FINANCING OF BUDGET DEFICITS AND INFLATION IN NIGERIA, 1966-85

BY

SHU'AIBU HASHIMU ABDULLAHI
B.Sc., M.Sc. (Econ) Zaria

A thesis in the Department of Economics

Submitted to the Faculty of the Social Sciences in partial fulfilment of the requirements

for the degree of
DOCTOR OF PHILOSOPHY

UNIVERSITY OF IBADAN

July 1995

ABSTRACT

In a federal system of government, it may not be sufficient to study the inflationary effect of government reliance on money creation as a major means of financing expenditure. This is particularly so as some level of government besides the central authority may finance its deficit without recourse to money creation but in ways that may ultimately augment the money supply. There is therefore the imperative need to study the interaction between budget deficits and inflation in the Nigerian economy taking into account the various financing options. The stock of money is considered to be affected by the net claims of the central bank and commercial banks on the government.

The public finance approch to inflation with its emphasis on the government budget constraint provides the analytical framework on which a monetarist model of inflation is formulated. The model is estimated using annual data for the period 1966-85. Equations are specified to explain price determination,

money supply, high-powered money, government net indebtedness to the banking system, revenue, and expenditure. Besides, identities relating to formation of expectations about inflation and the budget constraint are set out. Since the constructed model was over-identified based on the rank and order conditions for identification, the two-stage least squares technique was used in the estimation.

The empirical results show that government borrowing from the central bank as well as the banking system serve to expand the money supply and exert upward pressure on the price level. However, a given percentage increase in the debt holdings of the central bank greatly affects the money supply and price level more than an equivalent percentage increase in the net claims of commercial banks on the government. Debt holdings by the non-bank public was found to have similar macro-economic effects as private wealth. However, because the positive effect on aggregate demand through this financing source is

through a channel different from money supply and more importantly its relative insignificance, this phenomenon generally known as "Wealth-Savings Relation" was not incorporated in the analytical model.

DEDICATION

To my parents:

Alhaji Hashimu Abdullahi

Hajiya Hadiza Hashimu

and wife:

Hadiza Shu'aibu

ACKNOWLEDGEMENTS

In the preparation of this thesis, a number of individuals and institutions offered valuable assistance. First and foremost, the chairman of my thesis committee, Prof. T. A. Oyejide was quite accessible, patient humane and understanding throughout the duration of the research in spite of his tight schedule. He mooted an unexplored idea which was latter developed to the advantage of the study. The completion of this research owes much to his commitment and levelheadedness.

Dr Olu Ajakaiye was quite thorough, understanding and inspiring. Though only an associate lecturer in the department, he willingly agreed to be a member of my thesis committee and was diligent and prompt in going through whatever draft I presented to him. His suggestions facilitated the value added by this research and raised its technical quality. His frank criticisms of the work were often mellowed by the joviality and maturity with which they were conveyed. I am most grateful for his assistance.

I need to thank Dr. M. I. Raheem for consenting to replace Dr, Gini Mbanefoh on the committee. Even before joining, he always encouraged me to ensure that the work gets completed on time. He made useful suggestions particularly on the methodology of the research and offered me research papers which he co-authored with Dr. A. Ariyo.

Dr. G. F. Mbanefoh made detailed comments on the draft research proposal, while Dr. Akin Iwayemi supplied me with relevant journal articles for which I am grateful to both. The current Head of Department, Prof. M. O. Kayode, was willing to give his support towards an early completion of the work. I am also appreciative of the efforts of the current head of the postgraduate studies committee, Dr. F. O. Ogwumike and his predecessors, particularly Prof. S. Olofin.

Dr. Mike Kwanashie, former senior colleague and Head of Department of Economics at Ahmadu Bello university Zaria, deserves special mention. I treasure his advice to seek admission for Ph.D at the university of Ibadan

and to see to its completion. He has been quite generous and supportive (morally, academically and financially) throughout the duration of the programme. He was a hospitable host to me both at his office and residence while at the Policy Analysis Department of the Nigerian Institute of social and Economic Research Ibadan on a leave of absence from Ahmadu Bello University. Two of his office staff, J. Bogunjoko and F. Iyanya assisted in the processing of the data. Computer assistance was also rendered by B. M. Yusuf and A. Abdullahi, both of the Central Bank of Nigeria Lagos. I also benefitted from the encouragement of fellow colleague, A. G. Garba and Prof. J. S. Odama of A. B. U. Zaria. I should not forget my children who had to lose one year of schooling as a result of my enrolment for this programme. The Plateau State Government deserves commendation for awarding me scholarships all through my higher education. Finally, I am most grateful to the African Economic Consortium for financial support.

CERTIFICATION

We certify that this work was carried out by Mr. S. H. Abdullahi in the Department of Economics, University of Ibadan.

.....

T. A. Oyejide
B.Sc.(Econ) Ibadan, M.Sc.(Econ) London,
M.A; Ph.D (Econ) Princeton,
Professor in the Department of Economics
University of Ibadan.
Supervisor and Chairman Thesis Committee.

.....

D. Olu Ajakaiye
B.Sc. (Econ), M.Phil (Econ),
Ibadan,
M.A. (Pol. Econ.) Ph.D (Econ), Boston,
Head, Research and Consultancy Section,
Nigerian Institute of Social and Economic
Research, Ibadan.
Supervisor.

.....

M. I. Raheem
B.Ed. (Econ), Ife;
M.Sc., Ph.D (Econ), Ibadan;
Lecturer in the Department of Economics,
University of Ibadan, Nigeria.
Supervisor.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

RELEVANCE AND SCOPE OF THE STUDY

The persistent budgetary imbalance that has become the hallmark of public finance at all tiers of government in Nigeria continues to raise concern over its probable macroeconomic consequences. Of particular importance is the potential inflationary effect of such a budgetary practice. This study therefore examines the relationship between the financing of budget deficits and inflation in the Nigerian economy as a basis for informed policy prescription on the matter. This chapter begins with some definitions of key concepts associated with expansionary fiscal policy, followed by a statement of the research problem. The objectives and scope of the study are then enunciated.

1.1 INTRODUCTION

A recurrent theme in the theory of public finance and fiscal policy is that of budget deficit financing. Deficit financing is, in a sense, the antithesis of a balanced budget, the matching of total expenditure to recurrent revenue. Conventionally, a budget deficit is defined as the excess of government expenditure over revenues. The financing of this budgetary gap through money creation by the banking system is what has often been conceived as deficit financing. But in practice, covering the budgetary gap entails more than just money creation; it includes running down of treasury cash balances, borrowing from the commercial banks and non-bank public, running down of external reserves and external borrowing. Needless to

say that the financing of the deficit in whatever form has an immediate effect on the level of outstanding public sector debt which, in turn, has consequences for the debt-service burden, as well as the level of employment and output, among others.

