscal policies.

During recent years, Nigeria, like other less developed economies, has experienced substantial slack in the use of her productive potential, and both

unemployment and inflation remain disquietingly high.

In order to redress this undesirable state of affairs, Nigeria has been, and particularly under the Structural Adjustment Programme (SAP), using and emphasizing the combination of the tools of monetary and fiscal policies.

Unfortunately, the preceding economic problems persist, and even in most cases worsened. In the light of these developments, public confidence in the ability of government to manage the economy has waned, and belief in the likelihood of continuing economic growth with full employment and price stability has weakened. In effect, questions are being raised as to the effectiveness of monetary and fiscal policies adopted by the Government over these years.

Incidentally, neo-Keynesian accounts of the roles of monetary and fiscal policies have recently been challenged by a revival of classical macroeconomic thinking. This New-Classical Economics which was initially a response to the inflation of the 1960s and to Monetarist analysis of that inflation, is associated originally with Muth (1961) and more recently with

Lucas (1972, 1975, 1976), Sargent (1973 , 1976a), Sargent and Wallace (1975, 1976), Barro (1974, 1976, 1979a), and a host of others.

In effect, important recent papers by these economists have deomonstrated that if expectations are formed rationally, the systematic (anticipated) monetary and fiscal policies will not affect real economic variables (the policy-ineffectiveness proposition) but will only affect prices - only random (unanticipated) changes in aggregate demand will affect real variables. This proposition has been the subject of considerable discussion and controversy [See, for instance, Barro, 1976; Gordon, 1976; Fischer, 1977; McCallum, 1980; Buiter, 1980a,b; and Laidler, 1986]. But surprisingly, little attention has been devoted to the related issue of stabilizing potential of activist fiscal policy. In addition, the proposition has been extensively tested abroad (especially in developed countries) but has received no theoretical and empirical attention in Nigeria, except for Uba (1989) focusing exlusively on monetary policy and output and Odedokun (1988a, 1989)

focusing separately on monetary and fiscal policies. No work presently incorporates effects on unemployment as well as the importance of an open economy.

In the present study, given the persistence of inflation with recession in Nigeria, we wish to subject the proposition to econometric tests using Nigerian data. This will enable us determine the extent of the effectiveness of the monetary and fiscal policies adopted over the years while serving as a guide to future policy formulation and implementation. In addition, there is still much need to either validate or refute the findings of the proponents of the rational expectations hypothesis using different data set. That is, this research constitutes an additional contribution to the debate as well as a clarification of some of the issues involved, emphasizing empirical evidence from Nigeria, characterized in recent years by a stubborn combination of inflation with recession making the maintenance of non-inflationary growth with high employment the central economic problem of the times.

1.3 OBJECTIVES OF THE STUDY

The specific objectives of this study are:

a) To present a theoretically adequate macroeconomic model with rational expectations that incorporates important features of the Nigerian monetary and fiscal policies.

b) To estimate and analyze the effects of main monetary and fiscal variables upon selected economic indicators, viz, real overall GDP (output), unemployment, and the price level movements (or inflation and its growth rate) as well as analyze whether such effects conform to the implications of rational expectations macroeconomic models. The results will lead to the interpretation of the effectiveness of monetary and fiscal policies when expectations are formed rationally, that is, the comparative ability of anticipated and unanticipated elements of monetary and fiscal policies as lead indicator(s) for real economic activity and prices; and

(c) To analyze the various Nigerian Federal Government monetary and fiscal measures over the period 1970

to 1988. This will involve the examination of the analytical issues which have an important bearing on the applicability or otherwise of received macroeconomic theories to a developing economy like Nigeria. This enables us to discuss the broad policy options open to us.

1.4 HYPOTHESES OF THE STUDY

For the purpose of this study, we wish to put forward the following null hypotheses, that:

a) The systematic or anticipated (deterministic and known) parts of the policy instruments (monetary and fiscal) and their lagged values have no effect on real economic activity (output and unemployment) - "neutrality" or "policy ineffectiveness" proposition.

b) Only the stochastic or unanticipated parts of the policy instruments (monetary and fiscal policies) affect (or have real effect on) economic activity (output and unemployment) or that the stochastic monetary and fiscal policy behaviour can increase the variability of real variables relative to their full information values - or "worse"

proposition.

c) The anticipated parts of monetary and fiscal policies only affect the price level or the inflation rate - hence also the unanticipated parts of these policies and their lagged values are irrelevant to the determination of the price level.

d) Changes of monetary inpulses dominate changes of fiscal impulses in shaping the broad contours of fluctuations in output, unemployment, and the price level (and hence the rate of inflation).

1.5 SCOPE OF THE STUDY

By way of recapitulation, it is the primary objective of this study to econometrically analyze the effects of Nigerian Government monetary and fiscal policies if expectations are formed rationally, over the period 1970 to 1988.

We are interested in analyzing the effects these two policies have on three broad national macroeconomic objectives, viz, economic growth, high employment, and price stability. For the purpose of the study, economic

growth is interpreted in terms of real Gross Domestic Product (GDP), high employment reflects social equity, while price stability is reflected in price level movements (or inflation and its growth rate).

The fiscal policy tool chosen for the purpose of the study is real government expenditure on goods and services, while the monetary policy tool chosen is the nominal money stock (broad definition).

The period chosen (1970 to 1988) represents a special period in Nigeria's economic history. This is because it covers a post-war reconstruction period, and a period of economic boom linked with the oil wealth as well as a recessionary period involving sharp nose-diving in oil exports and revenue emanating from global oil glut. It also involves a period of military cum civilian regimes with their peculiar socio-economic policies and consequences. Above all, the period partly witnessed the introduction of a Structural Adjustment Programme (SAP) aimed at redressing the economic ills of the past and hence put the nation on the path of non-inflationary growth.

Thus, the period enables us to evaluate both expansionary and contractionary monetary and fiscal policies.

1.6 OUTLINE OF THE STUDY

The study is broken down into six chapters. Chapter I is the introduction. In Chapter II, a review of literature is presented, including monetary and fiscal policy issues in the literature, and the main issues in the rational expectations and macroeconomic stabilization policy debate.

In Chapter III, we review Nigeria's monetary and fiscal policies from 1970 to 1988.

We present the theoretical framework, methodology, and data requirements in Chapter IV. This includes model specification and model estimation procedure/ technique.

In Chapter V, the results are presented and analyzed, along with their relevant implications for policy formulation and implementation.

We conclude the study in Chapter VI where the main results from the study are summarized, policy recommendations made, the limitations of the study outlined, and suggestions for further research considered.

CHAPTER 2

LITERATURE REVIEW

2.1 REVIEW OF MONETARY POLICY ISSUES IN THE LITERATURE

2.1.1 The Concept of Monetary Policy

Monetary policy is a major economic stabilization weapon which involves measures designed to regulate and control the volume, cost, availability and direction of money and credit in an economy to achieve some specific macroeconomic policy objectives. That is, it is a deliberate effort by the monetary authorities (the Central Bank) to control the money supply and credit conditions for the purpose of achieving certain broad economic objectives (Wrightsman, 1976). Monetary policy is administered by the Central Bank, in some cases with some degree of political/government interference. For example, in the United States, the Federal Reserve System administers monetary policy with (relatively) minimum government interference.

In Nigeria, before 1986, the Central Bank of Nigeria was empowered to carry out monetary policy formulation and execution in consultation with the Federal Ministry

of Finance. By then, disagreements arose as to either what the contents of the policy were to be or the modus operandi of pushing it through, reference was made to the Federal Executive Council which was the final arbiter. However, thereafter, the Central Bank of Nigeria was made fully autonomous.

2.1.2 Objectives of Monetary Policy

Objectives of monetary policy refer to the ultimate macroeconomic goals which can change from time to time depending on the economic fortunes of a particular country. Generally, such objectives include:

a) Maintenance of relative stability in domestic prices.
b) Attainment of a high rate of, or full, employment.
c) Achievement of a high, rapid and sustainable economic growth.
d) Maintenance of balance of payments equilibrium.
e) Exchange rate stability.

These are discussed briefly in turns.

a) Maintenance of Relative Stability in Domestic Prices:

This involves avoiding wide gyrations of prices which are highly upsetting to the economy. Not only

do such wide price gyrations produce windfall profits and losses, but they also introduce uncertainties into the market that make it difficult for business to plan ahead. They, therefore, reduce the total level of economic activity.

This objective of avoiding inflation and deflation is desirable since rising and falling prices are both bad, bringing unnecessary losses to some and undue advantages to others. Price stability is also necessary to maintain international competitiveness.

But while wide price swings are universally condemned, there is no general agreement as to the most desirable pattern of price stabilization. Three possible alternatives have their adherents and some sort of a case can be made for each: slowly rising prices, slowly falling prices, and constant prices (though the last option is rather unrealistic in the real world).

b) Attainment of a High Rate of, or Full Employment:

This does not mean zero unemployment since there is always a certain amount of frictional voluntary, or seasonal unemployment (Ackley,1978). Thus, what

most policy makers aim at is actually minimum unemployment and the percentage varies among countries.

c) Achievement of a High, Rapid and Sustainable Economic Growth:

This means maximum sustainable high level of output, that is, the most possible output with all resources employed to the greatest possible extent, given the general social and organizational structure of the society at any given time.

This highly desirable economic growth implies raising people's standard of living. However, there is no agreement over "the magic number", that is, the annual growth rate which an economy should attain.

d) Maintenance of Balance of Payments Equilibrium:

This involves keeping international payments and receipts in equilibrium, that is, avoiding fundamental or persistent disequilibrium in the balance of payments position. Usually, however, nations worry about persistent balance of payments deficits.

The pursuit of this objective arises from the realization that deficit in the balance of payments

will retard the attainment of the other objectives, especially the objective of rapid economic growth.

e) Exchange Rate Stability:

This involves avoiding wide gyrations or swings (undue and unnecessary fluctuations), in the currency exchange rate. This is meant to help in protecting and promoting foreign trade.

Conflicts in the Achievement of Monetary Policy Objectives:

The relevant questions here are: are the multiple objectives of monetary policy compatible? Can they be achieved simultaneously? Or does the pursuit of one objective lead us further away from another?

Indeed, the objectives do conflict or are incompatible. That is, the attainment of one may preclude the attainment of another or others. In other words trade-offs do exist in the attainment of policy objectives.

Two types of conflicts in the attainment of policy objectives exist (Culbertson, 1961). These are (a) Necessary conflict and (b) Policy conflict.

Necessary Conflict:

This exists when the attainment of one objective

precludes the attainment of the other. That is, when the objectives are inherently incompatible. For example, if the "Phillips Curve" is accepted, at least in the short-run, improvements in employment may only be achieved at the cost of additional inflation and vice versa. Full employment may also conflict with rapid economic growth, which is dependent on the acceptance of innovation and changes, if maintenance of full employment encourages reliance on the status quo.

Policy Conflict:

This arises when monetary policy has difficulty in pursuing both goals simultaneously or when the government takes measures that would jeopardize the simultaneous achievement of the objectives. For example, an easy monetary policy will lower the rate of interest and may generate higher inflation if the growth is not sufficient enough to inhibit it.

Also, in a situation where the economy is experiencing inflation and slow economic growth, a tight monetary policy (to fight inflation) will reduce investment and growth even further.

Conflict Resolution:

In the event that monetary policy objectives are not mutually attainable, trade-offs among them must be considered and each objective ranked with respect to its relative importance. This ranking has to be the responsibility of the monetary authorities (the Central Bank) and the Government based on the state of the economy.

An Illustration of the Conflict in Monetary Policy Objectives with the Phillips Curve:

The concept of the Phillips Curve was popularized by A.W. Phillips (1957) where it was stated that an inverse and stable relationship exists between the rate of change of money wages and the rate of unemployment - the Phillips Curve:

$$\text{If } \frac{\dot{W}}{W} = f(U) = \frac{\dot{W}}{W} - \left(\frac{\dot{P}}{P}\right)^e \quad \ldots\ldots\ldots\ldots (2.1)$$

$$\text{then } \frac{\dot{W}}{W} = f(U) + \left(\frac{\dot{P}}{P}\right)^e \quad \ldots\ldots\ldots (2.2)$$

where $(\frac{\dot{W}}{W})$ is the rate of change of the real wage rate, U is unemployment, $(\frac{\dot{W}}{W})$ is the rate of change of the nominal wage rate, $(\frac{\dot{P}}{P})$ is the rate of change of the

price level, and $(\frac{\dot{P}}{P})^e$ is the expected rate of inflation.

Lipsey's (1960) modification introduced a current rate of price change $(\frac{\dot{P}}{P})$ such that

$$\frac{\dot{P}}{P} = \frac{\dot{W}}{W} - \frac{\dot{X}}{X} = f(U) + (\frac{\dot{P}}{P})^e - \frac{\dot{X}}{X} \quad \ldots\ldots\ldots (2.3)$$

where $\frac{\dot{X}}{X}$ is the rate of increase in labour productivity. The empirical results showed that low unemployment and low inflation do not go togehter; reducing unemployment usually involves tolerating more inflation. That is, there is a trade-off between inflation and unemployment. In graphical form, the trade-off became widely popularized as the Phillips Curve as shown in figure 2.1.

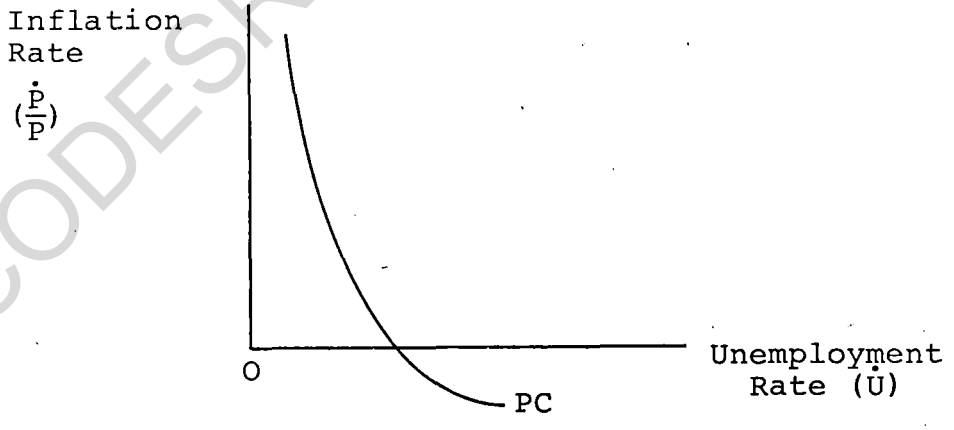


Figure 2.1: The Phillips Curve Trade-off between Inflation and Unemployment.

Historically, it was observed that the low rate of unemployment was associated with an increasing rate of inflation hence Economists began to advance the idea that Phillips Curve is unstable in the short-run, that it shifts up when unemployment is kept too low. Thus, Friedman (1968) took the position that there is no trade-off between inflation and unemployment in the long-run representing a monetarist view of the Phillips curve. He argued that any attempt to hold the unemployment rate at an artificially low level would cause inflation to accelerate indefinitely. His reasoning is based on neoclassical economic theory. His proposition began that there is a "natural rate" of unemployment where the real wage rate is in long-run equilibrium. For unemployment rate to be below its natural rate, employers must be willing to hire more employees, and potential employees must be willing to be hired. But employers will engage more employees only if there is an actual decrease in the real wage rate. Potential employees, on their own part, will accept work only if there is an actual or perceived increase in the real wage rate. Given that the real

wage rate cannot actually decrease and increase at the same time, any unemployment rate below the natural rate must, in the long-run, be a disequilibrium rate.

To Friedman, workers are not likely to suffer from "money illusion", i.e. they will not ignore what happens to their real pay in the long-run. An initial higher wage will force employers to raise prices in order to afford paying the higher wages. This leads once again to still higher wage demands, which, in turn, leads to still higher prices, and so on. Conceptually, therefore, there is no end to the wage-price spiral at any rate of unemployment below the natural rate.

Thus, using modifications of the original Phillips Curve, the excess demand model, the expectations-augmented model and the error-learning model we derive the naturalist and accelerationist hypotheses of the Phillips curve.

Thus, the accelerationists are of the view that in the long-run there is no trade-off between inflation and unemployment hence the Phillips Curve is viewed as a

vertical line passing through the natural rate of unemployment, as shown in figure 2.2 below.

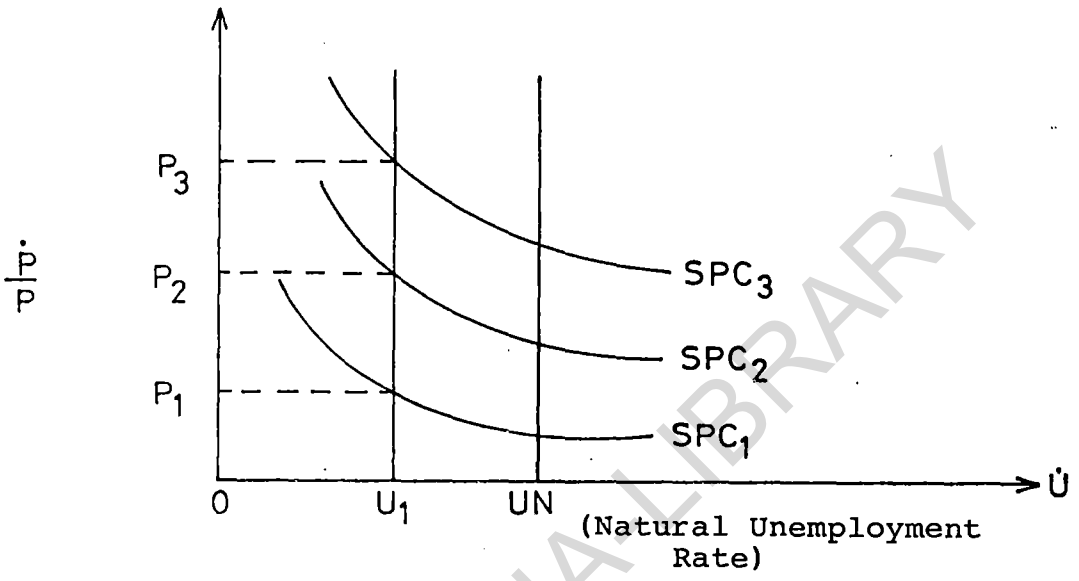


Fig. 2.2: Accelerationist view of the Long-Run Phillips Curve as a Vertical Line.

From the figure, we can see that any attempt to reduce unemployment below its natural rate (UN) say to U_1 will accelerate inflation from P_1 to P_2 to P_3, and so on.

Implications of the Vertical Phillips Curve for Monetary Policy.

a) It is impossible to reduce the unemployment rate below the natural rate without promoting runaway inflation.

b) The only way to reverse the course of inflation is to keep the unemployment rate above the natural rate, meaning that the cure for inflation is recession.

c) Monetary policy should focus on controlling inflation and forget about the unemployment problem. Accordingly, the unemployment problem should be solved by other means (see Spencer, 1971).

A Rejection of the Accelerationist Hypothesis:

Not all economists agree with the accelerationist view of the Phillips Curve being a vertical line, even in the long-run. To Tobin (1972), there is a long-run trade-off between inflation and unemployment. This is because not all workers will suffer or be victims of ignorance or inflation illusion given that they will not all insist on keeping their real wages up with inflation so long as the wage is livable and in line. Thus, to him, it takes a higher rate of inflation to reduce unemployment, but the higher inflation is stable rather than accelerating. Hence, the Phillips Curve may be steeper than originally imagined, but it is not vertical.

Thus, the controversy continues between the accelerationists and the non-accelerationists and remains unresolved.

We may observe, however, that given the structure of our economy, irrespective of whether or not a trade-off exists, the goals of full employment and price stability are still incompatible.

2.1.3 Instruments or Tools of Monetary Policy

Instruments or tools of monetary policy can broadly be classified into two: (a) Quantitative Instruments (Traditional and Non-traditional), (b) Qualitative Instruments (Ranlett, 1977).

A) Quantitative Instruments:

These are "impartial" or "impersonal" tools which operate primarily by influencing the cost, volume, and availability of bank reserves. They lead to the regulation of the supply of credit and cannot be used effectively to regulate the use of credit in particular areas or sectors of the credit market.

Quantitative tools are further classified into traditional or market weapons, and non-traditional tools or direct control of bank liquidity.

i) Traditional or Market Weapons:

These are called market weapons because they rely on market forces to transmit their effects to the economy. Specifically, these tools include Open Market Operations (OMO), Discount Rate Policy, and Reserve Requirements.

1. Open Market Operations (OMO):

This involves the sale or purchase of government securities in the open market depending on whether the economy is inflationary or deflationary, respectively. The effect is that when the monetary authorities sell securities to the market, banks' reserves decline, and when they buy banks' reserves increase. In this way, open market operations reduce or enhance, respectively, the banking system's ability to create credit and hence money supply.

Open market operations can be an important weapon of monetary control in an economy with well developed money and capital markets. In an economy like Nigeria's where the financial market is very narrow and under-developed coupled with large amount of excess reserves

usually maintained by banks, and the inadequate supply of securities, the successful use of OMO becomes limited.

2. Discount Rate Policy or the Rediscount Rate Policy or Bank Rate.

The discount rate is the rate of interest the monetary authorities (as lenders of last resort) charge the commercial banks on loans extended to them. It is also the official minimum rate at which the Central Bank would rediscount what is regarded as eligible bills (bank bills, or first class bills). If the Central Bank wishes to increase liquidity and investment, it reduces the discount rate. This, in turn, reduces, the interest rates charged by commercial banks thus resulting in attractive borrowing or low cost of borrowing and hence expansion in liquidity and investment.

On the other hand, if the Central Bank wishes to reduce liquidity in the economy, it will raise the discount rate. This, in turn, raises the interest rates charged by commercial banks hence lower investment and aggregate demand. Thus, other interest rates are geared to the discount rate.

It must be noted that the effectiveness of the discount rate policy is a function of the inability of commercial banks to have access to liquid assets and/or must not keep excess reserves, otherwise they would not need to go to the Central Bank in the first place.

3. Reserve Requirements/Required Reserve Ratios:

Commercial banks are required to maintain certain (or a minimum) reserve requirements in order to control their liquidity and influence their credit operations. These reserve requirements are usually expressed as a percentage of customers' deposits, and they can be manipulated by the Central Bank to vary the ability of commercial banks to make loans to the public by simply increasing or decreasing the ratios.

The reserve requirements include statutory cash reserve ratio, liquidity ratio, and variable cash reserve requirements.

a) Statutory Cash Reserve Ratio:

In some countries, custom demands that banks should maintain a minimum cash reserve ratio, in some others, the Central Bank has the right to fix it by law.

Such a requirement works only in one direction, i.e., in curbing an excess credit creation.

In Nigeria, the cash ratio, which is designed to raise or reduce the liquidity of banks, is applied in a discriminatory manner, with the banks grouped into categories according to size and the largest banks maintaining the largest ratios, and vice versa.

b) Liquidity Ratio:

The Central Bank also imposes upon the banks a minimum liquidity ratio, being varied according to the needs of the situation. It is designed to enhance the ability of banks to meet cash withdrawals on them by their customers. Such liquidity rato stands for the proportion of specified "liquid" assets (such as cash, bills, and government securities) in the total assets of a bank. In the Nigerian context, this remained at 25% until August 1987 when interest rates were deregulated consquent to which it was raised to 30% and later lowered to 27.5% in 1988. Essentially, it is now variable rather than fixed or inflexible.

c) Variable Cash Reserve Requirements or Deposits with the Central Bank:

This refers to the cash reserves or balances held by banks with the Central Bank and which the Central Bank has the authority to vary according to the exigencies of the credit control. Such deposits with the Central Bank must not be less than a prescribed proportion of the banks' deposit liabilities. It is far more effective than the OMO, for instance, since it acts directly and has no direct effect on the prices of government securities or on interest rates.

ii) Non-traditional Instruments or Direct Control of Bank Liquidity:

These tools are non-market tools that strike directly at banks' liquidity. They include supplementary reserve requirements and variable liquidity ratios.

1. Supplementary Reserve Requirements or Special Deposits:

The Central Bank, here, requires banks to hold, over and above the legal minimum cash reserves, a specified percentage of their deposits in government securities (such as stabilization securities issued by the Central Bank) hence it is also called special

deposits policy. The main objective is to influence banks' lending by freezing a certain percentage of their assets.

2. Variable Liquid Assets Ratio:

Here, banks are required to diversify their portfolio of liquid assets holding. This means that banks are required to redefine the composition of their liquid assets portfolios at different times to reduce or increase their credit base.

B. Qualitative or Selective Controls/Instruments:

These confer on the monetary authorities the power to regulate the terms on which credit is granted in specific sectors. These powers or controls seek typically to regulate the demand for credit for specific uses by determining minimum down-payments and regulating the period of time over which the loan is to be repaid. In other words, they involve official interference with the volume and direction of credit into those sectors of the economy which planners believe are of crucial importance to economic development. These tools include moral suasion and selective credit controls or guidelines.

1. Moral Suasion:

This involves the employment of friendly persuasive statements, public pronouncements or outright appeals on the part of monetary authorities to the banks requesting them to operate in a particular direction for the realization of specific government objectives. For example, the Central Bank or the government may appeal to the banks to exercise restraint in credit expansion by explaining to them how excess expansion of credit might involve serious consequences for both the banking system and the economy as a whole.

Moral suasion is supposed to work through voluntary action rather than by regulation and authority. However, experience has shown that it is fear of, or threat of, authoritative actions, if appeals are not complied with, that usually make the banks respond to moral suasion rather than the notion of acting on appeals or being public spirited or patriotic.

2. Selective Credit Controls or Guidelines:

Selective credit controls or guidelines involve administrative orders whereby the Central Bank, using guidelines, instructs banks on the cost and volume of

credit to specified sectors depending on the degree of priority of each sector. Thus, selective credit controls are examples of the use of monetary policy to influence directly the allocation of resources, indicating a lack of faith in the working of the free market.

Here, the Central Bank may resort to "credit rationing" by prescribing absolute limits up to which specified sectors of the economy may be authorized to get credit from the banking system or from particular types of banks.

The Central Bank might also insist on "margin requirements", used for regulating stock-market credit - a kind of direct regulation of private transactions. Here, the margin requirement is seen as that part of the purchase price of securities that may not be borrowed. This is mainly used in the United States.

Another variant may be the regulation of consumer credit with respect to specified goods and services. Here, a variety of restrictions of bank advances are applied - tightening them, relaxing them, removing them and reimposing the, depending on specific government objectives at each point in time (Haines, 1961).

It must be noted that monetary policy in an open economy also adopts an additional tool - exchange rate - that is, the rate at which the local currency is exchanged for other currencies.

To date, Nigeria has experimented with four approaches in determining the naira exchange rate. These are: pegging, managed float, import-weighted basket and freely floating or market-determined (Second-tier Foreign Exchange Market (SFEM) later Foreign-Exchange Market (FEM) and Inter-Bank Foreign Exchange Market (IFEM) introduced in September, 1986).

2.1.4 Monetary Policy Indicators:

Monetary policy indicator refers to the index of the effect of current policy, that is, some variable or combination of variables to measure the policy effect on the target variable (required to guage the effect of monetary policy).

In fact, to Brunner and Meltzer (1969), "the indicator of monetary policy provides a scale --- that permits policy makers --- to compare the thrust of monetary policy on economic activity, that is, to characterize one policy as more expansive than another

or to characterize policies as more or less expansive than before". Thus, the role of an indicator is to allow comparison and assessment of monetary policy.

The choice of monetary policy indicator requires some hypothesis concerning the structure of the economy. The indicator must be (a) easily observable with little or no time lag, (b) quickly affected by the policy undertaken, and (c) related to the target and to the goal variable.

Since the monetary policy indicator measures the effect of the immediate past policy and since the future course of policy will be influenced by the policy maker's judgement of this effect, the indicator must yield at least qualitatively correct results, otherwise, there is the danger that a policy will be continued when it, in fact, intensifies rather than moderates the cyclical fluctuations in the goal variable.

The candidates for the monetary policy indicator are (a) total reserves, (b) the money supply, (c) the interest rate, and (d) "free reserves", i.e. the difference between excess reserves and borrowed reserves (Ranlett, 1977).

The problem of the appropriate monetary policy indicator is part of the controversy between the Monetarists

and the Keynesians. Given their differing views on the relative stability of the economy, their choice as to the appropriate indicators for conducting and assessing monetary policy are not surprisingly different. Monetarists argue that monetary policy should be set in terms of the growth of the money supply or some monetary aggregate such as the monetary base (i.e, total reserves plus currency outstanding in the hands of the public) and that monetary policy can best be gauged by observing these variables. On the other hand, the Keynesians argue for monetary policy set in terms of the interest rate or free reserves, and that current monetary policy should be judged in terms of these variables.

Some economists have argued that the monetary policy indicator should be an exogenous variable, for otherwise an endogenous variable used as the monetary policy indicator may well be overwhelmed or swamped by non-policy-induced changes. That is, there is danger in choosing an endogeneously determined variable as the monetary policy indicator. Of the candidates earlier mentioned for use as an indicator of monetary

policy, three of them are endogeneously determined; the interest rate, free reserves, and the money supply. The only exgenously determined variable for use as an indicator of monetary policy is total reserves.

One would, however, say that the indicator problem is actually a problem only when there are several policy instruments and policy variables, that cannot be summarized by a single exogenous variable. In most cases, the choice depends on which school of economic thought one belongs to.

2.1.5 Targets of Monetary Policy

The question of monetary policy target arises because the ultimate objectives of policy are not directly and immediately affected by monetary policy. For monetary policy to be effective, it must affect spending decisions, but the chain of causation from given policy action to its impact on aggregate demand is circuitous and indirect and the speed of transmission may not be rapid. Therefore, policymakers need to select some "proxy" for the ultimate goal variable with the idea that by forcing the "proxy" or target variable to move in a given direction or to take on a given

value, the ultimate goal variable will respond appropriately.

Thus, the target is the value that the monetary authorities shoot at in determining their appropriate policies. It is a desired value of an endogenous variable chosen by a policy-maker, and which is observable with little or no time lag.

In fact, to Brunner and Meltzer (1969: 2), "the target problem is ... choosing an optimal strategy or strategies to guide monetary policy ... under the conditions of uncertainty and lags in the receipt of information about the more remote goals of policy."

The target variable must possess certain properties in order to function properly. Thus, for a variable to serve as a target variable, it must be (a) readily observable/measurable with little or no lag, (b) rapidly affected by the monetary policy instrument, and (c) related to the ultimate goal variable, unambiguously in the sense that policies resulting in the target variable taking on certain values must, in turn, result in the goal variable taking on certain values. In

addition, the monetary authorities should be capable of affecting it directly and in the right magnitude, and be able to neutralize the effect of any change in the target variable that is not related to policy.

The choice of a monetary policy target variable requires some theoretical hypothesis as to the interrelationship between the target variable and the ultimate goal variable.

Though the candidates for target variable include those for the indicator variable - interest rate, free reserves, the money supply, and total reserves - the most likely ones are the monetary aggregates (such as money supply) and interest rates.

2.1.6 Monetary Policy Lags - Timing Effects of Monetary Policy

Monetary policy affects or impacts on the economy in two major ways - the magnitudinal (size) dimension and the time dimension. Here, we are concerned with the time dimension which measures the lag in the effect of monetary policy (Friedman, 1961; Culbertson, 1960, 1961; Ando et al., 1963; Ranlett, 1977; and Willes, 1968).

Lags occur because of the time lapse before changes in monetary variables have effect on the economy.

Various forms of lags (total lag) exist, viz:

1. Inside Lag:

The inside lag is a combination of two lags (two phases - recognition lag and action lag), reflecting their involvement with the policy-making process rather than with the structure of the economy.

a) Recognition Lag: This is the time that elapses between the need for economic policy action and the recognition of this need by policy-makers - the lag between the time when a change in policy is needed and the time when the need for change is recognized.

b) Action Lag: This is the time between the recognition of the need for policy action by the policy-makers and the taking of action - measures the time between the recognized need for a policy change and the actual change in policy.

2. The Outside Lag or Impact Lag (or Lag-in-effect):

This is the time lag between the taking of a policy action and the subsequent impact of the action on the ultimate goals of economic policy. This also has two

phases: credit market lag and the output lag.

a) Credit Market Lag: This is the lag between the time when monetary policy is changed and the time when the change affects interest rates, the money supply, and other financial asset supplies.

b) The Output Lag: This lag measures the time elapsing between the change in money and financial market conditions and the resulting change in real income/output and employment.

The total lag in monetary policy is illustrated in figure 2.3.

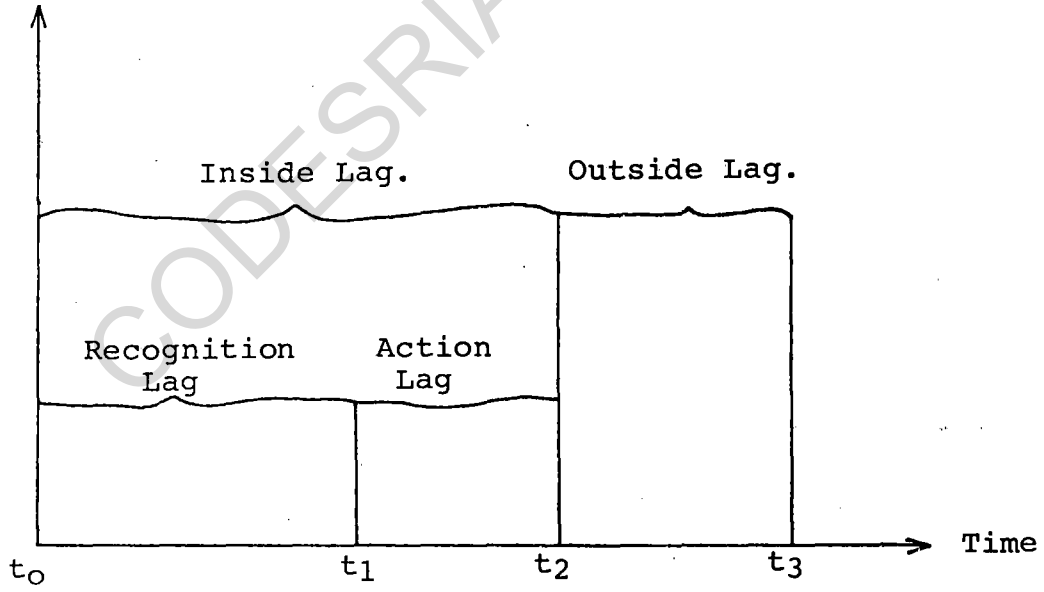


Figure 2.3: Illustration of Lags of Monetary Policy.

The Length and Variability of Monetary Policy Lag:

The inside lag is generally recognized as being quite short. However, estimates of the outside lag are the most tenuous and controversial.

The length of the lag issue says that it takes a fairly considerable time for monetary policy action to take effect while the variability of the lag issue says that lag period is not constant but ranges between six months and several years (Friedman and Shwartz, 1963).

As earlier said, there is no complete agreement as to the time dimensions of these various lags, i.e., the estimates of the lag vary considerably. Unlike before, Monetarists now take the view that the lag in the effect of monetary policy is relatively short and the Keynesians claiming longer lags.

However, a summary of representative estimates of a number of empirical studies is presented in table 2.1.

Table 2.1: Range of estimates of the Average Lag of Monetary Policy (months).

Inside Lag		Outside Lag	Total Lag
Recognition Lag	Action Lag		
3	0	1-20	4-23

Source: Willes (1968).

The factors influencing the variability of lags in the empirical works are:

a) The type of statistical model used: Structural or reduced form equations. Practically every structural model arrives at the conclusion that the lag should be long.

b) The specification of the monetary variable, i.e., money supply, monetary base, effective non-borrowed reserves, etc. The three variables usually yield different results (Willes, 1968; Ranlett, 1977).

We must also note that the lag in monetary policy effect is a distributed lag. The effect on prices, income, and employment does not occur at a single point in time after monetary policy is changed, but is distributed over time. Three estimates in monetary policy effect from three different econometric studies can be cited here. The Federal Reserve Bank of St. Louis model has it that the full effect of monetary policy is felt within one year, representing a rapid economic response to monetary change. The FMP (Federal Reserve MIT-Pennslyvania) model, given a taut-period decrease

in the money supply, says that most (80%) of the effect is felt within one year, but the full effect takes two years (twice as long as the St. Louis estimate). On the other hand, the FMP model, given a slack-period increase in the money supply, shows a very slow economic response to monetary change where only 55% of the total effect is felt by the end of two years. These illustrations show widespread differences of opinion about the lag in monetary policy effect.

We must also note that monetary policy lags have the following implications, viz;

a) That attempts to pursue a countercyclical monetary policy might aggravate rather than ameliorate economic fluctuations. This again has led to the debate between rules versus discretion in monetary policy implementation.

b) The problems of monetary policy targets and indicators.

2.1.7 Rules Versus Discretion/Authority in Monetary Policy - Techniques of Monetary Policy:

There has long been debate over the "proper" administration of monetary policy. The question is:

is monetary policy most appropriately administered by some type of discretion or monetary authority exercising its own judgement, or should action be taken automatically and only in accord with some predetermined rule or set of rules? This is the "rules versus discretion" debate.

Fixed rule monetary policy involves setting of specific values for policy indicators (e.g. money supply) which will not be changed while discretionary monetary policy is one where the indicators are varied at the instance of the authorities based on prevailing economic conditions. The former is "passive" monetary policy while the latter is "active" monetary policy (Simmons, 1937; Ranlett, 1977).

The major advocate of rules over discretion is Milton Friedman who suggested "that the Federal Reserve Board be instructed to let the US money supply (defined as M_2) grow at a constant rate of between 3 and 5 percent per annum".

The proponents of policy rules are highly optimistic about the equilibrating properties of the economy. They are of the view that the real sector is inherently

stable and fluctuations in the economy are caused by fluctuations in the supply of money. Thus, to them, a constant rate of money growth would likely eliminate destabilizing expectations. Therefore, absence of flexibility given the nature of the conomy, could lead to superior performance in terms of unemployment-inflation combinations and represents genuine policy behaviour.

Even amongst the Rules School, divisions of opinion exist as to the amount or level of growth in money supply that should be adopted. Thus, while Friedman advocates a constant growth rate (CGR) rule, Perry (1984) advocates adjustable growth rate (AGR) rule. To them this will have the following benefits: (a) It could correct for any tendency of base velocity growth to change secularly as the pace of technological innovation increases or decreases. (b) There would be stronger countercyclical effects on aggregate demand and these would be of an automatic type. (c) It would counteract the tendency of constant growth rate rules, plus fixed tax schedules to generate dynamic instability in the stock of government debt.

Advocates of discretionary policy, on their own part, are rather more pessimistic about the ability of the economy to remain in equilibrium without government action and they believe in the ability of government to operate appropriate stablizing policies. In addition, to them, if fixed rule monetary policy is adopted, then the economy would not be defended in the face of a recession or inflation since money supply grows at a constant rate in either case.

We would like to add that monetary policy must be employed with thought, judgement, discretion, and concern for the world as it is.

2.1.8 Magnitude or Size Effects of Monetary Policy and the Effectiveness of Monetary Policy:

The magnitudinal dimension of monetary policy effect has to do with what the ultimate size of the effect on economic activity, principally the GNP or national income, the price level and employment. Historically, there has been a wide divergence of opinion about the magnitude of a monetary effect. Early Keynesian estimates of the strength of monetary policy tended to be much lower than estimates made by monetarists.

At the extreme, some Keynesians believed that monetary policy could do little or nothing to alter the course of economic activity. Thus, the Keynesians concluded that "money does not matter". This is because of the rather weak, or long delayed, response of aggregate demand to changes in interest rates, that key channel of their monetary transmission mechanism. Money's only role is the minor one of keeping interest rates low in order to hold down interest payments on the government debt.

On the other hand, the Monetarists contend that changes in money exert a strong force on aggregate demand (measured in nominal terms), the price level, and output (i.e, "money matters"). Also, in determining the impact of money, a distinction must be made between nominal and real economic magnitudes and between the short-run and the long-run.

Changes in the trend growth of money, to the Monetarists, are considered the dominant, not the exclusive, determinant of the trend of nominal GNP and the price level. It is also contended by monetarists

that long-run movements in output are little influenced by changes in the growth rate of money but the trend movements in output are essentially determined by the growth of such factors as the labour force, technology, capital stock, and natural resources. However, in the short-run, changes in money exert a strong influence on output, the long-run influences are on the price level and nominal aggregate demand.

What follows below is an exposition of the contentions of the monetarists.

Monetarism

Monetarism's essence can be stated in the form of a few central propositions where the overwhelming influence of money is the centre piece.

Monetarists assign causal role to money, and since money is treated by them as exogenous, it is possible to control disturbances or disequilibrium in the economy by controlling the money supply, and hence, money matters. To them, fiscal policy is very complicated and difficult to execute in timely manner and given the constancy of the rate of interest over a long period,

suggesting horizontal IS curve (indicating infinitely elastic demand for new investment) and constant money supply, an increase in government investment will correspondingly reduce private investment, and this "crowding out" will reduce the efficacy of fiscal policy. As a result of this "crowding out", the effect of fiscal policy on nominal income will be zero, provided the LM curve is vertical. An increase in taxation and "crowding out" will raise the rate of interest to decrease the investment. Thus, to them, fiscal policy may change income, velocity, interest rate and so on but its expansionary effect is likely to be minor and transitory (temporary) on aggregate income and price levels (Friedman, 1976). Thus, pure fiscal policy does not matter for aggregate demand, nominal income and price level.

The St. Louis multiplier has been used to show that pure fiscal policy has no effect on nominal income. Fiscal policy impact depends on how the government deficit is financed. Finance by money creation (a monetary action) is seen to be more expansionary than

what is possible by the manipulation of fiscal tools. Thus, according to monetarism, what matters is the quantity of money created, and not how it is created (Niehans, 1976).

Monetarists are of the view that money and income are directly correlated. Monetary change affects long-run stock of real capital and hence output (Brunner and Meltzer, 1976). Fluctuation in money national income is attributed largely to monetary policy which effect is transmitted to national income both through the bond yield and other channels. Thus, the long-run economic activity and nominal income are essentially the function of the stock of money and flows themselves adjust to the stock (Brunner and Meltzer, 1976). The adjustment to change in money involves substitution between money and different types of assets, thus while wealth effect of a change in money is not of any empirical importance, the substitution effect appears to be. Given the tendency to assume that money is the only asset, the real balance effect and the wealth effect are also assumed to be

tantamout (Purvis, 1980). Because Friedman (1976) opined that the wealth effect is not important for explaining short-run economic fluctuations, he did not give any empirical weight to inside-outside money.

The monetarists concede a direct nexus between money supply and price level, which is proportional in the long-run. In effect, in the long-run, proper growth rate of money stock is crucial for stable growth part of output and prices. The monetarists argue that the long-run is the time period when all expectations are realized, while the short-run is marked by unanticipated changes. Thus, in the short-run money supply affects the output and in the long-run it changes mainly prices (Friedman, 1970a). Changes in money stock modify relative prices and initiate a process of substitution.

The economic system, especially the private sector, is assumed to be stable, and the cumulative movement of prices and output results mainly from the decisions or actions of the government. That is, cyclical instability is the outcome of inappropriate government

policies imposed on stabilizing the private sector.

It is the general belief of monetarists that an increase in money supply brings about, through liquidity effect, a reduction in the rate of interest. But it comes back to equilibrium after sometime. Thus, the real rate of interest can be taken to be constant.

The monetarists also have a monetary theory of price level. According to them, output is taken as a fixed datum and price level is regarded as variable to be determined by the economic system (Friedman, 1970b) Inflation, therefore, is a purely monetary phenomenon, and market mechanism or the price system operates as an efficient allocative mechanism in the economy.

However, monetary policy cannot predict the exact division of a change in aggregate demand between price level component and real output component (Kaufman and Gibson, 1971).

Money is basically neutral in the long-run in the sense that it does not disturb the real equilibrium of the system and also maintains the real rate of interest. Monetary policy is effective in controlling inflation by restricting money supply.

In the monetarist's parlance, money's price is the inverse of the price level. Also, the quantity theory is looked at basically as a theory of demand for money and emphasis is laid on the analysis of money income ratio. There is observed low interest elasticity of demand, hence a zero interest elasticity of the demand for money is seen neither as the necessary nor as the sufficient condition for the monetarist's proposition. Therefore, a monetarist conclusion can be reached without a vertical LM curve since in fact, the LM curve continuously moves and affects income and activities in the long-run unlike the IS-curve which shifts in a once-for-all form in the short-run. Thus, to the monetarists, the demand for money is stable in the long-run, and in fact, more stable than the Keynesian consumption function. It can also be easily predicted.

The monetarists also opine that a change in money supply results to a short-run fluctuation in unemployment rate. But the level of unemployment is independent of the rate of money supply (Stein, 1976).

Also, it is put forward that the monetary rule by which money supply should conform to the rate of growth

of output is better than discretion. That is, given our ignorance or incomplete knowledge, a discretionary monetary policy may increase the amplitude of the business cycle.

Monetary policy is distribution-neutral given that it is less concerned with income distribution issue as such. Monetary policy also has a longer and more uncertain lags than fiscal policy but this does not make fiscal policy necessarily better, so believes the monetarists.

Also, the monetarist transmission mechanism recognizes that money is not just a close substitute for a small class of financial assets but rather a substitute for a large spectrum of financial and real assets. There is a three-way asset choice: holding money, holding financial assets and holding real assets. This allows money to have a direct effect on consumption as well as giving it the possibility of operating through the Keynesian investment-income-consumption mechanism. Thus, given an equilibrium position, an increase in money supply raises the actual proportion of money relative to the desired proportion. People react by getting rid of the

excess balances. Transaction needs of different sectors within the economy rise and increases in the purchase of goods and services and/or securities ensue. The transaction in securities affects relative prices and interest rates. The decline in interest rates encourages investment spending. The interest rates serve to facilitate real and financial asset adjustments, though the impact of changes in money on any specific interest rate is both too brief and too weak to be captured statistically or identified as a strategic variable in the transmission mechanism. Therefore, the monetarists view the money supply as the strategic variable affecting income directly. Symbolically, the monetarist monetary transmission mechanism is shown as: $\uparrow$OMO $\rightarrow$ $\uparrow M^S \rightarrow \uparrow$Spending$\longrightarrow \uparrow$GNP, where OMO is open market operation, M^S is money supply and GNP is gross national product.

2.2 REVIEW OF FISCAL POLICY ISSUES IN THE LITERATURE

2.2.1 The Concept of Fiscal Policy

Fiscal policy refers to that part of government policy concerning the raising of revenue through taxation and other means and deciding on the level and

pattern of expenditure for the purpose of influencing economic activities. That is, to Shaw (1972), fiscal policy is seen generally as comprising those variations in government revenue and expenditure programmes which are undertaken with the express purpose of securing the goals of macroeconomic policy.

It deals with the effects of changes in the level of government receipts and expenditures and with the effects of changes in the budget deficit or surplus on economic activity (Commission on Money and Credit, 1961). Detailed fiscal policy analysis also involves consideration of the effects on the level of economic activity of changes in the composition of revenues and expenditures and the economic effects of differing fiscal policies at the different levels of government - federal, state and local.

One may extend the above view by saying that fiscal policy involves government actions that affect the economy in the form of government expenditures, revenues and debt management (Haines, 1961). In this sense, fiscal policy has two aspects: (a) the government budget, concerned with revenue and expenditure policy,

and (b) the management of the public debt - all of which are aimed at influencing economic activities or the achievement of certain macroeconomic goals.

2.2.2 Fiscal Policy Objectives:

Fiscal policy like monetary policy, as an effective instrument of policy, may be used to accomplish the following objectives:

a) Full Employment:

Governments usually aim at the smallest percentage of unemployment of resources (especially labour) which the nations can reasonably hope to maintain in the light of seasonal movements in the economy. In most cases, high unemployment warrants expansionary fiscal policy with a keen eye on its inflationary impact.

b) Price Stability:

Fiscal policy is used to counteract or to avoid inflation and deflation. Expansionary fiscal policy is often used to fight deflation while a contractionary fiscal policy is used to fight inflation, taking into cognizance the objective of attaining full employment.

c) Sustained Economic Growth:

One of the primary objectives of fiscal policy is the achievement of steady or sustained growth in national resources and in national output/income.

d) Balance of Payments Equilibrium:

Fiscal policy is used to avoid and/or correct imbalance in international payments accounts particularly to avoid persistent or fundamental disequilibrium in the balance of payments position.

e) Greater Equity in the Distribution of Income and Wealth:

Fiscal policy is used to redistribute income and wealth so as to achieve equity and for the attainment of social and economic justice.

In summary, as Musgrave and Musgrave (1980) put it, fiscal policy can be used for allocation, stabilization, and distribution. The allocation function becomes necessary so as to provide both private and social goods in appropriate mix with available resources. Stabilization function is that of maintaining high employment, a reasonable degree of price stability,

and an appropriate rate of economic growth, with allowances for effects on trade and on the balance of payments. The distribution function involves adjustment of the distribution of income and wealth to assure conformance with what society considers a "fair" or "just" state of distribution.

2.2.3 Approaches to Fiscal Policy

There are two main approaches to fiscal policy: countercyclical and compensatory approaches. Under the countercyclical approach, the government is assigned the role of varying its tax and expenditure policies with the objective of moderating fluctuations in income and employment over the business cycle (Groves, 1965). Here, the government is required to unbalance its budget during deflationary and inflationary periods, that is, to increase its expenditures and cut taxes when private spending declines to depression levels, and raise taxes and cut its expenditure during the prosperity (or inflationary stage of the business cycle). Its proponents still subscribe to a balanced-budget philosophy, but they are reconciled to the logic of

a cyclically rather than annually balanced budget since with proper management of government's budget, the depression deficit will be offset by the prosperity surplus.

On the other hand, proponents of a compensatory fiscal policy approach opine that given the future prospects of secular stagnation and/or secular inflation, deficit financing and surplus financing become a long-run imperative. Thus, if inflation is a continuing problem, long-run surplus financing will be necessary; on the other hand, if persistent deflationary tendencies develop, long-run deficit financing will be required. This is sometimes referred to as functional finance, originally due to Lerner (1944). The argument here is that the government budget should be used as the major instrument for achieving macroeconomic objectives and that budgetary changes should be made as often as desired and in whatever magnitude desired. Thus, here, the institutional aspects of taxation are subordinated to the compensatory interest since the purpose of taxation (according to its proponents) is never to raise money but to leave less in the hands of the tax-payers.

outlook that would otherwise take place and facilitate the forces of recovery contributing to an early upswing. They are very useful when the economy contracts but are a mixed blessing when it expands. That is, when business conditions recover from a recession, the tax system automatically cuts the growth in private spendable incomes, and hence the expansion tends to proceed more slowly, though when the recovery is strong, automatic stabilizers help to curb the inflationary pressure. In addition, the larger the government expenditures and tax receipts are in relation to the total level of economic activity, the stronger is the impact of the automatic fiscal stabilizers - the reverse is also true. Automatic fiscal stabilizers include personal income tax, company income tax, unemployment insurance programmes, and farm price supports.

On the other hand, a discretionary or "active" fiscal policy measure refers to a direct budgetary change responding in ad hoc fashion to a presently recognized macroeconomic problem. That is, discretionary fiscal policy measures are those actions which have to be designed by a legislative or executive action in

2.2.4 Techniques of Fiscal Policy

Fiscal policy techniques include balanced budget, unbalanced budget (tax and spending changes) and qualitative changes in the tax system. In this sense, fiscal policy instruments or tools are broadly classified into two: automatic or built-in fiscal stabilizers, and discretionary fiscal stabilizers (Hicks, 1961).

Automatic fiscal stabilizers or "passive" fiscal policy are among the most interesting tools in the government's anticyclical kit or those ingenious devices that help to bring the economy back to an even keel without any deliberate action on the part of anyone. These are designed to function in a countercyclical fashion to improve the performance of the economy, without the necessity of ad hoc adjustments in response to an immediate macroeconomic problem.

With a given tax and expenditure structure, changes in total output and income result in automatic changes in tax yields and in certain outlays, the first changing in the same direction as income and the latter in the opposite direction. Automatic fiscal stabilizers aid recovery by reducing cumulative deterioration in economic

order to deal with the problem at hand (Mbanefoh, 1989). Their effectiveness is impaired by inaccurate economic forecasts as well as the lack of promptness on the part of the legislature to enact discretionary measures and the time lag it takes the executive to put them into effect. Thus, discretionary measures require speed of decision and effect and can be successful if temporary and reversible fiscal changes for stabilization purposes are distinguished from permanent and structural changes. Discretionary fiscal policy includes deliberate changes in tax rates, tax bases and government spending (Herber, 1979).

It is also noteworthy that the recent resurgence of supply-side economics has put forward that an across the board reduction in tax rates would spur unprecedented growth, reduce inflation painlessly, increase tax revenue (since it would unleash an enormously depressed supply of effort), and stimulate a spectacular rise in personal saving (Feldstein, 1986). Again, this is another source of controversy in the economics of public finance.

2.2.5 Fiscal Policy Lags:

Fiscal policy lags are the same as monetary policy lags (Ando, 1965; Willes, 1968): inside lag (recognition and action lags), and outside lag (decision and production lags).

As noted earlier, the recognition lag is the time between when the need for action arises and when it is recognized by the fiscal authorities. The action lag is the time between when the need for action is recognized and when action is actually taken. The decision lag is the time between the change in credit conditions and the resulting change in spending decisions. On the other hand, production lag is the time between changes in the spending decisions and the related initial changes in production and employment.

As Ando and Brown (1963) observed, while the action lag for monetary policy is close to zero, for fiscal policy the action lag may encompass several years owing to its administrative inflexibility. On the other hand, once a change in fiscal policy is implemented, its effect takes hold rather quickly (about three to six months). This contrasts to monetary policy when the outside lag may be much longer.

Since changes in government spending policies have a relatively short outside lag, they affect the pace of economic activity quickly. At the same time, the outside lag associated with changes in the tax structure is also relatively short, though the actual lag depends on how long it takes to alter the disposable income of individuals and companies out of which spending occurs. The corporate adjustments to changes in the company income tax are somewhat more sluggish than those of individuals to changes - personal income tax. Whereas changes in the company income tax structure may produce changes in corporate spending in about three or four months, changes in personal income taxes may produce significant changes in disposable money income and consumption within a month or two. Thus, when the inside lag is added to the outside lag, the total lag for discretionary fiscal policy becomes two years or more depending on the time involved in legislative and executive branch deliberations.

The long inside lag in discretionary fiscal policy has partly convinced some economists that the government should get out of the stabilization business altogether.

These persons advocate replacing reliance on discretionary policies with a set of rules that would hold the fiscal environment stable. It has, therefore, become customary to relate fiscal instruments to specific norms, rules or guidelines for government to follow. A continuum of various fiscal policy rules are annually balanced budget norm (100% control orientation), cyclically balanced budget norm, high-employment budget norm, and functional finance norm or 100% goal orientation (Buchanan, 1965; Herber, 1979; Due and Friedlaender, 1973).

The annually balanced budget norm is based on the notion that a balanced budget indicates fiscal responsibility for government, households and business segments of the private sector. However, during periods of economic recession or boom, the rule, if literally applied, tends to be more perverse in its effects on the economy. Institutional impediments such as lobbying from pressure groups could prevent its realization.

A compromise rule, the cyclically balanced budget norm, advocates budget balance over the course of a

complete business cycle rather than in a particular fiscal year. Therefore, tax revenues and expenditures would be equal over the course of the cycle - whether measured from "peak to peak" or from "trough to trough". The policy prescription here calls for the government to apply a surplus budget at the time of a cyclical peak in order to restrain the pressures of demand [monetary] inflation, and to establish a deficit budget to expand the economy under conditions of cyclical recession or depression. In an ideal situation, the surpluses and deficits would offset each other in equal magnitude over the period of the cycle, thus providing budget balance over the cycle rather than for an annual fiscal year.

The drawbacks of this rule include, the unlikelihood of a given cycle being symmetrical, the peak of a cycle need not be inflationary, in addition to the institutional factor of lobby or pressure group influences thus leading to a built-in bias in favour of deficit budgets.

Another compromise rule, the high-employment budget norm (or budget balance at high-level income and employment), states that decisions made regarding tax

and public expenditure should always be made on the assumption that the high-level income and employment are to be maintained, and that balance between the two sides of the account should be present. It attempts to combine the control features of budget balance with the stabilization features of functional finance through the employment of the built-in-stabilizers, which tend automatically to produce deficits in recession and surpluses in booms. In other words, the recommendation here is that tax rates should be set only to balance the budget, but also provide a surplus budget for debt retirement at agreed high-employment and national income. Once these rates are set, they should be left alone unless there is some major change in national economic conditions. It is also based on the use of automatic fiscal stabilizers and hence avoids discretionary changes in tax rates, except under conditions of major national emergency.

Lastly, the functional finance rule, a complete antithesis to the annually balanced budget rule, advocates that the government budget should be used to promote macroeconomic goals at all times, without regard to

budget balance. In this sense, it is less concerned than the annually balanced budget with allocational and distributional considerations and more concerned with the stabilization goal.

The use of rule or norm arises because automatic stabilizers are inadequate in offsetting all income changes thus creating a stable, stagnant equilibrium.

On the other hand, since the economy is being subjected to various shocks, appropriate fiscal action also requires a constant assessment of the state of the economy and changing action to meet the existing situation - flexible discretionary action (and not constant "fine tuning" or changes in taxes and expenditures to meet small changes in projected aggregate demand).

An effective and rational fiscal policy approach for the attainment of macroeconomic stabilization objectives, as well as for achieving the microeconomic objectives of allocation and distribution, is the one that incorporates an eclectic combination of the best elements of the various specific rules and discretionary actions. This results in a desirable, comprehensive and flexible fiscal policy approach.

2.2.6 Magnitudinal Dimension/Effectiveness of Fiscal Policy:

The arguments regarding the effectiveness of fiscal policy are couched in neo-Keynesianism or fiscalism. The basic tenets are examined below.

Neo-Keynesianism or Fiscalism

The basic proposition of this school of thought is that money does not matter in the short-run. Money supply transmission mechanism, they argue, is an indirect process working through the cost of capital channel via rate of interest hence the monetarists' causal connection between money supply and income does not appear to be correct, rather the reverse causation in which a change in the income level effects change in money supply appears to be compatible.

Neo-Keynesianism is essentially based on the short period consideration when money flow rather than stock becomes a crucial variable. Here, the concept of the short-run is similar to the one applicable to the theory of the firm.

To the Neo-Keynesians, budgetary policy has significant effect on income, employment and output in the short-run, even if there is no new money supply. In

fact, public debt is as crucial as the stock of money (Dornbusch, 1976). An increase in the growth of interest-bearing debt would result in an increase in the equilibrium growth of nominal income, without a corresponding increase in the rate of money expansion. The balanced budget multiplier can give the economy substantial leeway for growth while government deficit is expansionary.

The proponents of this school also view money supply not as exogenous. To them, money supply has no effect on the real variables, notably on output, in the long-run hence pursuing a money supply target will be an exercise in futility.

Fiscal policy is also concerned with the aggregate demand as a determinant of output. Given that the causal link starts from demand to money, the appropriate action is to control the demand rather than money supply.

Neo-Keynesians also accept the importance of wealth effects though Keynes himself did not recognize any wealth effect involved in the buying and selling of securities, for according to him, open market operations merely swap one asset for another. His followers see

the wealth effect as explaining changes in the quantity of money.

They also see debt and capital as perfect substitutes hence no distinction is made between real rate and market rate of interest (Stein, 1976).

There is the view that price level is exogenously fixed leaving output as an endogenous variable. It is this view that gave rise to traditional IS-LM type of Keynesian construct. Thus, prices are constant in-so-far as output remains below the full employment level. Here, the short-run effect of money supply is small since price level which is initially fixed, is determined by historical and institutional factors. The production function and the state of labour market determine the price level in a dynamic Keynesian model; that is, a change in the price level can be brought about by changing the unit of labour cost, taxation, spending, etc. (Fand, 1970). The implication for the Fiscalists is that inflation is not a monetary phenomenon and this is compatible with the cost-push theory of price level. Hence, a restrictive fiscal policy can very well combat inflation. However, given the oscillatory and

fluctuating nature of the economy, the Fiscalists appeared to have ignored largely the price effect given that expenditure motives are highly volatile and do not pin their faith in the perfect working of the market mechanism. This is especially so when the private sector representing "animal spirits" remains unstable (Klein, 1973).

The Neo-Keynesians have a non-monetary theory of price hence they view money as not neutral. To them, it is possible to change the rate of interest, (which they see as the price of money) in several ways. As a result of variations in velocity and output, money-price proportionality is not possible in the short-run. Thus, the acceptance of Phillips Curve relation clearly indicates the Neo-Keynesians' proposition of non-neutrality of money.

They also maintain that the interest elasticity of demand for money is infinite. The effect of changes in the money stock depends only on the slope of liquidity preference or marginal efficiency of investment curves (Tobin, 1947). If money demand is a function of interest

rate as in the Keynesian speculative motive, monetary policy becomes at once ineffective, for in the situation of perfectly elastic LM or inelastic IS curve, money does not matter. Thus, the effects of the monetary policy have to be predictable, if the policy is to be of any utility; but the instability of velocity function clearly precludes that possibility (Fischer, 1976). Hence, it is said that the long-run quantity theory is deficient.

Unlike monetary policy, fiscal policy is mainly concerned with the allocation of resources as between private and public sector, and also with distribution of national income, through mainly, the tax parameter. Government policy is directly and immediately able to change the disposable income of consumers and profitability of investors.

Finally, when it is difficult for monetary policy to counteract short-run cyclical fluctuations, fiscal policy may prove to be a better device for it has a shorter lag. In this sense it has been suggested that it is not proper to rely on the monetary authorities for controlling the money supply since it is incapable for the job, for as Kaldor (1970) pointed out, the

Central Bank is like a monarch who can reign but cannot rule.

The monetary transmission mechanism of Keynesians deemphasizes the role of money but involves an indirect linkage of money with aggregate demand via the rate of interest in its simplest form, as symbolically shown below.

$$\uparrow OMO \rightarrow \uparrow R \rightarrow \uparrow M^S \rightarrow \downarrow r \rightarrow \uparrow I \rightarrow \uparrow GNP$$

where OMO is open market operation, R is commercial bank reserves, M^S is money supply, r is interest rate, I is investment, and GNP is the gross national product.

2.3 REVIEW OF THE MAIN ISSUES IN THE RATIONAL EXPECTATIONS AND MACROECONOMIC STABILIZATION POLICY DEBATE.

2.3.1 An Historical Perspective:

As Shiller (1978) noted, before the recent literature on rational expectations models, builders of macro-economic models interested in short-run policy evaluation and forecasting dealt with the problem of expectations modelling, about the only way they could, that is, by guessing the manner in which individuals form their expectations in practice and trying to find some quantitative representation of this behaviour.

For instance, future inflation rates were forecast by looking at past inflation rates - the adaptive expectations hypothesis (used in the 1950s and 1960s marked by relatively stable price). A common quantitative representation of this hypothesis originated by Irving Fisher is that individuals expect future inflation rates to behave like a weighted average or "distributed lag" of recent past inflation rate. Such "expectations proxy" or weighted average is then included in quantifying the behavioural relation in place of the actual expectations, which may be unknown. Such adaptive expectations hypothesis has some appealing characteristics, viz; while people can be fooled temporarily by the type of changes in the inflation rate assumed, they will not be fooled in the longer run; it is apparently fairly general since it can be applied to unemployment, rate of growth of real income, interest rate, etc; and it allows the relation of expected unobservable variables to actual observed variables (Attfield et al., 1985). However, adaptive expectations hypothesis is deficient for it may also predict badly if something happens which changes the way people form their expectations, for example, if

price controls are initiated or if there is a sudden hyperinflation as experienced in the 1970s and 1980s. Since one does not know how expectations will respond to such changes, macroeconomic model builders are sometimes obliged to make some outright guess of their own as to how this policy would affect the mechanism which generates price expectations. In addition, if the variable about which an expectation is being formed is continually falling (or continually rising), then the expectation will always be greater than (or less than) the actual variable. The hypothesis fails to give any guide about when or under what conditions such a change in the method of expectations formation will take place, nor about the precise form of the change. It also assumes that typical economic agents limit themselves to a very narrow set of information when they are forming expectations - it assumes that people look only at the past values of the variable they are trying to forecast. Because of these deficiencies, the adaptive expectations hypothesis was best seen as an empirical approximation of how expectations are formed rather than an adequate theory for expectations formation. Moreover, the theory

and the models built around it failed the test of accurate prediction (Christ, 1975).

An alternative expectations formation approach was originated by Muth (1961) drawing on ideas suggested in an earlier seminal paper by Modigliani and Grunberg (1954), and its earliest application some ten years later was made by the leader of Rational Expectations Revolution, Robert Lucas, Jr. (1972).

Muth initially introduced rational expectations into economics in a microeconomic context, namely the price expectations of business firms, for which it appears eminently plausible in view of the specialist expertise which such firms employ. However, its more remarkable applications have been in the field of macro-economics and in particular to individual economic agents constituting the labour market where casual empiricism casts doubt upon its validity as a behavioural mode.

Thus, recently, a number of macroeconomic theorists, Lucas (1972, 1973, 1976), Sargent (1972, 1976a), Sargent and Wallace (1973, 1975, 1976), Barro (1976, 1979), and a host of others, dissatisfied with conventional macro-

economic models, have suggested a different approach to economic modelling - the "rational expectations" approach or "contingent-claim" formulation (Lucas, 1980).

As Lucas (1976) has most forcefully argued, the kind of short-run policy analysis that is usually undertaken with macroeconomic models is incapable of giving reliable results because individuals' behaviour in forming expectations depends on their perceptions of the policy rule being followed, a fact not taken into account in conventional simulations.

The application of rational expectations to macroeconomics can be explained by the following factors: the accelerating inflation typical of the 1970s made adaptive expectations untenable; the stagflation of the 1970s confounded earlier Keynesian optimism with the Phillips Curve apparently experiencing increasing instability and collapse; and parallel developments in General Equilibrium Theory, and in particular the Arrow-Debreu achievements in Walrasian general equilibrium, carried implications for macroeconomics and reinforced the growing awareness that macroeconomic relationships must possess microeconomic foundations which assume utility

maximizing behaviour. Indeed, as Laidler (1982) noted, the co-existence of high and rising inflation with rising unemployment and slow and declining rates of economic growth then gave impetus to what he called the "neo-Austrian theory." Thus, when rational expectations was combined with other assumptions underlying the new classical macroeconomics the result generated startling novel implications for macroeconomic policy.

It is noteworthy that Muth has remained remarkably mute on the macroeconomic controversies generated by the concept he introduced into economics.

2.3.2 The Concept of Rational Expectations:

The term "rational" in Economics has a much more specific meaning than its general dictionary signification of "agreeable to reason; not absurd, not preposterous, not extravagant, not foolish, or fanciful, or the like; intelligent, sensible." But the rational man of Economics is a maximizer who will settle for nothing less than the best (Simon, 1978). In fact, Economics' main export commodity in its trade with the other social sciences is the concept of rationality, and a special form of it -

the rationality of the utility maximizer. Specifically, rationality in Economics refers to behaviour by an economic agent (consumer, producer, government, etc.) which is consistent with a set of rules governing preferences.

Thus, rational expectations is the application of the principle of rational maximizing behaviour to the acquisition and processing of information for the purpose of forming a view about the future (Pearce, 1983). Such expectations are informed predictions of future events and as such are essentially the same as the predictions of the relevant economic theory (Jonung and Laidler, 1988; McDonald, 1987). As Muth (1961) put it, rational expectations are true mathematical expectations of the future variables conditional on all variables in the model, which are known to the public at time t, that is, economic agents will form subjective expectations concerning future economic variables which are equal to the true mathematical conditional expectation to be taken by those variables - stronger Muthian/ hardline version. Thus, expectations will not differ from optimal forecasts (the best guess of the future)

using all available information (Mishkin, 1989). Technically, it reflects efficient use of available data within an ideal model of the system generating a variable. Indeed, as Grossman(1980) noted, the rational expectations assumption means that the subjective probabilities that private agents attach to the possible effects of perceived or predicted monetary and fiscal actions are equal to the true probabilities associated with these effects.

A more general definition of rational expectations given by Lucas and Prescott (1971) is similar to this, viz, that in models in which human behaviour at time t is supposed to depend on the subjective probability distribution held by market participants of future economic variables, rational expectations requires that this subjective distribution be the same as the true conditional distribution based on all information available at time t.

In this sense, rational (or optimal) expectations should be reserved for forecasts generated by a rational, expected utility maximizing decision process in which the costs of acquiring, processing and evaluating

additional information are balanced against the anticipated benefits from further refinement of the forecast (Buiter, 1980a) - weak version.

Fellner (1980) and Haberler (1980) have also proposed what they called the credibility version of rational expectations (conditioned market expectations) with implicit post-Keynesian consensus and moderate assumption - a hypothesis stressing the significance for market expectations of a consistent and credible policy posture, making allowance for four major qualifications, viz: absence of a detectable systematic component of nominal demand, institutional factors rendering a perfectly foreseen path of nominal demand nonneutral, and the possibility of different variance associated with different systematic components of nominal demand (Grossman, 1980).

In fact, Economists such as Stanley Fisher (1977) Fisher and Edmund Phelps (1977) and John Taylor (1979) believe in what Mishkin (1989) called "nonclassical rational expectations" because they do not agree with the complete wage and price flexibility of the new classical macroeconomics. However, they still recognize

the importance of expectations to the determination of aggregate supply and are willing to accept rational expectations theory as a reasonable characterization of how expectations are formed. Their "nonclassical rational expectations model" assumes that expectations are rational, but does not assume complete wage and price flexibility; instead, it assumes that wages and prices are sticky. Their basic conclusion, therefore, is that unanticipated policy has a larger effect on aggregate output than anticipated policy (as in the new classical model). However, in contrast to the new classical model, the policy ineffectiveness proposition does not hold: anticipated policy does affect aggregate output and the business cycle. This is, indeed, the nonneutrality hypothesis, which is also generated by an incomplete information assumption.

2.3.3 Assumptions and General Characteristics of Rational Expectations

Rational expectations assumes that the economy's equilibrium prices and quantities exhibit the central feature of the modern business cycle, viz, a systematic relation between the rate of change in nominal prices

and the real output (Lucas, 1972). Also, the economy is entirely free of money illusion and there is no information discrepancy between the government and the private sector, that is, the public possesses the same information as the government concerning the structure of the economy, the past values of relevant variables, and the policy rule in effect (McCallum and Whitaker, 1979).

Also, all prices are market clearing (instantaneous market equilibrium), all agents behave optimally in light of their objectives and expectations, the objectives of the market participants are set in "real" terms, in pursuit of their objectives the market participants are guided by all information worth acquiring (efficient markets), and expectations are formed optimally.

It is assumed that systematic monetary and fiscal actions are accurately predictable while many monetary and fiscal actions are neither readily predictable, that is, systematic, nor readily perceivable. Also, the degree of inaccuracy in beliefs about the state of

the economy that results from a given unpredictable and unperceivable monetary or fiscal action depends inversely on the magnitude and frequency of such actions, that is, on the variance of monetary or fiscal policies. This reflects that private agents who behave according to the rational expectations postulate do not make systematic mistakes. Further, the larger the variance of monetary and fiscal behaviour, the smaller the effects of given unpredictable and unperceivable monetary and fiscal actions on aggregate output and employment (variance hypothesis). Thus, the larger the variance of monetary and fiscal behaviour, the more likely are private agents to misinterpret other economic disturbances and to fail to make the adjustments in resource allocation that these other disturbances would otherwise call for (misallocation hypothesis - Barro, 1976 and Grossman, 1980).

To Muth (1961), the random disturbances are normally distributed: certainty equivalents exist for the variables to be predicted; and the equations of the system, including the expectations formulas are linear. There is also the irrelevance of large-scale macro-

econometric models (Brimmer and Sinai, 1981).

According to Pesaran (1982), the following "information availability" assumptions are also made, viz: all economic agents possess and use the same kind of information and thus apart from some random disturbances arrive at the same expectations; they know the "true" or what they regard as the "true" model of the economy; they have accurate estimates of the magnitude of all the structural parameters of the economic model they regard as "true"; and they have access to enough information to discover the systematic components of the government economic policy (monetary or fiscal) and to determine the stochastic processes that generate the non-policy exogenous variables.

There are three main general characteristics of rational expectations: the errors of rational expectations are, on average, zero; the errors of rational expectations exhibit no pattern, and rational expectations are the most accurate expectations or the most efficient method of forecasting - the variance of the forecasting errors will be lower under rational expectations than under any other method of forecasting or forming expectations (Attfield et al, 1985).

2.3.4 Macroeconomic/Policy Implications of Rational Expectations:

The central result of applying the rational expectations hypothesis in macroeconomics is that systematic changes or those movements in aggregate demand which are predictable will have no effect on real economic variables (output and unemployment) but will affect prices, while only random changes in aggregate demand can affect the level of real economic variables. In other words, no government macroeconomic policy whether monetary or fiscal, no matter how ingeniously formulated and how effectively implemented, can have any systematic or lasting impact upon real economic variables (Lucas, 1972, 1978; Sargent and Wallace, 1975, 1976; and Barro, 1976) - policy ineffectiveness proposition. This seriously questions the Keynesian interventionist demand management philosophy, thus asserting that the attempt at stabilization policy by systematic demand management strategy will become predictable and once predictable will be negated in their impact by rational utility maximizing agents. Only random policy shifts in aggregate demand will

affect real variables and such random actions are unlikely to move the economy closer to declared policy goals.

The implication is the advocacy of predetermined rules, such as a constant rate of monetary expansion, in place of any attempt at systematic countercyclical monetary and fiscal policy measures, i.e., no systematic rules for discretion exist, which justifies the need for policy rules originally due to Friedman (1968), as opposed to active intervention (Kydland and Prescott, 1977).

Another macroeconomic policy implication closely related to the policy ineffectiveness proposition concerns the costs of eliminating or reducing chronic inflation. If the learning process is relatively speedy then a change in policy stance upon the part of monetary authorities will be readily perceived and a new equilibrium quickly regained, hence the output and employment costs associated with the elimination of unemployment or inflation will be relatively minor. On the other hand, if the learning process on the part of economic agents takes considerable time the output

and employment costs could be sizeable. This generates an awareness that the informational features of the economy are an essential ingredient in the understanding of its macroeconomic behaviour. It is no wonder that the manner in which information is obtained, analyzed and transmitted is now an important part of most research programmes.

One of the most profound and most enduring implications of the rational expectations thesis is that which questions the validity or relevance of large-scale macro-econometric modelling for the analysis of policy measures (Brimmer and Sinai, 1981). That is, since large-scale macro-econometric models contain only estimates of true historical structural parameters, effects of new changes in policy are not captured hence such models cannot effectively analyze the impacts of economic policy. In essence, equations are missing from large-scale macroeconometric models that connect varying structural parameters to changes in policy. Such large econometric models, primarily Keynesian in orientation, derive coefficients which the model builder believes describe the constant structure

of the economy, and it is this assumption of constant structure which allows him to evaluate alternative policies by carrying out simulation exercises. But the rational expectations hypothesis suggests structural paramater changes in response to changes in the prevailing macroeconomic policy regime. This is due to the fact that a change in policy regime will change the process by which individuals form their expectations about the outcome of policy and will change the way that they react to the policy. In this sense, the imposition of constant values on coefficients which are not invariant to the policy regime is seen as a fatal flaw in the standard econometric model building approach and largely invalidates recommendations concerning policy changes. This, then, seriously questions much of the econometric modelling of macroeconomy which has become increasingly fashionable in recent years but whose predictive power appeared to have collapsed dramatically with the advent of stagflation during the 1970s and 1980s. This critique has come to be known as Lucas Critique, after Lucas (1976).

Also, both the new classical and nonclassical rational expectations models indicate that for an anti-inflation policy to be successful in reducing inflation at the lowest output cost, the public must believe (expect) that it will be implemented (credibility) (Mishkin, 1989). Table 2.3 summarizes the adaptive expectations, the new classical rational expectations, and the nonclassical rational expectations, model.

2.3.5 Rational Expections and Some Econometric Issues:

The first econometric issue is that testing rational expectations hypothesis directly by using sample or tendency surveys results in "error in variables" while consistent expectations may emerge when only a few "sophisticated" individuals operating in a market make the market function as if rational expectations were operating (Attfield et al, 1985; Gourieroux and Pradel, 1986). This has led to the favouring of measuring a rational expectation of a variable by its actual value and teasting imposed restrictions.

The other issue is that of "observational equivalence" where data cannot discriminate between two competing theories/models (Sargent, 1976a). Apart from

Table 2.3: A summary of the Three Models

Model	Response to Unanticipated Expansionary Policy	Response to Anticipated Expansionary Policy	Can Activist Policy Be Beneficial?	Response to Unanticipated Anti-Inflation Policy	Response to Anticipated Anti-Inflation Policy	Is Credibility Important to successful Anti-Inflation Policy?
The Adaptive Expectations Model	$Y\uparrow$ $P\uparrow$	$Y\uparrow$ $P\uparrow$ by same as when policy is unanticipated.	Yes	$Y\downarrow$ $\pi\downarrow$	$Y\downarrow$ $\pi\downarrow$ by same as when policy is unanticipated.	No
The New Classical Macroeconomic Model (Classical Rational Expectations Model)	$Y\uparrow$ $P\uparrow$	Y unchanged, $P\uparrow$ by more than when policy is unanticipated.	No	$Y\downarrow$ $\pi\downarrow$	Y unchanged, $\pi\downarrow$ by more than when policy is unanticipated.	Yes
The Non-classical Rational Expectation Model.	$Y\uparrow$ $P\uparrow$	$Y\uparrow$ by less than when policy is unanticipated $P\uparrow$ by more than when policy is unanticipated.	Yes, but is hard to design a beneficial policy.	$Y\downarrow$ $\pi\downarrow$	$Y\downarrow$ by less than when policy is unanticipated. $\pi\downarrow$ by more than when policy is unanticipated.	Yes

Note: Y = Aggregate output; P = Price level; π = inflation rate.

Source: Adapted from Mishkin (1989).

using prior knowledge of differing lag lengths of variables and breaks or changes in the process determining a variable, Mishkin (1982) has suggested that this identification problem can be overcome if the variables on the right hand side of a forecasting equation include lagged values of at least one other exogenous variable which does not appear separately in the reduced form solution.

Apart from the Lucas critique (policy invariance of a model structure), another econometric issue is the appropriate method of estimation when the regression equation includes constructed variables. It has been suggested that the full information maximum likelihood (FIML) estimator yields consistent and efficient estimates but this is under the proviso that the model is correctly specified, errors are normally distributed and the sample size be large.

2.3.6 Some Rational expectations Tests and Empirical Results:

In testing for the validity of rational expectations two difficulties are borne in mind: the incorporation of other assumptions such as price clearing postulates

(Shaw, 1987) and the problem of observational equivalence (Laidler, 1986).

In terms of evidence from sample surveys, testing the unbiasedness property, Mullineaux (1978, 1980) supports the rationality proposition while Turnovsky (1970), Pesando (1975), Pearce (1979), and Figlewski and Wachtel (1981) who investiagted the same data set for the United States have mixed conclusions and hence no clear case for or against rational expections emerges.

For a test of the efficiency property, Benjamin Friedman (1980) tests the interest rate expectations of a number of money market professionals and found that they reveal both biasedness and inefficiency.