The economic analysis of government deficit spending has tended to be preoccupied with either the rationale for or the consequences of such a practice, with the latter aspect predominating. The budget balance (whether surplus or deficit) is used as a convenient yardstick with which to assess the impact of the budget on the economy, in spite of the reservations of some authorities on the subject given that tax revenues and expenditures are partly determined by the level of economic activity.[1] Deficits are a feature in at least one type of macro-economic imbalance-inflation, scarcity of foreign exchange, the crowding-out of the private sector, or a foreign debt crisis. The kind of

[1]Chelliah, R. J. (1973), "Significance of alternative concepts of budget deficits, "Staff Papers, I. M. F., p.84.

imbalance depends on the means of financing: respectively, printing money, running down foreign exchange reserves, domestic borrowing, or foreign borrowing.[2] The present study intends to examine the effect of deficit financing on a key macroeconomic variable, namely, inflation in Nigeria.

Inflation has been defined as an upward movement in the general price level.[3] An alternative definition of inflation as a sustained rise in the general price level has found favour with monetarists. The implication of the latter definition is that the increase in the general price level can only continue, if it is accompanied by an increase in the money supply.[4] Two arguments against the earlier definition proffered by

---

[2]Easterly, W. and Schmidt-Hebbel, K. (1993), "Fiscal accounts and macro-economic performance," World Bank Policy Research Bulletin, 4(3:May-July), p.1.

[3]See Lipsey, R. (1979), "Inflation," Economic Record, p.285.

[4]Laidler, W. and Parkin, M. (1975), "Inflation: a survey," Economic Journal, 85, p.74.

Johnson are:[5] first, many of the factors that generate price impulses are limited in their scope and, what is more, they do not pose a serious policy problem. Apparently dissatisfied with the various definitions especially in the context of developing economies, Aboyade[6] defines inflation as:

> a disequilibrium phenomenon, arising largely from an imbalance between an economy's spending power and the availability to it of supplies (represented by the sum of its productive capacity and its import). Such an underlying disequilibrium pressure would then set in motion a process of sustained rise in money incomes and general prices in a way that tends to reduce over time the purchasing power of the economy's monetary units.

Deficit spending is considered inflationary for three main reasons. First, by this action, government is making a net addition to aggregate demand. Second, financing the deficit often results in an increase in money supply. The addition to the money supply resulting from deficit financing

---

[5]Johnson, H. G. (1978), Selected essays in monetary economics, chapter III, p.

[6]Aboyade, O. (1983), Integrated economics: a study of developing economies. p.104.

increases bank reserves which, in the absence of regulatory measures, may encourage banks to give loans to business firms and households. Moreover, debt holdings by individuals, by adding to their stock of wealth, may possibly lead to a higher propensity to consume.[7]

It is on the basis of means of financing that many analysts conclude that deficit budgeting must be a great source of inflation in Nigeria, given the fact that the bulk of the country's domestic debt has normally been held by the banking system, and in particular, the Central bank. For example, over the 1966-1985 period, the Central Bank and Commercial banks respectively held an average of 32.28% and 33.76% of the domestic debt, while the non-bank public held 33.96%. In recent times, much concern has been expressed by economists, the business community, as well as the International Monetary Fund (IMF) and the World Bank about the growing public sector deficit. A major cause of the outcry has been

[7]Burkhead, J. (1955), "The balanced budget," in A. Smithies and J. K. Butters (eds.) Readings in Fiscal Policy.

with the potential inflationary consequences of the budget deficits, given the means of financing them. For instance, many informed commentators on Federal Government budgets have, with reference to the growing deficit, usually expressed apprehension about the heightening of inflationary pressures. Indeed, a particular survey of the Nigerian economy concluded that such a deficit level posed a "threat" to the successful implementation of the Structural Adjustment Programme (SAP), which has, as a cardinal objective, the maintenance of price stability.[8]

1.2 NATURE OF THE PROBLEM

In order to establish the links between budget deficits and inflation in Nigeria, a

[8]See West Africa, 21/3/88.

formulation of a model of the inflationary process becomes vital. For one reason, a positive association between changes in the money supply and the rate of change in prices is not sufficient to suggest a causal relationship that can be attributed to deficit financing since the money supply can change in response to influences other than budget deficits. This fact is compounded by the sometime ambivalent relationship between budget deficits and movement in the money supply. Gordon[9] for example, cited a few instances in the United States when money supply expanded while the federal budget was in surplus such as during 1919 - 20 and when money supply contracted while the federal budget was in deficit as in 1929-33. Dornbusch[10] attributes the absence of a tight link between deficits and inflation to the

[9]Gordon, R. J. (1976), "Recent developments in the theory of inflation and unemployment," Journal of Monetary Economics, 2, 185-219.

[10]Dornbusch, R. (1992), "Lessons from experiences with high inflation," The World Bank Economic Review, 6(1) p.18.

adjustment of velocity and the availability of alternative modes of financing the deficit (foreign borrowing, use of reserves and domestic debt finance). One advantage of formulating a realistic model of the inflationary impact of deficit financing in the Nigerian economy is that it will enable researchers and policy-makers to determine whether a reduction in the budget deficit is sufficient, in itself, to minimize inflation. Besides, an effective anti-inflationary programme requires a correct diagnosis of the major as distinct from the minor or proximate causes of the phenomenon. Further, even if the relationship between deficits and inflation is consistent with theoretical expectation, it is perhaps more plausible to, in addition, explore the potential inflationary consequences of non-monetary forms of financing a deficit under certain conditions.

As will become clear in the review of literature, most of the models that have been developed to study the inflationary effect of budget deficits have either considered only

debt purchases by the central bank, or treated the federal deficit as equivalent to, or proxy for, borrowing from the central bank. Undoubtedly, both approaches are consistent with monetarist analysis of inflation as they aim to validate the proposition that, "Inflation is always and everywhere a monetary phenomenon."[11] Further, the studies are consistent with a monetarist dictum which claims that only monetary policy matters for changes in nominal income. This dictum is necessary to establish another proposition which asserts that an increase in money supply is a necessary and sufficient condition for a sustained rise in prices.