As Prescott (1977) notes, expectations cannot be measured directly, they have to be inferred, hence Lucas (1973) investigates the unemployment - inflation trade offs across countries and finds that, in general, predictions of the theory are not entirely inconsistent with the data. Lucas' study has been extended by other authors, Alberro (1981), and Kormendi and Meguire (1984) with less than clear cut results. In general, countries experiencing extremely volatile demand impacts tend to

support the Lucas thesis. However, as Attfield et al (1985) note Lucas' test and its extensions are subject to measurement error and misspecification problems, quite apart from not testing for structural neutrality. Subsequent research such as Gordons' (1982) and Demery's (1984) that take these flaws into account have tended to reject the Lucas findings - for Gordon and Demery find that anticipated changes in aggregate demand had real effects in the United States and United Kingdom respectively, contrary to the central feature of Lucas' model. Alogoskoufis and Pissarides (1983) challenge the Lucas' result by arguing that price inflexibility is an important feature of the U.K. economy.

The other approach is that which stipulates that only unpredictable movements in aggregate demand will affect real variables such as real output or unemployment. This led Barro, in particular, to pursue a series of studies (Barro, 1977a, 1978a, 1979, 1980) aimed at separating the growth of the money supply into its anticipated and unanticipated components since monetary expansion and contraction are assumed to be the key

determinant of changes in the level of aggregate demand. In general, Barro's results support the rational expectations thesis. In similar and extensions of Barro's approach, Attfield et al (1981a, 1981b), Grossman (1979) Froyen (1979), Barro and Hercowitz (1980), Barro and Rush (1980), Neumann (1978), Korteweg (1978), Fratianni (1978), Dutton (1978), and Leiderman (1980), the results lend support to the findings of Barro. In a somewhat different approach, Sargent (1976) supports Barro's results too.

The results of Hanson (1980), Alogoskoufis (1982), Blejer and Fernandez (1983), and Chopra and Montiel (1986), generally support the new classical view of short-run output determination in various developing countries. Also Uba (1989) finds support for monetary neutrality on real output in the Nigerian case though he offers no satsifactory explanation for discarding the results of an equation which contradict this stance. In another important earlier study for Nigeria, based on both annual and disaggregated data, Odedokun's (1988) results reject the monetary neutrality proposition with respect

to aggregate output and inflation but weakly support it with respect to manufacturing output.

These findings have not gone unchallenged and such challenge has taken several forms. For example, Mishkin (1982a, 1982b) rejects the Barro results and demonstrates that anticipated changes in the monetary growth do exert real effects and moreover continue to do so over a considerable period of time. He shows that Barro's results depend crucially on the length of the lag allowed for in modelling the influence of money on output.

In a rather different approach, Pesaran (1982) rejects a modified Barro model in favour of one displaying "Keynesian" features. He argues that existing econometric tests are weakened by their failure to consider "at least one genuine alternative" (p. 535). He demonstrates that whilst the Barro model is consistent with the data, a Keynesian specified model is even more consistent with the data and therefore is logically to be preferred. Minford et al (1980), and Fair's (1979) results also reject Barro's results.

Garner (1982) provides mixed rejection of the rational expectations results for the U.K. Recent studies by Horne and McDonald (1984), Driscoll et al. (1983); Akerlof and Yellen (1985), Cecchetti (1986), Darrat (1987), and Siegloff and Groenewold (1987) reject the Barrow results too. In a recent study, Alexander (1990) strongly rejects the rational expectations hypothesis for the German economy, as did Rao and Srivastava (1989) for Australia.

With respect to government purchases, Barro (1981) finds that expansionary output effect for temporary purchases exceeds that of permanent purchases. Again, Fitzgerald (1982) finds that fiscal policy is non-neutral, that is, fiscal variables are consistent and rational functions of the behaviour of the economy using the six largest industrialized economies, and that fiscal policy seems to have a consistent impact on subsequent real economic activity and prices. Again, Odedokun's (1989) findings contradict the rational expectations hypothesis (REH) as cyclical movements in each of four real output categories were better explained by anticipated fiscal policy actions proxies (expenditure-GDP ratio and public domestic debt) hence the scope for discretionary fiscal

policy in Nigeria was concluded to remain unshaken.

Attfield and Duck (1983) combine the Lucas and Barro approaches and test both predictions at the same time. Their results do not reject the rational expectations hypothesis. Kormendi and Meguire (1984) reach broadly the same conclusion using a similar model but with a much larger sample of forty-seven countries.

With respect to other developing nations, Hanson's (1980) positive rational expectations results for five Latin American countries are disputed by Edwards (1983). Montiel's (1987) results for Mexico are mixed. Adverse results are also reported by Sheehey (1984) for the majority of cases in his fifteen-country sample of Latin American countries. Also, Shostak (1981) strongly rejects the rational expectations proposition in the South African economy though Kantor and Ruskin (1982) state that his methodology is unsatisfactory both on theoretical and empirical grounds. However, as Shostak (1982) shows in his reply, the critiques offer no alternative.

2.3.7 Criticisms of the Rational Expectations Revolution:

Criticisms of rational expectations take various dimensions. These include attacks on the concept

itself, its assumptions and characteristics, its implications, and models and tests.

To Simon (1978), using "rational expectations" rather than the more neutral "consistent expectations" for the 'rational expectations' models which pass over the problems of procedural rationality and ignore potential coalitions, will be providing them with a rather unwarranted legitimation. This probably influences Lucas' (1980) preference for "contingent claim" interpretation though he sees such criticisms as "vulgarity in economics".

There is also the argument of the implausibility of rationality since it is not plausible for the typical individual to be sufficiently sensible to use all the available information about the process determining a variable - due to ignorance. The reply is that rationality is judged on the accuracy of its predictions while others (say professionals) can form expectations for an individual. However, as Grossman and Stigliz (1980), and Bray (1983) note when arbitrage is costly informationally efficient markets become impossible hence Feige and Pierce (1976) argue that such costs should be

taken into account and with this done "rationality" assumption is flawed.

Fellner (1980) and Shiller (1978) point out the inability of economic agents to learn the required information and formulate the correct model of the economy.

Arrow (1978) points out that the rational expectations assumptions imply requiring economic agents to be superior statisticians, capable of analyzing the future general equilibrium of the economy. Brimmer and Sinai (1981) note that this is a difficult pill to swallow since not even elaborate, detailed specifications of economic processes that incorporate large bodies of data have achieved a sufficient degree of success in describing the economy.

The applicability of rational expectations is also being questioned especially in exceptional, unusual or non-recurring processes/events.

Despite Willes (1981), and Sargent and Wallace (1975) insistence on free information announcement, Anderson (1986), King (1982, 1983), Shiller (1978), Okun (1980), Harris and Holmsstrøm (1983) note that

the government may use an "information advantage" (asymmetric information) to influence the variance of real variables. Yet Weiss (1980) and Turnovsky (1980) make a case for the effectiveness of stabilization policy when some groups in the private sector possess better information than others.

On the issue of testability of rational expectations, the phenomenon of "observational equivalence" has led Pesaran (1982) to argue that research so far carried out by the rational expectations school fails to provide any empirical basis for abandoning the Keynesian explanations of unemployment, for instance.

With respect to the impotence proposition, room is said to be created for discretionary strategy when the government faces a credibility problem (Kantor, 1979; Shaw, 1987; Backus and Driffill, 1985).

However, Barro (1985) sees the uncommitted policy-maker masquerading as committed initially for reputation enhancement but his actions become subsequently anticipated.

As Neary and Stigliz (1983) argue, once the assumption of price flexibility is dropped the conventional Keynesian policy prescription re-emerges and in

some cases its potency is reinforced because of the assumption of rationality. A good deal of models have been developed exhibiting varying degrees of wage and price flexibility, such as Phelps and Taylor (1977), Fischer (1977), Muellbauer and Portes (1978), McCallum (1977, 1978), Burmeister (1980), Horne and McDonald (1984). The critique of sluggish price movements has been attacked by McCallum (1979b) by arguing that the rational expectations model does not rule out price level stickiness since it permits a many-period, distributed-lag response of the price level changes to the money stock.

Fischer (1977), Laidler (1982), Cagan (1980), Benjamin Friedman (1979), Fischer (1980), and Buiter (1980a,b) show that due to long-term contracting the neutrality proposition breaks down, which compelled a notable advocate of rational expectations to write that "the potential usefulness of activist policy rules in dampening fluctuations --- may survive the rational expectations revolution" (McCallum, 1980: 738). However, Willes (1981) insists that to avoid exploitation agents would insists on short-term contracts or escalator clauses.

Tobin (1980), and Green and Laffont (1981) also see the continous market - clearing assumption as unrealistic since as Arrow (1978) notes agents confront quantity constraints in both labour and commodity markets - though Okun (1980) opines that rational economic agents may not actively seek the market clearing price especially in the labour market.

Burmeister (1980) argues that rational expectations paths are not always convergent paths hence for policy evaluation we should not be limited to equilibrium models, and while not suggesting that disequilibrium "speed-of-adjustment" models are necessarily better suited for policy evaluation, we should regard the question as open, meriting further serious theoretical analysis and empirical investigation. Tobin (1980: 797) also argues for avoidance of the "substantive emptiness of general equilibrium models" since to him classical theory like a lamppost, is applicable only to one area and unable to solve our macroeconomic problems. But Willes (1981) argues that this is underestimating the capabilities of equilibrium modelling since one should not "grope in the dark when a light is available" (p. 92).

Torr (1984) disagrees since such models were even under attack before the rational expectations revolution.

In Haberler's (1980) rejection of the hard-line version of the rational expectations proposition, he argues for a post-Keynesian consensus (a moderate monetarist position and Fellner's credibility hypothesis) that in the short-run, even after a long period of inflation, monetary and fiscal policies are still effective though they become less and less effective the longer the inflation lasts because money illusion erodes and inflationary expectations become stronger.

Peel (1981) argues also that there is scope for active fiscal and monetary policies when future expectations enter the IS schedule of the Sargent-Wallace and Lucas models. He shows that, in this case, in general the authorities are able to influence the variance of both output and prices hence rational expectations per se do not provide any real support for the view that the authorities should abandom activist stabilization policy. He opines that the intellectual support for such a case must be sought elsewhere such as on welfare grounds.

To Perry (1984), the rational expectations hypothesis amounts to a kind of "studied neglect" entailing clear costs and risks. He argues that it is bad science to build models that are inconsistent with the facts [as Modigliani (1977) also notes] because they fit a particular theory - the tension between observed facts is nowhere more evident than in attempting to integrate Walrasian market clearing and macro-economics. Given this situation, he argues that it is the particular theory that should be replaced.

Conclusively, as Kristol (1981) notes, as Economics sheds what current 'revisionists' critics see as its pseudoscientific aspects and its scope shrinks correspondingly, "it will be more genuinely scientific, only it will be more scientific less of the human world" (p. 203).

CHAPTER 3

AN OVERVIEW OF MONETARY AND FISCAL POLICIES IN NIGERIA, 1970 - 1988

3.1 INTRODUCTION

The period, 1970 to 1988, corresponds to the period of the Second, Third and Fourth National Development Plans, and the introduction/operation of the Structural Adjustment Programme (SAP) in Nigeria for two years. The objective here is the examination of the monetary and fiscal policy goals and tools applied in Nigeria within the period as reflected in the three National Development Plans and Annual Budgets, emphasizing the *a priori* expectations and actual performance.

3.2 MONETARY POLICY MEASURES IN NIGERIA, 1970 - 1988

Within the period under review, monetary policy was accorded due recognition in the management of the nation's economy and hence was assigned specific objectives in the plan documents and annual government budgets. For instance, the Second National Development Plan (1970-74) contains three objectives while the Third National Development Plan (1975-80) and Fourth

National Development Plan (1981-85) provided two objectives each for monetary policy as shown in Table 3.2a below.

Table 3.2a: Objectives of Monetary Policy, 1970-85.

Second National Development Plan (1970-74)	Third National Development Plan (1975-80)	Fourth National Development Plan (1981-85)
a) Maintenance of confidence in the Nigerian currency through measures to stabilize domestic wages and prices.	(a) To control inflation.	(a) To promote the expansion of productive capacity.
b) Support for increasing levels of agricultural and industrial output.	(b) To correct the maladjustment in the monetary sector.	(b) To control inflation.
c) Effective arrangements for supplementing current government revenue and for providing development finance		

Sources: Second, Third and Fourth National Development Plans.

For the period, 1986 to 1988, (for which no National Plan existed), the specific monetary policy objectives are summarised in Table 3.2b.

Table 3.2b: Objectives of Monetary Policy, 1986 - 88

1986	1987	1988
a) To substantially reduce the high rate of unemployment.	(a) Moderation of inflationary pressures due to naira depreciation.	(a) To stimulate growth in national output.
b) To accelerate rate in national output.	(b) Stimulation of demestic financial savings.	(b) To create more employment.
c) Moderation of inflationary pressures.	(c) Encouraging foreign capital in-flow.	(c) To enhance financial savings and efficient resources allocation.
d) Stimulation of increased financial savings and capital formation.	(d) Increasing export earnings from non-oil sources.	(d) To moderate the rate of price inflation.
e) Expansion and diversification of the export base in order to restore a healthy balance of payments position.	(e) Stimulation of local production of goods and services.	(e) To improve the balance of payments position.
	(f) Ensuring improvement in the balance of payments.	

Sources: Federal Government of Nigeria Annual Budgets, 1986, 1987 and 1988.

The monetary control tools which were applied at various times by the Central Bank of Nigeria could be categorized into three, viz: quantitative tools, cost tools, and directional tools (Nwankwo, 1980). The quantitative tools are reserve requirements (liquidity ratios, cash reserve requirements/ratio, variable liquidity assets ratio, stabilization securities and special deposits). The cost tools are rediscount rate and other interest charges, while the directional tools are the credit guidelines/direct control of credit.

3.2.1 Reserve Requirements

For the period under review, the liquidity ratio was maintained at 25% until July 31, 1987 when the Central Bank announced the deregulation of interest rates, consequent upon which it (the liquidity ratio) was raised to 30% (with effect from August, 1987). This was revised downwards to 27.5% for commercial banks, and fixed at 20% for merchant banks in 1988.

In 1976/77 cash ratios (defined as cash/demand deposits) ranging between 5% and 12.5% were imposed on the commercial banks on the basis of four - group

classification based on the size of total deposit liabilities of the banks. These ratios were reduced to between 2.5% and 6.25% in 1979 and by 1985 they stood at between 2% and 5% for small and big banks. However, in 1988 these supplementary cash reserve ratios for the various categories of commercial banks were raised by 2% respectively.

The money restraining measures in the monetary policy instruments included those which sought to freeze imports' "advance deposits" made with Banks to obtain letters of credit and the imposition of stabilization securities on the Banks. With respect to the advance deposits, banks were requested to deposit with the Central Bank customers' deposits are ineligible for meeting statutory liquid assets reserve requirements. In 1976, stabilization securities were established for banks at 4% interest which increased to 4½% the succeeding year. Though phased out in 1979 and later reintroduced, the stabilization securities were meant to effectively reduce the size of the free reserves on which banks

base their credit operations, and hence to reduce the high rate of inflation in the economy.

3.2.2 Rediscount rate and Interest rate Structure

As table 3.2c shows the Central Bank minimum discount rate stood at 4½% between 1970 and 1975 when it was reduced to 3½% for the second part of 1975 but again increased the following year. By July 31, 1987 it stood at 11.0% but following the deregulation of interest rates it was increased to 15% (August) though revised downwards to 12.7% in December 1987 and 1988. The treasury bill rate ranged from 4% in 1970 to $11\frac{3}{4}$% (minimum) in 1988. Comparable adjustments were made in the treasury certificate rates.

Commercial bank deposit rates ranged between 3% to 4% in 1970 to between 12/13% to 13/15% in 1988. Commercial bank savings rates ranged from 3% in 1970 to between 12% and 12½% in 1988, while commercial banks' lending rates ranged between 7% and 8% in 1970 to between 11% and $19\frac{1}{4}$% in 1988 (see table 3.2c).

It is also important to note that interest rates in Nigeria were directly managed by the monetary authorities until August 1, 1987 when they were deregulated.

Table 3.2c: Selected Predominant Interest Rates (Percentage)

Description	1970	1971	1972	1973	1974	1975	1976	1977	1978
CENTRAL BANK									
Min. Rediscount Rate	4½	4½	4½	4½	4½	4½,3½	3½	4	5
Treasury Bills Rate	4	4	4	4	4	4,2½	2½	3	4
Treasury Certificate									
a) One-year maturity	4½	4½	4½	4½	4½	4½	3	3½	4½
b) Two-year maturity	4⅝	4⅝	4⅝	4⅝	4⅝	4⅝	3⅝	3⅝	4⅝
COMMERCIAL BANKS									
1. Deposit Rates									
a) Time									
i. 3 months	3	3	3	3	3	3	3,2½	3½,3	2,4¾
ii. 3-6 months	3	3	3½	3½	3½	3,3½	3,3½	3½,3	2,5
iii. 6-12 months	4½	3½	3½,4	3½	3½,4	3,3½	3,3½	2½,3	2,5¼
iv. Over 12 months	3,4	4	4	4	4	4	3,3½	3,3½	3,5½
b) Savings rates	3	3	3	3	3	4	4	4	4,5
2. Lending rates									
a) First Class Advances	7	7	7	7	7	6	6	6	7
b) Produce Advances	7,7¾	9	10	10	10	9	8	6	11
c) Other Advances	7½,8	10	10	10	10	9	10	6	11
Federal Savings Bank	2½	2½	2½,4	4	4	4,5	5	5	5

Table 3.2c (cont'd)

Description	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
CENTRAL BANK										
Min. Rediscount Rate	5	6	6	8	8	10	10	10	11*,15*,12¾*	12¾*
Treasury Bills Rate	4	5	5	7	7	8½	8½	8½	10,14,11¾	11¾
Treasury Certificate										
a) One-year maturity	4½	5½	5½	7½	7½	9	9	9	10½,14½,12¼	12¼
b) Two-year maturity	4⅝	6	6	8	8	9½	9½	9½	11,15,12¾	12¾
COMMERCIAL BANKS										
1. Deposit Rates										
a) Time										
i. 3 months	4¾	5¾	5½	7¼	7¼	9¼	9¼	9¼	9¼,16½	12-14
ii. 3-6 months	5	6	6	7½	7½	9½	9½	9½	9½-16¾	13-16
iii. 6-12 months	5¼	6¼	6¼	7¾	7¾	9¾	9¾	9¾	9¾ -11½	14-16
iv. Over 12 months	5½	6½	6½	8	8	10	10	10	10-17¾	13-15
b) Savings	5	6	6	7½	7½	9½	9½	9½	11**Neg.	Neg.
2. Lending rates										
a) First Class Advances	7½	7½	7¼	10¼	10	12½	9¼	10½	15*-20½	11-19¼
b) Produce Advances	9	8½	9¾	7¾	9¾	7	8½	10½	14 Negotiable	
c) Other Advances	11	9½	10	11¾	11½	13	11¾	12	14 Negotiable	
Federal Savings Bank	5	6	6	7½	7½	9½	9½	9½	11* Negotiable	

Sources: Central Bank of Nigeria, Nigeria's Principal Economic & Financial Indicators, 1970-1987; and Annual Report and Statement of Accounts, 31st December, 1988.

Neg. = Negotiable

Before then, the practice in Nigeria made it possible for the government to set the deposit and lending rates of the financial intermediaries at their prevailing levels. For instance, lending rates of the Nigerian Agricultural and Co-operative Bank (NACB), NIDB, NBCI and Federal Mortgage Bank were lower than those of other financial intermediaries. In addition, the practice made it possible for the government to set the rates for lending to specified sectors of the economy with a view to encouraging (or discouraging) lending to those sectors. It was in this sense that lending rates to agriculture, residential building construction, and small-scale industries were lower than the rates for other borrowers.

3.2.3 Direct Control of Credit/Guidelines:

In order to achieve the desired goals of macro-economic policy and Development Plans and especially to combat inflationary pressures, the Central Bank of Nigeria relied heavily on the use of credit guidelines. Between 1970 and 1972, the policy took the form of credit ceilings which were set for each broad sector. In 1972, this approach was abandoned (later to be reintroduced

in 1976) in favour of new guidelines which indicated the proportions of total credit to be made available to the various economic sectors. The Central Bank prescribes sectoral and sub-sectoral allocation of credit in such a way that available bank loans and advances are allocated to the borrowing sectors and sub-sectors in accordance with the desired objectives of policy. For the purpose of such sectoral and sub-sectoral allocations of credit, the sectors and sub-sectors are categorized into "preferred sectors" and "less-preferred sectors" (or "Production", "General Commerce", "Services", and "Others"). Thus, credit expansion by commercial banks ranged from 20% in 1970/71 to 8% in 1988 while their prescribed percentage of loans and advances stood at 50% each to "high priority sectors" and "other sectors" in 1988 (see Table 3.2d below for prescribed and actual performance). Table 3.2e shows bank credit allocations to the private and government sectors for the period under review, while Table 3.2f shows actual commercial and merchant banks' loans and advances to the economy.

Banks are also required to provide a specified proportion of the available credit to indigenous

Table 3.2d: Commercial Banks' Loans and Advances Classified by Purpose in Percentages (Credit Guidelines Performance, 1970-1988).

Sectors	Percentage Distribution of Aggregate Loans and Advances													
	1970		1971		1972		1973		1974		1975		1976	
	R*	A*	R*	A*	R*	A*	R*	A*	R*	A*	R*	A*	R*	A*
1. Production/ Preferred Sector	45.0	60.1	30.0	8.1	45.6	38.1	45.0	38.2	45.0	43.6	48.0	44.2	48.0	52.1
2. General Commerce	10.0	12.6	5.1	39.6	32.0	35.7	32.0	34.4	32.0	30.0	32.0	30.4	30.0	25.1
3. Services	50.0	64.2	11.2	74.0	11.0	7.7	11.0	8.2	11.0	7.5	10.0	7.5	10.0	9.2
4. Others: Less Preferred Sector	0.0	31.0	33.6**	48.1	12.0	18.5	12.0	19.2	12.0	18.9	10.0	17.9	12.0	13.6

Table 3.2d (cont'd)

Sectors	Percentage Distribution of Aggregate Loans and Advances											
	1977		1978		1979		1980		1981		1982	
	R*	A*	R*	A*	R*	A*	R*	A*	R*	A*	R*	A*
1. Production/ Preferred Sector	48.0	53.2	50.0	55.6	53.0	59.3	75.0	70.8	75.0	69.3	76.0	67.9
2. General Commerce	30.0	23.8	28.0	21.6	24.0	19.2	-	-	-	-	-	-
3. Services	10.0	9.3	10.0	8.2	11.0	8.2	-	-	-	-	-	-
4. Others: Less Preferred Sector	12.0	13.7	12.0	14.6	12.0	13.3	25.0	29.2	25.0	30.3	25.0	30.7

Table 3.2d (cont'd)

Sectors	Percentage Distribution of Aggregate Loans and Advances											
	1983		1984		1985		1986		1987		1988	
	R*	A*	R*	A*	R*	A*	R*	A*	R*	A*	R*	A*
1. Production/ Preferred Sector	76.0	67.9	75.0	68.2	75.0	68.4	78.0	69.2	50.0	41.9	50.0	45.4
2. General Commerce	-	-	-	-	-	-	-	-	-	-	-	-
3. Services	-	-	-	-	-	-	-	-	-	-	-	-
4. Others: Less Preferred Sector	24.0	32.1	25.0	31.8	25.0	31.6	22.0	30.8	50.0	50.1	50.0	54.6

Note: R* = Required/Prescribed Percentage Allocation A* = Actual Percentage Allocation

From 1980, the classifications were "Preferred Sectors" and "Less-Preferred Sectors".

Sources: (a) Second (1970-74), Third (1975-80) and Fourth (1981-85) National Development Plans

(b) Central Bank of Nigeria, Twenty Years of Central Banking in Nigeria, 1979.

(c) Central Bank of Nigeria, Annual Report and Statement of Accounts (Various Years).

Table 3.2e : Banking System Credit (₦'m), 1970-1988

Year	Aggregate Credit	Credit to Private Sector	Credit to Govt. Sector	Credit by Central Bank	Credit by Commerical Banks
1970	1,140.4	544.6	662.4	640.8	726.0
1971	1,122.6	591.2	531.4	689.4	792.0
1972	1,269.2	750.2	519.0	265.7	999.6
1983	1,342.5	845.4	497.1	223.8	1,114.1
1974	-463.9	1,070.2	-1,534.1	-2,039.3	1,570.7
1975	488.6	1,770.1	-1,281.5	-1,600.8	2,083.3
1976	2,617.3	2,417.8	199.5	-337.6	2,948.1
1977	5,608.8	3,514.4	2,094.4	1,501.9	4,098.9
1978	8,059.9	4,723.0	3,336.9	2,821.1	5,238.8
1979	8,855.3	5,416.8	3,438.5	1,814.0	7,041.3
1980	10,780.1	7,190.0	3,589.2	1,713.2	9,066.9
1981	16,261.4	9,654.2	6,607.2	5,491.2	10,770.1
1982	21,899.7	11,371.5	10,528.2	8,475.0	13,424.7
1983	28,178.4	12,353.9	15,824.5	11,591.0	16,587.4
1984	31,136.5	12,942.0	18,194.5	10,711.5	20,425.0
1985	32,680.3	13,700.2	18,980.1	10,265.3	22,245.0
1986	36,820.3	17,365.0	19,455.3	16,510.8	20,309.5
1987	42,082.0	19,817.0	22,265.0	16,210.8	25,871.2
1988	57,326.3	29,773.6	27,552.7	24,185.7	33,140.5

Sources: Central Bank of Nigeria, Economic and Financial Review, Various Years; and Annual Report and Statement of Accounts, Various Years.

Table 3.2f: Commercial and Merchant Banks' Loans and Advances (₦m), 1970-1988.

Year	Commercial Banks' Loans & Advances	Merchant Banks' Loans & Advances
1970	351.3	-
1971	502.0	-
1972	619.5	-
1973	753.5	-
1974	938.1	-
1975	1,537.3	80.7
1976	2,122.9	96.4
1977	3,074.6	109.6
1978	4,109.7	194.2
1979	4,624.4	226.2
1980	6,349.1	400.2
1981	8,582.9	712.0
1982	10,277.0	1,026.8
1983	11,093.9	1,485.5
1984	11,503.5	1,686.0
1985	12,170.3	1,802.9
1986	15,701.5	2,771.5
1987	17,530.9	4,165.8
1988	19,461.2	4,289.8

Sources: Central Bank of Nigeria, Economic and Financial Review, Various Years.

borrowers. The proportion of total loans to indigenous borrowers has been set at 90% out of which 16% must be reserved for small-scale enterprises wholly-owned by Nigerians.

Another aspect of banks' credit allocation relates to the stipulation that not less than 40% (by 1985-87) or 45% (in 1988) of total deposits collected through the banks' rural branches should be lent to customers in those rural areas.

3.2.4 Money Supply:

The posture of credit ease and cheap money as well as movement in government expenditure have inevitably resulted in the rapid expansion of the money stock. Between 1970 and 1988 the money supply (M_1), that is, currency in circulation plus demand deposits of commercial banks plus domestic deposits with the Central Bank, less Federal Government deposits at commercial banks, increased from ₦608.3m to ₦20,052.6m or by 96.97%. Using the broader definition of money supply (M_2) which includes M_1 and quasi-money (the sum of savings and time deposits with the commercial banks), an even greater rate of

increase (97.51%) was recorded in the same period (i.e from ₦956.9m to ₦38,449.9m). Table 3.2g summarises the trend for the period under review.

3.3 FISCAL POLICY MEASURES IN NIGERIA, 1970-1988

The pace of expansion in the monetary aggregates observed during the period under review depended largely on the type of actions taken by the Government in a bid to attain the objectives of fiscal policy. Such objectives are usually stated in National Development Plans and in Annual Government Budgets (see tables 3.3a and 3.3b).

In Nigeria, the major fiscal policy instruments include changes in taxation rates (on personal income, company income, petroleum profits, capital gains, import duties, export duties and excise duties, as well as mining rents, royalties and NNPC earnings), government expenditure (recurrent and capital) and public debt. These taxes along with interests and repayments, and licences and fees constitute government revenue. Such taxes are imposed not only to generate revenue but also to provide incentives and/or disincentives in certain

Table 3.2g: Money Supply (₦m).

Year	Currency in circulation	Currency Outside Banks	Demand Deposits	Money Supply (M_1)	Quasi Money	Money Supply (M_2)
1970	370.4	342.3	266.0	608.3	348.6	956.9
1971	406.4	354.5	274.4	628.9	376.4	1,005.3
1972	414.0	385.2	315.0	700.2	461.1	1,161.4
1973	486.3	435.9	391.3	827.2	586.8	1,414.0
1974	638.7	569.8	608.5	1,178.3	977.9	2,156.2
1975	1,155.5	1,030.7	1,013.4	2,044.1	1,580.5	3,624.6
1976	1,540.0	1,361.2	1,941.8	3,293.0	1,986.1	5,279.1
1977	2,162.6	1,593.5	2,453.9	4,047.4	2,263.1	6,310.5
1978	2,381.6	2,157.2	2,628.6	4,785.8	2,609.8	7,395.6
1979	2,703.4	2,350.8	3,795.8	6,146.6	3,709.8	9,857.2
1980	3,589.5	3,185.9	6,040.9	9,226.8	5,170.5	14,397.4
1981	4,347.7	3,861.9	5,883.0	9,744.9	5,803.2	15,548.1
1982	4,728.8	4,222.4	5,826.2	10,048.6	5,842.2	16,894.0
1983	5,299.3	4,842.8	6,439.6	11,282.4	8,088.7	19,368.9
1984	5,347.1	4,883.5	7,320.6	12,204.1	9,404.4	21,600.5
1985	5,375.0	4,909.9	8,357.9	13,267.8	10,550.8	23,818.6
1986	5,696.3	5,177.9	7,927.1	13,267.8	11,487.7	24,592.7
1987	6,854.9	6,296.6	8,607.3	14,905.9	15,088.7	29,994.6
1988	10,210.5	9,412.2	11,736.3	21,148.6	21,691.7	42,780.3

Sources: Central Bank of Nigeria's Principal Economic & Financial Indicators 1970-1987; and Economic & Financial Review (Various Years).

Table 3.3a: Objectives of Fiscal Policy, 1970-88.

Second National Dev. Plan (1970-74)	Third National Dev. Plan (1975-80)	Fourth National Dev. Plan (1981-85)
a) To make available for financing economic development the maximum flow of material resources consistent with minimum consumption requirements.	(a) Mainly to reduce inflationay pressures.	(a) To encourage domestic production.
b) To maintain reasonable economic and political stability in the face of inherent inflationary pressure.		(b) To contain inflationary pressure.
c) To minimize existing inequalities in wealth, income and consumption standards which may tend to undermine production efficiency, offend a sense of social justice and endanger political stability.		(c) To raise additional revenue

Sources: Second, Third and Fourth National Development Plans.

Table 3.3b: Objectives of Fiscal Policy, 1986-88:

1986	1987	1988
a) To substantially reduce government budget deficit.	(a) To promote economic growth.	(a) To reflate the economy.
b) To generate increased revenue.	(b) To lessen the continued heavy dependence on the oil sector as the main source of foreign exchange earning and government revenue.	(b) To provide for economic growth.
c) To improve effective control and efficiency in government fiscal operations.	(c) To check high inflation and unemployment levels.	(c) To generate employment.
	(d) To fight the twin issues of low productivity in agriculture and low capacity utilization in manufacturing.	(d) To improve the general well-being of Nigerians.
	(e) To reduce over-stretched economic and social infrastructures.	
	(f) To reduce the heavy burden on both external and internal debts.	
	(g) To correct the distorted patterns of both domestic consumption and production.	

Sources: Federal Government of Nigeria Annual Budgets, 1986, 1987 and 1988

specific socio-economic activities. Tariff rates are also varied not only to regulate the external sector of the economy but also to encourage domestic production as well as to protect domestic (particularly infant) industries.

On the other hand, government expenditures constitute an instrument for direct resource allocation while generating employment opportunities and influencing the general price level as well as determining the extent of fiscal deficit or surplus each fiscal year. It is the public debt (domestic and external) which bridge the financial gaps by supplementing domestic resources, and aiding capital formation.

3.3.1 Taxation

The basic personal income tax (PIT) law in Nigeria is the ITMA (1961) with subsequent amendments. Before 1975, the determination of PIT rates and personal reliefs and allowances was under the jurisdiction of the regional/state governments.

In 1975 uniform rates of tax and deductions were imposed throughout the country via Income Tax Management (Uniform Taxation Provisions, etc) Decree, 1975.

The major changes in the 1975 rate structure occurred in 1977 and 1987 as shown in table 3.3c.

In 1987, personal allowances were raised in order to ameliorate the tax burden on tax payers and these were retained in 1988. Tables 3.3c and 3.3d show PIT rates (1975-88) and personal allowances and reliefs (1975-1987).

In the area of company income tax, in 1975, profits less than ₦6,000 were tax-free, profits in excess of ₦6,000 but less than ₦10,000 were taxed at 45%. The rate was increased to 50% in 1978 but reduced to 45% the following year. In 1982, it took the form of maximum of 2% based on turnover or 45% of taxable profit, whichever was higher. The turnover tax was abolished in 1985. But in 1987, the rate of company income tax was reduced from 45% to 40% while graduated tax free dividends were allowed to individuals.

Of all the fiscal policy tools, it is the tariff measures that have been most often changed. Such fluctuations reflect similar trend in the nation's external earnings. In fact, when prospective earnings are high, a liberalization approach is adopted but restrictive

Table 3.3c: Changes in personal income tax rates, 1975-1987.

Income to be Taxed		Rate of Tax (%)		
		1975	1977	1987
For every naira of the first	₦2,000	10	10	10
For every naira of the next	₦2,000	15	15	15
" " " " " "	₦2,000	20	20	20
" " " " " "	₦2,000	25	25	25
" " " " " "	₦2,000	30	30	30
" " " " " "	₦5,000	35	35	35
" " " " " "	₦5,000	40	40	40
" " " " " "	₦10,000	45	45	45
" " " " " "	₦10,000	n.a.	n.a.	50
For every naira over	₦30,000	50	70	n.a
" " " "	₦40,000	n.a.	n.a.	55

n.a. = not available.

Source: Income Tax Management Act, 1961 (with Amendments up to 1987).

Table 3.3d: Changes in personal allowances and reliefs, 1975-1987

	Personal Allowance	Wife's/ Alimoney Allowance	Children's Allowance[1]	Dependents Allowance
1975	₦600	₦300	₦250	₦400
1977-79	₦600 if earned income < ₦2,500, ₦1,200 or ₦600 plus 10% of earned income, if earned income > ₦2,500.	₦300	₦250	₦400
1985	₦1,200 if income < ₦6,000 ₦1,200 + 12.5% of income in excess of ₦6,000	₦300	₦250	₦400
1987	₦1,000 + 12.5% of earned income	₦500	₦400	₦600

1. Rate per child, up to a maximum of 4 children.

Source: Income Tax Management Act, 1961 (with Amendments up to 1987).

measures are taken when induced import demand exceeds the import capacity.

Thus, in order to reduce the inflationary pressure consequent upon increased aggregate demand on the economy imports were liberalized in 1971 though a six months' ban was in force on some selected items. In 1977, some import duty rates were raised while others were lowered. These lasted until 1980 when reduction in rates from 10-25% to 5-15% was made to liberalize imports for certain specific commodities. From 1979, some other commodities were placed on the prohibition list. In 1981, duties were once more increased until 1984 when the range of import duties was reduced and allowed to last for three years. In 1986, adjustments were made in customs and excise tariff to give advantage to locally assembled agricultural equipment, while some items were placed under ban. In 1987, three import duty surchages earlier abrogated in 1986 were reintroduced while a comprehensive customs and excise tariff review was completed in 1987. Though a more liberalized trade regime came into force, a number of

items were placed on import and export prohibition. In 1988, the comprehensive tariff structure was adopted (designed to last for seven years), partly to provide higher degree of protection to local industries and make for continuity. There was a reduction in the number of excisable products from 412 to 182. The harmonized commodity and coding system (H.S) was incorporated into the new tariff structure while anti-dumping tariff on certain items came into force.

A notable development since 1972 is the displacement of indirect taxation by direct taxation as a major source of government current revenue as a result of the growth of mining operations, particularly the oil sub-sectors (see Tables 3.3e and 3.3f). Company and personal income taxes are not yet a significant source of government revenue in Nigeria as reflected in Table 3.3g. Personal income tax suffers from the problem of tax evasion, narrowness of the base and some defects in the structure. Also, the insignificant level of revenue from company tax reflects, among other things, the narrowness of the industrial sector, the generous tax incentives offered to attract foreign private capital investment into Nigeria, tax evasion and avoidance and inefficient administration.

Table 3.3e: Nigeria: Federally Collected Revenue and Indirect Taxes (1970-1988) [₦ million]

Year	Total Revenue	Indirect Taxes	Import Duties	Excise Duties	Export Duties
1970	633.3	369.4	215.5	112.6	41.2
1971	1,168.3	491.0	284.8	168.5	37.7
1972	1,405.1	481.1	274.4	179.8	26.9
1973	1,695.3	516.2	307.9	196.0	12.3
1974	4,537.4	498.3	328.3	164.4	5.6
1975	5,514.7	760.7	629.4	125.5	5.8
1976	6,765.9	882.8	724.3	152.4	6.1
1977	8,039.0	1,142.4	902.2	236.0	4.2
1978	7,371.0	1,698.3	1,436.3	259.2	2.8
1979	10,912.4	1,143.9	870.6	273.1	0.2
1980	15,234.0	1,813.5	1,470.2	406.2	0.1
1981	12,180.2	2,535.5	1,880.9	654.6	-
1982	11,764.4	2,482.7	1,801.7	680.7	0.3
1983	10,508.7	1,985.2	1,114.8	869.3	1.1
1984	11,191.2	1,616.0	924.0	690.8	1.0
1985	14,606.1	2,183.5	1,199.0	978.9	5.6
1986	12,302.0	2,346.9	1,298.7	1,041.4	6.8
1987	25,099.8	3,540.8	2,222.9	814.4	3.5
1988	27,310.8	4,264.1	3,360.1	891.2	18.8

Sources: (i) Central Bank of Nigeria, Nigeria's Principal Economic and Financial Indicators 1970-1987.

(ii) Central Bank of Nigeria, Annual Report and Statement of Accounts, various issues, Lagos.

Table 3.3f: Percentage contributions of revenue from indirect taxes, 1970-1988.

Year	$\frac{IT}{TR}$	$\frac{ID}{TR}$	$\frac{ID}{IT}$	$\frac{ED}{TR}$	$\frac{ED}{IT}$
1970	58.33	34.02	58.34	17.78	30.48
1971	42.03	24.38	58.00	14.42	34.32
1972	34.24	19.53	57.04	12.80	37.37
1973	30.45	18.16	59.65	11.56	37.97
1974	10.98	7.24	65.88	3.62	32.99
1975	13.79	11.41	82.74	2.28	16.50
1976	13.05	10.71	82.05	2.25	17.26
1977	14.21	11.22	78.97	2.94	20.66
1978	23.04	19.49	84.57	3.52	15.26
1979	10.48	7.98	76.11	2.50	23.87
1980	11.90	9.65	81.07	2.67	22.40
1981	20.82	15.44	74.18	5.37	25.82
1982	21.10	13.31	72.57	5.79	27.42
1983	18.89	10.61	56.16	8.27	43.79
1984	14.44	8.26	57.18	6.17	42.75
1985	14.95	8.20	54.91	6.70	44.83
1986	19.08	10.56	55.34	8.47	44.37
1987	14.11	10.85	76.90	3.24	23.00
1988	15.61	12.30	78.80	2.26	20.90

Note: IT/TR = Percentage contribution of indirect tax revenue to federally collected revenue.
ID/TR = Percentage contribution of income from import duties to federally collected revenue.
ID/IT = Percentage contribution of income from import duties to indirect tax revenue.
ED/TR = Percentage contribution of earnings from excise duties to federally collected revenue.
ED/IT = Percentage contribution of earnings from excise duties to indirect taxes.

Source: Same as Table 3.3e.

Table 3.3g: Current revenue of the Federal Government (₦m)

Type/Source	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1. Direct Taxes	144.6	451.1	624.4	852.9	3,032.5	2,990.2	3,852.4	4,839.2	3,962.3	5,753.7
a) Personal Income Tax	0.8	0.2	0.0	1.2	11.1	15.9	3.5	3.5	3.3	2.9
b) Company Income Tax	45.8	67.5	80.4	80.8	148.8	261.9	222.2	476.8	527.4	575.1
c) Petroleum Profit Tax	97.7	383.1	540.5	769.2	2,870.1	2,707.5	3,624.9	4,330.7	3,415.7	5,164.1
d) Other taxes - (Capital Gains, Stamp Duties, etc.)	0.3	0.3	3.5	1.7	2.5	4.9	1.8	28.2	15.9	11.6
2. Indirect Taxes	369.3	491.0	481.1	516.2	498.3	760.7	882.8	1,142.4	1,698.3	1,143.9
a) Import Duties	215.5	284.8	274.4	307.9	328.3	629.4	724.3	902.2	1,436.3	870.6
b) Export Duties	41.2	37.7	26.9	12.3	5.6	5.8	6.1	4.2	2.8	0.2
c) Excise Duties	112.6	168.5	179.8	196.0	164.4	125.5	152.4	236.0	259.2	273.1
3. Other Tax Revenue	119.4	226.7	299.1	326.2	1,006.6	1,763.8	2,030.8	2,057.0	1,808.8	4,014.8
4. Less Statutory Transfers to States.	267.6	330.8	331.0	307.3	643.1	1,040.0	1,142.8	1,572.5	1,240.0	2,044.0
5. Federally Retained Revenue	365.7	836.0	1074.1	1388.0	3,894.3	4,474.7	5,623.1	6,466.5	6,131.1	8,868.4

Table 3.3g (cont'd)

Type/Source	1980	1981	1982	1983	1984	1985	1986	1987	1988
1. Direct Taxes	9,161.1	6,827.3	5,608.0	4,330.9	5,581.0	7,798.8	5,880.9	13,776.1	14,090.5
a) Personal Income Tax	4.0	3.9	12.5	4.5	13.3	15.1	11.1	11.3	16.5
b) Company Income Tax	579.2	483.0	734.0	561.5	787.2	1,004.3	1.019.3	1,235.2	1,572.4
c) Petroleum Profit Tax	8,564.3	6,325.8	4,846.4	3,746.9	4,761.4	6,711.0	4,811.1	12,504.0	12,496.5
d) Other taxes - (Capital Gains, Stamp Duties, etc.)	13.6	14.6	15.1	18.0	19.1	59.4	39.4	24.6	5.1
2. Indirect Taxes	1,813.5	2,535.5	2,482.7	1,985.2	1,616.0	2,183.5	2,346.9	3,540.8	4,264.1
a) Import Duties	1,407.2	1,880.9	1,801.7	1,114.8	924.0	1,199.0	1,298.7	2,722.9	3,360.1
b) Export Duties	0.1	-	0.3	1.1	1.0	5.6	6.8	3.5	12.8
c) Excise Duties	406.2	654.6	608.7	869.3	690.8	978.9	1,041.4	814.4	891.2
3. Other Tax Revenue	4,259.4	2,817.4	3,673.7	4,192.6	4,569.8	4,707.5	4,609.8	7,819.8	
4. Less Statutory Transfers to States.	3,095.3	4,670.4	4,264.4	4,274.6	4,195.2	4,965.8	4,332.6	8,970.2	11,722.2
5. Federally Retained Revenue	12,138.7	7,509.8	7,500.0	6,234.1	6,234.1	6,996.0	7,969.4	16,129.0	15,588.6

Sources: Central Bank of Nigeria, Nigeria's Principal economic and Financial Indicators 1970 - 1987, 1970 - 1990; and Economic and Financial Review (various Years).

3.3.2 Government Expenditure

The Federal Government recurrent expenditure grew from ₦638.3m in 1970 to ₦19,409.4m in 1988. Also, the capital expenditure of government grew from ₦200.5m in 1970 to ₦8,340.1m in 1988.

The total expenditure (i.e both recurrent and capital) of the Federal Government increased from ₦838.3m in 1970 to ₦27,749.5m in 1988.

The period 1981-1986 witnessed persistent decline from the 1980 expenditure level to ₦12,524.1m in 1986, although increase of 13.1% and 38.4% were recorded in 1982 and 1985 over the 1981 and 1984 levels, respectively.

The observed pattern of growth in total expenditure in the country during the 1970s reflected the abundance of financial resources resulting from the monetization of the foreign exchange earnings from crude oil. The decreases recorded in expenditure levels in the 1980s (before 1987) showed the declining fortunes of the crude oil sector. In fact, the levels of expenditures in those years resulted in increased overall budget deficits (see Table 3.3h).

In absolute terms, the total expenditure of ₦27,749.5m in 1988 was the highest level of spending in the nineteen-year period. During this period of consolidation of the "gains" of the Structural Adjustment Programme government revenue increased as a result of continued depreciation of the naira at the foreign exchange market. Moreover, the year marked the beginning of a transition programme, hence government expenditures were heavily influenced by the demands of administration and quasi-government bodies, as well as the transfer payments in the form of contingency funds and non-statutory transfers to state governments.

3.3.3 Public Debt

Nigeria's public debt is composed of both domestic and external debts. Domestic public debts include loans through the issue of Treasury Bills, Treasury Certificates, Development Stocks, Stabilization Securities, Ways and Means Advances, etc. External public debt, on the other hand, is composed of bilateral, multilateral, international capital markets, refinanced, unrefinanced arrears, and other loans (unguaranteed state/private) loans.

Table 3.3h: Federal government recurrent and capital expenditure and overall surplus/deficit (₦m).

Year	Recurrent Expenditure	Capital Expenditure	Total Expenditure	Overall surplus(+)/ Deficit (-)
1970	638.3	200.5	838.8	-473.1
1971	492.8	146.2	639.0	+199.0
1972	681.2	295.9	977.1	+ 96.8
1973	656.1	435.1	1,091.2	+296.7
1974	874.0	1,223.5	2,097.5	+1,796.8
1975	1,695.0	3,207.7	4,902.7	-427.4
1976	2,672.6	4,041.3	6,713.9	-1,068.2
1977	2,246.7	5,004.6	7,251.3	-901.5
1978	3,427.7	5,092.3	8,520.0	-2,389.0
1979	3,187.1	4,219.6	7,406.7	+1,461.7
1980	6,022.0	8,091.9	14,113.9	-1,975.2
1981	5,739.1	5,699.3	11,438.4	-3,928.6
1982	7,417.9	5,522.5	12,940.4	-5,440.4
1983	5,656.5	4,033.6	9,690.1	-3,456.0
1984	6,275.4	3,277.9	9,553.3	-2,557.6
1985	7,215.3	6,005.2	13,220.5	-3,039.7
1986	7,641.5	4,882.6	12,524.1	-8,254.3
1987	15,646.2	6,372.5	22,018.7	-5,889.1
1988	19,409.4	8,340.1	27,749.5	-12,160.9

Source: Central Bank of Nigeria, Nigeria's Principal Economic & Financial

Table 3.3i presents data showing the trend in the growth of outstanding domestic debt for Nigeria from 1970 to 1988. It reveals a marked upward movement particularly from the mid-1970s. Between 1970 and 1975, total domestic debt grew by 56.8%, that is from ₦1070.8 million to ₦1678.9 million.

But it grew from ₦1,678.9 million in 1975 to ₦10,399.0 million in 1980 representing 519.4% increase. Between 1980 and 1985 total domestic debt had grown from ₦10,399.0 million to ₦27,952.0 million showing an increase of 168.8%. However, between 1985 and 1988 total outstanding domestic debt grew from ₦27,952.0 million to ₦47,031.1 million (an increase of 68.3%) due mainly to increased deficitfinancing.

In terms of source, Nigeria's indebtedness had been generated largely through the banking system. In 1970, for instance, 62.6% of the debt was held by the Central Bank and the commercial banks. The proportion voluntarily held by the non-bank public was just 37.4%. The distribution remained fairly stable until 1977 when the banking system's hold of domestic debt rose to 72.7% while 27.3% was held by the non-bank public.

Table 3.3i: Size and Ownership of Nigeria's Domestic Debt Outstanding, 1970-1988.

Year	Total Domestic Debt (₦'m)	Ownership (%)	
		Banking System	Non-Bank Public
1970	1,070.8	62.6	37.4
1971	1,118.3	60.0	40.0
1972	1,000.7	58.1	41.9
1973	1,061.2	57.5	42.5
1974	1,226.6	62.2	37.8
1975	1,678.9	66.4	33.6
1976	2,630.0	63.0	37.0
1977	4,636.0	72.7	27.3
1978	5,983.1	73.5	26.5
1979	7,282.3	68.2	31.8
1980	7,918.5	73.7	26.3
1981	11,445.5	71.5	29.5
1982	14,847.5	75.4	24.6
1983	22,224.3	75.6	24.4
1984	25,675.0	76.7	23.3
1985	27,952.0	79.4	20.6
1986	28,451.2	79.8	20.2
1987	36,790.6	75.0	25.0
1988	47,031.1	75.2	24.8

Sources: Central Bank of Nigeria, Annual Report and Statement of Accounts, and Economic and Financial Review, various years.

This new trend continued till 1988 when the banking system's ownership of public debt stood at 75.2% leaving 24.8% for the non-bank public.

With respect to external debt, one may observe that in 1970, following the end of the civil war, the external loans (Rehabilitation, Reconstruction and Development) Decree authorized the raising and use of external loans of amounts not exceeding ₦1 billion for rehabilitation, reconstruction and development, and for on-lending to state governments.

The Second National Development Plan (1970-1974), based on the disappointing performance under the First Plan (1962-68) merely expected about 19.4% financing from external sources.

Following the oil boom, government felt it quite that there will be no savings and foreign exchange constraints during the Third National Development Plan period (1975-1980) and beyond since national savings would exceed investment by nearly ₦15 billion during the plan period. Accordingly, the original Third Plan was to be financed exclusively from domestic sources despite size of ₦30 billion and later revision to ₦43 billion.

During the period, long-term external finance proved disappointing for it financed only a small part of the First and Second Plans. This resulted in an increased resort to short- and medium-term domestic borrowings to fill the gap. Moreover, the revenue surplus planned for the Third Plan did not materialize and with balance of payments deficits in 1976 and 1977, serious foreign exchange scarcity became a problem, contrary to the Third Plan's projections. It is against this background that the nation's external debt evolved over the years (particularly since mid-1970s). The magnitude skyrocketted from 1986 following large depreciation of the naira consequent upon the introduction of the Second-Tier Foreign Exchange Market (SFEM), later Foreign Exchange Market (FEM), and Inter-Bank Foreign Exchange Market (IFEM).

Thus, as table 3.3j shows, Nigeria's outstanding external debt in 1970 was ₦488.8 million. This was made up of ₦59.8 million or 12.2% short-term trade arrears arising from the civil war while ₦429 million or 87.8% was medium- and long-term. Much of this, including the short-term debt was paid off in the course of 1971 with the result that the outstanding debt at the end of

Table 3.3j: Magnitude of Nigeria's external debt outstanding, 1970-1988 (₦m).

Year	Short-term	Medium and Long term	Total
1970	59.8	429.0	488.8
1971	-	214.5	214.5
1972	-	263.4	263.4
1973	-	276.9	276.9
1974	-	322.4	322.4
1975	-	349.9	349.9
1976	-	384.6	384.6
1977	-	496.9	496.9
1978	-	1,265.7	2,265.7
1979	-	1,611.5	1,611.5
1980	-	1,866.8	1,866.8
1981	-	2,331.2	2,331.2
1982	1,981.7	6,837.7	8,819.4
1983	2,758.8	7,818.9	10,577.7
1984	5,443.4	9,093.2	14,536.6
1985	6,164.3	11,126.3	17,290.6
1986	12,279.7	29,949.8	42,229.5
1987 (End October)	n.a	n.a.	100,787.6
1988 (End September)	n.a	n.a.	133,956.3

Source: Central Bank of Nigeria, Bullion, October/December, 1986; Central Bank of Nigeria, Annual Report and Statement of Accounts (Several Years).

1971 amounted to only ₦214.5 million.

External debt outstanding progressively increased to ₦263.4 million in 1972, ₦276.9 million in 1973, ₦322.4 million in 1974 and ₦349.9 million in 1975. It increased from ₦374.6 million in 1976 to ₦496.9 million in 1977. Thereafter it virtually increased by three times to ₦1,265.7 million in 1978 and was ₦1,866.8 million at the end of 1980.

In 1981 it increased to ₦2,331.2 million. By the end of 1982 it had skyrocketted to ₦8,819.4 million. Progressively it increased to ₦10,577.7 million; ₦14,536 million, and ₦17,290.6 million; and ₦41,160.9 million in 1983, 1984, 1985 and 1986 respectively. At the end of October 1987, it stood at ₦100,787.6 million while at the end of September, 1988, it had risen to ₦133,956.3 million (see Table 3.3j). It is also important to note that in 1986 the total external loan commitment was ₦57,029.0 million while at the end of October, 1987 it was ₦142,302.6 million. At the end of September 1988, it stood at ₦182,857.8 million.

In addition, the bulk of the external loans consist of high-cost medium-term international capital market (ICM) loans at floating interest rates with

fixed margins above London Interbank Offer Rates (LIBOR) and with high agency fees, commitment, placement, management and legal fees (Anyanwu, 1988). The grace period of three years offered is too short for the projects to reach full operations before starting principal repayment instalments, taking into account that the actual repayment period is effectively only five years.

3.3.4 Fiscal Balance

The Federal Government has always appreciated the desirability of fiscal discipline and the need to bring planned expenditure and projected revenue into reasonable alignment. However, her performance in this regard from 1975 to 1988 was far from satisfactory for apart from 1979, huge deficits were recorded in those years as table 3.3h shows.

The reasons for this trend include dwindling government revenue and extra-budgetary releases. Indeed, over-reliance on the oil revenue had exposed the nation to the vicissitudes of world oil price fluctuations making budgetary revenue expectations to deviate widely from expenditure.

These budgetary gaps have been filled by external loans and internal loans (from the banking system - Central and commercial banks - and the non-bank public). This trend has not only increased the size and burden of both external and internal debts but has also fuelled the inflationary trend in the country (see Olopoenia, 1986).

3.4 BRIEF REVIEW OF SOME EMPIRICAL STUDIES ON THE EFFECTS OF MONETARY AND FISCAL POLICIES IN NIGERIA

Following Anderson and Jordan (1968), Ajayi (1974) empirically tested the relative effectiveness of monetary and fiscal policy in changing the level of income in the Nigerian economy (1960-1970). He found out that the response of economic activity to monetary influences are much larger and more predictable than fiscal influences, hence he counselled that greater reliance should be placed on monetary actions.

In another study, Ajayi (1978), using the Burger (1978) approach, found out that monetary factors influence prices, among other factors as found out in Ajayi and Teriba (1973). Also, Ajayi (1983) showed empirically that money plays an important role in the determination of prices (as did Egwaikhide, 1988) and

that there is unidirectional causality between money and prices with the causation going from money to prices for the period observed from the first quarter of 1961 to the second quarter of 1977, though Ajayi and Ojo (1981) had shown that money alone cannot adequately explain Nigeria's inflationary trends.

Poloamina (1986), using a multiplier analysis of individual policy effects, found out that: a change in money supply used as a policy tool induced a larger and longer-run impact on the economy than a change in either government deficit or public capital expenditure does; and a change in government deficit generated larger short-run impacts on the economy than that of a change in money supply - the average multiplier impact of a change in public capital expenditure was large but it was negative in sign. He thus concluded that the impact of fiscal measures had more direct effects than that of money supply for the period of Nigeria's three development plans, 1975 to 1985.

Confirming the findings of Ajayi (1974), Ubogu (1985) showed that monetary policy (M_2) is more potent than fiscal policy (current government expenditure) in

influencing changes in economic activty (GDP) in Nigeria.

Also, Odedokun (1988b) found that monetary and credit policies are more potent on economic activity (GDP, industrial production, and imports) and the price level than fiscal policy (government expenditure and government budget deficit).

In addition, Odedokun (1988a,1989) has rejected the rational expectations hypothesis with respect to monetary and fiscal policies, respectively, given the potency of anticipated policy to influence output and the unanticipated policy to affect prices. He thus, made a case for activist monetary and fiscal policies in influencing output and a "trickery" monetary policy in fighting inflation in Nigeria.

CHAPTER 4

THEORETICAL FRAMEWORK, METHODOLOGY AND DATA REQUIREMENTS

4.1 THE THEORETICAL FRAMEWORK:

Expectations are very important in macroeconomics and economics in general. Until recently, expectations were incorporated into economic models mechanically - neglecting relevant information. This criticism partly led to the formulation of the theory of rational expectations.

The rational expectations hypothesis has not only put other theories of expectations formation on the defensive but also has been used to generate distinctive and important predictions in many areas of macroeconomics - prices, interest rates, consumption, foreign exchange market, fiscal and monetary policies, etc.

The basic idea behind rational expectations is that many economic variables should be seen as being determined by processes. The process determining a variable limits its potential values and in doing so it provides a basis for a rational expectation. Thus, if an economic variable is determined in line with a discernible process, rational people will form their

expectation of that variable in accordance with the process, using all the relevant information (concerning the process) available to them at the time they form their expectation (Attfield et al., 1985).

Consider an economic variable, X, whose value in any period t is actually determined by its own lagged values and lagged values of other variables Y and Z in accordance with the following process:

$$X_t = a_o + a_1X_{t-1} + a_2Y_{t-1} + a_3Z_{t-1} \quad \text{----------} \quad (4.1)$$

where X, Y, Z are all variables and a_o, a_1, etc are constant coefficients.

The rational expectation of X_t formed at period t-1 is the mathematical expectation of X_t conditional on the available information, that is:

$$E_{t-1}X_t = a_o + a_1X_{t-1} + a_2Y_{t-1} + a_3Z_{t-1} \quad \text{--------} \quad (4.2)$$

where $E_{t-1}X_t$ is the expectation of X_t formed on the basis of the information at the end of period t-1.
More formally, $E_{t-1}X_t = E(X_t\ I_{t-1})$
where E is the mathematical expectations operator and I_{t-1} is the set of information available at period t-1.

A number of important results follow from the above fundamental idea of rational expectations. Firstly, the expectations of the future are based upon past observation. But pure observation is not enough. Hence, secondly, the individual economic agent must possess some formal model (implicitly or otherwise) whereby he translates his observation and the information set at his disposal into the outcome to be generated in the future. If he knows the correct model which governs the economy and follows the process given above in equation (2), then this person's expectation will be perfectly accurate, that is, the person's forecasting or expectational error - the difference between the actual value a variable takes and the value the person was expecting it to take - is zero. This special case assumes that the process determining the variable is deterministic. But most economic processes are stochastic (i.e. including an inherently unpredictable element) represented by u_t (random variable) and can be incorporated in equation (1) as follows:

$$X_t = a_o + a_1X_{t-1} + a_2Y_{t-1} + a_3Z_{t-1} + u_t \text{ ----- } (4.3)$$

where u is a variable with a probability distribution centred at zero and having a constant and finite variance (σ_u^2). Then expectations of X_t will be of the form:

$$E_{t-1}X_t = a_o + a_1X_{t-1} + a_2Y_{t-1} + a_3Z_{t-1} + E_{t-1}u_t \text{ --- (4.4)}$$

where $E_{t-1}u_t$ is the expectation of u_t formed on the basis of all the information available at the end of the period t-1. The rational expectation of u in period t, based on the information set available in period t-1, is that u will equal zero, that is,

$$E_{t-1}u_t = 0 \text{ -------- (4.5)}$$

hence

$$E_{t-1}X_t = a_o + a_1X_{t-1} + a_2Y_{t-1} + a_3Z_{t-1}.$$

Two conditions must be satisfied for such expectations to be considered rational. First, rational expectations must be at least as accurate as the optimal time series predictor (Batchelor, 1982).

Second, an economic agent is asserted not to make systematic errors. But where his expectation diverges from reality it will do so by totally random disturbances which could not have been perceived or incorporated into

his information set at the time his prediction was made. In this sense any forecast errors will themselves possess the feature that the conditional expectation of the forecast error was zero. It follows that any forecast error should be completely uncorrelated with any available information which the economic agent finds it worthwhile to analyze since, if any correlation existed, then the rational economic agent should logically include it in forming his initial expectation. These forecast errors which remain are essentially random, possess a mean value of zero and reveal no discernible pattern.

In our example, if the actual value of X is determined in accordance with equation (3), it follows that the forecasting or expectational error will be given as

$$X_t - E_{t-1}X_t = u_t \qquad \text{---------- (4.6)}$$

As Glahe (1985) noted, when a prediction based on the theory of rational expectations is later proved incorrect, the cause of the failed theory is considered to be an "unanticipated event" that was not incorporated into the expectation-formation process originally because

the possibility of such even was not included in the set of all available information.

Thus, according to the rational expectations theory, if expansionary macroeconomic policy is to work in the short-run, a "policy surprise" must occur. The policy surprise may be a "monetary surprise", a "fiscal surprise", or some combination of the two. A monetary surprise occurs when the actual rate of growth of the money supply differs from the expected rate of growth; a fiscal surprise occurs when future levels of government expenditure and taxation differ from expected levels. Since it is not easy to fool the public when the government initiates countercyclical policy and because it would not be productive with respect to the desired results of the policy to keep the policy secret (even if it were possible to do so), the rational expectations school argues that countercyclical policy will not change the levels of employment or income. The only variables that will be affected will be the price level and the interest rate (monetary variables).

Thus, the implications of rational expectations for aggregate demand and supply analysis can be

demonstrated graphically. As earlier noted, in the new classical model, all wages and prices are completely flexible with respect to expected changes in the price level; that is, a rise in the expected price level results in an immediate and equal rise in wages and prices because workers try to keep their real wages from falling when they expect the price level to rise.

Such a view of how wages and prices are set indicates that a rise in the expected price level causes an immediate upward shift in the aggregate supply curve, which leaves real wages unchanged and aggregate output at the natural rate (full employment) level if expectations are realized. The model, therefore, opines that anticipated policy has no effect on aggregate output and unemployment; only unanticipated policy has an effect.

In figure 4.1a, we first consider the short-run response to an unanticipated (unexpected) policy such as an unexpected increase in the money supply. In that figure, the aggregate supply curve (AS_1) is drawn for an expected price level P_1. The initial aggregate demand curve (AD_1) intersects the AS_1 at point 1,

where the realized price level is at the expected price level (P_1) and aggregate output is at the natural rate level (Y_n). Because point 1 is also on the long-run aggregate supply curve at Y_n, there is no tendency for the aggregate supply to shift. The economy remains in long-run equilibrium.

Suppose the Central Bank suddenly decides that the unemployment rate is too high, and so makes a large bond purchase which is unexpected by the public (policy surprise). Then the money supply rises and the aggregate demand curve shifts out to AD_2. Because the shift is unexpected (aggregate demand shock), the expected price level remains at P_1 and the aggregate supply curve remains at AS_1. Now, equilibrium is at point 2, the intersection of AD_2 and AS_1. Aggregate output rises above the natural rate level to Y_2 and the realized price level rises to P_2 (price level surprise).

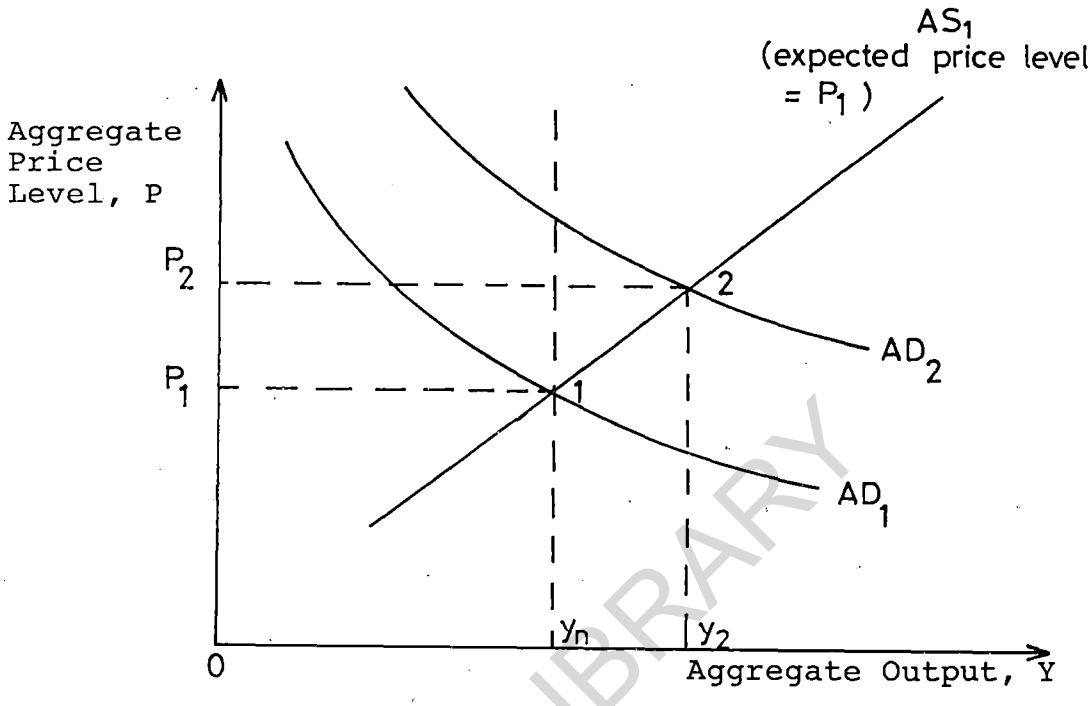


Figure 4.1a: The Short-Run Response to Unanticipated Expansionary Policy in the New Classical Model.

On the other hand, figure 4.1b illustrates the short-run response to anticipated policy in the rational expectations model. That is, if, on the other hand, the public expects that the Central Bank will make those open market purchases in order to lower unemployment because they have seen this done in the past, the expansionary policy will be anticipated. Because expectations are rational, workers and firms recognize that an expansionary policy will shift out the aggregate demand curve and they will expect the aggregate

price level to increase to P_2. Workers will demand higher wages so that their real wage will remain the same when the price level increases. The aggregate supply curve then shifts in to AS_2, where it intersects AD_2 at point 2, an equilibrium point for which aggregate output is at the natural rate level (Y_n) and the price level has risen to P_2 (Mishkin, 1989; Glahe, 1985). Thus, the new classical macroeconomic model demonstrates that aggregate output does not increase as a result of anticipated expansionary policy and that the economy immediately moves to a point of long-run equilibrium (point 2) in which aggregate output is at the natural rate level.

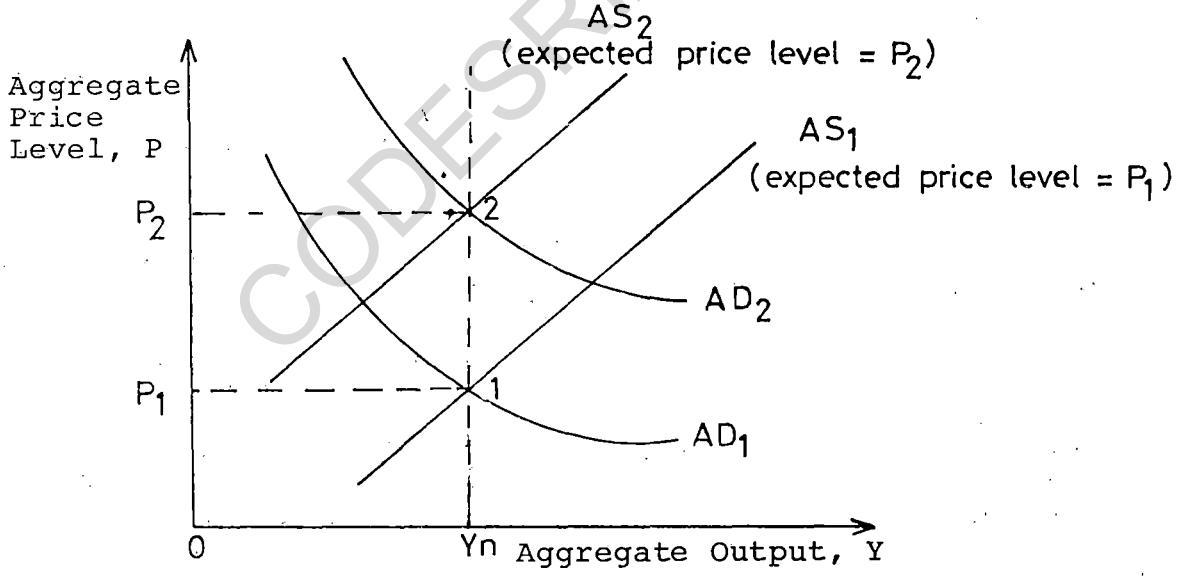


Figure 4.1b: The short-run response to anticipated expansionary policy in the new classical model.

4.2 THE METHODOLOGY

In order to test the hypothesis that only the unanticipated part of monetary and fiscal policies (money supply or m_t and government expenditure or g_t) and their lagged values affect real economic activity, while the anticipated part affects monetary variables such as the inflation rate (the structural neutrality or policy ineffectiveness hypothesis), it is necessary to decompose overall measures of monetary and fiscal policies into their anticipated or systematic (.e. m_t^e and g_t^e) and unanticipated or unsystematic [i.e $(m_t - m_t^e)$ and $(g_t - g_t^e)$] elements. Then the comparative ability of each policy element to act as a lead indicator for real economic activities and policies should be examined. This type of decomposition of m_t ang g_t clearly depends on the particular stochastic process assumed to characterize monetary and fiscal policies. A non-ad hoc derivation of a stochastic process for m_t (or g_t) is generally attempted by assuming that the authorities can set the values of m_t (ot g_t) with the aim of achieving certain macroeconomic objectives. The stochastic processes that emerge from this exercise are typically in the

form of linear feed-back policy rules.

There are two alternatives for deriving measures of anticipated and unanticipated policy. We could either use a multivariate time series modelling approach such as the State Space Forecasting discussed by IEEE (1974) and adopted by Fitzgerald and Pollio (1982) or we could estimate some econometric relationship between the policy variable and other chosen variables, including its own lagged values, an approach adopted, for example, by Barro (1977, 1978); Grossman (1979), and Attfield et al. (1981) to forecast the policy variables.

One problem with the former approach, which was acknowledged by Fitzgerald and Pollio, is that altering the order in which the variables enter the system may substantially alter the structure of the forecasts. In this study, therefore, the latter approach is adopted. In this sense, we draw on the work of Barro (1977, 1978, 1979, 1980, 1981b), Leiderman (1980), Attfield et al. (1981, 1985), Pesaran (1982), Mishkin (1982a, b) Siegloff and Groenewold (1987), and Darrat (1987). Though, these studies focus on monetary policy, they nevertheless provide useful insights into the methodology.

For such decomposition, consider a general example with the following rules:

$$m_t = b_1 m_{t-1} + b_2 A_{t-1} + e_{tm} \quad \text{----------} \quad (4.7)$$

$$g_t = c_1 g_{t-1} + c_2 B_{t-1} + e_{tg} \quad \text{----------} \quad (4.8)$$

where A and B are variables whose values in period t-1 partly determine monetary growth and fiscal growth respectively in period t. The variables e_{tm} and e_{tg} represent random or unsystematic components of the monetary and fiscal policies respectively and are assumed to be distributed with zero means and finite variances independently both of their own past and the structural disturbances e_t. That is, they should be white noise (serially uncorrelated) and stable.

It is important to note that the only theoretical constraint placed on the form of the forecasting equations of monetary and fiscal growth is that only lagged values of the right-hand-side be used.

The systematic parts of monetary and fiscal policies can then be written as their expectations conditional on the information set I_t available at t-1:

$$m_t^e = E(m_t | I_{t-1}) = b_1 m_{t-1} + b_2 A_{t-1} \quad \text{--------} \quad (4.9)$$

$$g_t^e = E(g_t | I_{t-1}) = c_1 g_{t-1} + c_2 B_{t-1} \quad \text{--------} \quad (4.10)$$

where E represents expectations notation and I_{t-1} denotes the information set available to economic agents at time t-1. Under the rational expectations hypothesis, economic agents are supposed to have accurate knowledge of policy rules and their parameters, hence the unanticipated components of monetary and fiscal policies will be equal to the non-autocorrelated disturbances e_{tm} and e_{tg} respectively, that is

$$e_{tm} = m_t - m_t^e \quad \text{----------} \quad (4.11)$$

$$e_{tg} = g_t - g_t^e \quad \text{----------} \quad (4.12)$$

4.2.1 Testing for Policy Ineffectiveness/Policy Neutrality:

To test the prediction that unanticipated components of monetary and fiscal policies affect real variables, the real economic activity (such as output-y_t) is regressed on the current and lagged values of e_{tm} and e_{tg} and other variables which are seen to influence that real economic activity, that is:

$$y_t = \alpha W_t + \beta(m_t - m_t^e) + \lambda (g_t - g_t^e) + v_{t1} \text{ ------ } (4.13)$$

where W_t = a variable or a number of variables which determine the natural level of output (or any other real economic activity).

m_t = growth of the quantity of money in period t.

m_t^e = the expectation of the growth of the quantity of money.

g_t = growth of government expenditure in period t.

g_t^e = the expectation of the growth of government expenditure.

α = a coefficient (or vector of coefficients).

β = a positive coefficient (i.e. $\beta > o$).

λ = a positive coefficient (i.e. $\lambda > o$).

v_{t1} = random error with mean zero.

Equation (4.13) is a formal statement that if monetary and fiscal growth are equal to their respective expectations, then output will be at its natural level;

and if monetary growth and fiscal growth are greater (less) than expected, output will be greater (less) than its natural level.

Still using the example of output as the real economic activity and putting the equations (4.13), (4.9), (4.10), (4.11), and (4.12) together, that is, imposing rational expectations, gives the general three-equation rational expectations model:

$$m_t = b_1 m_{t-1} + b_2 A_{t-1} + e_{tm} \quad \text{--------- (a)}$$

$$g_t = c_1 g_{t-1} + c_2 B_{t-1} + e_{tg} \quad \text{--------- (b)} \quad \text{---- (4.14)}$$

$$y_t = \alpha W_t + \beta e_{tm} + \lambda e_{tg} + v_{t1} \quad \text{--------- (c)}$$

It is significant that system (4.14) assumes or imposes structural neutrality (i.e. only unexpected monetary growth and fiscal growth affect output) and rational expectations (expected monetary and fiscal growth are equal to the predicatable/anticipated components of the processes determining monetary growth and fiscal growth). The presence in the output equation of the random components of the money growth equation

(e_{tm}) and fiscal growth equation (e_{tg}) and the absence of any other component of monetary and fiscal growth in that same equation reflect the imposition of both of these restrictions.

The restrictions which are imposed on system (4.14) by the assumption of rational expectations and which can be used to test for the validity of the rational expectations hypothesis can be most easily seen if we substitute the expressions

$$e_{tm} = m_t - b_1 m_{t-1} - b_2 A_{t-1} \quad \text{and}$$

$$e_{tg} = g_t - c_1 g_{t-1} - c_2 B_{t-1}$$

into the output equation to give an alternative form of the three-equation system as:

$$m_t = b_1 m_{t-1} + b_2 A_{t-1} + e_{tm} \quad \text{-------- (a)}$$

$$g_t = c_1 g_{t-1} + c_2 B_{t-1} + e_{tg} \quad \text{-------- (b) ---- (4.15)}$$

$$y_t = \alpha W_t + \beta m_t - \beta b_1 m_{t-1} - \beta b_2 A_{t-1} + \lambda g_t - \lambda c_1 g_{t-1} - \lambda c_2 B_{t-1} + v_{t_1} \text{ -- (c)}$$

In the system (4.15) there are four restrictions imposed by the assumption of rational expectations: (1) The coefficients of m_{t-1} and A_{t-1} in the output equation must both be the negative of the product of their respective coefficients in the money growth equation, b_1 and b_2, and the coefficient of actual money growth in the output equation; and (2) the coefficients of g_{t-1} and B_{t-1} in the output equation must both be the negative of the product of their respective coefficients in the fiscal growth equation, c_1 and c_2, and the coefficient on actual fiscal growth in the output equation.

Thus, given rational expectations, independence does not exist - expectations are formed in a restricted way to be in accordance with the processes which monetary growth and fiscal growth actually follow; the coefficient of m_{t-1} in the output equation is therefore restricted by the coefficient of m_{t-1} in the money growth equation. Similarly, the coefficient of g_{t-1} in the output equation is restricted by the coefficient on g_{t-1} in the fiscal growth equation. The same argument applies to A_{t-1} and B_{t-1}.

However, in order to test the policy ineffectiveness proposition, the real economic activity (e.g output) must incorporate not only the variables explaining its natural level but also both anticipated and unanticipated policy changes (money and fiscal growth) [Mishkin, 1982a,b; Siegloff and Groenewold, 1987; and Darrat, 1987]. Thus:

$$y_t = \alpha W_t + \beta(m_t - m_t^e) + fm_t^e + v_t \quad \text{----- (a)}$$

$$y_t = \alpha W_t + \lambda(g_t - g_t^e) + hg_t^e + v_t \quad \text{---- (b)} \qquad \text{-------- (4.16)}$$

$$y_t = \alpha W_t + \beta(m_t - m_t^e) + \lambda(g_t - g_t^e) + v_t \quad \text{--- (c)}$$

$$y_t = \alpha W_t + fm_t^e + hg_t^e + v_t \quad \text{----- (d)}$$

where α, β, f, λ, and h are coefficients and v_t is an error term.

As before, $(m_t - m_t^e)$ and $(g_t - g_t^e)$ are the unanticipated monetary and fiscal policies, respectively, while m_t^e and g_t^e are the anticipated components of monetary and fiscal policies, respectively. The rational expectations hypothesis contends that only unanticipated monetary and fiscal policies influence the real side of the economy, i.e β and λ are statistically significant,

while f and h are not different from zero (f = o, h = o). Hence to test the policy-ineffectiveness proposition on the restrictions which need to be placed on (4.16), (4.7) and (4.8), we obtain the model:

$$m_t = b_1 m_{t-1} + b_2 A_{t-1} + e_{tm} \quad \text{--- (a)}$$

$$g_t = c_1 g_{t-1} + c_2 B_{t-1} + e_{tg} \quad \text{--- (b)} \quad \text{---(4.17)}$$

$$y_t = \alpha W_t + \beta(m_t - m_t^e) + \lambda(g_t - g_t^e) + v_t \quad \text{--- (c)}$$

$$y_t = \alpha W_t + \beta(m_t - m_t^e) + s_t \quad \text{--- (d)}$$

$$y_t = \alpha W_t + \lambda(g_t - g_t^e) + z_t \quad \text{--- (e)}$$

Similarly, neutrality (with rationality maintained) is tested by comparing system (4.17) to the system comprising (4.7), (4.8) and (4.16) shown as (4.18) below, and testing the implied restrictions.

$$m_t = b_1 m_{t-1} + b_2 A_{t-1} + e_{tm} \quad \text{----- (a)}$$

$$g_t = c_1 g_{t-1} + c_2 B_{t-1} + e_{tg} \quad \text{----- (b)} \quad \text{---- (4.18)}$$

$$y_t = \alpha W_t + \beta(m_t - m_t^e) + f m_t^e + v_t \quad \text{----- (c)}$$

$$y_t = \alpha W_t + \lambda(g_t - g_t^e) + h g_t^e + v_{1t} \quad \text{----- (d)}$$

$$y_t = \alpha W_t + f m_t^e + h g_t^e + v_{2t} \quad \text{----- (e)}$$

In addition, the hypothesis of monetary impulse dominance over fiscal impulse can be gauged from the systems of equations in (4.17) and (4.18) by using the relevant test statistics.