These studies, however, have three main shortcomings. First, they neglect the fact that much of government borrowing is undertaken through the commercial banks and non-bank private sector. Second, the possible inflationary consequence of deficit spending

---

[11]Friedman, M. (1966), "What price guide-posts?" in George p. Schultz and Robert Z. Aliber (eds.), Guidelines, Informal Controls and the Market Place. p.25.

by sub-central units of government is not considered. This drawback can be especially severe in instances where the combined annual budget deficits of the state governments exceed that of the Federal Government and they finance their deficits through means that do not directly involve creation of high-powered money. Indeed it is now recognised that the pursuit of counter-cyclical action by the central government may either be reinforced or frustrated by the fiscal actions of the lower tiers of government; the same goes for expanding public capital formation. Third, equating the federal deficit with borrowing from the Central Bank exaggerates the inflationary impact of money creation and leads to incorrect policy prescriptions. The present study intends to remedy these defects by formulating a model that considers the inflationary impact of different modes of financing a deficit which is applicable to all levels of government.

While the postulated relationship between budget deficits and inflation has both

intuitive and theoretical appeal, it is often contradicted in practice. In Nigeria, for example, a casual inspection of the data may lead to the conclusion that there is no correlation, let alone causal relationship, between budget deficits and inflation. As will later become evident, some of the studies to be reviewed have reached similar conclusions albeit for a different economy. Earlier published work on inflation in Nigeria,[12] have by and large, not investigated the relationship between deficits and inflation in the economy, perhaps either because budget deficits were quite negligible before the 1980s or the relationship between deficits and inflation was considered positive and stable.[13] The few exceptions include

[12]See Ajayi, S. I. (1978), "Money, prices and interest: the Nigerian paradigm,: The Nigerian Journal of Economic and Social Studies, 20(2), 175-94. Also, Awosika, K. (1980), "Nigeria's anti-inflationary policies in the 1970s," The Nigerian Economy under the Military, proceedings of the 1980 annual conference of the Nigerian Economic Society, 275-307; Onitiri, H. M. and Awosika, K. (1982), Inflation in Nigeria.

[13]See for example Mbanefoh, G. (1982), "Sources and consequences of deficit financing in the Nigerian economy," and Usman, S. (1982), "The constitutional and other implications of deficit financing in the Nigerian economy,"

Oyejide's pioneer study and Ariyo and Raheem's more recent works.[14]

On a general level, the economic analysis of the causes and associated remedies for inflation has pre-occupied economists from the inception of the discipline. That is partly because inflation has proved to be more of a retarding factor of economic growth in different societies, big or small, developing or developed. It needs only to be emphasized that a continuous depreciation in the value of a currency has adverse implications for the ability of money to perform its functions as a store of value, medium of exchange and a means for making deferred payments.[15]

---

both papers presented at a national workshop on Deficit Financing and the Nigerian Economy.

[14]Oyejide, T. A. (1972), "Deficit financing, inflation and capital formation: an analysis of the Nigerian experience, 1957-70," The Nigerian Journal of Economic and Social Studies, 14(1), 27-42. Ariyo, A. and Raheem, M. I. (1990), "Deficit financing and economic development: empirical perspectives from Nigeria." Also, "Effect of fiscal deficit on some macro-economic aggregates in Nigeria," (1992), by the same authors.

[15]See footnote 4.

1.3 OBJECTIVES AND SCOPE OF THE STUDY

The main objective of this study is to examine the link between deficits and inflation in the Nigerian economy by taking into account the various methods by which the deficits are financed as well as the roles of the various tiers of government.

The models to be formulated and tested are intended to establish any direct impact of alternative modes of financing deficits on inflation in Nigeria. More specifically, the models would be used to:

(1) determine the impact of government borrowing from the banking system including the central bank on money supply;

(2) study the influence of money supply on the price level;

(3) conduct historical simulation of the behaviour of the endogenous variables;

(4) calculate multipliers as a basis for

indicating the effects of changes in the claims of commercial banks and the central bank on inflation;

(5) examine the possible inflationary effect of government borrowing from the non-bank public; and

(6) make policy recommendations on how to minimize the inflationary impact of deficit financing in the Nigerian economy.

The study covers the period, 1966 - 1985, because deficit budgeting has been the vogue through most of the period. At the federal level, only in two years was the budget balance positive. The combined budget balance of the state governments was also for most of the years in deficit. In a few of those years, their combined deficits were greater than that of the federal government. In analysing the impact of deficit financing on the economy, this study will, in addition to federal fiscal variables, consider the influence exerted by the finances of other tiers of government. Hence, the study intends to incorporate state governments' revenues,

expenditures and deficits in the analysis. Local government fiscal variables will not be included because these are presently incomplete, unreliable and insignificant for the period to be covered. From 1976 when reforms were initiated in the local government system, data on their activities has become more organized and regular.

1.4 ORGANISATION OF THE STUDY

The remainder of the study is divided as follows:

Chapter two probes into the origin and extent of deficit spending in the Nigerian economy and provides an overview of the federal and state governments' debt outstanding, both internal and external. In chapter three, the monetary and price developments of the Nigerian economy over the 1966-85 period are surveyed in broad terms.

Chapter four is devoted to a review of public debt theory and the empirical analysis of the inflationary effect of deficits. With regards to the theoretical analysis, the three main strands of thought surveyed are "wealth-saving relation", "monetarist analysis" and " models of anticipated inflation". Empirical studies on the interaction between deficits, money supply and the price level in both developed and developing countries are reviewed.

The theoretical framework for the present study is outlined in chapter five. The research hypotheses together with the assumptions and features of the model are highlighted before the complete model is specified. Tests of causality between money supply and prices as well as wealth saving relation to be undertaken are also indicated.

The methodology of the study is discussed in chapter six. The sources, measurement, refinements and limitation of the data are mentioned. The definition of the variables used in the study as well as techniques of

analysis are also dwelt on.

The results of the various computations made are shown and analyzed in chapter seven. In particular, the two-stage least squares estimates of the model are reported while the results of the causality tests between money supply and prices as well as the tax discounting hypothesis are separately presented. The major findings and implications of the results are subsequently highlighted. The concluding chapter contains the summary and recommendations in addition to suggestions for further research.

CHAPTER TWO

TRENDS IN PUBLIC SECTOR DEFICITS AND DEBT IN THE NIGERIAN ECONOMY

The chapter explores the genesis of deficit budgeting in Nigeria, as well as the pattern, structure and extent to which domestic and

external debts have grown and the reasons behind the growth.