4.2.2 Explaining Money Gorwth and Expenditure Growth Equations.

Turning to the money growth and government expenditure growth equations one observes some variables which the literature identifies as explanatory variables. The money growth equation includes lagged values of money growth, real GDP growth, an interest rate, unemployment rate, inflation rates or the price level, government expenditure, public domestic borrowing requirement, etc. As Mishkin (1982a) notes, it is difficult on purely theoretical grounds to ignore any particualr piece of available information as a relevant predictor of the stance in monetary policy. For example, even though theory suggests the exclusion of a given macro variable from the vector of variables explaining the money supply, the variable could still be a useful predictor of money growth due to the special circumstances involved. It is in this sense that an atheoretical statistical procedure is used to determine the selection of the relevant

predictors of the stance of monetary policy (and fiscal policy). Ajayi (1976), in an adaptive expectations model, made money supply a function of high-powered money (variously defined), quite apart from its lagged values and time trend as in Ajayi (1978). Also, in a recent study by Poloamina (1986), it was found that money supply is a function of government deficit financing, government borrowing as a proxy for government activity which influences the stock of money, and foreign exchange earnings [as an index of the extent of monetization of foreign exchange earnings]. In addition, Ogun (1989) found foreign reserves as a significant explanation of money supply though lagged values of the money supply were some-what generally insignificant. Odedokun (1988b) had found two lagged values of money supply and foreign reserves significant in explaining money supply.

The literature also explains the manner in which the anticipated and unanticipated increase in money supply influence the economy. As Attfield et al (1981a,b) note, an x% anticipated increase in money supply will have no effect on output (or any other real activity)

since, by assumption, only unanticipated monetary growth will do that. When the demand for money function is expressed as a demand for real money balances, this x% change in money supply will cause an x% change in the price level. In the case of an x% unanticipated increase in money supply, first, there will be a rise in output (given the monetary surprises), and second, since output is a determinant of the price level there will be two distinguishable but simultaneous effects on the price level. The first is that the increase in the actual money supply, as before, will increase the price level equiproportionately. Second, output also increases hence part of the increase in the money supply is absorbed by the increase in income. This second effect will tend to reduce prices and the total increase in the price level will be less than the proportionate rise in the money supply. Under the assumption that no further monetary surprises occur in subsequent periods, then the influences of the increased money supply will be partly absorbed by a level of output higher than its natural level, and partly by a higher level of prices. The exact effects on each variable are determined by the

coefficients of the system, especially those showing how output responds to lagged monetary surprises. In the event that the lagged influence on output of monetary surprises tapers off to zero, then output will eventually be back at its initial level (in the absence of any growth in the natural level of output), and hence the only variable that will have changed the price level is the money supply. Thus, the price level will eventually have risen in proportion to the increase in the money supply. This means that the proportionate relationship between money supply and the price level will be maintained in both cases, though in the second case it will be temporarily obscured.

With respect to government expenditure, the general postulate of rational expectations is that the observed rate of output growth will be equal to its natural rate, and that the observed rate of inflation will equal the anticipated rate, when this fiscal impulse is fully anticipated. In particular, the actual rate of output growth will (transitorily) deviate from its normal rate only if economic agents experience "surprises" with respect to the movements of the impulse. Hence the growth

of capacity is independent of systematic fiscal policy. For instance, following Barro (1974), if the private sector rationally perceives the future taxes implied by debt financing, the present value of the implied future taxes equals the current taxes avoided by debt financing. Hence, the choice of tax versus debt financing of current government expenditures leaves the real economy unaffected. That is, if the implied future taxes of government expenditure are perceived and discounted by the private sector, the current period's tax reduction will be used to increase private saving to pay for the future taxes, and government debt will be absorbed without any real effects on the economy (Kormendi, 1983). However, the question of capacity growth being independent of systematic fiscal policy has not gone unchallenged. For instance, McCallum and Whitaker (1979) note that this may not be true due to "crowding out" effects on aggregate demand or the disincentive effects on taxes on labour supply. Bailey's (1962, 1971) development of the effects of government spending on private consumption and aggregate economic activity is the seminal contribution. Other contributions and extensions of the ideas are

David and Scadding (1974), Buiter (1977), Barro (1980, 1981b), O'Driscoll (1977), Hall (1978), Kochin (1974), Tanner (1978, 1979), Feldstein (1982), Aschaeuer (1985), Koskela and Viren (1983), etc.

The literature identifies the following explanatory variables for government expenditure - gross domestic product (GDP) or gross national product (GNP), government revenue, unemployment rate, government deficits, and government external borrowing, government domestic borrowing, apart from the lagged values of government expenditure. In the Nigerian case and for government current expenditure, both Olofin and Ekeoku (1985), and Ekeoku (1986), and Taiwo (1989), identify the relevant variables as government current revenue, total gross domestic product (GDP), government deficits, and government external borrowing. The NISER Econometric model adds total credit.

4.2.3 Explaining Output, Unemployment and Prices:

In the literature on rational expectations, output is viewed as consisting of two compnents: a natural level and fluctiations around that level which are

themselves due to current and lagged unanticipated policy measures. The explanation for the influence of current monetary "surprises", for instance, on output is that agents with information may misinterprete unexpected shifts in aggregate demand as relative shifts, and may attempt to take advantage of what they mistakenly perceive to be a temporary relative own price increase by raising their output (see Blanchard, 1987). If this happens throughout the economy then aggregate output will respond positively to unexpected movements in the money shock.

In the literature, one also identifies several reasons for the influence of lagged monetary surprises on output. For instance, Blinder and Fischer (1979) developed a model in which an unanticipated increase in aggregate demand is partly met out of increased production and partly from a decrease in inventories. To them, the need to re-establish the desired levels of inventories is the "propagation mechanism" by which serially uncorrelated errors in forecasts of monetary growth are converted into serially correlated disturbances in output or by which monetary surprises affect output in subsequent periods.

Earlier, Lucas (1975) had relied on lagged information and the subsequent impact of shocks on stocks of productive capital carried foreword into future periods, to explain this behaviour.

In the content of this study, output (y_t) is regressed on the anticipated and unanticipated components of the selected monetary (money supply) and fiscal (government expenditure) policies, a variable (terms of trade) reflecting external influence (given an open economy), and a time trend.
This is consistent with recent literature on rational expectations [See, for instance, Darrat1987,Odeokun, 1988].

Unemployment (UN) is regressed on the monetary and fiscal impulses, as well as on its lagged values. Ogbe (1986), Akinnifesi (1986), and Anyanwu (1986) theoretically postulate population as an explanatory variable, while Ige (1986) suggests real export revenue, real value of imports, government sector capital formation, and real value of government expenditure. Barro (1977, 1978) also postulates that minimum wage is a relevant argument in the unemployment equation though in Barro (1979b) he dropped this argument in favour of real

federal purchases of goods and services. Under Nigeria's Structural Adjustment Programme (SAP), retrenchment could also be a relevant argument.

With respect to the derivation of the price (P) equation, the literature suggests that this can be done through the money demand (M) equation (e.g. log(M) - log(P)) or using the rate of inflation or change in the consumer price index (DP_t) [e.g. $DP_t = \log(P_t) - \log(P_t-1)$]. The arugments in the price equation include government expenditure, money supply, government deficit, domestic credit, world price level of exports, world output measured by world industrial production, demand pressure or supply gap, a cost-push factor such as average wage in the modern sector of the economy, import price index, and the lagged value of the price level [Ajayi and Awosika, 1980; Ajayi and Teriba, 1982; Owosekun and Odama, 1982; Adeyokunnu and Ladipo, 1982; Poloamina, 1986; and Ojameruaye, 1988].

It must be remembered again that in the context of rational expectations, the anticipated part of policy measure affects the price level while the unanticiapted component affects the real economy.

4.3 MODEL SPECIFICATION:

Most tests of the policy-ineffectiveness proposition have assumed that the rate of growth of the quantity of money in an economy is the prime determinant of the rate of growth of aggregate demand in that economy. With this assumption, rather than estimating and testing complete models, they have proceeded to test the significance of anticipated and unanticipated monetary policy alone.

However, in a developing economy like Nigeria, both the rate of growth of the quantity of money and government expenditure influence the rate of growth of aggregate demand. It is in this sense that we make a modification in existing models so as to test a complete model comprising both monetary and fiscal policies simultaneously.

Thus, instead of testing systems 4.19 (or (a) and (d) of equation 4.17) (for policy-ineffectiveness) and 4.20 (or (a) and (c) of equation 4.18) (for neutrality) as has previously been the case, we test systems 4.21 (for policy-ineffectiveness) and 4.22 (for neutrality).

$$m_t = b_1 m_{t-1} + b_2 A_{t-1} + e_{tm} \quad \text{----- (a)}$$

$$y_t = \alpha W_t + \beta(m_t - m_t^e) \quad \text{----- (b)} \qquad \text{-----(4.19)}$$

$$m_t = b_1 m_{t-1} + b_2 A_{t-1} + e_{tm} \quad \text{---- (a)}$$

$$y_t = {}_{\alpha} W_t + {}_{\beta}(m_t - m_t^e) + f m_t^e + v_t \quad \text{---- (b)} \qquad \text{---(4.20)}$$

$$m_t = b_1 m_{t-1} + b_2 A_{t-1} + e_{tm} \quad \text{---- (a)}$$

$$g_t = c_1 g_{t-1} + c_2 B_{t-1} + e_{tg} \quad \text{---- (b)}$$

$$y_t = {}^{\alpha} W_t + {}^{\beta}(m_t - m_t^e) + {}^{\lambda}(g_t - g_t^e) + v_t \quad \text{-- (c)} \qquad \text{---(4.21)}$$

$$y_t = {}_{\alpha} W_t + {}^{\beta}(m_t - m_t^e) + v_{1_t} \quad \text{---- (d)}$$

$$y_t = {}_{\alpha} W_t + {}_{\lambda}(g_t - g_t^e) + v_{2_t} \quad \text{---- (e)}$$

$$m_t = b_1 m_{t-1} + b_2 A_{t-1} + e_{tm} \quad \text{---- (a)}$$

$$g_t = c_1 g_{t-1} + c_2 B_{t-1} + e_{tg} \quad \text{---- (b)} \qquad \text{--(4.22)}$$

$$y_t = {}^{\alpha} W_t + {}^{\beta}(m_t - m_t^e) + f m_t^e + v_t \quad \text{---- (c)}$$

$$y_t = \alpha W_t + \lambda(g - g_t^e) + h g_t^e + v_t \quad \text{---- (d)}$$

$$y_t = {}_{\alpha} W_t + f m_t^e + h g_t^e + v_{1_t} \quad \text{---- (e)}$$

In addition, contrary to previous practice, we incorporate the external sector to reflect external influence (open economy). This becomes very relevant for the Nigerian economy that is highly dependent on the external sector both for imports, exports, and financial requirements.

The model, therefore, consists of a money-growth equation; government expenditure growth equation; output equations; unemployment equations; and price level equations. The essence is to test the proposition that the predictable component of the rate of growth of the quantity of money and government expenditure have no effect on any real variable (output and unemployment) but affect the price level; while only the unpredictable or random component of monetary and fiscal growth affect real variables.

4.3.1 Money-Growth Equation:

The money-growth equation, which is used to divide observed money growth into anticipated and unanticipated components, is

$$DM_t = b_o + b_1 DM_{t-1} + b_2 DM_{t-2} + b_3 E_{t-i} + b_4 B_{t-i} + b_5 L_{t-i} + e_{tg} \quad \text{---------- 4.23}$$

where

M_t = Annual nominal money supply.

$DM_t = \log(M_t) - \log(M)_{t-1}$ = Annual money growth/change

E_t = log of the real value of external reserves

B_t = log of the real value of domestic government borrowing.

L_t = log of the real value of government external borrowing outstanding.

The money growth equation used in this study applies to annual observations for the 1970-88 period. The three definitions of money supply (M_1 - currency outside banks plus demand deposits of commercial banks plus domestic deposits with the Central Bank, less Federal Government deposits at commercial banks; and M_2 - M_1 plus the sum of time deposits with the commercial banks; and M_3 - M_2 plus the sum of savings deposits with the commercial banks or M_1 plus quasi-money were tried). Government domestic borrowing is used as a proxy for government activity which influences the stock of money, while foreign reserves act as an index of the extent of monetization of Nigeria's foreign exchange earnings.

The money growth equation includes two lagged values of money growth as "explanatory" variables, possibly to pick up any elements of serial dependence or lagged adjustment that have not been captured by the other independent variables.

Having obtained a measure of anticipated money growth, the computation of the unanticipated component of money growth is the difference between actual monetary

growth and the anticipated component of monetary growth, that is:

$$DMR_t = DM_t - D\hat{M}_t \qquad \text{-------(4.24)}$$

Put differently, DMR is the estimated residual from the regression of equation (4.23).

4.3.2 Government Expenditure Growth Equation:

The government expenditure growth equation which is used to divide observed government expenditure growth (DG_t) into anticipated and unanticipated components, is:

$$DG_t = c_o+c_1DG_{t-1}+c_2DG_{t-2}+c_3V_{t-1}+C_4B_{t-1}+C_5L_{t-1}+e_{tg} \qquad \text{----(4.25)}$$

where

G_t = Annual nominal Federal Government Expenditure.

$DG_t = \log(G_t) - \log(G)_{t-1}$ = Annual Federal Government expenditure growth/change.

V_t - log of the real value of total Federal Government revenue.

B_t = log of the real value of Federal Government domestic debt.

L_t = log of the real value of Federal Government external borrowing outstanding.

The government expenditure growth equation used in this study applies to annual observations for the 1970-88 period. The lagged values of the government expenditure are meant to pick up any elements of serial dependence or lagged adjustment that have not been captured by the other independent variables.

Having obtained a measure of anticipated Federal Government Expenditure, the computation of the unanticipated component of Federal expenditure is the difference between actual Federal expenditure growth and the anticipated component of Federal expenditure growth, that is:

$$DGR_t = DG_t - \hat{DG}_t \qquad \text{-------} \quad (4.26)$$

where DGR is the estimated residual of equation (4.25).

4.3.3 Output Equations:

The hypothesis that money growth and federal expenditure growth influence output only when these growths are unanticipated implies that current and lagged values of DMR and DGR enter the output equation, but current and lagged values of actual money growth, $\hat{DM}$, and current and lagged values of actual federal expenditure

growth, $\hat{DG}$, are excluded. Apart from time trend, a variable to capture external influence - the terms of trade - is included. Then, the empirical form of the output equations are:

$$\log(y_t) = \alpha_o + \alpha_1 T + \alpha_2 X_t + \sum_{i=o}^{n} \alpha_{3,i} DMR_{t-i} + \sum_{i=o}^{m} \alpha_{4,j} DGR_{t-i} \quad v_{3,t}$$

$$\log(y_t) = \gamma_o + \gamma_1 T + \gamma_2 X_t + \sum_{i=1}^{n} \gamma_3 DMR_{t-i} + v_{4t} \qquad \text{---(4.27)}$$

$$\log(y_t) = \alpha_o + \alpha_1 T + \alpha_2 X_t + \sum_{i=i}^{m} \alpha_3 DGR_{t-i} + v_{5t}$$

where

y_t = real GDP

X_t = variable representing international influence (terms of trade)

DMR_t = unanticipated (unsystematic) component of money growth.

DGR_t = unanticipated (unsystematic) component of federal expenditure growth.

v_t = a stochastic term with the usual properties of zero mean, constant variance (and serially uncorrelated).

A priori, it is expected that only unanticipated policy measures can influence real output, i.e. α_3, i(i=0, 1, ..., n) are statistically significant, and α_4, j(j=0, 1, ..., m) as well as γ_3 and a_3 are statistically significant. α_o, α_1, α_2, are positive constants while the other coefficients are also expected to be positive, i.e., (γ_o, γ_1, γ_2, a_o, a_1, a_2, > 0).

In order to test for the irrelevance of the $\hat{DM}$ and $\hat{DG}$ variables for output determination, given the values of the DMR and DGR variables, we estimated output equations that include simultaneously the variables $\hat{DM}_{t-i}$ and DMR_{t-i}, as well as $\hat{DG}_{t-i}$ and DGR_{t-i} (and one without the unanticipated parts):

$$\log (y_t) = d_o + d_1T + d_2X_t + \sum_{i=o}^{k} d_3 DM_{t-i} + \sum_{i=o}^{l} d_4 DMR_{t-i} + U_5, t \quad \text{------ (4.28)}$$

$$\log(y_t) = k_o + k_1T + k_2X_t + \sum_{i=o}^{m} k_3 \hat{DG}_{t-i} + \sum_{i=o}^{n} k_4 DGR_{t-i} + U_6, t$$

The other is:

$$\log(y_t) = l_o + l_1T + l_2X_t + \Sigma l_3 DM_{t-i} + \Sigma l_4 DG_{t-l} + U_7, t\text{-----} \quad (4.29)$$

This hypothesis postulates that while d_3, k_3, i_3 and i_4 are not different from zero, d_4 and k_4 are statistically significant. Again, d_o, d_1, d_2, k_o, k_1, k_2, l_o, l_1 and l_2 are all strictly positive. Closed economy tests are carried out in all cases, while anticipated monetary and fiscal effects on output are also tested separately. In addition, the hypothesis of monetary impulse dominance over fiscal impulse can be examined from each of the tests for output effects.

4.3.4 The Unemployment Equations:

Again, the hypothesis that money growth and federal expenditure growth influence unemployment only when these growths are unanticipated implies that current and lagged values of DMR and DGR enter the unemployment equation, but current and lagged values of actual money growth DM, and current and lagged values of actual federal expenditure growth, $\hat{DG}$, are excluded. Included in the equation is one-period lagged value of unemployment rate. The equation becomes:

$$UN_t = \gamma_o + \gamma_1 UN_{t-1} + \sum_{i=o}^{M} \gamma_2 DMR_{t-i} + \sum_{i=o}^{N} \gamma_3 DGR_{t-i} + e_t \qquad \text{-------- (4.30)}$$

where UN_t is the log of the unemployment rate.

Here, it is required that γ_2 and γ_3 be statistically significant, where γ_o, $\gamma_1 > 0$. Of course, e_t is the error term with the usual properties.

In order to test for the irrelevance of $\hat{DM}$ and $\hat{DG}$ variables in the determination of the level of unemployment, given the values of DMR and DGR variables, we estimated unemployment equations that include the variables $\hat{DM}_{t-i}$ and DMR_{t-i}, as well as $\hat{DG}_{t-i}$ and DGR_{t-i} simultaneously (and one without the unanticipated parts).

$$UN_t = \lambda_o, + \lambda_1 UN_{t-1} + \sum_{i=o}^{M} \lambda_2 \hat{DM}_{t-1} + \sum_{i=o}^{M} \lambda_3 DMR_{t-i} + S_{j,t}$$

$$UN_t = q_o + q_1 UN_{t-1} + \sum_{i=o}^{M} q_2 \hat{DG}_{t-i} + \sum_{i=o}^{N} q_3 DGR_{t-i} + S_{k,t} \quad \text{--(4.31)}$$

The other is

$$UN_t = \gamma_o + \gamma_1 UN_{t-i} + \sum_{i=o}^{N} \gamma_2 \hat{DM}_{t-i} + \sum_{i=o}^{N} {}_3\hat{DG}_{t-i} + S_{1,t} \quad \text{----(4.32)}$$

Again, this hypothesis postulates that while λ_2, q_2, $_2$, and γ_3 are not different from zero, λ_3 and q_3 are statistically significant, while λ_o, λ_1, q_o, q_1, λ_o, $\lambda_1 > o$. s_t is the error term with the usual properties. We also tested for the effects of monetary and fiscal impulses

separately. Again, the hypothesis of monetary impulse dominance over fiscal impulse is gauged from each of the tests for unemployment effects.

4.3.5. Price Level Equations:

For our purpose, the change in the inflation rate is used for the price level, i.e. $DP = \log(P_t) - \log(P)_{t-1}$. For robustness, we also used the log of the price level(inflation) ($\text{Log } P_t$). To test the hypothesis that only anticipated money and federal expenditure growth influence the price level, we regressed the price level on the current and lagged values of $\hat{DM}$ and $\hat{DG}$. viz:

$$DP_t = \beta_o + \sum_{i=o}^{M} \beta_1 \hat{DM}_{t-i} + \sum_{i=o}^{N} \beta_2 \hat{DG}_{t-i} + Z_{1,t} \quad --(4.33)$$

β_1 and β_2 are expected to be statisitcally significant. $\beta_o > 0$ while $z_{1,t}$ is the error term with the usual properties. β_1 is expected to dominate β_2.

To test the hypothesis of the irrelevance of the unanticipated components of policy measures on the price level, we use the following form of the equations, and alternately deleting the set of anticipated variables for the test:

$$DP_t = j_o + \sum_{i=o}^{M} j_1 DM_{t-i} + \sum_{i=o}^{M} j_2 DMR_{t-1} + z_{2,t} \qquad \text{-------- (4.34)}$$

$$DP_t = w_o + \sum_{i=o}^{N} w_1 DG_{t-i} + \sum_{i=o}^{N} w_2 DGR_{t-i} + z_{3,t}$$

j_2 and w_2 are expected to be statistically not different form zero while j_1 and w_1 are expected to be statistically significant but with j_1 dominating w_1. However, we expect j_o, $w_o > 0$, while z_t is the error term with the usual properties.

4.4 MODEL ESTIMATION TECHNIQUE

The prediction equations and the output, unemployment and price equations are estimated separately in a two-step procedure (two-stage least squares - 2SLS) on the MICROFIT computer package. In the first step, the prediction equations for DM_t and DG_t are estimated. The fitted values from these equations are used as proxies for DMR and DGR in the second-stage procedure for estimating output, unemployment, and prices. Assuming serially independent errors and no omitted variables in the prediction equations, this two-step procedure yields consistent, but inefficient, estimates of the parameters

in the model. By estimating the prediction equations and those for output, unemployment, and prices at the same time, using a procedure such as full information maximum likelihood (FIML), more efficient parameter estimates could be generated. However, with only nineteen (19) data points for DM_t and DG_t and seventeen for the indicator equations, jointly estimating the equation systems with a host of cross-equation restrictions using FIML is hardly justified.

FIML typically has a smaller variance, but it is sensitive to specification errors. Given the disagreements among researchers in this field, the problem of specification errors must be taken seriously. In this sense, as Summers (1965) and Chow (1987) report, the 2SLS appears to be the steadiest and most popular technique, yielding satisfactory results. In addition, as Poloamina (1986) notes, and Fisher (1965) demonstrates, improvements in estimates generated by alternative techniques have not been more than 5%. Thus, the increased costs in terms of time and other factors far outweigh the expected benefits. Similar results using alternative methods bear this out (see Attfield et al., 1981; Barro, 1978, 1980; Chopra and Montiel, 1986).

4.5 DATA REQUIREMENTS AND SOURCES:

Data required include: annual money supply, domestic government borrowing, foreign reserves, federal government expenditure, federal government revenue, federal government external debt, the Gross Domestic Product, terms of trade, unemployment rate and inflation rates - for the period 1970 to 1988.

In the case of unemployment rate where data are incomplete, shorter sample period (1975-88) was used for urban unemployment rate. The unanticipated components of monetary and fiscal policies were generated as residuals by the computer.

The domestic data series for the model were obtained from the following sources:

a) The Central Bank of Nigeria's publications:
   i) Annual Report and Statement of Accounts.
   ii) Economic and Financial Review.
   iii) Nigeria's Principal Economic and Financial Indicators;

b) The Federal Office of Statistics' publications;
   i) Gross Domestic Product (GDP) and Allied Macro-aggregates (Series);

ii) Digest of statistics, and

iii) Abstracts of Statistics.

c) Federal Ministry of Employment, Labour and Employment publication - Quarterly Bulletin of Labour Statistics.

The Annual Federal Budgets published by the Budget Office, and the National Development Plans published by the Federal Ministry of Budget and Planning, Lagos, are also useful for data purposes.

The international data series came from the following publications.

a) International Financial Statistics (IMF);

b) Year Book of National Accounts Statistics (United Nations);

c) Year Book of International Trade Statistics (United Nations), and

d) World Tables (World Bank).

CHAPTER 5

PRESENTATION AND ANALYSIS OF RESULTS

The empirical results for testing the hypotheses we formulated in chapter one are presented and discussed in this chapter. This is specifically done in section 5.1. Monetary policy and fiscal policy growth equations are presented and discussed in sub-section 5.1.1 while in subsection 5.1.2 we present and analyze the output equations. We do same for unemployment and price equations in sub-sections 5.1.3 and 5.1.4 respectively. Finally, in section 5.2 we look at the policy formulation and implementation implications of our empirical results.

5.1. MONETARY AND FISCAL POLICY GROWTH EQUATIONS.

As stated earlier, our monetary policy variable is the money supply while the chosen fiscal policy variable is federal government expenditure.

5.1.1a. MONEY GROWTH EQUATION

After considerable experimentation, the broad definition of money - M_3 (currency plus demand deposits plus time and savings deposits) - was chosen.

An atheoretical statistical procedure was used to determine the selection of the relevant predictors of the stance of the Nigerian monetary policy (see Mishkin, 1982b; Darrat, 1987).

Thus, the application of the atheoretical statistical procedure and the Ordinary Least Squares (OLS) Method on MICROFIT (see Pesaran and Pesaran, 1990) with annual data for 1970 to 1988 have resulted in the empirical results reported in equation 5.1 to forecast the Nigerian money growth - the systematic part of the money growth equation:

$$DM_t = 3.961 - 0.470\ DM_{t-1} - 0.871DM_{t-2} + 0.084E_{t-1} + 0.043E_{t-2}$$
$$(4.92)\quad (-2.04)\qquad (-4.17)\qquad (1.76)\qquad (0.91)$$
$$-0.334B_{t-1} - 0.210B_{t-2} + 0.099\ L_{t-2} \quad \ldots\ldots\ldots (5.1)$$
$$(-2.33)\qquad (-1.70)\qquad (2.38)$$

$R^2 = 0.81$, $\bar{R}^2 = 0.69$, S.E. = 0.0741, F (7,11) = 6.62,
D.W. = 2.22, Durbin h = -2.19, $x^2(1) = 0.60$
F^* (1,10) = 0.33, N = 19,

where the numbers in parentheses below the co-efficient estimates are the absolute values of the t - ratios, x^2 is the Godfrey (1978a, b) statistics for testing the presence of autocorrelation in the residuals. As Johnston (1984) noted, the advantage of the Godfrey approach over many standard procedures is that it is a valid test against

autoregressive and moving average processes of the errors. As a complement, the Durbin-h statistics is reported given the inclusion of lagged valeus of the dependent variable. Also, the F* - statistics is for testing the hypothesis of white noise residuals, while the F-statistics is for testing the significance of the regression. We note that DM_t is the money growth rate $(\log (M_3)_t - \log (M_3)_{t-1})$, E = log of real external reserves, B = log of real domestic public debt, and L = log of real external debt outstanding.

The variables found to be important determinants of money growth over the data period, 1970-1988, are the dependent variable lagged from one to two periods, log of real external reserves (lagged one to two periods), log of real domestic public debt (lagged one to two periods), and the log of real external debt outstanding (second period lag).

Before any further use of the money growth forecasting equation, we need to make sure that it satisfies the required criteria:

(a) The equation uses only lagged values of the explanatory variables.

(b) In accordance with the rational expectations theory, the Godfrey test (with one degree of freedom, the 5% critical x^2 = 3.84 against the calculated value of 0.60) and the F* - statistics (with v_1 = 1 and v_2 = 10, the 5% critical F* = 4.96 against the calculated value of 0.33. Also both the Durbin-Watson and Durbin-h statistics (at 1% level) indicate that the residuals from the money prediction equation are white noise. Thus, we cannot reject the hypothesis of zero first order serial correlation of the errors.

(c) The equation explains a significant proportion of the variation in money growth (the calculated F = 6.62 while the critical 5% F(7,11) = 3.01). Also, both the R^2= 0.81 and $\bar{R}^2$ = 0.69, are high.

(d) Finally, the forecasting equation also appears structurally stable throughout the estimation period on the basis of the Chow (1960) test. Using the mid-point as the breaking date, the calculated F = 0.59, while the 5% critical F = 8.85 hence we cannot reject the hypothesis of the same coefficients in the two sub-periods. Other breaking dates did not indicate structural instability. The plots of the cumulative sum of recursive residuals and the cumulative sum of squares of recursive residuals in

figures 5.1a and 5.1b confirm this. It should be noted, following Mishkin (1982b), that no problem of observational equivalence (Sargent, 1976) should exist here because the anticipated money growth equation contains lagged values of variables that are not directly included in the output, unemployment, and price equations.

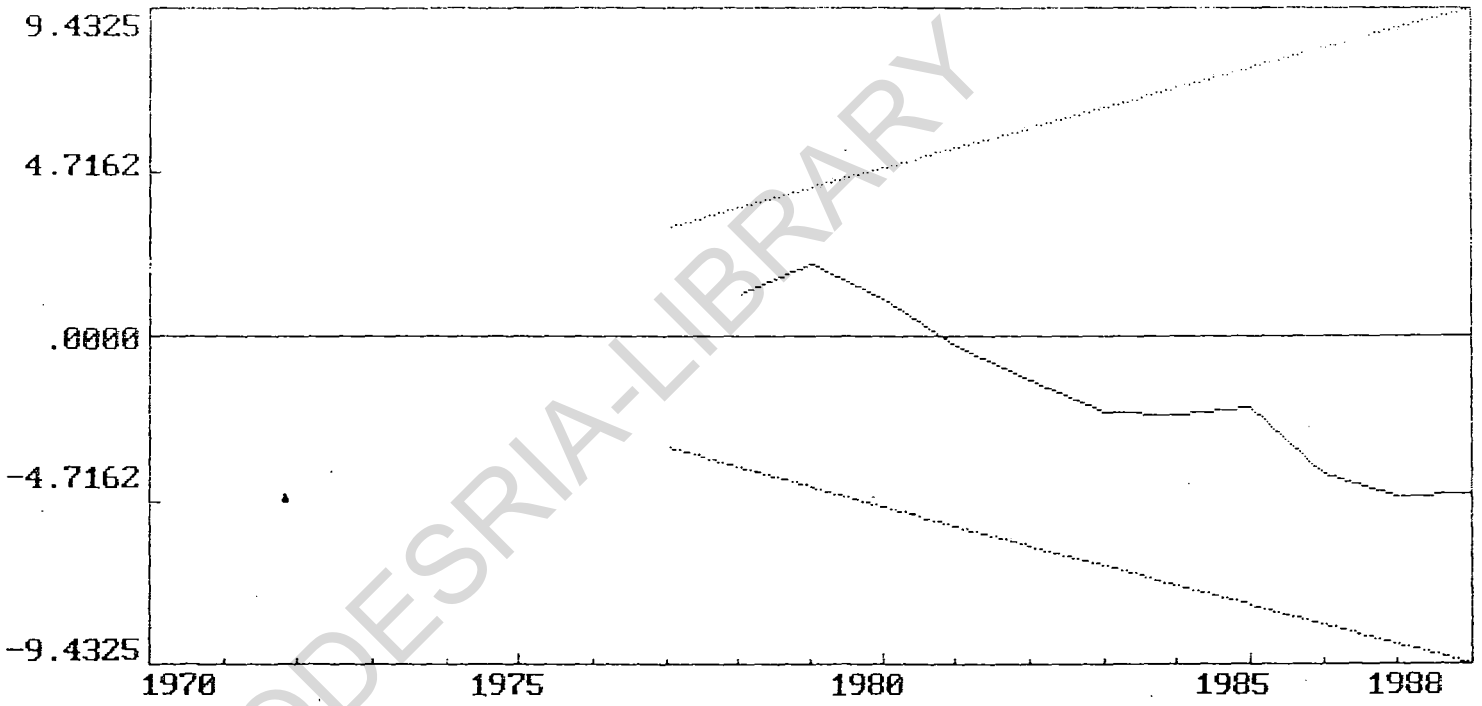
Anticipated money growth rates ($D\hat{M}_t = DMA_t$) are measured by the predicted values from equation 5.1. The residuals (actual minus predicted values) represent the unanticipated money growth component ($DMR_t = DM_t - \hat{DM}_t$) or the "surprise" or "news" component. The estimated values, $D\hat{M}_t$ (or DMA_t) and DMR_t, are indicated along with values of actual money growth in table 5a. Figure 5.1c shows the plot of the actual and fitted money growth values while figure 5.1d shows the plot of the residuals and standard error bands.

In fact, the pattern of the graphy (fig. 5.1c) of the actual and fitted values of the money growth shows that the equation has a good fit and that there is absence of serial correlation. Figure 5.1d confirms the latter point since the graphy exhibits no clear pattern.

Table 5.1a: Values of Money Supply Growth

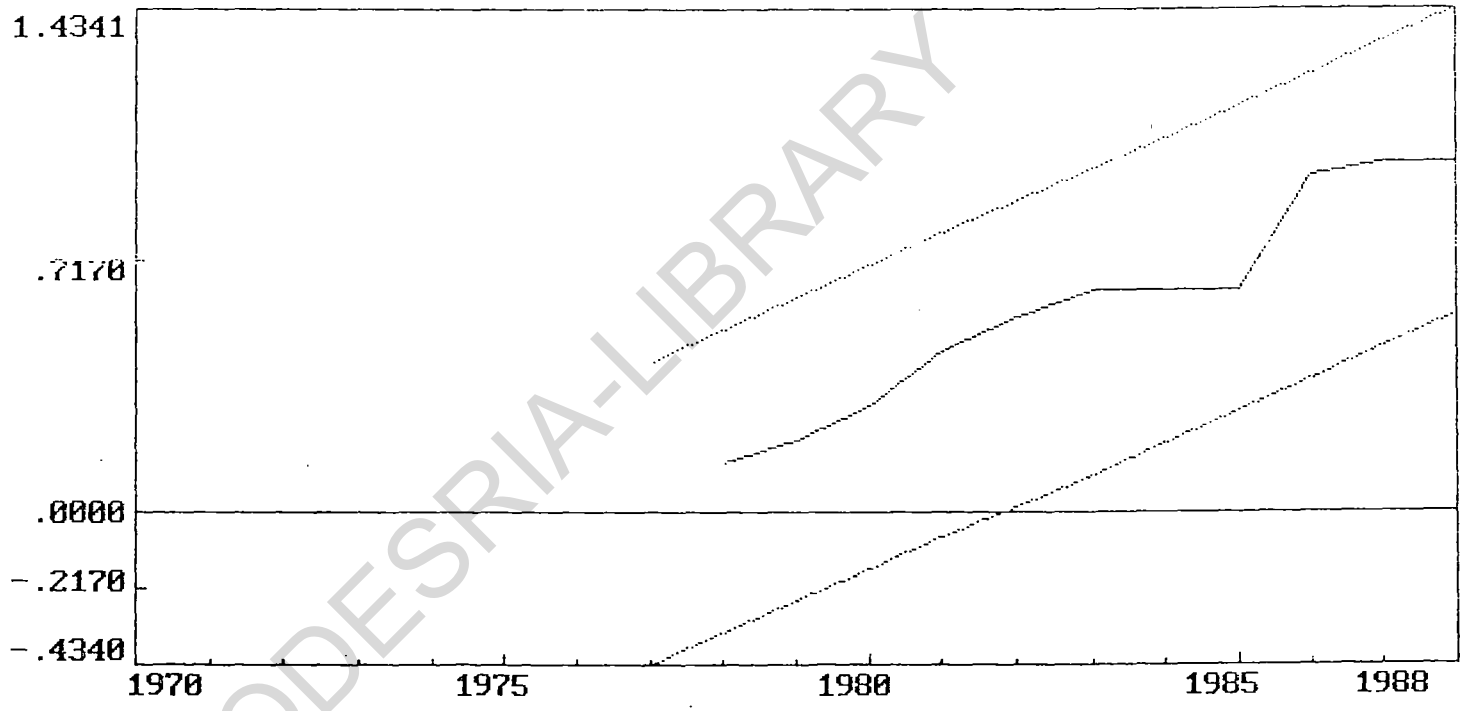
Year	Actual (DM_t)	Fitted ($\hat{DM}_t$)	Residual (DMR_t)
1970	.3980	.3680	.0299
1971	.0502	.0988	-.0486
1972	.1443	.1295	.0148
1973	.1968	.3275	-.1307
1974	.4219	.3672	.0547
1975	.5194	.5216	-.0022043
1976	.3760	.3655	.0105
1977	.1785	.2091	-.0306
1978	.1587	.1831	-.0244
1979	.2771	.1672	.1099
1980	.3890	.2653	.1238
1981	.0769	.1307	-.0538
1982	.0830	.0838	-.0007618
1983	.1367	.1710	-.0343
1984	.1090	.0724	.0367
1985	.0978	.0230	.0748
1986	.0320	.1273	-.0953
1987	.1986	.2365	-.0380
1988	.3551	.3515	.0035318

Fig. 5.1a: DM_3 - Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Fig. 5.1b: DM_3 Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Fig. 5.1c: DM_3 - Plot of Actual and Fitted Values

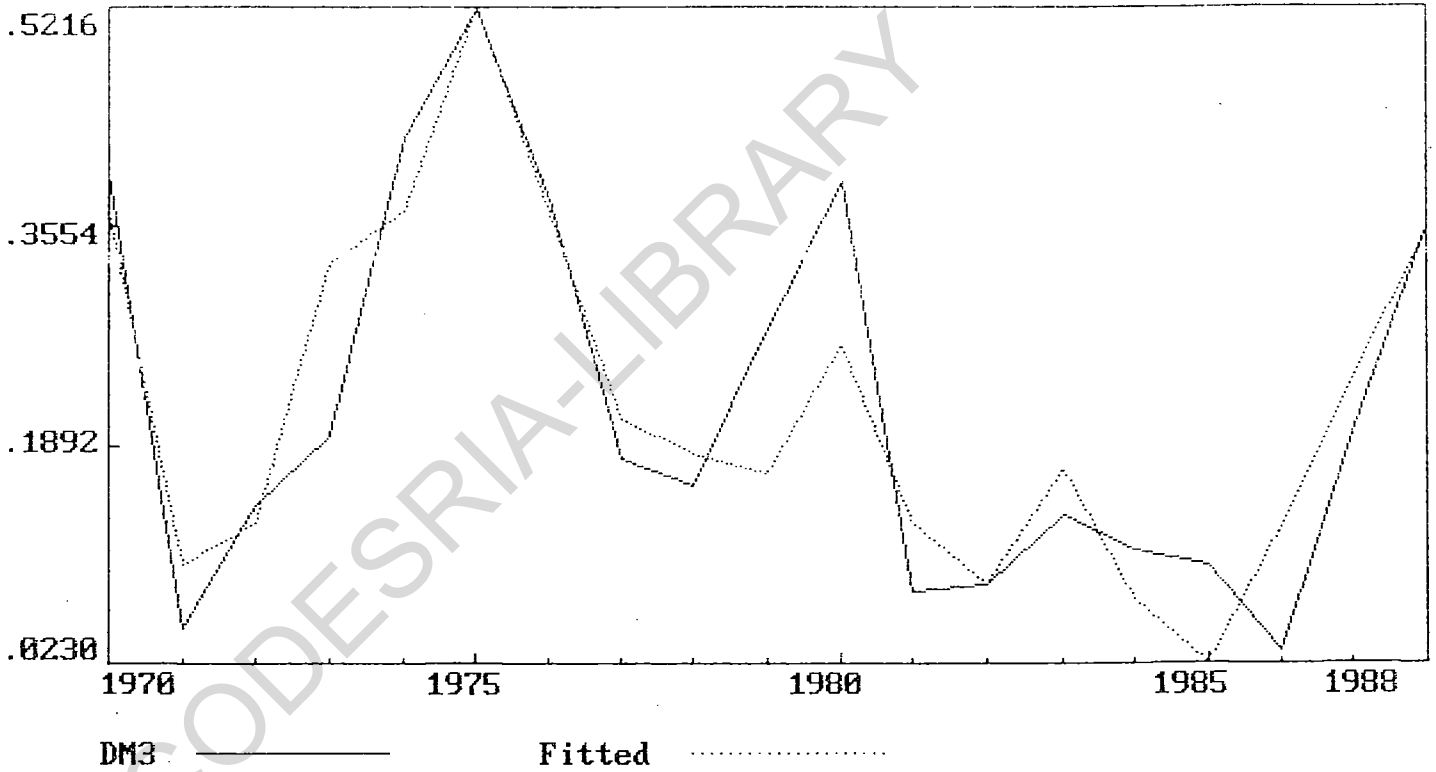
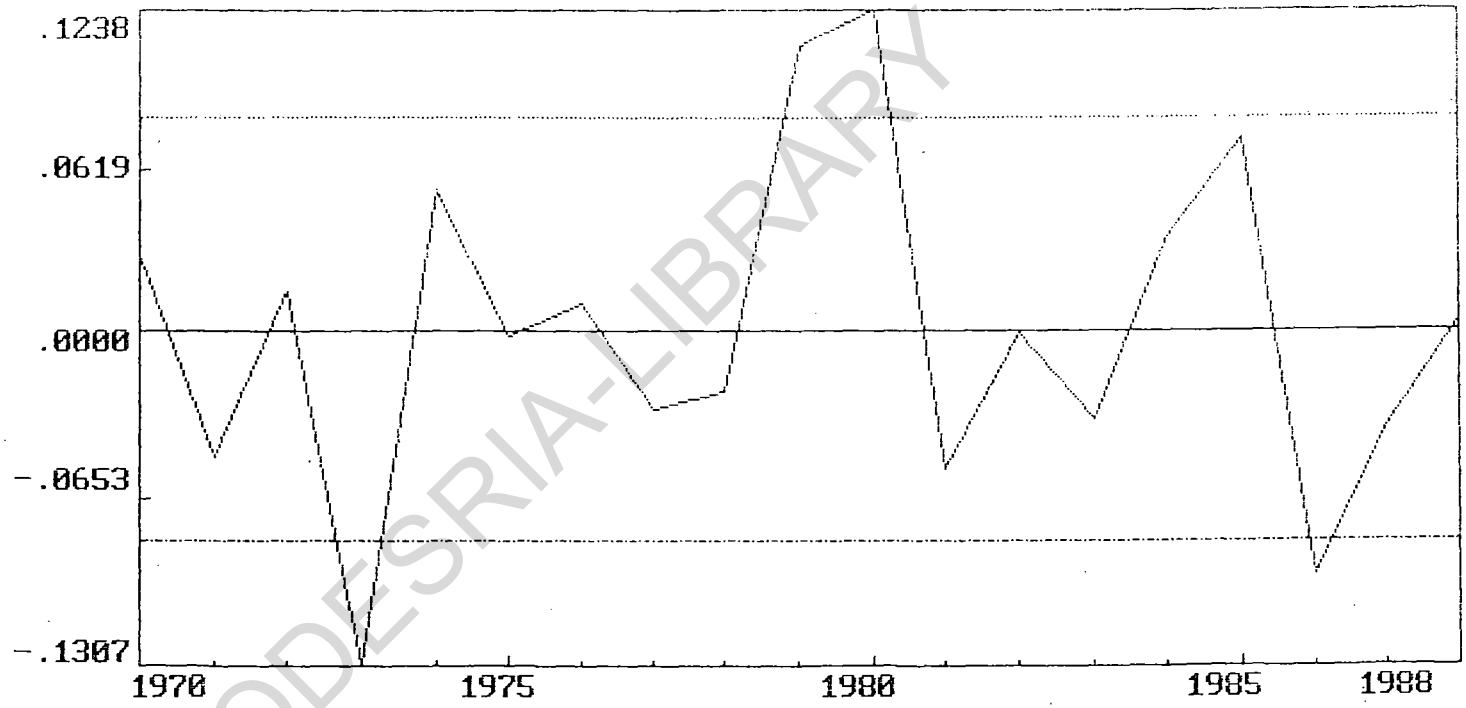


Fig. 5.1d: DM_3 - Plot of Residuals and Standard Error Bands



5.1.1b GOVERNMENT EXPENDITURE GROWTH EQUATION.