2.1 AN OVERVIEW OF FEDERAL AND STATES FINANCES

If there is a common denominator between federal and state government budgets over the period, 1966-85, it is that they are characterised by large deficits. Indeed, deficit financing seemed to have been a fashion if not an article of faith of budget policy during this period. For instance, federal government revenue rose from just N321.8 million in 1966, peaked at N12,993.3 million in 1980, began a downward slide until it slumped to N6,234.1 million in 1983. Its expenditures were highest in 1982, but could not fall as fast as revenues with the result that by 1983, expenditures were N11,525.0 million, creating a budget deficit that year of N5290.9 million. (see Table 2.1).

A perusal of Table 2.2, reveals that the

consolidated revenue of state governments rose from N181.2 million in 1966/67 to almost N6 billion in 1981, only to decline to N4,412.2 million in 1983, before steadily rising to N4,844.9 million in 1985. But their expenditures witnessed a sustained increase over the period, with the 1983 figure (N11,485.4 million) more than double the 1979/80 figure of N5,508.2 million. Not surprisingly, their deficits, which amounted to N2,099.7 million in 1979/80 had more than tripled by 1983 to N7,073.2 million. These substantial levels of revenue, expenditure and deficits, no doubt, have far-reaching consequences on many economic variables such as money supply, inflation and the national debt-service ratio and as such should not be ignored in an analysis of the effect of budget deficit on inflation in Nigeria. Table 2.3 shows total national revenue, expenditure and deficit or surplus over the period of the study. Revenues rose sharply from =N=503.0 million in 1966 to their highest level of =N=17,618.0 million in 1980. Expenditures

which started at =N=486.4 million in 1966, reached their peak of =N=26,048.7 million in 1982 only to tumble to =N=18,751.3 million by 1984. Surpluses were only recorded in 1966, 1967, 1971 and 1974.

As a proportion of total national revenue, federal government revenue declined from its highest level of 84 percent in 1974 to merely 57.6 percent in 1984. Similarly, its expenditure fell from its highest level of 75 percent in 1978 to 50 percent of the total national expenditure in 1983. Federal government deficit as a proportion of the total national deficit peaked at 81 percent in 1985 up from its 1968 level of 49.5 percent (Table 2.4). This demonstrates that the state governments have been gradually eroding the taxing and spending powers of the federal government. This observation does not detract from the apparent centralisation of the fiscal system in the country. The factors identified as responsible for this tendency include:

(i) federal government veto of states' financial decisions especially under military

rule;

(ii) the centre having the largest share of the Federation Account;

(iii) power to borrow externally vested in the federal government;

(iv) federal grants to states;

(v) the oil boom-enlarged resources which are controlled by the federal government and

(vi) the fact that the federal government grants tax incentives to investors; varies the personal income tax rates as well as levies the corporation income tax.[16] As Table 2.5 clearly indicates, the combined revenue of the state governments as a percentage of total national revenue increased from just 12 percent in 1974 to 45.8 percent in 1981, before falling to 31.4 percent in 1985. Their expenditures after rising to 50.5 percent of total national expenditure in 1981 declined to 32 percent in 1985. All these provide additional proofs of the considerable weight of states' finances in the entire fiscal

[16]See Olowononi, G. D. (1991), Fiscal centralisation in Nigeria, Ph.D thesis, A. B. U. Zaria.

system and leads to the important conclusion that both in times of prosperity and crisis, it will be of interest to know how much of each is directly or indirectly generated by the actions and policies of the states even if, admittedly, the federal government holds absolute sway in such areas as external trade and money supply.

Table 2.6 shows the percentage changes in federal government revenue, expenditure and deficit over the 1973 - 85 period. What stand out from the data are the wild fluctuations in the value of these variables instead of a steady increase or decrease. This perhaps reflects the drastic decline in revenue during some of the years, in addition to the unplanned and profligate spending that was characteristic of that era. On Table 2.7, there is first a noticeable improvement in the financial position of the states before the deteriorating situation sets in during 1982 - 83. Expenditures, on the other hand, have proved rigid against decline except for 1978, 1982, 1984 and 1985. Increases in the state

governments' indebtedness throughout the period can be verified by a perusal of the last column of the table.

Focusing on recurrent expenditure of the federal government, the largest sum of money was channeled to administration (due to the heavy weight of expenditure on wages, salaries, allowances, etc.) followed by social and community services and economic services in that order (see Table 2.8). Over the period, the trend in the direction of federal government capital expenditure shows a predominance of spending on economic services (comprising agriculture, construction, transport and communications). This highlights the fact that during that period, the federal government gid venture into the field of investment in productive services and did not limit itself to just infrastructure and support services. This is followed by spending on such services as education and health, closely followed by administration which includes general administration and internal security (see Table 2.9).

Data on sources of federal government revenue as shown on Table 2.10, clearly reveal that by 1972 direct taxes (comprising petroleum profits tax, company income tax, personal income tax, capital gains and casino taxes) had become the main source, due largely to the influence of petroleum profits tax which from that year became the single most important source of federal government revenue. This trend in general revenue has confirmed in a rather oblique way the hypothesis that as a nation develops, the role of direct taxes increases at the expense of indirect taxes (import/export and excise duties). Other revenue sources consisting of mining rents and royalties, interest and repayments and miscellaneous (fees, licences, etc.) come second. This again can be attributed to the influence of petroleum mining. Indirect taxes have relatively diminished in importance particularly from the early 1970s to date despite a steady absolute increase over the years. One component of indirect tax, the excise duty, has grown in

importance as domestic manufacturing production expanded. Import duties have regularly been levied and they are particularly high on luxury imports to discourage their consumption. These duties which also serve to protect local infant industry were most prominent up to the mid-1960s. Export duties on such commodities as cocoa, hides and skins, palm produce, etc. were also important prior to the advent of petroleum export boom. They served as a means of transferring surplus from the rural sector to government. Export duties on marketing board-handled produce were however abolished in 1973.

While a yearly breakdown of recurrent and capital expenditure by the states combined is hard to come by, Table 2.11 provides a summary of federal and state governments' actual capital expenditure during the third plan spanning the period 1975/76-1979/80. While the federal government utilized over 65 percent of its capital expenditure in the economic sector which encompasses agriculture,

mining and quarrying, manufacturing, commerce, transport, power, communications, and so on, the states, in comparison, only spent 36 percent of their funds in that sector. In the social services sector (education, health and sports), while states channeled as much as 25 percent of their actual capital expenditure to them, the federal government utilized only 9 percent. These characteristics reflect:

(i) the monopoly enjoyed by the federal government in such sub-sectors as mining and power;

(ii) the large capital outlay required in such sub-sectors as telecommunications which is beyond the capability of individual states;

(iii) the specialty of the states in providing to the vast majority of the population such services as health-care and education than anything else and

(iv) the demarcation of statutory responsibilities or functions rather than of any conscious attempt at harmonization.