Again, an atheoretical statistical procedure was used to determine the selection of the relevant predictors of the stance of the Nigerian fiscal policy.

Thus, using this procedure and the Ordinary Least Squares (OLS) Method resulted in the empirical results reported in equation 5.2 to forecast the Nigerian/federal expenditure growth - the systematic part of the government expenditure equation:

$$DG_t = \underset{(1.48)}{4.929} - \underset{(-1.98)}{0.560DG_{t-1}} - \underset{(-0.76)}{0.305DG_{t-2}} - \underset{(-1.42)}{0.748V_{t-1}}$$

$$+ \underset{(2.98)}{0.636E_{t-1}} - \underset{(-1.41)}{0.198E_{t-2}} - \underset{(-1.41)}{0.085L_{t-1}} \quad \ldots\ldots\ldots (5.2)$$

$R^2 = 0.61$, $\bar{R}^2 = 0.41$, S.E. = 0.2530, $F(6,12) = 3.12$, D.W. = 1.85, $x^2(1) = 0.04$, $F^*(1,11) = 0.036$, N = 19, where the numbers in parentheses below the coefficient estimates are the absolute values of the t-ratios, x^2 is the Godfrey statistics for testing the presence of autocorrelation in the residuals. Other descriptions are as in the case of money growth equation. The Durbin-h is not valid here given the high variance of the coefficient of DG_{t-1} resulting in negative square root which cannot be taken (see Pindyck and Rubinfeld,1981). Thus, both x^2

and F* - statistics are used for testing for white noise in the residuals.

We note that DG_t is the government expenditure growth/change ($\log (DG)_t - \log (DG)_{t-1}$), V = log of real government revenue, E = log of real external reserves, L = log of real external debt outstanding.
Also, the equation was estimated using OLS on MICROFIT with annual data for 1970 to 1988.

The variables found to be important determinants of government expenditure growth, over the data period, 1970 - 1988, are the dependent variable lagged from one to two periods, one-period lag of the log of real government revenue, one to two period lags of the log of real external reserves, and one-period lag of the log of real external debt outstanding.

Again, before any further use of the government expenditure growth forecasting equation, we need to make sure that it satisfies the required criteria:

(a) The equation uses only lagged values of the explanatory variables.

(b) In accordance with the rational expectations theory, the Lagrange Multiplier (Godfrey test) at the 5% critical $x^2 = 3.84$ against calculated value of 0.04) indicates

absence of serial correlation among the residuals. This finding is corroborated by the F* - statistic (with V=1, V_2 = 11, the 5% critical F* =4.96 against calculated F* = 0.03).

(c) The equation explains a significant proportion of the variation in the government expenditure growth (the calculated F = 3.12 while the critical 5% F(6,12) = 3.00). Also, both the R^2 = 0.61 and $\bar{R}^2$ = 0.41, are high.

(d) Finally, the forecasting equation also appears structurally stable throughout the estimation period on the basis of the Chow test. Using the mid-point as the breaking date, the calculated F = 0.64, while the 5% critical F = 4.88, hence we cannot reject the hypothesis of the same coefficients in the two sub-periods (see figures 5.1e and 5.1f). Other breaking dates did not indicate structural instability. There was also no problem of observational equivalence since the anticipated government expenditure equation contains lagged values of variables that are not directly included in the output, unemployment, and price equations.

Anticipated government expenditure growth rates ($\hat{DG}_t = DGA_t$) are measured by the predicted values from equation 5.2. The residuals (actual minus predicted

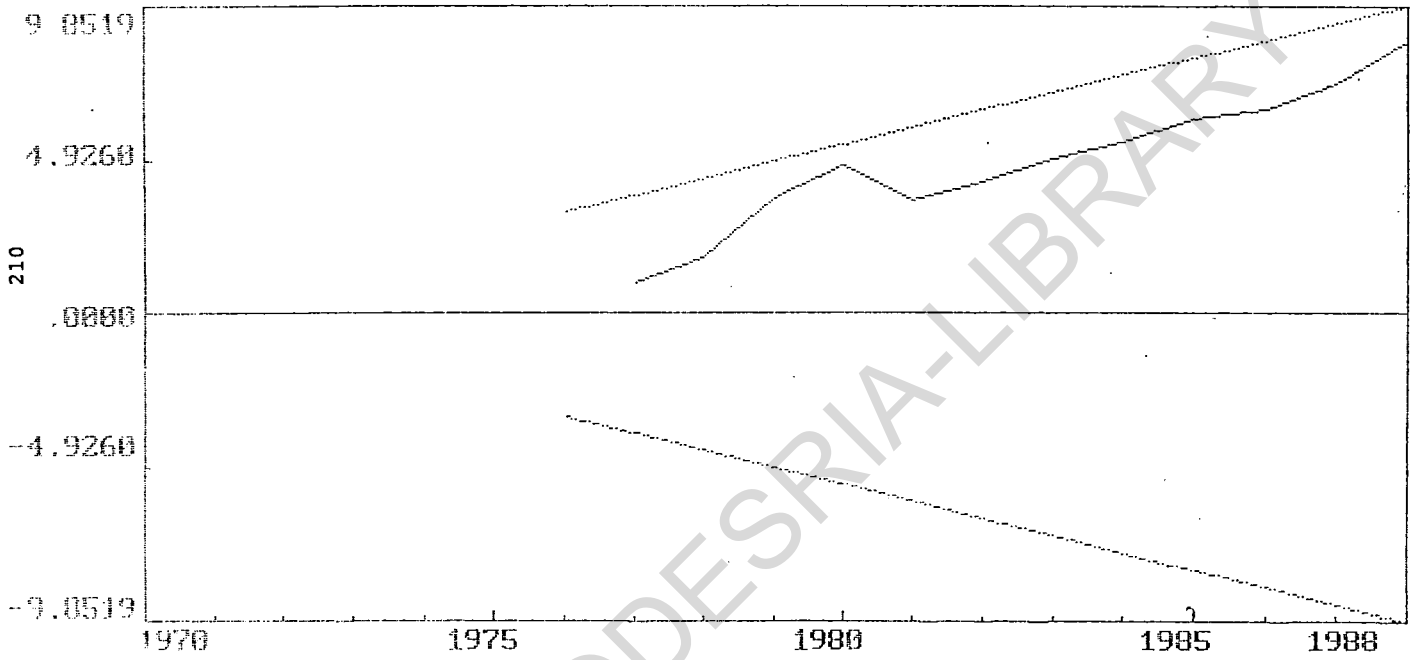
values) represent the unanticipated government expenditure growth component ($DGR_t = DG_t - \hat{DG}_t$) or "surprise" or "news" component. The estimated values, $\hat{DG}_t$ (or DGA_t) and DGR_t are indicated along with values of actual government expenditure growth in table 5.1b. Figure 5.1g shows the plot of the actual and fitted government expenditure growth values while figure 5.1h shows the plot of the residuals and standard error bands.

Again, the pattern of the graph (fig. 5.1g) of the actual and fitted valeus of the expenditure growth shows that the equation has a good fit and that there is absence of serial correlation. Figure 5.1h confirms the latter point since the graph exhibits no clear pattern.

Table 5.1b Values of Government Expenditure Growth

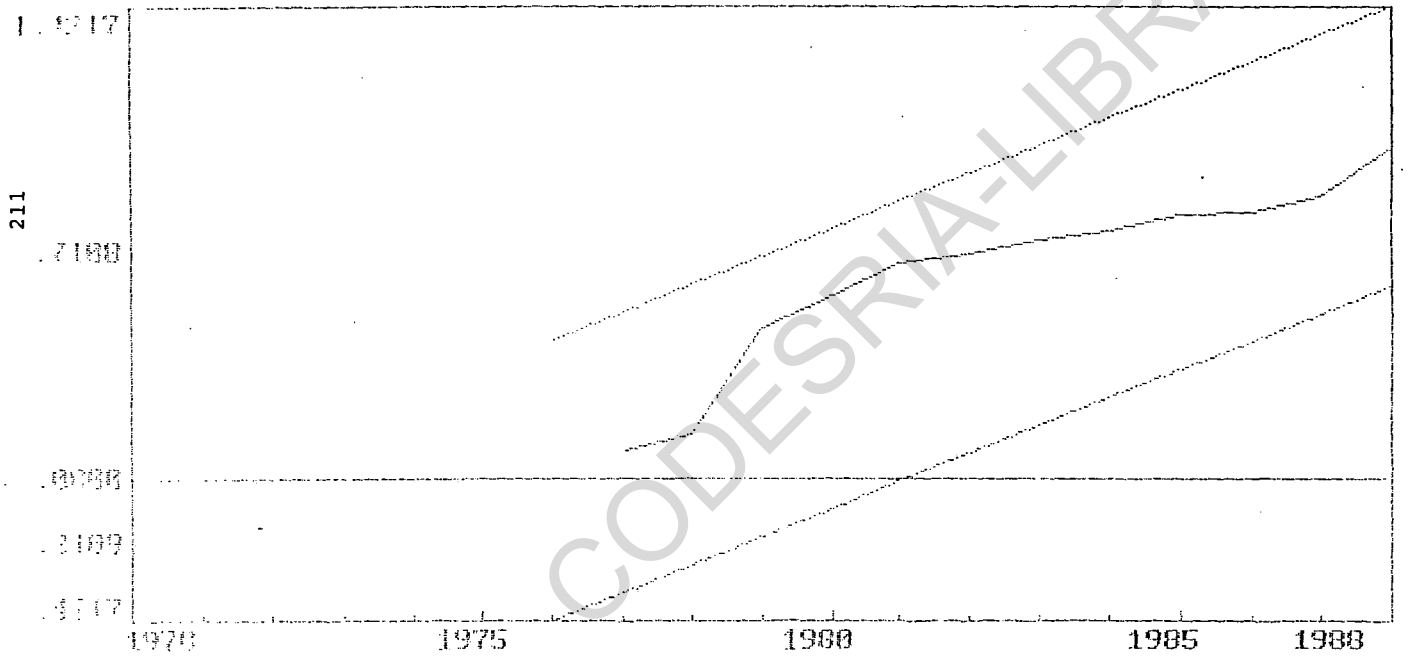
Year	Actual (DG)	Fitted ($\hat{DG}$)	Residual (DGR)
1970	.4108	.3247	.0862
1971	-.2721	.2126	-.4846
1972	.4249	.4669	-.0420
1973	.1103	-.0773	.1876
1974	.6534	.2282	.4252
1975	.8489	.8096	.0393
1976	.3111	.0807	.2304
1977	.0963	.2150	-.1187
1978	.1453	.2656	-.1203
1979	-.1400	-.1177	-.0223
1980	.6448	.5591	.0857
1981	-.2102	.1580	.3682
1982	.1234	.1004	.0230
1983	-.2892	-.2410	-.0483
1984	-.0142	.0431	-.0573
1985	.3249	.2930	.0319
1986	-.0541	.0666	-.1207
1987	.5642	.5330	.0312
1988	.2313	-.1017	.2421

Fig. 5.1e: DG - Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

Fig. 5.1f: DG - Plot of Cumulative Sum of Squares of Recursive Residuals



Straight lines represent critical bounds at 5% significance level

Fig. 5.1g DG - Plot of Actual and Fitted Values

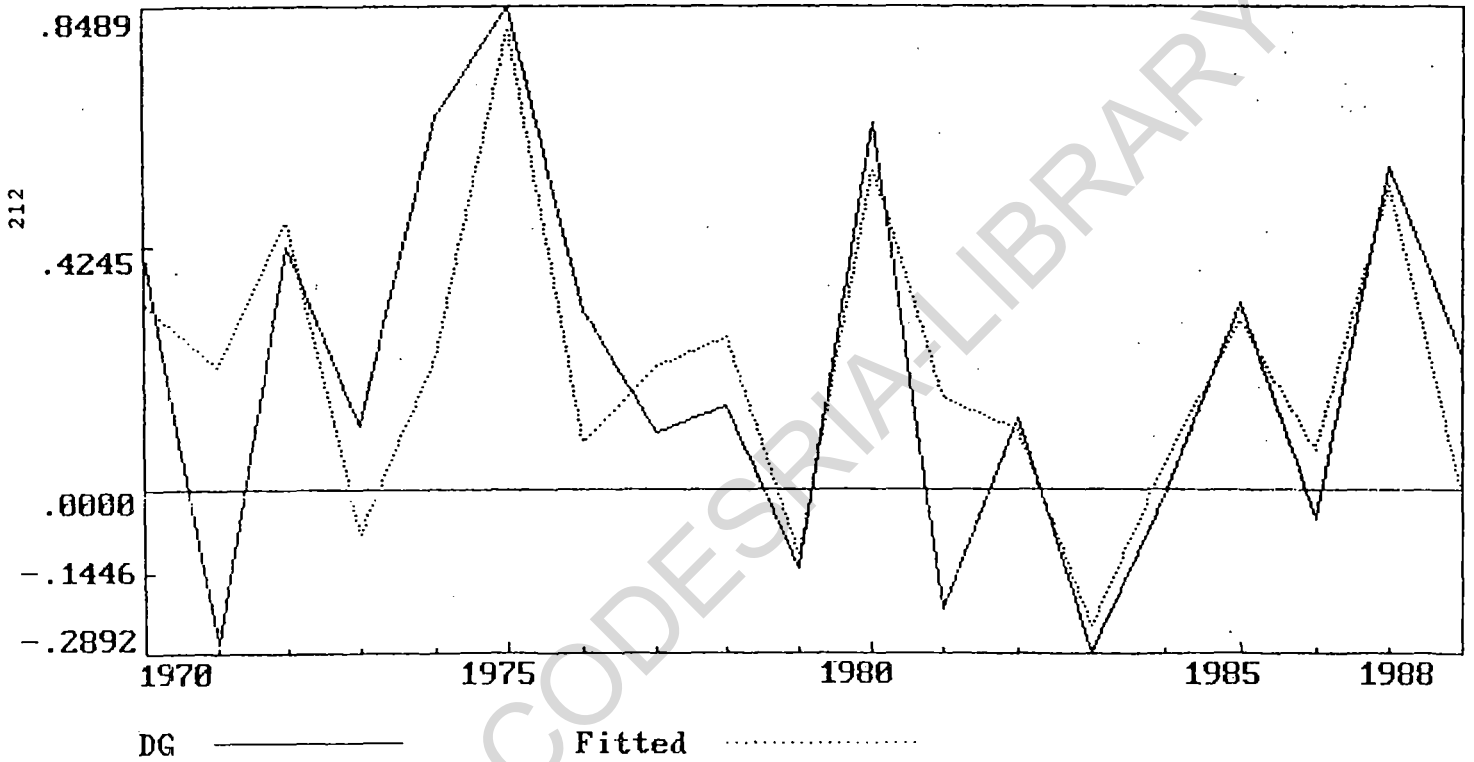
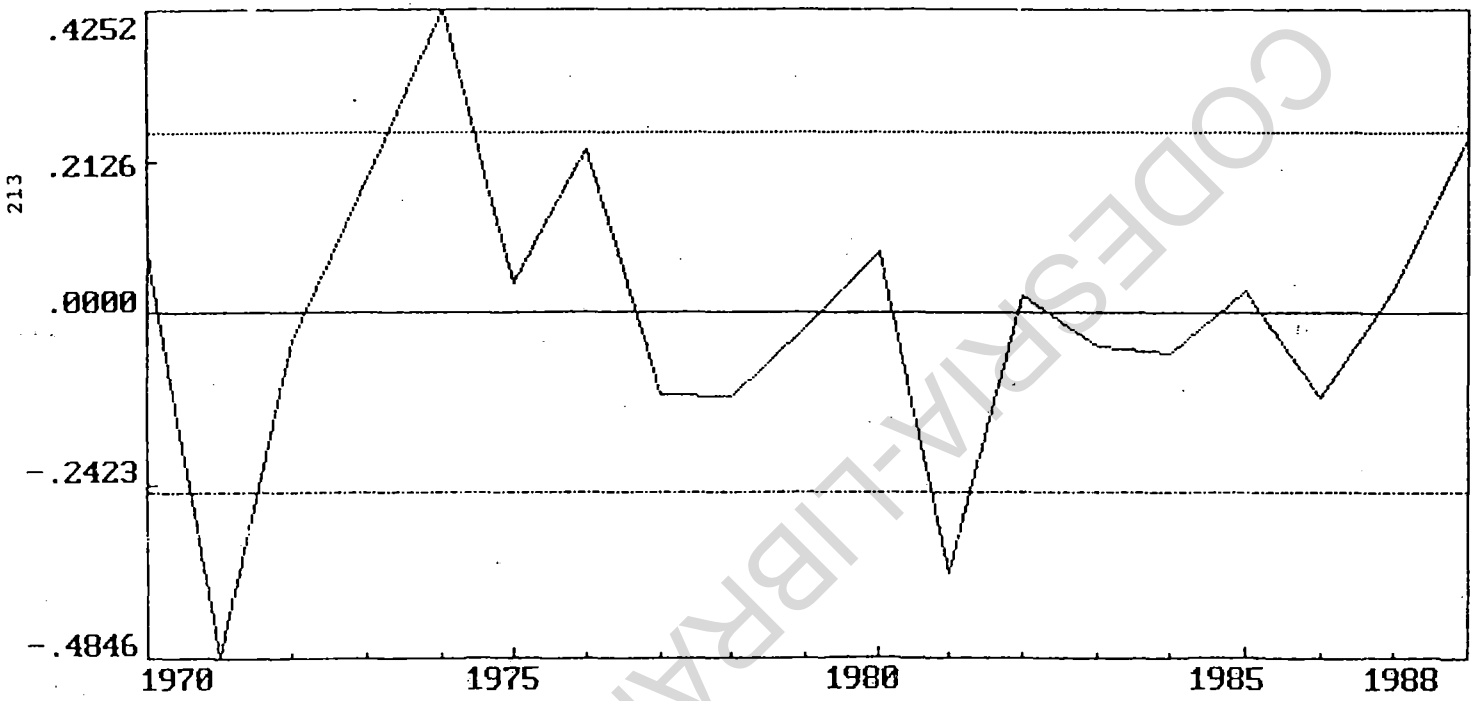


Fig. 5.1h: DG - Plot of Residuals and Standard Error Bands



5.1.2 OUTPUT EQUATIONS

In this second stage, the contemporaneous and lagged values of the systematic and surprise components of money growth and government expenditure growth are used in estimating the overall output (in logarithms) equations. There are two versions of the output (real GDP measured at 1985 prices) equation that are estimated. The first version is the closed-economy version. The estimation results for the closed-economy version are presented in table 5.1c while the open-economy version results are presented in table 5.1d. In each case, depending on the hypothesis being tested, a contemporaneous and two annual lag values of DMA, DMR, DGA, and DGR are used, respectively. In each case, too, the time trend (T) is used to capture the effects of secular growth in the natural rate of output.

The x^2 (chi-square), Durbin-Watson (and F-statistics) complement each other in measuring for the presence of serial correlation in the residuals. The F^{MA}, F^{MR}, F^{GA}, and F^{GR} are the computed F-statistics values for testing the joint significance of coefficients on DMA's, DMR's, DGA's, and DGR's, respectively. These are complemented by L^C (the likelihood ratio statistics, also for the

joint test of zero restrictions on the coefficients of the variables). The results show that the fits of the equations are good, and there is no significant auto-correlation.

(a) The CLOSED-ECONOMY CASE

The first hypothesis to be tested is that of "neutrality" or "policy-ineffectiveness", that is, the systematic or anticipated parts of monetary and fiscal policies and their lagged values have no effect on output. This is tested by evaluating columns (i), (iii), and (iv) of table 5.1c.In column (i), at both the 5% and 1% significance levels, the null hypothesis cannot be rejected for both monetary and fiscal policies, due principally to the simultaneous appearance of DMA and DGA values in the equation. However, in column (iii) for monetary policy, the hypothesis is rejected at the 10% significance level (the calculated value of F-statistic, 2.88 is above the critical value of 2.61). Also the calculated likelihood ratio statistic is 9.22 which is above the critical value of 7.81 at the 5% significance level.

In column (iv), the null hypothesis is accepted for fiscal policy as shown by both the F-statistics and likeli-

Table 5.1c: THE REDUCED FORM CLOSED-ECONOMY OUTPUT EQUATIONS, 1972-1988[c]

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Intercept	10.924	11.161	10.945	11.029	10.902	11.050	11.152	11.167
	(98.58)	(166.39)	(107.04)	(129.12)	(103.40)	(119.51)	(172.26)	(181.52)
Time	0.015	0.008	0.014	0.012	0.015	0.012	0.008	0.007
	(3.41)	(1.93)	(3.50)	(3.01)	(3.72)	(2.82)	(2.18)	(1.96)
DMA_t	0.049		0.045		0.317			
	(0.22)		(0.25)		(1.32)			
DMA_{t-1}	0.180		0.186		-0.020			
	(0.82)		(0.94)		(-0.09)			
DMA_{t-2}	0.222		0.278		0.339			
	(1.05)		(1.62)		(1.94)			
DMR_t		0.436			0.419			0.400
		(1.32)			(1.66)			(1.41)
DMR_{t-1}		0.159			0.239			0.252
		(0.41)			(1.03)			(0.91)
DMR_{t-2}		0.394			0.463			0.216
		(1.02)			(1.46)			(0.77)

Table 5.1c cont'd

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
DGA_t	0.004			0.067		0.021		
	(0.05)			(0.95)		(0.24)		
DGA_{t-1}	0.008			0.922		0.068		
	(0.97)			(1.26)		(0.83)		
DGA_{t-2}	0.092			0.162		0.172		
	(1.11)			(2.11)		(2.08)		
DGR_t		0.009				-0.054	-0.011	
		(0.06)				(-0.52)	(-0.10)	
DGR_{t-1}		0.145				0.122	0.089	
		(1.20)				(1.38)	(0.98)	
DGR_{t-2}		0.031				0.069	0.099	
		(0.29)				(0.66)	(1.08)	
R^2	0.62	0.49	0.55	0.45	0.69	0.54	0.35	0.37
$\bar{R}^2$	0.32	0.10	0.40	0.27	0.45	0.23	0.13	0.17
D.W	0.96	1.02	1.21	0 7	1.60	1.11	1.11	0.79
x^2	4.42	5.36	2.03	5.36	0.31	5.54	4.69	4.77
$F^{MA}(L^C)$	F(3,9)= 1.29(6.09)		F(3,12)= 2.88(9.22)		F(3,9)= 3.04(11.89)			

Table 5.1c Cont'd

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
$F^{MR}(L^C)$		F(3,9)=0.83 (4.14)			F(3,9)=1.31 (6.15)			F(3,12)=0.91(3.48)
$F^{GA}(L^C)$	F(3,9)= 0.51(2.67)			F(3,12)= 1.62(5.79)		F(3,9)= 1.52(6.95)		
$F^{GR}(L^C)$		F(3,9)= 0.69(3.51)				F(3,9)= 0.80(4.01)	F(3,12)= 0.73(2.85)	

Note: ^{C}; numbers in parentheses below the coefficients are t- ratios

hood ratio statistic which are below their critical values at even 10% significance level. This is at variance with the results of Odedokun (1989).

The second hypothesis for testing is that only the unanticipated parts of monetary and fiscal policies affect real output ("worse" proposition). This can be tested by analyzing columns (ii), (v), (vi), (vii), and (viii) of table 5.1c. The null hypothesis is rejected for both the monetary and fiscal policies in all the equations given the very low calculated F-statistics and the likelihood ratio statistics for DMRs and DGRs. Instead, as the results in column (v) show, there is a stronger reaffirmation of the significant effect of the anticipated part of monetary policy on output (the critical value of the F-statistics at the 10% significance level is 3.04 against the calculated value of 2.81 while the critical value of the likelihood ratio is 7.81 at the 5% significance level against the calculated value of 11.89). This result is comparable to that of Odedokun (1988).

A third hypothesis for testing is that changes of monetary impulses dominate changes of fiscal impulses in shaping the broad contours of fluctuations in output.

It is clear from the results in all the columns in table 5c that both anticipated and unanticipated monetary impulses dominate anticipated and unanticipated fiscal impulses in shaping the broad contours of fluctuations in output (for example, in column (v), $F^{MA} = 3.04$ while in column (vi) $F^{GA} = 1.52$ while in column (viii) $F^{MR} = 0.91$ and in column (vii) $F^{GR} = 0.73$). Thus, the null hypothesis is accepted.

(b) THE OPEN-ECONOMY CASE:

A proxy for external variables - terms of trade (export unit value divided by import unit value) - was used. This is shown in the equations as XT (log of terms of trade). It appears with the correct (positive) sign except in column (ii) of table 5.1d.

Again, to test for the "neutrality" hypothesis, we examine columns (i), (iii), and (iv) of table 5.1d. In column (i), at both the 5% and 1% significance levels, the null hypothesis could not be rejected for both monetary and fiscal policies. This is again due to the appearance of the DMA's and DGA's together in that equation. In column (iii), though the $F^{MA} = 2.40$ is high, the null hypothesis could only be rejected for monetary policy

Table 5.1d: THE REDUCED FORM OPEN-ECONOMY OUTPUT EQUATIONS, 1972-1988[d]

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Intercept	10.614	11.193	10.753	10.701	10.798	10.729	10.973	11.036
	(52.14)	(38.25)	(60.92)	(74.26)	(51.15)	(51.29)	(64.59)	(56.03)
Time	0.012	0.008	0.013	0.009	0.014	0.010	0.006	0.006
	(2.68)	(1.64)	(2.92)	(2.71)	(3.12)	(2.44)	(1.52)	(1.41)
XT	0.084	-0.008	0.052	0.084	0.028		0.050	0.036
	(1.75)	(-0.11)	(1.32)	(2.61)	(0.57)		(1.13)	(0.70)
DMA_t	0.198		0.169		0.366			
	(0.93)		(0.86)		(1.39)			
DMA_{t-1}	-0.119		0.024		-0.092			
	(-0.46)		(0.10)		(-0.34)			
DMA_{t-2}	0.240		0.322		0.364			
	(1.25)		(1.89)		(1.95)			
DMR_t		o.479			0.339			0.264
		(0.91)			(1.14)			(0.76)
DMR_{t-1}		0.158			0.183			0.172
		(0.39)			(0.70)			(0.56)

Table 5.1d Cont'd

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
DMR_{t-2}		0.429			0.446			0.137
		(0.83)			(1.35)			(0.44)
DGA_t	0.030			0.084		0.081		
	(0.39)			(1.44)		(0.92)		
DGA_{t-1}	0.100			0.146		0.142		
	(1.06)			(2.30)		(1.64)		
DGA_{t-2}	0.134			0.174		0.183		
	(1.70)			(2.75)		(2.41)		
DGR_t		0.003				-0.011	0.017	
		(0.02)				(-0.11)	(0.15)	
DGR_{t-1}		0.157				0.056	0.054	
		(0.91)				(0.62)	(0.57)	
DGR_{t-2}		0.028				-0.010	0.079	
		(0.33)				(-0.09)	(0.86)	
R^2	0.72	0.49	0.61	0.66	0.70	0.68	0.42	0.40
$\bar{R}^2$	0.45	-0.02	0.44	0.51	0.40	0.36	0.15	0.13
D.W.	1.02	1.04	1.28	1.09	1.58	1.03	1.03	0.79
x^2	6.44	1.39	2.39	3.73	0.59	6.07	4.85	5.37

Table 5.1d Cont'd

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
$F^{MA}(L^C)$	F(3,8)=0.59 (3.41)		F(3,11)=2.40 (8.55)		F(3,8)=2.68 (11.84)			
$F^{MR}(L^C)$		F(3,8)=0.38 (2.29)			F(3,8)=0.78 (4.35)			F(3,11)=0.24 (1.07)
$F^{GA}(L^C)$	F(3,8)=1.06 (5.67)			F(3,11)=3.26 (10.81)		F(3,8)=2.19 (10.18)		
$F^{GR}(L^C)$		F(3,8)=0.48 (2.79)				F(3,8)=0.15 (0.94)	F(3,11)=0.36 (1.59)	

Note: d; Numbers in parentheses below the coefficients are t-ratios.

on the basis of F-statistic at below 10% significance level. However, on the basis of the likelihood ratio statistic we clearly reject the null hypothesis at the 5% significance level given the critical value of 7.81 as against the calculated value of 8.55.

In column (iv), the null hypothesis is clearly rejected for fiscal policy on the basis of both the F-statistic and the likelihood ratio statistic. At the 10% significance level, the calculated F-statistic is 3.26 against the critical value of 2.66. Also, at the 5% significance level the critical value of the likelihood ratio is 7.81 against the calculated value of 10.81. This behaviour of fiscal policy could be because government expenditure is significantly externally-led.

To test for the "worse" proposition, we examine columns (ii), (v), (vi), (vii), and (viii) in table 5.1d. As in the closed-economy case, the null hypothesis is rejected for both the monetary and fiscal policies in all the equations given the very low calculated F-statistics and the likelihood ratio statistics for DMRs and DGRs. Instead, as the results in columns (v) and (vi) show, there is a reaffirmation of the significant effect of the anticipated parts of monetary and fiscal policies on output.

The critical value of the likelihood ratio at the 5% significance level is 7.81 against the calculated value of 11.84 in the case of anticipated monetary policy. This result is comparable to the result of Darrat (1987) for Denmark. For the anticipated part of fiscal policy, the critical value of the likelihood ratio at the 5% level is 7.81 against the computed value at 10.18. Overall, therefore, the Nigerian data rejects the rational expectations hypothesis.

With respect to the monetary dominance hypothesis, we observe that with the exception of columns (v) and (vi), anticipated and unanticipated fiscal policy dominates the anticipated and unanticipated monetary policy for the open-economy output equations. Thus, generally, the null hypothesis of monetary dominance is rejected in the open-economy case of output equations of the Nigerian economy. This conclusion is consistent with the findings of Fourcans (1978) for a closed-economy case.

5.1.3 THE UNEMPLOYMENT EQUATIONS.

Equations in table 5.1e represent the urban unemployment equations (in logarithms) for the period 1975-1988 for which data were available both spatially and in terms of time period. Depending on which hypothesis is being tested the equations include one - period lag of unemployment, a contemporaneous and two annual lag values of DMA, and DMR, DGA, and DGR. The results indicate that the fits of the equations are good, and there is no significant autocorrelation.

To test the "neutrality" hypothesis, we examine columns (i), (iii), and (iv) of table 5.1e. Column (i) exhibits similar character as in the output equations such that, though the F-statistic for monetary policy ($F^{MA} = 3.17$) is high, the hypothesis could only be rejected at above the 10% significance level. However, the hypothesis is clearly rejected using the likelihood ratio whose calculated value at 5% significance level is 13.28 against the critical value of 7.81.

On the other hand, the results for fiscal policy in column (i) clearly accepts the null hypothesis both in terms of the F-statistic and the likelihood ratio

Table 5.1e: THE REDUCED FORM UNEMPLOYMENT (UN_t) EQUATIONS, 1975-1988[e]

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Intercept	0.902	0.219	0.962	0.657	1.303	0.293	0.142	0.409
	(2.85)	(0.31)	(2.98)	(1.89)	(3.19)	(0.59)	(0.32)	(0.90)
UN_{t-1}	0.819	0.873	0.781	0.780	0.644	0.970	0.915	0.744
	(5.03)	(1.99)	(4.74)	(4.16)	(3.31)	(3.93)	(3.24)	(2.62)
DMA_t	-2.852		-2.923		-3.600			
	(-2.30)		(-2.62)		(-2.50)			
DMA_{t-1}	3.009		3.890		4.399			
	(1.97)		(2.78)		(2.76)			
DMA_{t-2}	-2.852		-3.805		-4.170			
	(-2.48)		(-3.69)		(-3.74)			
DMR_t		0.541			-2.828			-0.950
		(0.10)			(-1.45)			(-0.32)
DMR_{t-1}		-1.845			-1.130			-0.896
		(-0.42)			(-0.66)			(-0.33)
DMR_{t-2}		2.286			-2.183			1.806
		(0.42)			(-1.05)			(0.69)
DGA_t	-0.180			-0.842		-0.710		
	(-0.38)			(-1.81)		(-1.05)		
DGA_{t-1}	0.423			0.124		0.321		
	(0.80)			(0.26)		(0.47)		
DGA_{t-2}	-0.498			-0.985		-0.961		
	(-1.09)			(-2.07)		(-1.80)		

Table 5.1e Cont'd.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
DGR_t		-0.978				-1.338	-1.294	
		(-0.43)				(-1.20)	(-1.02)	
DGR_{t-1}		0.165				-0.776	-0.789	
		(0.07)				(-0.88)	(-0.88)	
DGR_{t-2}		-0.471				0.327	-0.017	
		(-0.34)				(0.34)	(-0.02)	
R^2	0.89	0.59	0.83	0.72	0.88	0.79	0.57	0.55
$\bar{R}^2$	0.77	0.10	0.76	0.60	0.74	0.55	0.37	0.34
D.W.(h)	2.73(-1.73)	2.47(None*)	2.67(-1.59)	2.67(-1.75)	2.48(-1.32)	2.73(-3.55)	2.59(None*)	2.26(None*)
x^2	4.14	3.47	2.88	2.65	2.15	2.70	2.81	1.50
$F^{MA}(L^C)$	F(3,6)=3.17 (13.28)		F(3,9)=6.11 (15.55)		F(3,6)=5.54 (18.58)			
$F^{MR}(L^C)$		F(3,6)=0.10 (0.66)			F(3.6)=0.81 (4.78)			F(3,9)=0.40 (1.74)
$F^{GA}(L^C)$	F(3,6)=1.16 (6.40)		F(3,9)=2.57 (8.66)		F(3,6)=2.17 (10.30)			
$F^{GR}(L^C)$		F(3,6)=0.19 (1.29)			F(3,6)=0.66 (4.00)	F(3,9)=0.55 (2.37)		

NOTE: e: Numbers in parentheses below the coefficients are t-ratios

statistic. While the calculated F-value is 1.16, the critical value is 4.76 at the 5% significance level and 3.29 at the 10% significance level.

The pattern clearly emerges in column (ii) for monetary policy. The coefficients of DMAs (anticipated monetary policy) as a group yields $F(3,9) = 6.11$ against a critical value of 3.86 at the 5% significance level. Further, applying the likelihood ratio to test that the DMAs (as a group) are equal to zero, gives $x^2(3) = 15.55$ against a critical value of 7.81 at the 5% level and 11.3 at the 1% level, so that the hypothesis that anticipated part of monetary policy growth does not affect unemployment can be rejected at the 95% and 99% confidence levels.

In column (iv), the coefficients of DGAs (anticipated fiscal policy) as a group yields $F(3,9) = 2.57$ which could not be used to reject the null hypothesis unless at above the 10% significance level. However, using the likelihood ratio whose calculated value is 8.66 we can clearly reject the null hypothesis at the 5% significance level where the critical value is 7.81.

To test the "worse" proposition, we examine columns (ii), (v), (vi), (vii), and (viii). As in the output

equations, the null hypothesis is rejected for both the monetary and fiscal policies in all the equations given that the computed F-statistics and likelihood ratios for the DMRs and DGRs fall far below their critical values. Instead,as the results in columns (v) and (vi) show, there is a reaffirmation of the significant effect of the anticipated parts of monetary and fiscal policies on unemployment. The computed F-statistic for anticipated monetary policy is $F(3,6) = 5.54$ against the critical value of 4.76 at the 5% significance level, while the computed likelihood ratio is 18.58 against the critical value of 7.81 at the 5% significance level. For fiscal policy, the computed likelihood ratio is 10.38 against the critical value of 7.81 at the 5% significance level. Thus for the unemployment equations, there is a clear rejection of the rational expectations hypothesis (REH).

With respect to the monetary dominance hypothesis, all the results in table 5e show that anticipated monetary policy dominates the anticipated part of fiscal policy in shaping the broad contours of unemployment in the Nigerian economy. For example, while $F^{MA} = 6.11$ in column (iii), $F^{GA} = 2.57$ in column (iv). On the other hand, all the results in table 5e show that the unantici-

pated part of fiscal policy dominates the unanticipated part of monetary policy in influencing unemployment in Nigeria. For example, in column (vii) $F^{GR} = 0.55$ while in column (viii) $F^{MR} = 0.40$ - they are, however, not significantly different from each other.

5.1.4 THE PRICE EQUATIONS

Table 5f contains the basic empirical results for the price equations. The results apply to annual observations for the 1972-1988 period and measure P_t or the inflation rate such that $DP_t = \log(P_t) - \log(P)_{t-1}$ measures the growth rate of inflation.

The results indicate that the fits of the equations are good and that there is absence of serial correlation in the residuals.

To test the hypothesis that the anticipated parts of monetary and fiscal policies only affect the price level, we examine columns (i), (iii) and (iv) of table 5f . The hypothesis is decisively accepted for monetary policy as the results in columns (i) and (iii) show. In column (i), the coefficients of DMAs (anticipated monetary policy) as a group yield $F(3,10) = 4.91$ against a critical value of 3.71 at the 5% significance level while the computed

Table 5.1f REDUCED FORM PRICE (P_t) EQUATIONS, 1972-1988[f]

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Intercept	-0.250	0.095	-0.235	0.175	-0.023	0.034	0.078	0.067
	(-0.54)	(0.50)	(-0.54)		(0.05)	(0.07)	(0.41)	(0.31)
DMA_t	4.935		3.429		0.676			
	(2.13)		(1.77)		(0.27)			
DMA_{t-1}	1.494		1.893		4.231			
	(0.60)		(0.82)		(1.68)			
DMA_{t-2}	-2.872		-4.020		-4.572			
	(-1.33)		(-2.34)		(-2.80)			
DMR_t		-3.871			-6.303			-6.694
		(-1.21)			(-2.20)			(-1.95)
DMR_{t-1}		-4.645			-0.378			-1.482
		(-1.23)			(-0.14)			(-0.44)
DMR_{t-2}		0.396			-4.406			-5.688
		(0.10)			(-1.25)			(1.67)
DGA_t	-1.270			-0.504		-0.304		
	(-1.33)			(-0.49)		(-0.30)		
DGA_{t-1}	-0.854			0.123		0.334		
	(-0.86)			(0.12)		(0.35)		
DGA_{t-2}	-0.230			-0.253		0.193		
	(-0.24)			(-0.24)		(0.21)		
DGR_t		-0.346				0.149	0.223	

Table 5.1f Contd.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(vii)
		(-0.24)				(0.12)	(0.20)	
DGR_{t-1}		3.311				2.923	2.841	
		(2.80)				(2.69)	(3.02)	
DGR_{t-2}		-1.412				-1.323	-1.415	
		(-1.34)				(-1.03)	(-1.52)	
R^2	0.61	0.62	0.53	0.03	0.69	0.49	0.47	0.30
$\bar{R}^2$	0.37	0.39	0.42	-0.20	0.50	0.19	0.35	0.14
D.W.	2.41	1.85	2.27	1.86	1.70	2.06	1.99	1.58
x^2	1.09	0.001	0.72	0.09	0.39	0.14	0.77	0.08
$F^{MA}(L^C)$	F(3,10)=4.91 (15.40)		F(3,13)=4.88 (12.82)		F(3,10)=4.18 (13.81)			
$F^{MR}(L^C)$		F(3,10)=1.27 (5.48)			F(3,10)=1.73 (1.09)			F(3,13)=1.87 (6.11)
$F^{GA}(L^C)$	F(3,10)=0.66 (3.06)			F(3,13)=0.13 (0.48)		F(3,10)=0.13 (10.89)		
$F^{GR}(L^C)$		F(3,10)=2.76 (10.27)				F(3,10)=3.06 (11.06)	F(3,13)=3.89 (10.89)	

Note: f: Numbers in parentheses below the coefficients are t-ratios.

likelihood ratio is 15.40 against the critical value of 7.81 at the 5% significance level. Also, in column (iii), the coefficients of DMAs as a group yield $F(3, 13) = 4.88$ against a critical vlaue of 3.41 at the 5% significance level while the calculated likelihood ratio is 12.82 against the critical value of 7.81 at the 5% significance level. These results are confirmed in column (v) where the computed F-statistic for the DMAs as a group is 4.18 against the critical value of 3.71 at the 5% significance level while the calculated likelihood ratio is 13.81% against the critical value of 7.81 at the 5% significance level. This provides a strong support for one of the propositions of the rational expectations school- that anticipated monetary policy affects the price level.

On the other hand, the hypothesis is clearly rejected in the case of fiscal policy as the results in columns (i) and (iv) show. In each case, both the computed F-statistics and likelihood ratios for the DGAs as a group are far below their critical values at any reasonable or acceptable significance levels. For example, in column (i), the $F(3,10) = 0.66$ while in column (iii) it is only 0.13. This same result is replicated in column (vi) where the F-statistic for the DGAs is still only 0.13.

This means a rejection of one of the propositions of the rational expectations school - that anticipated fiscal policy affects the price level.

The other complementary test is that of the irrelevance of the unanticipated parts of monetary and fiscal policies in the determination of the price level. This can be done by analyzing the results in columns (ii), (v), (vi), (vii) and (viii) of table 5f. This hypothesis is clearly accepted for monetary policy as the results in columns (iv), (v) and (viii) indicate since both the computed F-statistics and likelihood ratios are below their critical levels at any acceptable significance levels. For example, in column (viii), f(3,13) = 1.87 while in column (ii) it is only 1.27. On the other hand, the hypothesis is rejected for fiscal policy as the results in column (ii), (vi) and (vii) indicate. For example, in column (vii) the coefficients of DGRs (unanticipated fiscal policy) as a group yield F(3,13) = 3.89 against a critical value of 3.41 at the 5% significance level while the computed likelihood ratio is 10.89 against the critical value of 7.81 at the same 5% significance level.

There is also the hypothesis that the changes in monetary impulses dominate changes of fiscal impulses in

Table 5.1g REDUCED FORM PRICE (LP_t) EQUATIONS, 1972-1988[9]

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
Intercept	2.184	2.682	2.138	2.717	2.543	3.123	2.654	2.597
	(5.96)	(15.73)	(5.37)	(6.58)	(6.16)	(8.47)	(16.25)	(13.00)
DMA_t	1.141		-0.701		-4.133			
	(0.62)		(-0.40)		(-1.82)			
DMA_{t-1}	4.954		5.002		7.603			
	(2.49)		(2.38)		(3.31)			
DMA_{t-2}	0.174		-1.966		-2.756			
	(0.10)		(-1.26)		(-1.84)			
DMR_t		1.188			-2.393			-0.015
		(0.41)			(-0.92)			(-0.005)
DMR_{t-1}		-4.333			-0.494			-0.195
		(-1.26)			(-0.21)			(-0.06)
DMR_{t-2}		-2.204			-7.149			-3.587
		(-0.64)			(-2.22)			(-1.15)
DGA_t	-1.400			-0.318		-1.385		
	(-1.84)			(-0.39)		(-1.80)		
DGA_{t-1}	-1.586			0.037		-0.565		
	(-2.00)			(0.044)		(-0.79)		
DGA_{t-2}	-1.415			-0.360		-0.286		
	(-1.85)			(-0.42)		(-0.41)		
DGR_t		-1.610				-0.226	-0.351	
		(1.23)				(-0.24)	(-0.38)	

Table 5.1g Contd.

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
DGR_{t-1}		2.554				2.521	2.284	
		(2.38)				(3.08)	(2.86)	
DGR_{t-2}		0.675				1.720	0.752	
		(0.70)				(1.79)	(0.95)	
R^2	0.61	0.52	0.40	0.03	0.60	0.56	0.41	0.10
$\bar{R}^2$	0.38	0.22	0.26	-0.20	0.36	0.29	0.28	-0.11
D.W.	1.40	1.51	1.59	1.16	1.46	1.47	1.29	1.23
χ^2	1.32	0.31	0.27	1.29	1.54	0.68	1.07	1.30
$F^{MA}(L^C)$	F(3,10)=5.08 (15.73)		F(3,13)=2.90 (8.71)		F(3,10)=4.23 (13.92)			
$F^{MR}(L^C)$		F(3,10)=0.69 (3.22)			F(3,10)=1.67 (6.91)			F(3,13)=0.46 (1.70)
$F^{GA}(L^C)$	F(3,10)=1.84 (7.48)			F(3,13)=0.12 (0.45)		F(3,10)=1.08 (4.79)		
$F^{GR}(L^C)$		F(3,10)=2.89 (10.62)				F(3,10)=4.01 (13.43)	F(3,13)=3.07 (9.10)	

Note: g: Numbers in parentheses below the coefficients are t-ratios.

shaping the broad contours of the price level (and hence the rate of change in inflation). From the results analyzed above, it is clear that the anticipated part of monetary impulse dominates the anticipated part of fiscal impulse in influencing the price level. This is at variance with the findings of Fourcans (1978) and Neumann (1978). On the other hand, the resutls in table 5f show that the unanticipated part of fiscal impulse dominates the unanticipated part of monetary impulse in influencing the price level or the change in inflation rate in Nigeria.

For robustness, the price equations were re-estimated using the inflation rate (P_t). The results are reported in table 5g. It is clear that the conclusions above for DP_t is far more decisive when inflation rate is used. For example, in column (i) of that table, the coefficients of DMAs as a group yield F(3,10) = 5.08 against a critical value of 3.71 at the 5% significance level while the likelihood ratio is 15.73 against a critical value of 7.81 at the same 5% significance level. In column (v) of the table, F^{MA} = 4.23 against the critical value of 3.71 at the 5% significance level while the likelihood ratio is 13.92 against the critical value of 7.81 at the 5% level of significance. Thus, the anticipated part of monetary policy affects the price level and hence the inflation

rate in Nigeria. This contrasts Odedokun's (1988) results for Nigeria - but supports Barro's (1978).

Contrariwise, the anticipated part of fiscal policy does not affect the price level and hence inflation rate in Nigeria.

The results also show that the unanticipated parts of monetary policy are irrelevant in the determination of the inflation rate in Nigeria given the very low computed F-statistics and likelihood ratios.
In contradistinction, the unanticipated parts of fiscal policy are clearly relevant in determining inflation rate in Nigeria over the sample period. For example, in column (vi) the calculated $F(3,10) = 4.01$ against the critical value of 3.71 at the 95% confidence level while the likelihood ratio is 13.43 against the critical value of 7.81 at the same confidence level.

Again, while the anticipated parts of monetary policy dominate the anticipated parts of fiscal policy in determining the inflation rate in Nigeria, the unanticipated parts of fiscal policy dominate the unanticipated portion of monetary policy in determining the Nigerian inflation rate.

The appendices contain variable definitions and data sets while the relevant graphs are in figures 5.1i.

5.2 POLICY FORMULATION AND IMPLEMENTATION IMPLICATIONS

The relevance of anticipated monetary and fiscal policies in the short-run Nigerian economy to cause deviations of output and unemployment from their "normal" levels can be attributed to a number of reasons.

First, in a developing economy like Nigeria, one of the key assumptions of rational expectations - perfect price flexibility-is absent. The stickiness of prices as manifested in long-term wage and price contracts (as well as price tags, wage offers, search, shopping, customer relations, and career jobs) suggests that a Keynesian mechanism, in which changes in money and government expenditure affect aggregate demand, which affects output and unemployment, is at work (Fischer, 1980; Okun 1980). The response of some prices, particularly wages to changes in demand is sluggish relative to the period over which policy is formulated (see Fischer 1980; Horne and McDonald, 1984) hence a rejection of the hypothesis of price flexibility also implies rejection of the joint hypothesis of rational expectation and neutrality (Phelps

and Taylor, 1977; Fischer, 1977). Indeed, in the short-run in which prices are sticky, anticipated monetary and fiscal policies do affect the behaviour of output and unemployment in the manner suggested by Keynesian disequilibrium analysis, in which quantities are not necessarily determined at the intersections of supply and demand curves. There is, therefore, no presumption that any intervention, ab nitio, will only worsen the situation in such, circumstances. In an economy with a gradual adjustment of prices, the Central Bank can control output even when the entire population knows exactly what it is doing, because it can manipulate the effective demand curves for labour and output (Gordon, 1980).

Second, in a developing economy like Nigeria, there is the presence of high transactions and information costs, particularly under a situation of high illiteracy rate. There are costs of acquiring and processing information, and of reducing the length of contract periods. The costs that prevent the private sector from insulating itself against aggregate disturbances result to temporarily sticky prices which produce the presumption that private sector output is not continuously optimal. Indeed, as Fischer (1980) noted, those costs

are the underlying reason there is a role for activist monetary (and fiscal) policy in attempting to offset aggregate disturbances (see also Familoni, 1989). Thus, as Buiter (1980b) explained, imperfect, costly, and asymmetric information characterize personal and corporate credit markets and insurance markets as much as the labour market, the housing market, or the market in second-hand cars. Therefore, privately rational, optimizing behaviour results in socially inefficient, quantity-constrained equilibria in which market prices are sticky in the sense that they do not always respond to the existence of excess supply or demand. Indeed, asymmetric information between the private sector and the monetary authorities and/or the public sector is another reason for anticipated monetary and fiscal policies to have real effects. Even if it were possible for the public sector to communicate its privileged information to the private sector, there are lags and/or filtering problems as public sector information is disseminated. Thus, the public sector in most cases uses its informational advantage to influence real private sector behaviour.

Third, as Gordon (1980) stated, knowledge about the size and growth rate of the money supply spreads rapidly, over a period of weeks or months - but the period of gradual adjustment of prices to demand shocks is significantly longer than this brief span required to adjust one's estimate of the money supply. In the interim between the adjustment of anticipations about a monetary change and the full adjustment of prices to that change, output in the real economy is ruled by an effective demand constraint which the Central Bank is fully capable of manipulating.

Fourth, there is the concept of the political business cycle in Nigeria, (where regimes start with relative austerity in early years and end up with the potlatch right before elections) and of the manipulation of the economy for electoral purposes. As Nordhaus (1975) noted, if these realities are neglected, then it would amount to relegating them to a museum for rational expectations propositions.

Thus, the policy implication of our results can be illustrated by an example. Consider the effects of a stabilization programme adopted to take effect during

period t and consisting of an announced tightening of monetary policy during period t. According to our analysis, the monetary tightening, since it is anticipated, would have effect on real domestic output in the short-run. The reduction in money supply would result in a less than proportionate decrease in the price level, so the real money supply would decrease and domestic absorption would fall.

Thus, monetary and fiscal policies can still be used to influence the cyclical movements of real variables. Since the anticipated monetary and fiscal policies, from our results, appear to be more potent in accomplishing this, some form of expansionary systematic or deterministic monetary and fiscal policy rules may be pursued to increase output or to reduce unemployment. However, given our results, the opportunity cost of the increase in output (from expansionary monetary policy) in terms of an increase in inflation rates would be high/large in view of the fact that the relative positive impact of anticipated monetary policy on inflation rates is found to be larger, when compared with a surprise monetary policy. This results in a policy dilemma. In fact, it might be appropriate to view the resulting interplay

between output (or unemployment) and prices that is described above as providing a menu for a policy trade-off in the Nigerian economy. As we shall later argue, the implication for inflation is leaning more towards heterodox policies with comprehensive, many sided, anti-inflationary programme (Anyanwu, 1990). Also, the behaviour of our price equations not only provides support for rational expectations with respect to the impact of anticipated monetary policy on prices, but also confirms the monetarist hypothesis that inflation is always and everywhere a 'monetary phenomenon' (Friedman, 1966: 18), hence prices tend to rise when the rate of increase in money supply is greater than the rate of increase in real output of goods and services (Johnson, 1973).

On the other hand, as the surprise component of fiscal policy has been found to exert a positive impact on the inflation rate and the growth rate of inflation, the success of countercyclical policies becomes crucially dependent on policymakers' ability to conduct consistently a "trickery" or "deceptive" policy (by tricking or fooling economic agents) a possibility which seems both theoretically unattractive and empirically infeasible (Barro, 1976;

Lucas, 1973, 1976; and Grossman, 1979). However, with respect to real variables, the government is still in a position to adopt aggregate fiscal policy as a demand management tool, in contradistinction to the rational expectations' school of thought.

Thus, we conclude that:

a) quantity rationing and inertia in the adjustment processes of wages and prices cause real economic variables to track different time paths when alternative, fully anticipated monetary or fiscal policies are followed, hence anticipated monetary and fiscal policies do alter real effective demand, output and unemployment;

b) the behaviour of real economic variables is not in general, invariant under alternative fully anticipated trajectories of fiscal policy instruments such as government expenditure;

c) the behaviour of real economic variables is not in general, invariant under alternative fully anticipated rates of growth of the nominal money stock (i.e, money is not neutral);

d) the behaviour of the inflation rate (and its rate of growth) is not in general invariant under alternative fully anticipated rate of growth of the nominal money stock; and the behaviour of the inflation rate (and its rate of growth) is not, in general, invariant under alternative unanticipated trajectories of fiscal policy instruments such as government expenditure.

Indeed, there is no reasonable case that systematic monetary and fiscal policies cannot alter the cyclical fluctuations of the Nigerian economy or the nature of its trend growth path. However, whether "stabilization policy" has in fact been stabilizing or destabilizing is a separate issue. The recognition that monetary and fiscal policies give the government a handle on the real economy implies the existence of scope for both beneficial and detrimental policy behaviour (see Buiter, 1980a).

One needs to note that this confirmation of the importance of monetary and fiscal policies for the cyclical behaviour of the real economy is not necessarily a source of comfort (see Buiter, 1980b), after all, policy

neutrality would be most welcome when the conduct of policy is incompetent, confusing, or erratic as has been the case in Nigeia, particularly during the Structural Adjustment Programme (SAP) period. Unfortunately, no such easy escape is available to the Nigerian policy-makers, policy can stabilize and it can destabilize, it can promote growth and prosperity or destroy it. This, indeed, is in accord with the behaviour of the Nigerian economy in recent years.

CHAPTER 6

SUMMARY OF RESULTS, LIMITATIONS, AND SUGGESTIONS FOR FURTHER RESEARCH.

6.1 SUMMARY OF RESULTS

The proposition that systematic aggregate - demand policy does not affect real variables (the policy-ineffectiveness proposition or PIP) in the short-run is usually derived from a stochastic macromodel having two properties - rational expectations (RE) and structural neutrality (SN). The proposition has been extensively tested using overseas data but, with the exception of the Uba (1989) and Odedokun (1988a, 1989) studies, has received little empirical attention in Nigeria. In addition, none of these Nigerian studies incorporates effects on unemployment as well as the importance of an open economy. In this study, given the persistence of inflation with recession (and high unemployment) in Nigeria, we subjected the proposition to econometric tests using Nigerian annual data from 1970 to 1988.

Indeed, the new classical macroeconomics provides an attractive theoretical underpinning for the notion that the short-run output (and unemployment) effects of

restrictive demand - management policies associated with stabilization programmes in developing countries are less adverse than is commonly supposed. This provided an added fillip for the study, to establish the empirical relevance in a developing economy of the policy ineffectiveness proposition associated with this school of thought.

Apart from analyzing the various Nigerian/Federal Government monetary and fiscal measures over the period 1970 to 1988, we presented a theoretically simple macro-economic model with rational expectations that incorporated important features of the Nigerian monetary and fiscal policies.

We went ahead to estimate the money growth and the expenditure growth prediction equations. The variables found to be important determinants of money growth over the data period, 1970-1988, are the dependent variable lagged from one to two periods, one to two period lags of the log of real external reserves, one to two period lags of the log of real domestic public debt, and the second period lag of the log of real external debt outstanding on the other hand, the variables found to be important determinants of government expenditure growth rate over the same

period are the dependent variable lagged from one to two periods, one-period lag of the log of real government revenue, one to two period lags of the log of real external reserves, and one-period lag of the log of real external debt outstanding.

To test and analyze the effects of main monetary (broad money supply) and fiscal (federal government expenditure) variables upon selected economic indicators (output, unemployment and the price level - inflation and its growth rate), we proceeded to decompose the policy variables into their anticipated and unanticipated components.

Using annual data for Nigeria over the 1972 to 1988 period, we examined the separate and simultaneous impacts of the systematic (anticipated) and surprise (unanticipated) components of monetary and fiscal policies on real GDP (output) and the inflation rate (and its rate of growth). The same was carried out for urban unemployment for the period 1975 to 1988 for which data were available.

Our empirical results can be summarized as follows:

(a) In the closed Nigerian economy, anticipated monetary growth exerts a significantly positive impact on output while its unanticipated component does not.

On the other hand, both the anticipated and unanticipated components of fiscal policy do not significantly affect output in the closed Nigerian economy. Also, monetary policy (both anticipated and unanticipated) dominates fiscal policy in influencing domestic output.

(b) In an open Nigerian economy, anticipated monetary and fiscal growths exert significantly positive impact on output while their unanticipated components do not significantly affect output. However, generally, fiscal impulse (anticipated and unanticipated) dominates monetary impulse in shaping the broad contours of output in an open Nigerian economy.

(c) Anticipated monetary and fiscal growths exert significantly negative impact on urban unemployment in Nigeria while their unanticipated components do not. However, while the anticipated part of monetary policy dominates the anticipated part of fiscal policy in influencing urban unemployment, the unanticipated part of fiscal policy dominates the unanticipated part of monetary policy in insignificantly affecting urban unemployment.

d) Anticipated monetary policy exerts significantly positive impact on the price level (inflation and its growth rate), while the anticipated part of fiscal policy does not.

e) On the other hand, while unanticipated fiscal policy exerts significantly positive impact on the price level (inflation and its growth rate), the unanticipated part of monetary policy does not.

f) In addition, anticipated monetary policy dominates anticipated fiscal policy in influencing the price level (inflation and its growth rate), while unanticipated fiscal policy dominates unanticipated monetary policy in influencing the price level (inflation and its growth rate).

Thus, from our results, rational expectations hypothesis receives support only for anticipated fiscal policy with respect to output in the closed (unrealistic) Nigerian economy, and for anticipated monetary policy with respect to the price level (inflation and its growth rate). But generally, our results contradict the monetary

and fiscal neutrality hypothesis as well as the implied policy-ineffectiveness proposition (PIP) of the rational expectations school. This may be attributed to the invalidation of many fundamental rational expectations assumptions in a developing Nigerian economy, especially with respect to the existence of costly information, gradual wage and price adjustments, the political business cycle, and asymmetric information between the private sector and the monetary authorities (or the public sector). While this implies that monetary and fiscal policies can still be used to influence the cyclical movements of real variables in the short-run, a dilemma (and indeed a trade-off)results with respect to monetary policy given the high opportunity cost of increase in inflation rates and the theoretically unattractive and empirically infeasible "deceptive" ("trickery") fiscal policy imperative.

6.2 POLICY RECOMMENDATIONS

Our results indicate that there is still scope for the use of orthodox stabilization or demand-management policies to influence real variables in the short-run.

And since the surprise component of fiscal policy has been found to exert a greater positive impact on the inflation rate (and its growth), contractionary "deceptive" ("trickery") or surprising fiscal policy, should be used in controlling the rates of inflation in Nigeria, provided that this is feasible. With such a policy strategy, a significant inflation reduction with relatively little opportunity cost in terms of real output reduction and unemployment increase, can be attained.

With the resulting trade-off between output (or unemployment) and inflation with respect to anticipated monetary policy, we recommend the appropriate combination of monetary and fiscal policies. While a constant growth rate rule monetary policy can be used to lower the inflation rate, an expansionary fiscal policy should be used to expand output and lower unemployment rate.

Also, given the resulting trade-off between output (or unemployment) and inflation, we recommend that in fighting inflation, we lean more towards heterodox policies with comprehensive, many sided, anti-inflationary programme. The government needs to remove the fundamental sources of

continuing inflation (external debt management strategies, foreign exchange operations, removal of subsidies on petroleum products and fertilizer, privatization and commercialization, trade liberalization, and interest rates deregulation - see Anyanwu, 1990) in a credible and sustainable manner, carefully putting into effect a set of transitional measures, and ensuring the existence of a broad-based political will and consensus to support those measures. Such support should be exploited while it lasts, thus providing a strong argument in favour of "shock treatment" over gradualism. Thus, we need careful co-ordination between interventions in prices, nominal wages, and exchange rates, backed by fundamental reforms as happened in Argentina, Brazil and Israel (Knight et al, 1986).

Finally, we wish to recommend not a strict monetary growth rate rule but a kind of modified constant monetary growth rate rule that prescribes expected conduct for the Central Bank of Nigeria but leaves it with sufficient discretion to take quick action if that is necessary (see Fischer, 1980). There would then be constant growth rate rule in the ordinary course of events, and active

monetary policy when circumstances warrant. That is, it would leave the initiative for taking action with the Central Bank, in the case of financial panic, for instance, but it would remain the presumption that in the ordinary course of events, monetary policy would be passive. Under the arrangement, the Central Bank would be expected to maintain a constant growth rate rule and would be required to explain ex post (within some specified period) all deviations from the constant growth rate path to a federal legislative review panel.

6.3 LIMITATIONS OF THE STUDY

The findings of the study are limited somewhat by the dearth of data on unemployment particularly on an economy-wide basis or even for urban versus rural areas. It is only from 1983 that such national, and rural versus urban unemployment rates began to be computed. With time and as adequate and consistent data become available, similar works can be extended to incorporate such economic indicators. In view of its important policy implications, it merits further empirical testing using national economy-wide data.

The findings are also limited by the absence of quarterly data especially for fiscal variables and economic indicators that would have been used to check for robustness.

Also, given the deregulation of interest rates from 1987 and the foreign exchange market from 1986 the extension of our results to both interest-rate and foreign exchange rate determination with respect to anticipated and unanticipated policy would have been a worthwhile exercise given the important policy implications of those measures.

However, it is still our belief that this work provides some very useful information which could help Nigerian economic managers better combine monetary and fiscal policies particularly in an era of the Structural Adjustment Programme (SAP) for the promotion of growth and development in our political economy.

6.4 SUGGESTIONS FOR FURTHER RESEARCH

The limitations identified above indicate likely areas for further research. As more data become available, it will be necessary to develop and implant

in the model, national (economy-wide) unemployment rates and quarterly monetary and fiscal policies as well as economic indicators for a richer analysis of the effects of monetary and fiscal policies under rational expectations. Such an extension would generate information on a wider context for testing the rational expectations hypothesis as well as checking the greater robustness of our results.

A further extension of this work to include interest rate and exchange rate determination would yield results that will educate policy makers in Nigeria on the issue of activist policy in the wider money and foreign exchange markets.

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APPENDIX A:

LIST OF MODEL VARIABLES

LIST OF VARIABLES

B_t = Log of the Real (1985) value of Domestic Public Debt.

DG_t = Nominal Federal Government Expenditure Growth Rate expressed as $DG_t = \log(G_t) - \log(G)_{t-1}$

DM_t = Nominal Broad Money Supply (currency plus demand deposits plus time and savings deposits) Growth Rate expressed as $DM_t = \log(M_t) - \log(M_3)_{t-1}$.

DP_t = Rate of Growth of Inflation expressed as $DP_t = \log(P_t) - \log(P)_{t-1}$.

DGA_t = Anticipated part of fiscal policy (federal expenditure growth).

DGR_t = Unanticipated part of fiscal policy (federal expenditure growth).

DMA_t = Anticipated part of monetary policy (broad money supply).

DMR_t = Unanticipated part of monetary policy (broad money supply).

E_t = Log of the Real (1985) Value of External Reserves.

LP_t = Log of the Price Level (Inflation Rate).

L_t = Log of the Real (1985) Value of External Debt Outstanding

Time = Time Trend

UN_t = Log of Urban Unemployment Rate.

V_t = Log of the Real (1985) Values of Federal Revenue.

XT = Log of the Terms of Trade (1985).

Y_t = Log of the Real (1985) Value of the Gross Domestic Product (GDP) - Output.

APPENDIX B: VALUES OF MODEL DATA

Year	B_t	DG_t	$DM3_t$	DP_t	DGA_t	DGR_t	DMA_t	DMR_t	E_t
1968	8.6215	0.3047	0.1403	-	-	-	-	-	5.8699
1969	9.1130	0.4635	0.2272	-	-	-	-	-	5.9093
1970	9.2205	0.4108	0.3980	0.1926	0.3247	0.0862	0.3680	0.0299	6.2249
1971	9.1999	-0.2721	0.0502	0.1614	0.2126	-0.4846	0.0988	-0.0486	6.6021
1972	9.0800	0.4249	0.1443	-1.7856	0.4669	-0.0420	0.1295	0.0148	6.3726
1973	8.7873	0.1103	0.1968	0.7472	-0.0773	0.1876	0.3275	-0.1307	6.6280
1974	8.5425	0.6534	0.4219	0.7853	0.2282	0.4252	0.3672	0.0547	8.5987
1975	8.6467	0.8489	0.5194	0.9888	0.8096	0.0393	0.5216	-0.0022043	8.5197
1976	8.9654	0.3111	0.3760	-0.4235	0.0807	0.2304	0.3655	0.0105	8.4276
1977	9.4440	0.0963	0.1785	-0.0277	0.2150	-0.1187	0.2091	-0.0306	8.1539
1978	9.5337	0.1453	0.1587	0.0139	0.2656	-0.1203	0.1831	-0.0244	7.2951
1979	9.5626	-0.1400	0.2771	-0.6177	-1.1177	-0.0223	0.1672	0.1099	8.0661
1980	9.5550	0.6448	0.3890	-0.1570	0.5591	0.0857	0.2653	0.1238	8.5170
1981	9.7063	-0.2102	0.0769	0.7324	0.1580	-0.3682	0.1307	-0.0538	7.7009
1982	9.9053	0.1234	0.0830	-0.9937	0.1004	0.0203	0.0838	-0.0007618	6.8625
1983	10.2209	-0.2892	0.1367	1.1029	-0.2410	-0.0483	0.1710	-0.0343	6.6397
1984	10.1962	-0.0142	0.1090	0.5347	0.0431	-0.0573	0.0724	0.0367	6.9877
1985	10.2382	0.3249	0.0978	-0.9741	0.2930	0.0319	0.0230	0.0748	7.4031
1986	10.2761	-0.0541	0.0320	-0.0183	0.0666	-0.1207	0.1273	-0.0953	8.0639
1987	10.2233	0.5642	0.1986	0.6360	0.5330	0.0312	0.2365	-0.0380	8.3178
1988	10.2942	0.2313	0.3551	1.3231	-0.0107	0.2421	0.3515	0.0035318	7.8772

APPENDIX B (Contd.)

Year	LP_t	L_t	UN_t	V_t	XT	Y_t
1968	-	7.5198	-	8.0916	4.3095	10.3839
1969	2.4248	7.4969	-	8.2993	3.7160	10.6212
1970	2.6174	7.3632	-	8.6968	3.2619	10.8891
1971	2.7788	6.3306	-	9.2441	3.0956	11.0507
1972	0.9933	6.4508	-	9.4149	3.0493	11.1211
1973	1.7405	6.3168	-	9.2558	3.2108	11.1265
1974	2.5257	6.2252	1.8245	9.8185	4.2836	11.2410
1975	3.5145	6.2317	1.4110	9.8360	4.1667	11.2104
1976	3.0910	6.3335	1.4586	9.9103	4.2542	11.3138
1977	3.0634	6.5028	0.7419	9.9949	4.2753	11.3921
1978	3.0773	7.8905	0.4700	9.7423	4.1682	11.3161
1979	2.4596	7.4237	0.9933	9.9671	4.3783	11.3409
1980	2.3026	7.4421	0.0953	10.2093	4.7131	11.3929
1981	3.0350	7.6616	1.3350	9.7685	4.8048	11.3053
1982	2.0412	9.0133	1.4110	9.6726	4.7265	11.3101
1983	3.1442	9.2447	1.4351	9.4719	4.6959	11.2677
1984	3.6788	9.5874	2.0669	9.4159	4.7050	11.1986
1985	1.7047	9.7579	2.2824	9.5943	4.6052	11.2744
1986	1.6864	10.5295	2.2083	9.4803	3.9060	11.3063
1987	2.3224	11.3977	2.2824	9.8409	4.0927	11.3239
1988	3.6454	11.5475	2.3125	9.7507	3.800	11.3632

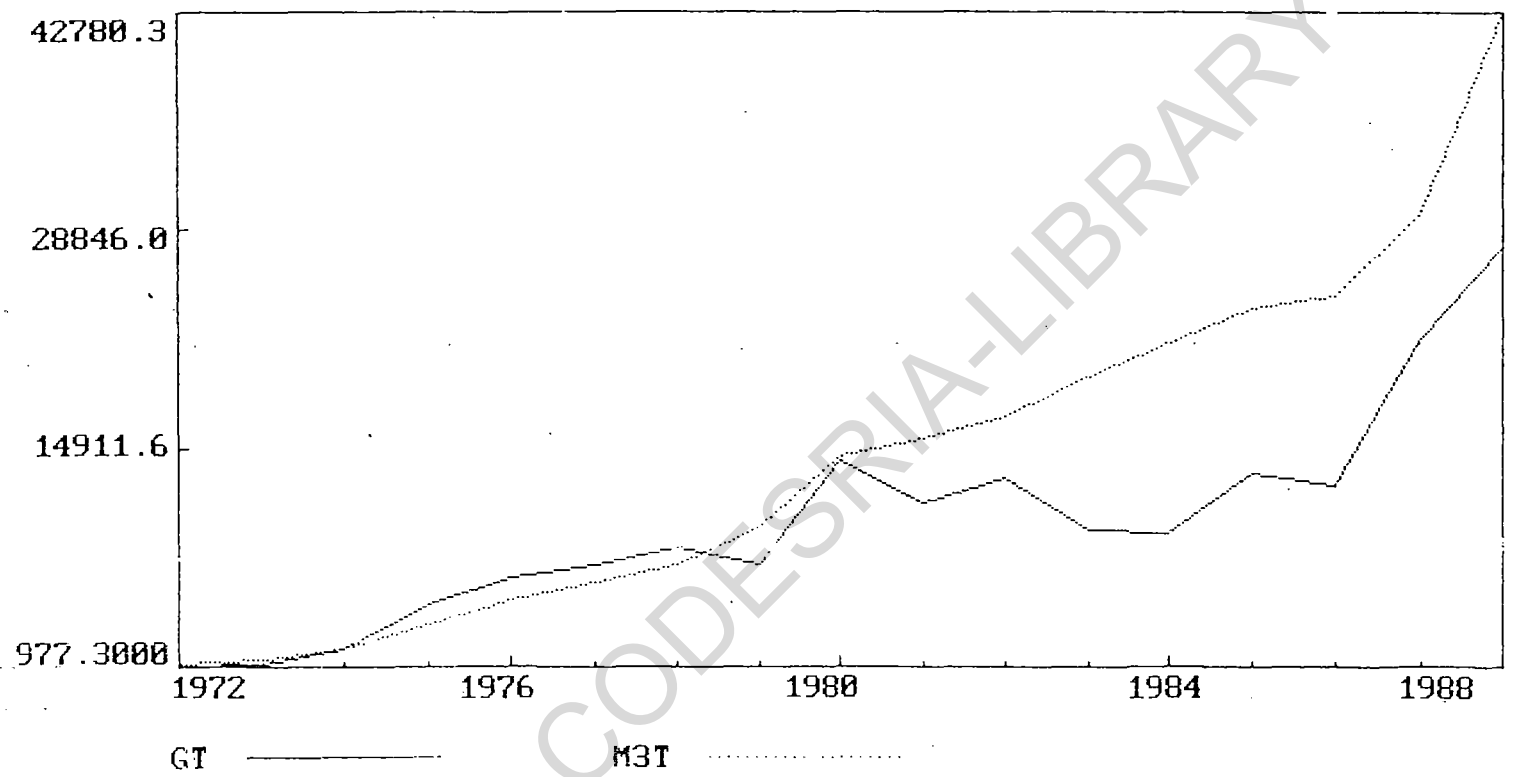
APPENDIX C:

PLOTS OF POLICY VARIABLES/ECONOMIC INDICATORS

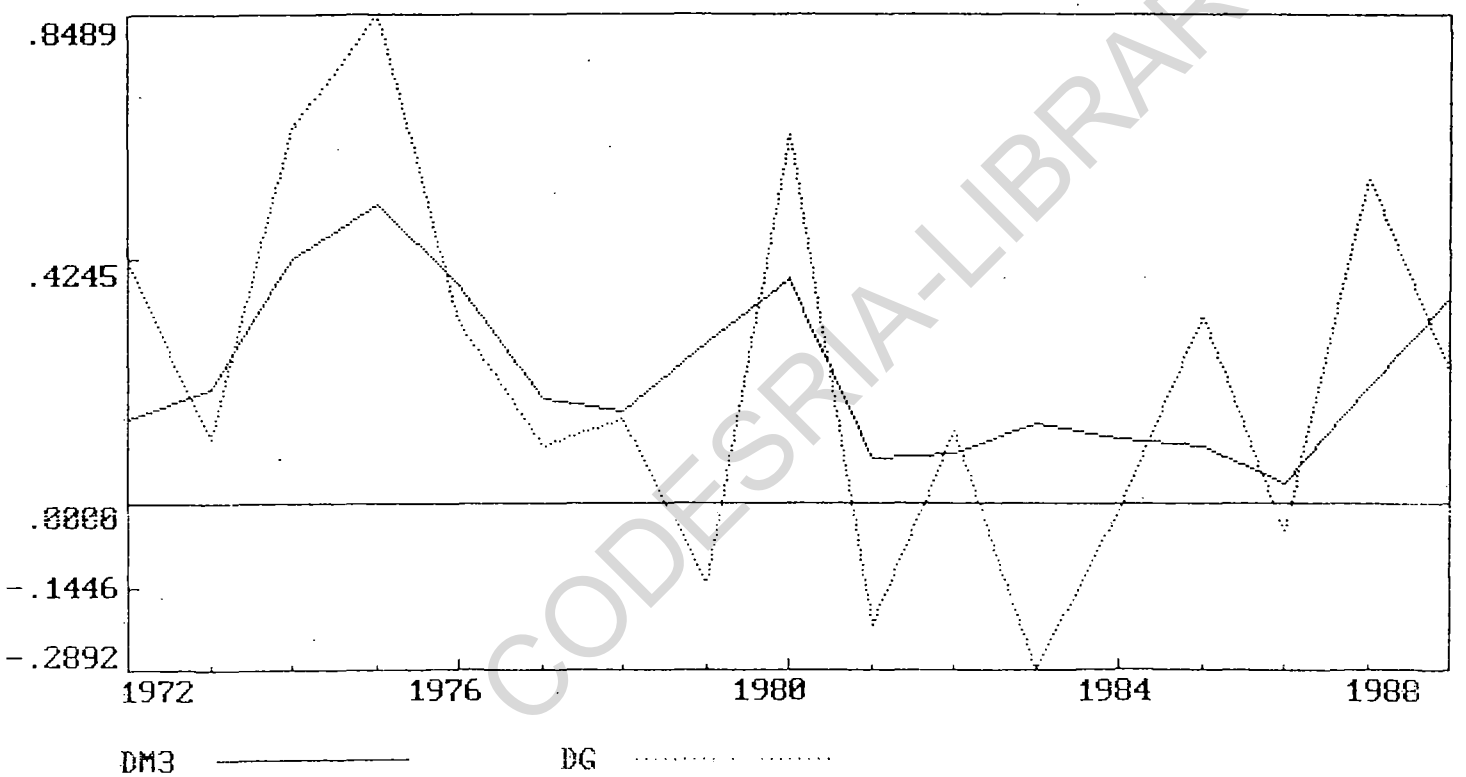
APPENDIX B

VALUES OF MODEL DATA

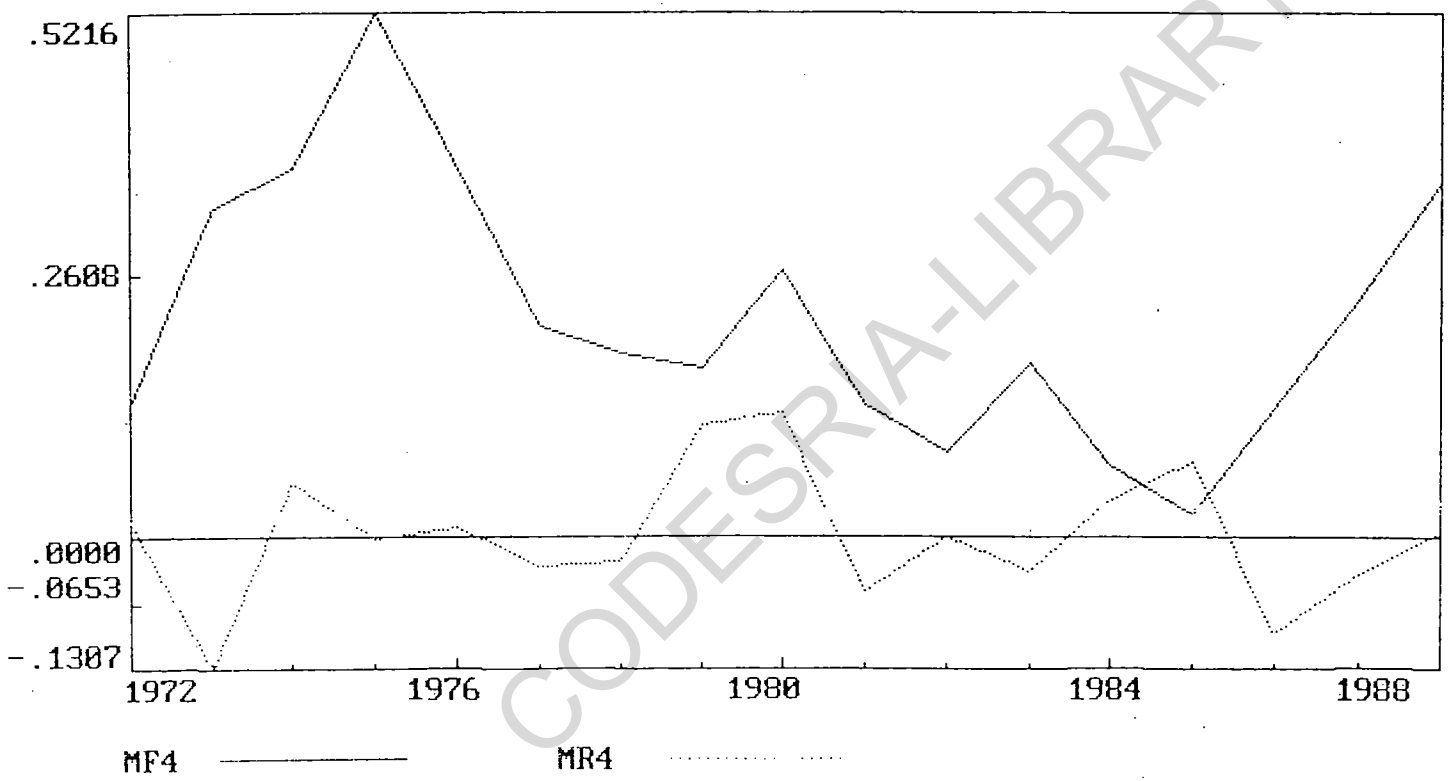
1. NOMINAL GOVERNMENT EXPENDITURE(GT) AND NOMINAL MONEY SUPPLY (M3T):