Turning to regional development which is defined to refer to the provision of water

supply, housing, community development, sewage disposal and town/country planning, it is observed, that the states are dominant both in absolute and proportionate terms. While N2,014.390m or 27 percent of states' actual capital spending went to this sphere, the federal government only spent N1,099.996m or 4 percent of its own total. In the area of administration, which as before includes security and defence, the federal government spent as much as 19 percent in that sector with the states committing a mere 9 percent which is hardly surprising as the former holds the major responsibility for national defence.

As is well-known, the States' budgets, just like the federal budget, is composed of recurrent and capital components. The recurrent budget shows the sources of government's estimated revenue as well as recurrent expenditure which consists of personnel and overhead costs. States' sources of internal revenue can be categorised into two. The first category comprises those revenue sources that are wholly under state

jurisdiction. This includes sales or purchase tax, pools and betting taxes, motor vehicle and drivers licences, entertainment tax, cattle tax (jangali) and poll tax. The other category consists of those revenue sources that are subject to federal legislation but are collected and used by the states. Taxes that fit this classification are personal income tax, capital gains tax, stamp duties, gift taxes and estate duties. Other recurrent revenue sources of the state governments are fees, interest and dividends, reimbursements, earnings, and levies of all sorts (such as for general development, education and industrialisation).

The single most important source of states' internal revenue is the personal income tax. This highly buoyant tax which in the developed capitalist economies and indeed virtually all other federations is not only legislated but collected and retained by the central government is, in this country, collected and utilized by the states, except that of armed forces personnel and foreign service workers.

This situation may be attributed to the fact that petroleum-derived revenues which constitute the most important revenue source for the Federation is largely appropriated by the central government which could thereby conveniently allow state governments to collect and keep for their own use the personal income tax. Under the personal income tax, the Pay-As-You-Earn (PAYE) has continued to provide the bulk of the funds, usually not less than 70 percent, while direct assessment of self-employed persons supplies the remainder. Thus, the personal income tax in Nigeria can truly be said to be a most inequitable tax as the self-employed and property-owners regularly escape their obligations. This is all the more unfortunate as it is this tax that can most effectively be used to alter inter-personal distribution of income in a socially desirable manner. The other important sources of revenue to the states are motor vehicle and drivers' licences, fees, earnings and sales followed by community and cattle taxes.

A greater part of state revenue comes from the Federation Account in the form of statutory transfers. States' internal revenue as a percentage of their total recurrent revenue during 1977-85 for which comprehensive data on their fiscal operations are available varied widely from as low as 17 percent in 1977 to a peak of 62 percent in 1984 (Table 2.12). This development is partly explained by the imposition of new taxes, levies and fees and the generally intensified revenue-generating efforts at the state level and partly by the diminished income transfer from the Federation Account.

From the foregoing, it is quite obvious that taxable capacity of the states with respect to rates payable is reasonably high, ranging from 10 to 70 percent for incomes beginning from N2,000). The number of tax payers in the total population (which is adult population in the case of poll tax and wage and sundry income earners in the case of personal income tax), is also considerable. The sources of revenues to governments as

listed above is wide-ranging and the degree of responsiveness of the revenue sources to growth and prosperity in the states is not totally unsatisfactory. What may be deficient is effective tax collection machinery. Indeed, central to the financial difficulties facing state governments with regards to internal revenue generation are the problems of rampant tax delinquency, avoidance and evasion, much of which is aided by the nonchalant and corrupt tendencies of tax officials. This situation has two obvious effects: first, it deprives the states of much-needed revenue; second, it worsens income distribution inequality since most of those that dodge tax payment are property-owners while those that comply (even if involuntarily)are wage and salary earners. Here lies a major factor responsible for the incongruity that even though the tax structure is progressive on paper, yet in reality, income distribution has only become highly-skewed with time. The "Progressive" tax structure has thereby failed to ameliorate

the injustice and inequity in the society. It can thus be argued that what is required is not an extension of tax coverage or an increase in rate per se but the adequate tapping of existing revenue sources.

State recurrent expenditure goes into the settlement of wages, salaries, allowances to employees of ministries and departments, ministerial and departmental running costs, the consolidated revenue fund charges (pensions and gratuities, etc.) contingency reserve and a surplus to be transferred to the capital budget.

Coming under the capital budget are "Capital receipts" and "Capital expenditure". The former include recurrent revenue surplus, domestic and external loans, while the latter includes various projects ranging from road construction to building of classrooms.

The main agency for implementing the budget is the Ministry of Finance. Its internal revenue division assesses and collects taxes. The treasury division is charged with the duty of collection and

disbursement of funds, while the duty of auditing departmental and ministerial accounts is that of the audit department. The budget office prepares the budget document.

A cursory examination of the yearly budgets will lead to the conclusion that the dominant procedure for budgeting at both the federal and state levels is the so-called incremental budgeting system whereby this year's budget is simply a linear projection of last year's with allowance made for changed circumstances and expenditures itemized under such heads as salaries, fuel, stationery, etc. It suffices to mention that this technique has been criticized for, among other things, its failure to keep constantly in view the targets and goals of the budget with the result that there is very little linkage between what is contained in the budget and subsequent implementation and performance. Indeed, experience has shown that the incremental approach to budgeting gives undue importance to expenditure instead of performance. It exacerbates friction between sponsoring

ministries and evaluating ministries, the former regarding the latter as intent on reducing the size of proposals. This leads to conscious exxageration of proposed expenditure such that after the cuts, the resulting budget becomes even more unrealistic. It entails a historical approach that favours items already admitted in the budget and by forwning at new items, tends to frustrate genuine demands. In the process, it retards progress and discourages a thorough scrutiny of the continued relevance of existing items of expenditure.

2.2 GENESIS AND DIMENSION OF BUDGETARY IMBALANCE IN THE NIGERIAN ECONOMY

At political independence, Nigeria inherited a non-buoyant tax structure that was highly dependent on indirect taxation.[17] Consolidated federal and regional government revenues constituted a mere 11.5 percent of Gross Domestic Product at factor cost in 1961 and this rose to 12.3 percent in 1966/67. The defect in the structure is further exemplified by the fact that 71.6 percent of federal revenues were derived from indirect taxes in 1961, with import duties responsible for 53.7 percent as can be verified from Table 2.13. As shown on the table, this unimpressive revenue performance continued up to 1968/69, and in the two years that followed, the share of non-oil revenues in Gross Domstic Product

[17]See World bank (1974), Nigeria: options for long-term development, p.20.

increased to 13.3 percent and 15.7 percent. This growth was not as impressive as it seems, since it was attributable to increased foreign exchange earnings from petroleum exports which facilitated a liberalization of import that in turn led to appreciable increases in customs and excise receipts. The share of indirect taxes continued to hover around 70 percent through most of the decade, aided by growth in excise duties until 1966. Regional revenue, however, changed from N130 million per annum in 1962 to N181 million in 1966.

Turning to spending, the most notable development in this period was the rising expenditure on defence on both current and capital accounts. From 7.5 percent of government expenditure (11 percent of Gross Domestic Product) in 1961, it climbed to 9.4 percent in 1966 and to as high as 41.7 percent (12 percent of Gross Domestic Product) in 1969/70. Even prior to 1966, government recurrent expenditure was increasing at about 13 percent per annum, thereby reducing the current surplus which had amounted to 24 percent of

retained revenues in 1961. Recurrent expenditure on general administration doubled from 1961 to 1966, growing slowly thereafter. Expenditure on economic and social services was adversely affected by these trends. This expenditure item declined from 35.2 per cent of recurrent federal expenditure in 1961 to 34.3 percent in 1966. By 1968/69, it had slumped to 12.4 percent, also declining in absolute terms compared to previous levels. This trend in expenditure is shown on Table 2.14 for 1961 and 1966.

Nonetheless, in the regions, recurrent expenditure on economic and social services increased from N75 million (64.8 percent of regional recurrent expenditure) in 1961 to N116.8 million (67.8 percent of regional recurrent expenditure) in 1966 (see Table 2.15). Available evidence shows that till the end of the decade, expenditure on economic and social services was always over 60 percent of regional recurrent spending.

In 1966/67, the recurrent surplus of the consolidated government account which has been

realized annually since independence changed into a massive deficit. Although the immediate cause of this transition was rising defence expenditures due to the civil war, the combined recurrent expenditure of the federal and regional governments was growing at 10.5 percent per annum even prior to 1967, while revenues were increasing at 6 percent per annum. This pattern of spending resulted in lower capital expenditure, lower current expenditure on economic and social services and a significant jump in the governments' internal indebtedness. Government borrowing reached 35 percent of Gross Domestic Product by the end of 1970, while debt service consumed 23 percent of the government total revenues in 1969/70.

In relation to the goal of optimising the rate of economic development, fiscal arrangements in the early sixties were adjudged inadequate.[18] Current expenditure on non-essential items was sometimes allowed and

[18] Ibid; p.22.

the tax effort was low. It is noteworthy however, that a country with such financial constraints could emerge from a long and costly civil war without extra external borrowing. Even regarding internal debt, the Central Bank of Nigeria Act[19] only permitted it to accommodate government up to the limit of 10 percent of its paid-up capital and reserves.

Large deficits continued to be incurred throughout the civil war to the beginning of the 1970s decade when the expenditure programme on reconstruction and development was launched. But the consolidated budget balance moved to a surplus in 1971 and again in 1974. The accounts of the federal and state governments together were in deficit from 1975 onwards. The only exception was 1979 when a surplus in excess of =N=800 million was recorded in the federal budget. Thus, it becomes clear from the foregoing that budget deficits have become a common feature of the

[19]See Central Bank of Nigeria act (1958).

budgetary practices of various Nigerian governments from the late sixties. Budgetary surpluses were a rare phenomenon. While budgetary deficits might be justifiable during a period of national emergency (such as during civil war and recession), it is hardly defensible under peacetime conditions especially when the economy is experiencing a boom. The consolidated budget deficits of the federal and state governments have varied from as low as ₦N=174 million in 1973 to a peak of ₦N=11 billion in 1983 as shown on Table 2.3. The overall federal deficit as a proportion of total federal expenditure was merely 10.7 percent in 1968 and reached as high as 43.2 percent in 1984. As a proportion of real Gross Domestic Product, the ratio changed from 0.3 percent to 20.3 percent over the same period (see Table 2.16).

Among the factors that have caused fiscal deficits in Nigeria are over-generous revenue estimates, uncontrolled spending and in particular unsustainable level of capital spending, unanticipated fall in the price and

quantity of crude oil exported, public sector salaries and wages reviews, extra-budgetary or unplanned expenditures, over-invoicing of imports and inflation of contracts. High import propensity often resulted in high importation which did not decline even when foreign exchange resources began to dwindle. Consequently, trade payments arrears mounted and with them rose the stock of external debt.[20]

2.3 SOURCES OF FINANCING THE DEFICITS

The federal government finances its deficits through internal loans, external loans and other funds. The subscribers to the internal loans are the Central Bank of Nigeria, commercial banks and lately merchant banks in addition to the non-bank public .

[20]Sanusi, J. O. (1987), "Nigeria's external debt: genesis, structure and management," Bullion, 11(3), p.8

The instruments traded are treasury bills, treasury certificates and development loan stock, Other funds (which are made up of public, special and trust funds, treasury clearance funds, etc) in addition to Ways and Means Advances.[21] Another source of funding is through external loans obtained from the International Capital Market and bilateral/multilateral sources. In terms of the relative weights of the sources of deficit financing, internal loans are the most significant followed by external loans and other funds over the period of the study (see Table 2.17).

There are five methods by which state governments in Nigeria finance their deficits. These are: internal loans, external loans, federal grants, miscellaneous and unspecified. External loans guaranteed by the Federal Government take the form of borrowing from the international capital market (ICM) as well as

[21]For a detailed discussion on the growth, composition, ownership and maturity structure of Nigeria's domestic debt, see Okunrounmu T. O. (1992), A review of developments in domestic debt in Nigeria, 1960-1991, Central Bank of Nigeria Research Department Occasional Paper, no. 4, 2-12.

bilateral/multilateral sources. The internal loans take the form of development loan stock which are floated by the federal government for on-lending to the states. The subscribers to this long-term financial instrument are the Central Bank of Nigeria, commercial and merchant banks as well as the non-bank public (NBP). Financing the budgetary gap by federal grants entails an income transfer to the states from the federally-retained revenue. The grant which in this case is non-matching raises states' revenues by the exact amount by which it reduces federal revenue with the result that total national revenue remains unaltered. The miscellaneous component of states' deficit financing sources comprises of fertilizer/grains sales, interest, dividends, loan repayment etc. The unspecified source is a residual representing mainly the part of the deficit whose financing cannot be identified due to lack of data. In terms of the significance of the various methods, unspecified other funds ranks first, followed by external loans, internal loans, federal

grants and miscellaneous. In the early '80s for example, unspecified constituted over 50 percent of states' sources of deficit financing, evidently a reflection of paucity of data on states' finances (Table 2.18).

2.4 THE NATION'S DEBT PROFILE

The distinction between internal and external debt is useful for among other things determining the cost of the public debt; that is the distribution of the debt burden over time. Internal debt is considered costless as far as the burden distribution between present and future generations is concerned on the grounds that the resources borrowed are not from future time periods. While with a private debt, there is a lender who can make a legal claim on the property of the debtor when the amortization period is due, this is not the case with the government internal debt. The same people who owe the debt (the citizens) are the same people for whom the debt is owed. The government can raise taxes or create money to liquidate the liability. Given this argument, Nigeria could afford to

feel sanguine about its huge debt since a very high proportion of it over the study period was internally held. As can be seen from Table 2.19, Nigeria's total debt has risen appreciably from a meagre N284.8 million in 1966 to N38,300.7 million in 1985, an increase of 13,367 percent. Most of this rise was however attributable to the spectacular increase in internal debt which rose from N144.4 million to N24,338.7 million. Over the same period, external debt rose sharply from N140.4 million to N13,962.0 million, an increase of 9,844 percent. Thus, both in terms of magnitude and rate of growth, the dominance of internal over external debt was unchallenged over the period of this study. In proportionate terms, internal debt had never fallen below 60 per cent of the total over the period. In 1969, it was 82.7%; in 1977, 92.0% and in 1984, 64.9%.

A number of factors contributed in making external debt modest before the late '70s. One such factor is the External Loans (rehabilitation, Reconstruction and

Development) decree 1970 which limited the raising of external loans to =N=1 billion. This figure was latter raised to =N=5 billion in 1978. Moreover, the economy was enjoying the oil boom of the '70s that was precipitated by the quadrupling of oil prices in 1974. Indeed, the financial position was so comfortable that the country lent money to the International Monetary Fund in 1974.[22]

Table 2.20 shows the share of total, external and internal debts in national income. As a proportion of nominal GDP, total debt rose from 5.2% to 53.7% in 1985. The average over the period was however 21 per cent. In the case of internal debt, its share in GDP increased from 1.1% in 1966 to 34.1% in 1985, an average of 5 per cent. External debt was only 3.3% of GDP in 1970, only to rise to 19.6% in 1985, with the average ratio over the entire period at 6.8%. Because of this pattern of ownership of the debt, so goes a proposition, repayment will only involve a

[22]Ibid.

transfer between tax payers and bond-holders. Similarly, the internal debt can never become so large that the interest payments are prohibitive since they are themselves subject to income tax.

The contrary view is that bond-holders do not bear the costs of a debt since their surrender of current funds is a wholly voluntary and private transfer in which they exchange current purchasing power for a promise on the part of the government of income in future periods. These bond holders do not regard themselves to be exchanging purchasing power in the public interest which would be the case if they should really be bearing the cost. It is therefore misleading to think that future tax liabilities and current surrender of income by bond-holders will cancel each other merely because the tax-payers and bond-holders may partially overlap in membership. In the Nigerian case, these arguments are hardly relevant given the negligible individual holding of government debt instruments. The burden of external debt

is less of a contentious issue. Repayment entails an outflow of resources to non-resident foreigners and is thus a burden on future generations. Upward movements in the rate of interest aggravates the debt burden. Where the debt has to be either refinanced, rescheduled or restructured, the cost of debt servicing not only increases but the country becomes vulnerable to disruption in capital earnings all of which erode confidence and credit-worthiness of the debtor country. Refinancing is also at the risk of added costs in the form of additional interest payments and the expense of mortgaging the future development of the country.

Perhaps reflecting the bias in the literature on public debt that only external borrowing constitutes a real burden on the economy, most measures of debt burden ignore domestic debt. The indicators of debt service burden are usually the ratio of external public debt service to total income or to export earnings (the so-called debt-service ratio) and the ratio of external public debt

to exports. Ratios of either external or internal debt service to total expenditure could be a useful indicator of not only the weight of borrowing in financing government but importantly of the debt burden. This is so because if a large proportion of government earnings has to be allocated each year in a manner dictated by previous commitments, future development efforts may be frustrated.

The external debt service has been remarkably low until 1981. For example, the debt service ratio for most of the 1970s was less that 2 per cent. The ratio rose steeply to 12.6 per cent in 1978 and to 15.3 per cent in 1985. The increasing debt-service ratio was both a reflection of falling export earnings as much as rising debt-service. For instance, exports never matched their peak of ₦14,186.7 million recorded in 1980 for the rest of the study period. On the other hand, debt-service grew from ₦278.3 million in 1980 to ₦980.5 million in 1985 (see Table 2.21). The ratio of public debt charges to federal recurrent expenditure has fluctuated from 35.2

per cent in 1966, to 5.6 per cent in 1977 and 27.5 per cent in 1985. The deficit-total expenditure ratio has varied from as low as 0.18 per cent in 1971 to a peak of 46.3 per cent in 1984.

2.5 STRUCTURE AND MAGNITUDE OF THE NATIONAL DEBT

A close look at the structure of Nigeria's external debt over the period reveals that until 1978, the country did not venture into the International Capital Market (ICM). The largest part of the foreign debt was sourced from bilateral sources, followed by multilateral organizations such as the World Bank that provides long-term loans of up to 50 years maturity at lower interest rates. From N100.2 million in 1970, loans obtained from bilateral sources rose to N350.3 million in 1977. The multilateral component rose from

₦37.9 million to N140.2 million over the same period. Nigeria borrowed $1 billion from the international capital market for balance of payments support following the collapse of the oil boom when the government became convinced that the country was under-borrowed. Being a privately sourced loan, the maturity was relatively shorter and interest rate higher. Since its debut in 1978, borrowing from the international capital market continues to lead all other sources. This shift in the structure of the external debt was caused by that programme or "Jumbo" loan. The amount outstanding under this category increased from N641.0 million in 1978 to ₦5,400.0 million in 1985. External loans outstanding from ICM was overtaken only in 1984 by unrefinanced arrears of debt. The payment arrears which began to accumulate in 1982 were estimated to be N6,164.7 million in 1985. This development is attributable to the indiscriminate recourse to external borrowing by both federal and state governments between 1979 and 1983. A new item of external debt (refinanced debt)

appeared for the first time in 1983 in the nation's debt tables. This was when it became necessary to obtain fresh loans to service existing ones (see Table 2.21).

Regarding the type of external debt, the country never had any short-term trade debt until 1982 at the onset of economic crisis. That year, short-term trade arrears stood at ₦1,981 million and this has multiplied several times since then. Before then, the external debt was either the medium or long-term type, with the former obtained from the ICM or bilateral sources, while the later was obtained either from the World Bank or bilateral means. As shown on Table 2.22, the medium and long-term debt declined from N429 million in 1970 to N214.5 million in 1971 and rose steadily thereafter. The only significant rise occurred between 1977 and 1978 when this type of debt increased from ₦496.9 million to N1,265.7 million in the wake of the jumbo loan of $1 billion (₦600 million) secured from the ICM in this period. By 1985, medium and long-term external debt outstanding

had risen to ₦12,900 million the bulk of which was medium-term. It will be noticed from the table also that the bulk of the external debt was attributable to the federal government. State/private loans was a mere ₦500 million as at the end of 1985. The increased level of debt and more exacting borrowing terms implied higher debt service. Between 1966 and 1985, external debt service payments rose from =N=27.2m to =N=980.5m. As a percentage of exports and federal recurrent expenditure, these were respectively 1.4 per cent and 8 per cent in 1985 (see Table 2.21).

The domestic debt of the federal and state governments is predominantly short-term composed mainly of treasury bills of three months maturity and treasury certificates of not more than one-year maturity. Development loan stocks which are of medium to long-term maturity lag behind these two. Table 2.23 shows the composition of the internal debt of the federal government. For instance, treasury bills outstanding rose from =N=128 million in 1966/67 to reach =N=16,976 million in 1985, an

increase of 13,162 per cent, whereas treasury certificates outstanding jumped from =N=236 million in 1970 to peak at =N=6,654 million in 1985, a rise of 2,719 per cent. The value of development loan stock in 1985 was comparatively lower at =N=4,319 million.

As shown on Table 2.24, the banking system held =N=127.8 million out of the =N=288.2 million domestic debt outstanding in 1966 whereas the non-bank public accounted for =N=160.4 million. The corresponding figures for 1985 were =N=22,191 million for the banking system and =N=5,761 million for the non-bank public. Table 2.25 shows that in proportionate terms, the share of the banking system increased from 44.3 per cent in 1966 to 79.4 per cent in 1985, an average of 66.04 per cent over the entire period. The share of the non-bank public however declined sharply from 55.7 per cent in 1966 to 20.6 per cent in 1985, an average of 33.96 per cent over the whole period.

CHAPTER THREE

MONEY SUPPLY AND INFLATION TRENDS

Before formulating the analytical model, this chapter reviews broadly the monetary and price developments of the Nigerian economy over the 1966 - 85 period and the factors underlying these developments.

3.1 TREND IN MONEY SUPPLY

The period 1966 - 70 was characterised by modest increases in money supply with the average growth of narrow and broad money supply at 17.0 and 12.1 percent respectively (see Table 3.1).

TABLE 3.1

Major economic indicators, 1966-85

GROWTH IN MONETARY AGGREGATES (In per cent	1967-70	1971-75	1976-80	1981-85
Narrow Money(M1)	17	29.4	36.8	7.6
Broad Money(M2)	12.1	20.4	25	8.4
Net Domestic Credit	13.8	51.3	38.4	19.1
Credit to Private Sector	0.3	8.3	24.2	11.8
Credit to Government	34.1	16.2	175.4	26.7
Net Foreign Assets	-0.14	29.2	-0.04	-6.1
Other Assets (net)	36	5.4	16.4	24.8
Ratio of Deficit to GDP	1.8	2.3	11.2	11.0
GDP Growth Rate	6.3	6.4	3.0	-2.3
Inflation Rate	5.0	12.2	15.4	19.4

Source: Computed from C.B.N. Annual Reports; various issues.

Indeed, there was decline in M2 in 1967 and

another decline in M1 in 1968. Such changes were never to occur again. The decline in money supply in both years was not unconnected with the outbreak of civil strife and the secession of one part of the country from the federation. Both components of M1 were affected by this episode. In 1968 for example, currency in circulation fell by 33 percent, whereas demand deposits rose by a mere 8 percent. With the cessation of hostilities in 1970 however, M1 and M2 rose 26 and 31 percent respectively. Both components of M1 contributed to this significant growth, as currency outside the banking system increased by 26 percent, while demand deposits increased by 35 percent. The main sources of growth in the money supply were a substantial increase in net foreign assets and bank credit to the private sector which increased by 32 percent.

The period 1971 - 1975 witnessed substantial increases in money supply. The average growth rate of narrow and broad money supply were 29.4 and 20.4 percent respectively. Money

supply increase was sustained over the period until it hit an all-time record at the peak of the oil boom in 1975. Between 1974 and 1975, M1 expanded by N865 million or 42 percent, while M2 grew by N2,369 million or 45 percent. Both components of M1 rose sharply in 1975. Currency in circulation grew at the rate of 45 per cent compared to 3 percent in 1971, while banks' deposits rose by 39 percent as against 3 percent five years earlier. The main source of M1 growth during the year was the rise in bank credit to the private sector, which was reinforced by an increase in net foreign assets. The unusually large rates of growth of money supply were traceable to the monetization of the relatively large revenue from oil exports which made the financial system excessively liquid. With government becoming a net creditor to the banking system, the large pool of credit could only be channelled to the private sector. The rise in money supply in 1975 marked a highly significant acceleration in the steep and inflationary trend in money supply growth

which was to become a feature of later periods.

The 1976-80 era witnessed another rapid growth in domestic liquidity. Average growth in M1 was 36.8 percent, while that of M2 was 25 percent. The highest growth rate in both M1 and M2 were recorded in 1976. Currency in circulation and demand deposits grew by 33 and 48 percent respectively. The main source of growth was credit to the government sector, which expanded by N648 million or 742 percent. The resultant growth in M1 was however moderated by the fall in net foreign assets and the substantial rise in quasi-money. Over the entire period, banking system claims on the government sector grew by an average 175 percent, while claims on the private sector rose 24 