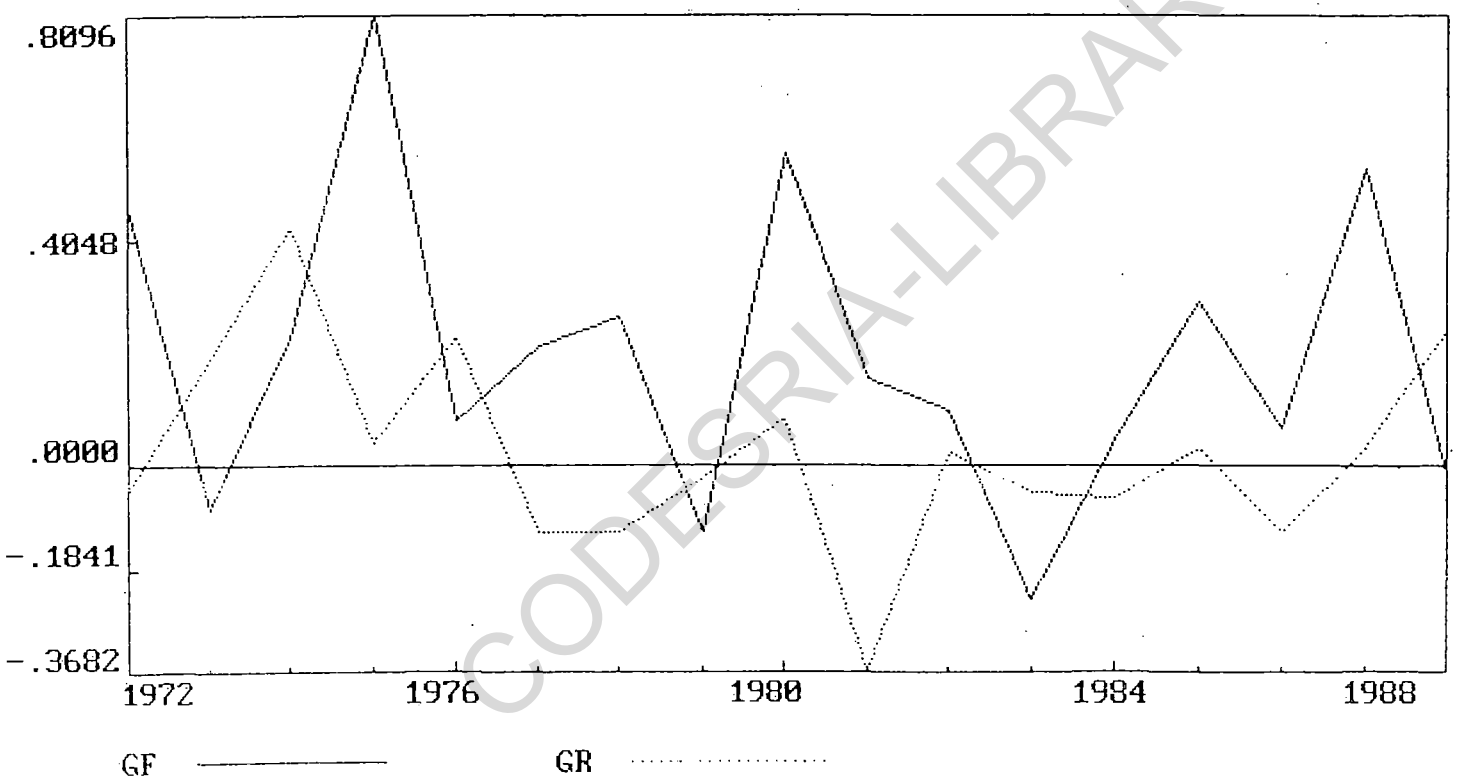
2. GROWTH RATE OF MONEY SUPPLY (DM3) AND GROWTH RATE OF GOVERNMENT EXPENDITURE (DG):



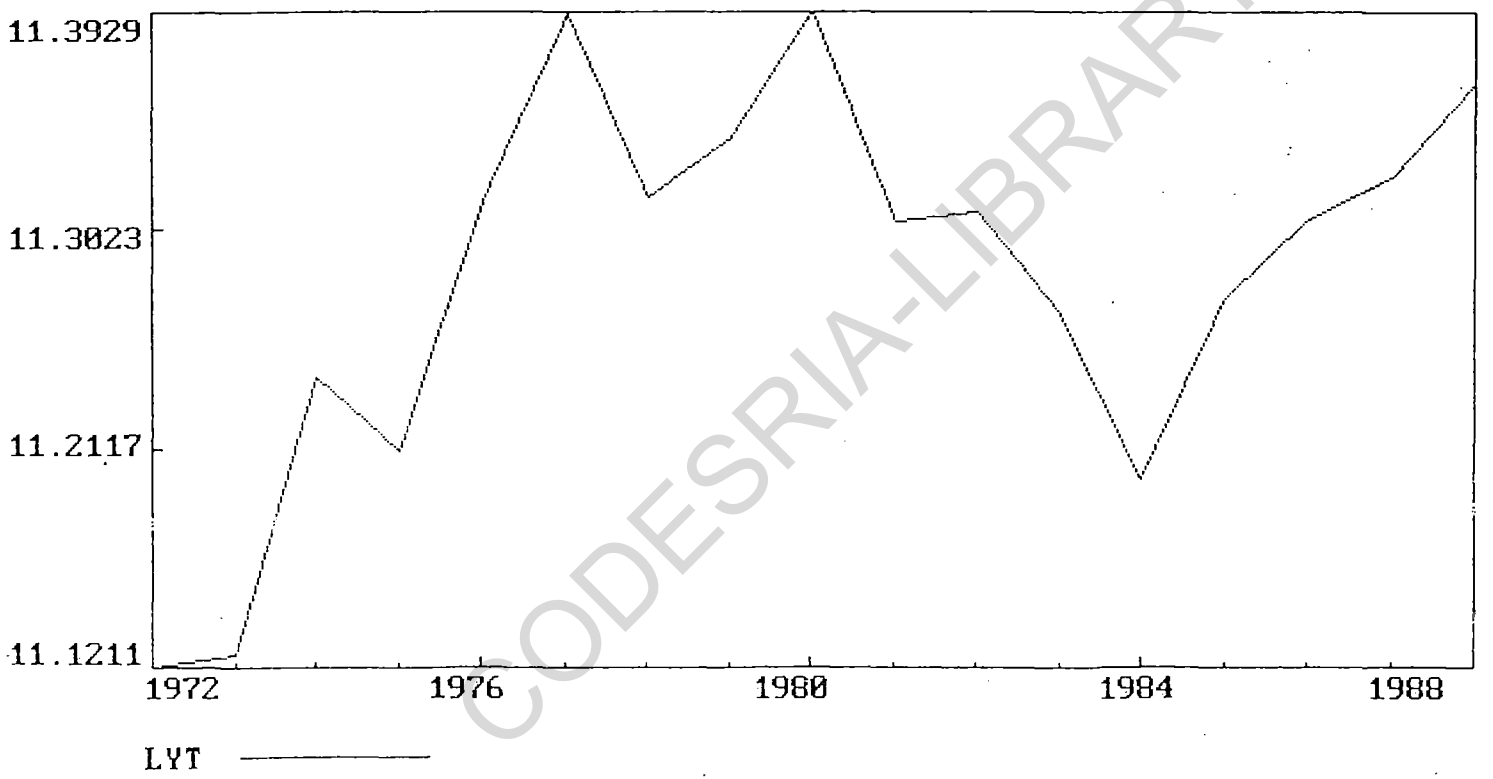
3. MONEY SUPPLY: ANTICIPATED (MF4) AND UNANTICIPATED (MR4):



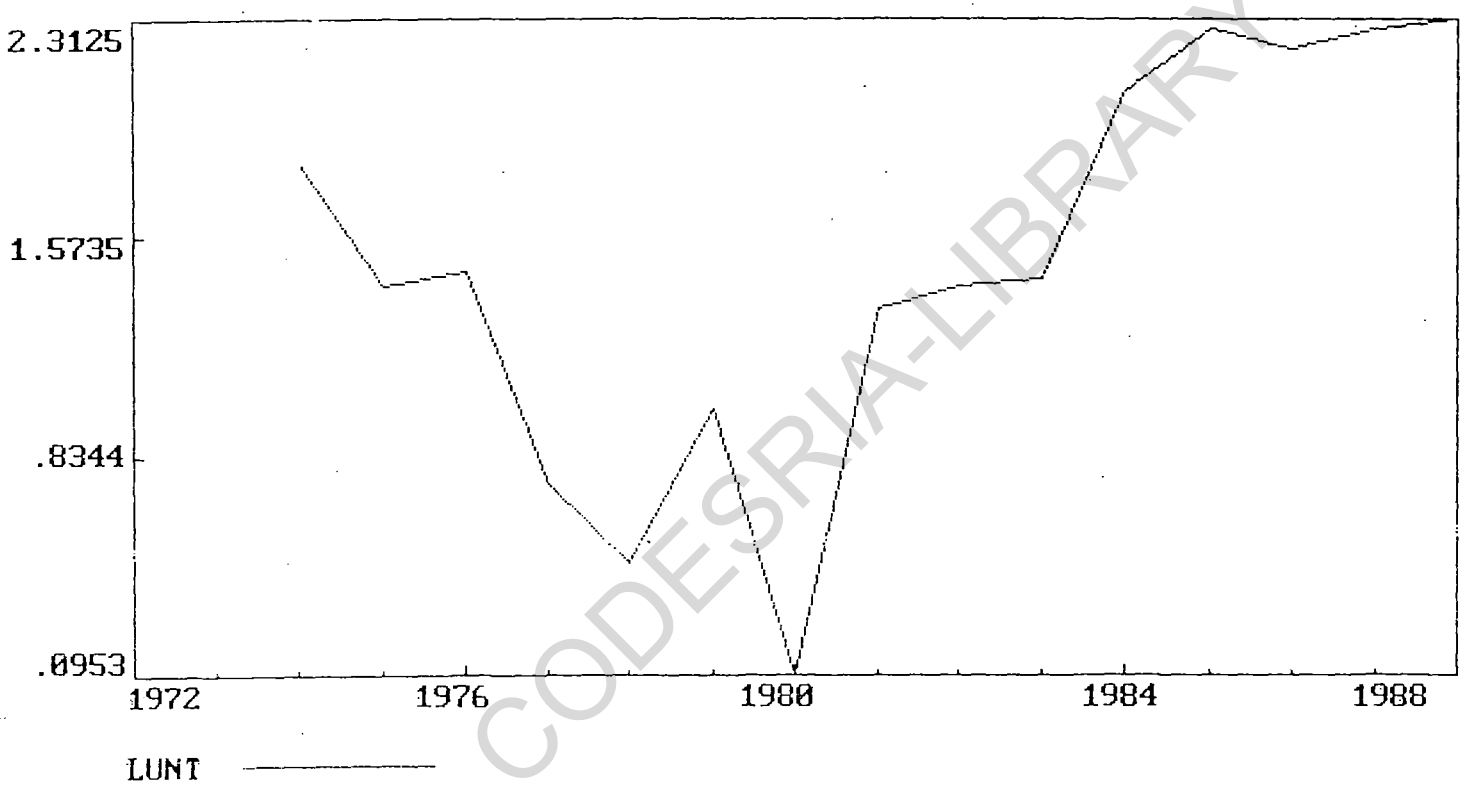
4. GOVERNMENT EXPENDITURE: ANTICIPATED (GF) AND UNANTICIPATED (GR):



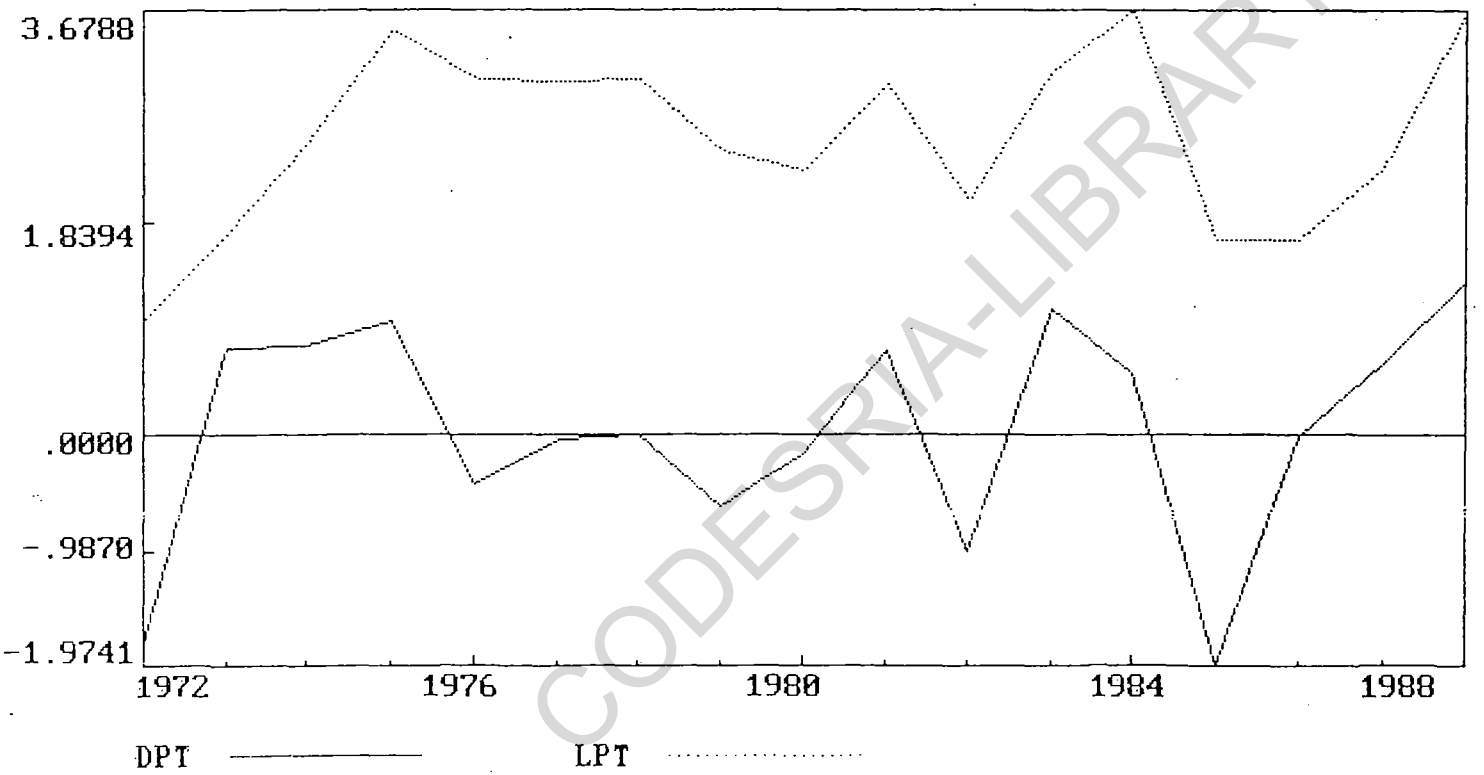
5. OUTPUT:



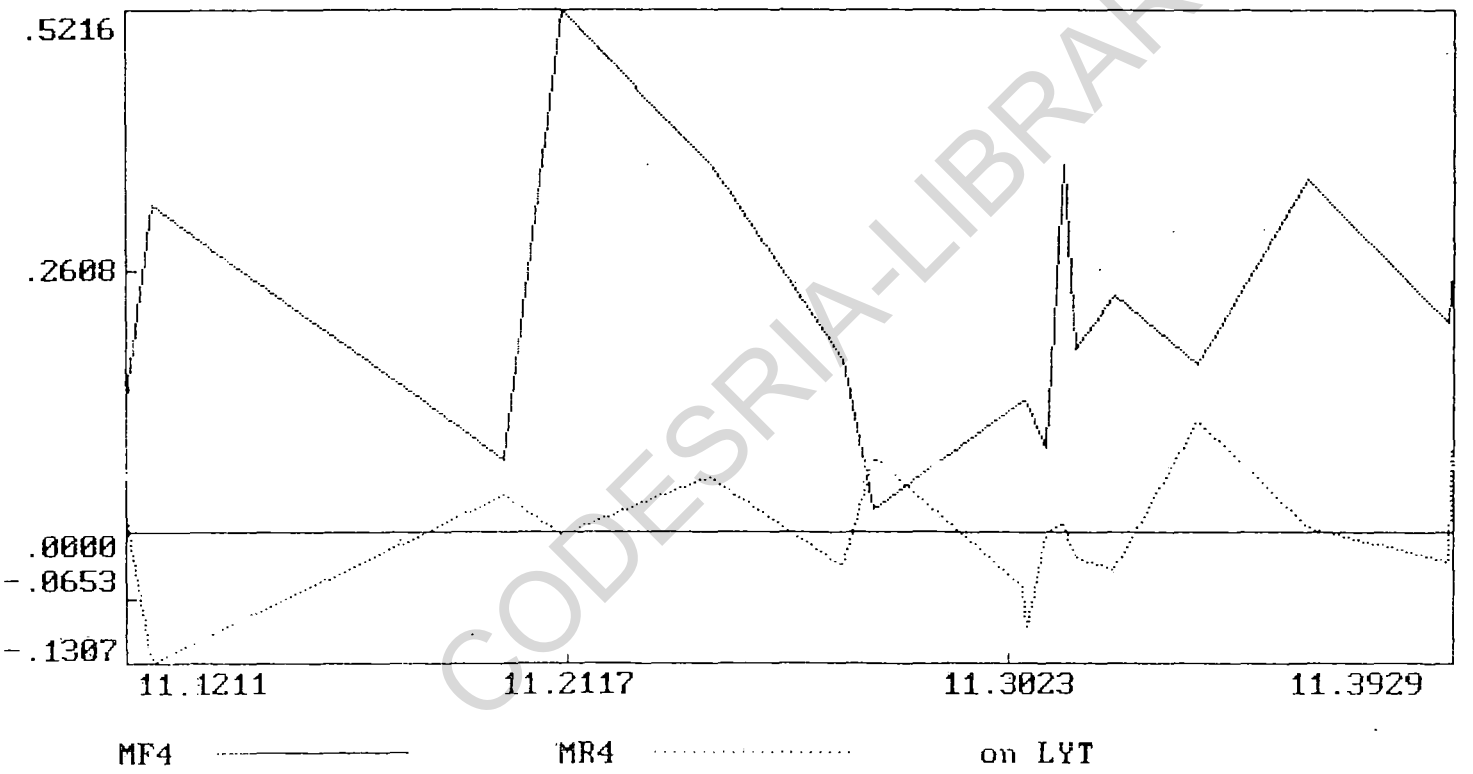
6. UNEMPLOYMENT:



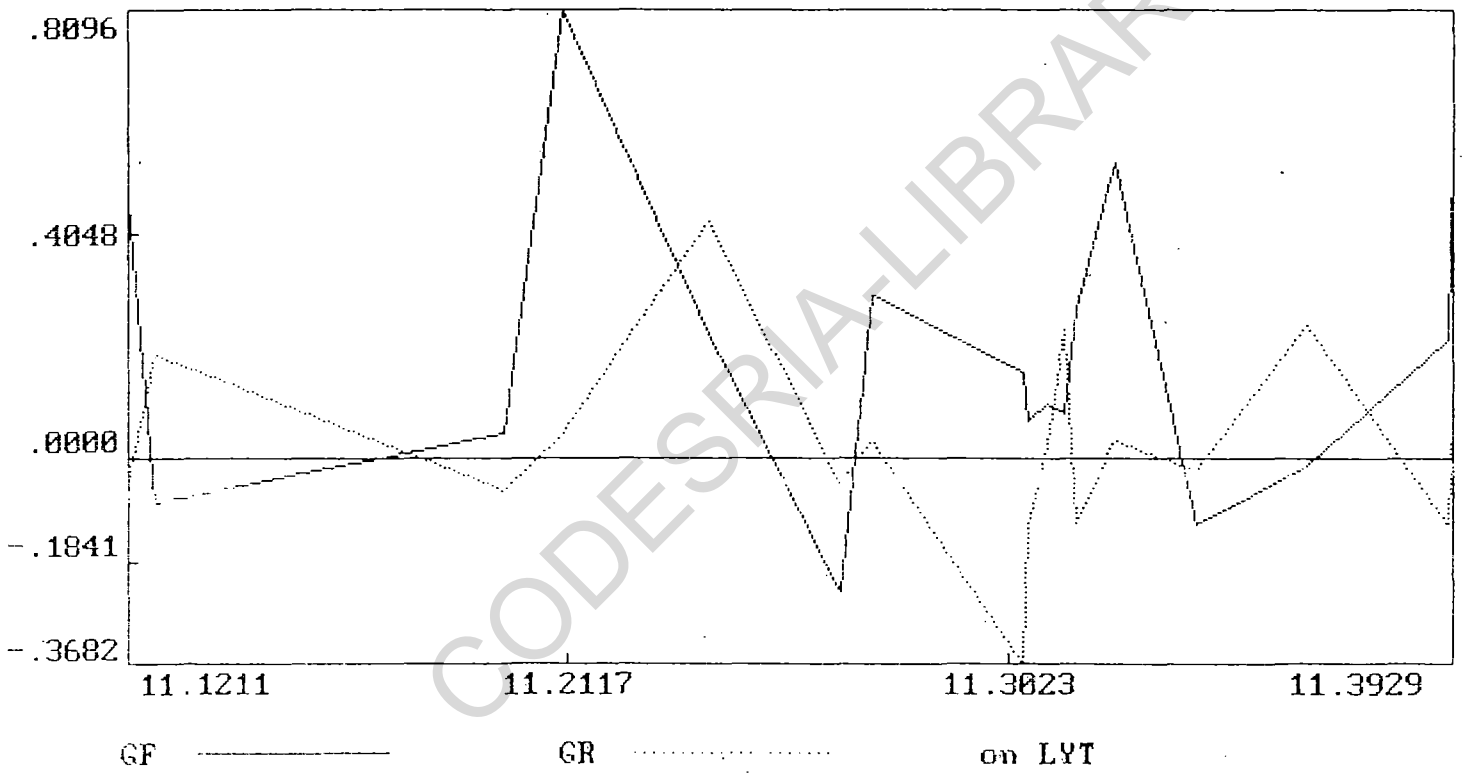
7. INFLATION RATE (LPT) AND GROWTH RATE OF INFLATION (DPT):



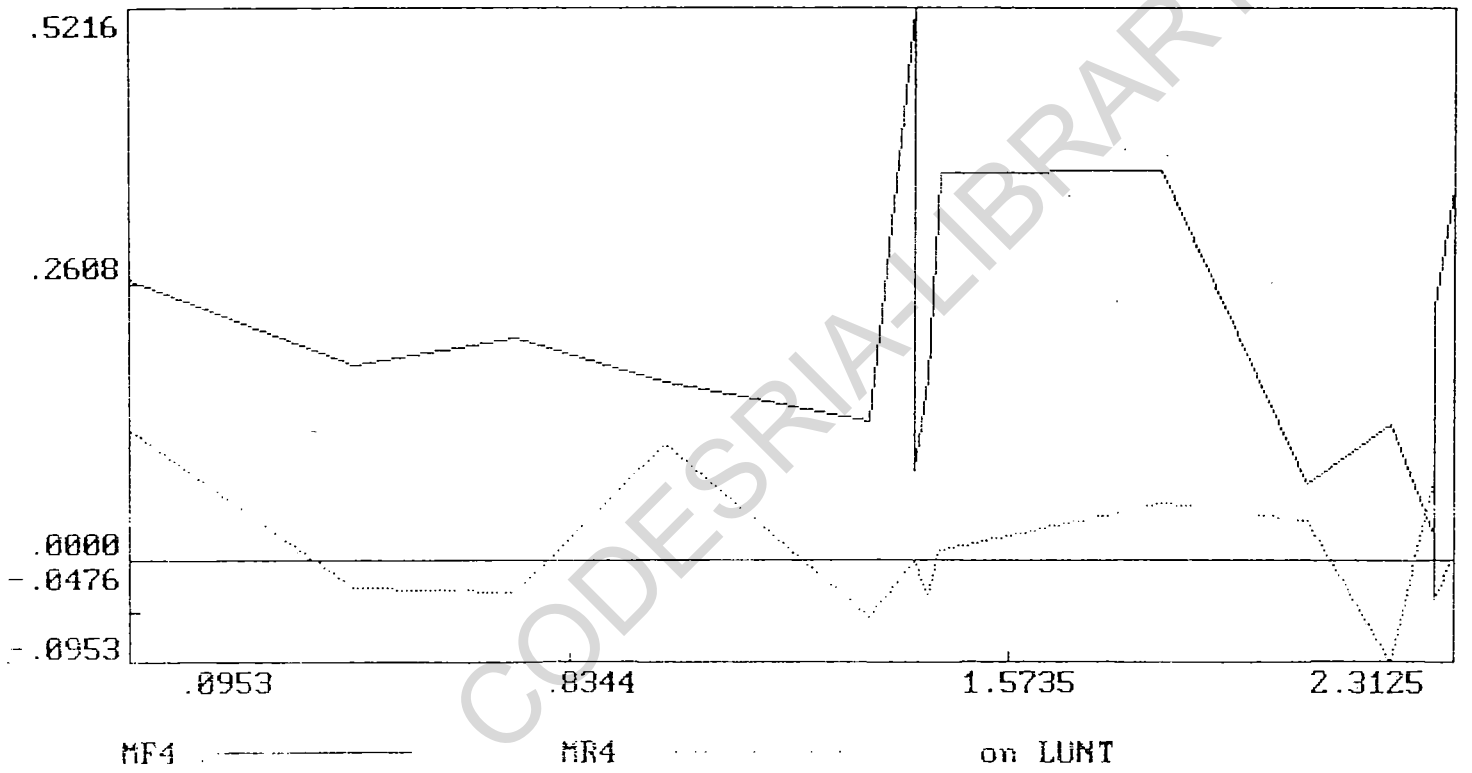
8. ANTICIPATED AND UNANTICIPATED MONEY SUPPLY ON OUTPUT:



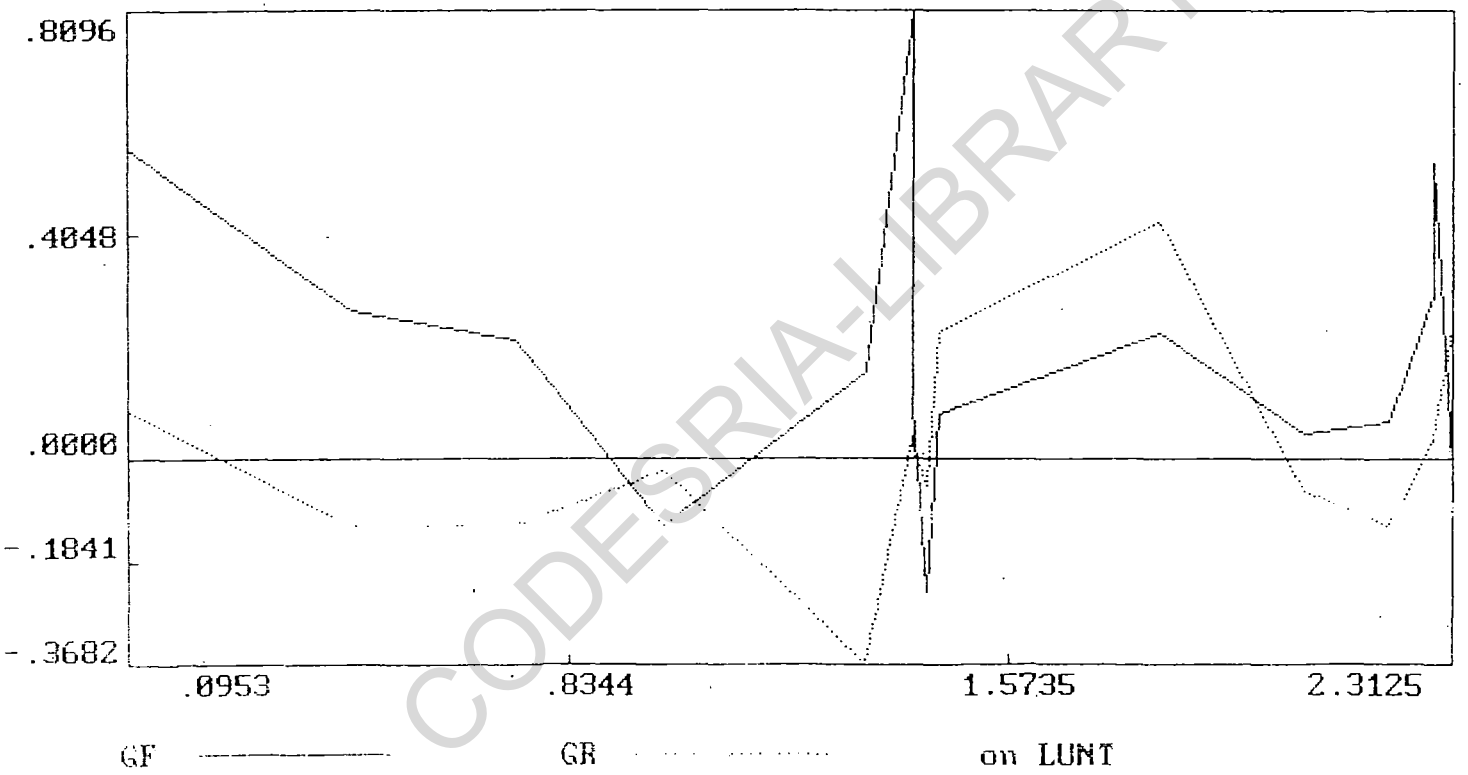
9. ANTICIPATED AND UNANTICIPATED GOVERNMENT EXPENDITURE ON OUTPUT:



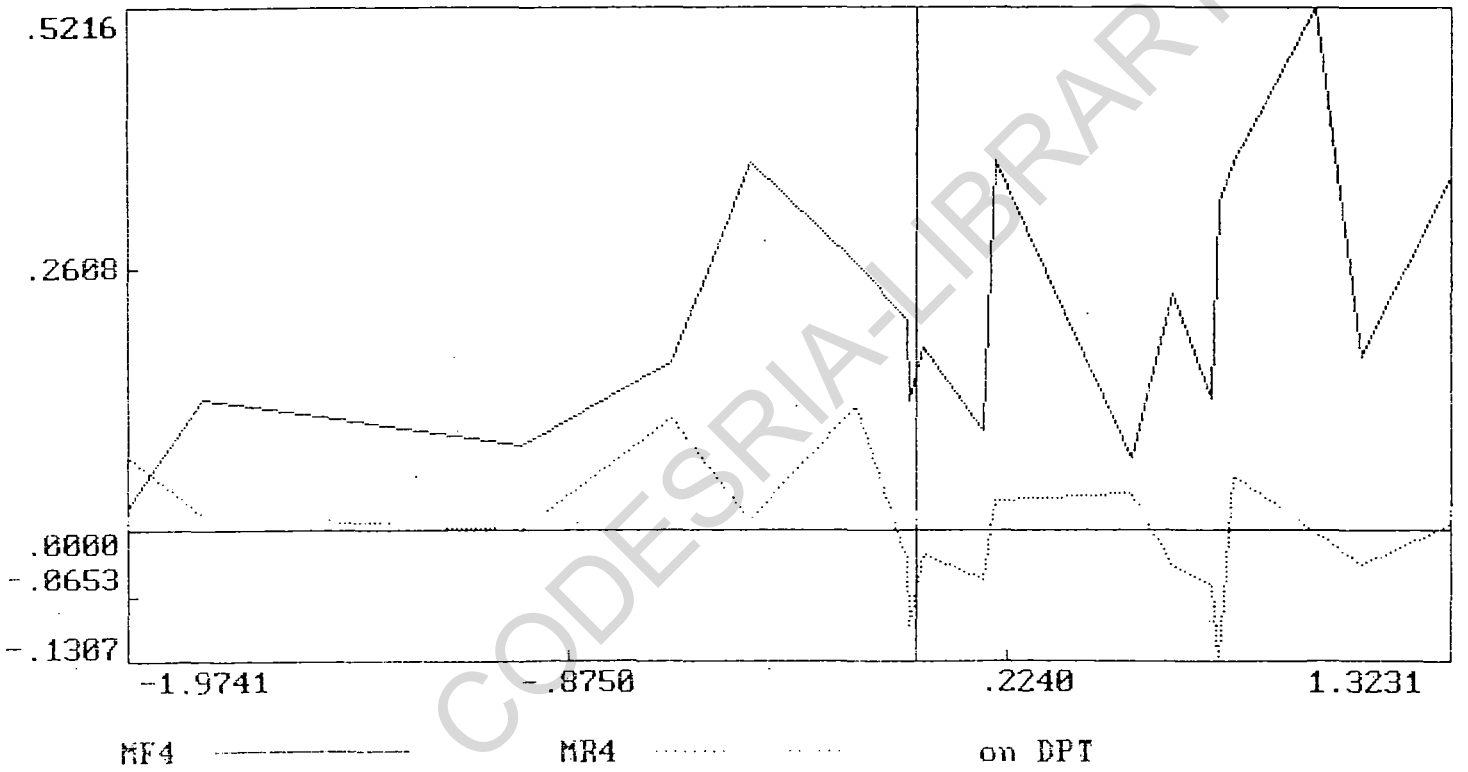
10. ANTICIPATED AND UNANTICIPATED MONEY SUPPLY ON UNEMPLOYMENT:



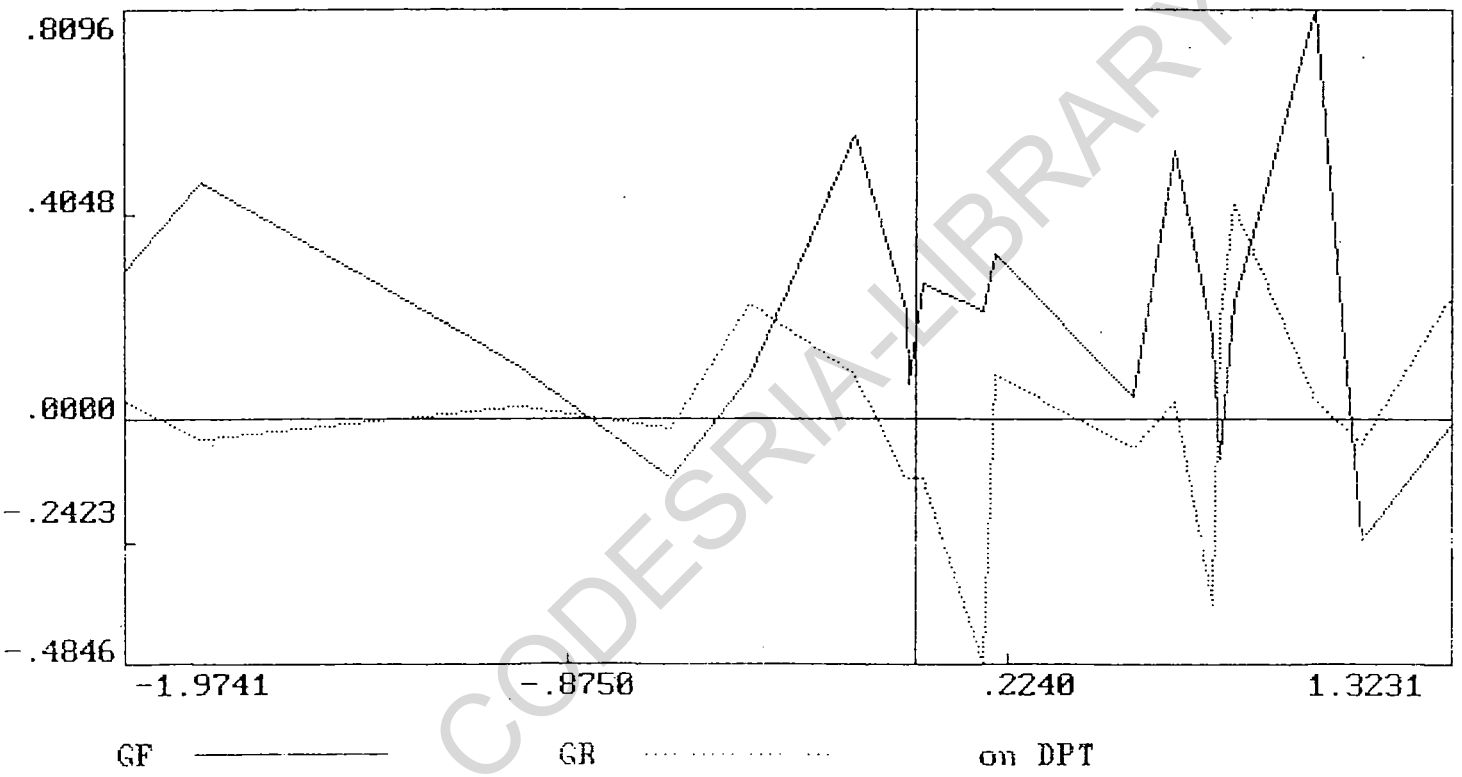
11. ANTICIPATED AND UNANTICIPATED GOVERNMENT EXPENDITURE ON UNEMPLOYMENT:



12. ANTICIPATED AND UNANTICIPATED MONEY SUPPLY ON GROWTH RATE OF INFLATION:



13. ANTICIPATED AND UNANTICIPATED GOVERNMENT EXPENDITURE ON GROWTH RATE OF INFLATION:



14. ANTICIPATED AND UNANTICIPATED MONEY SUPPLY ON INFLATION RATE: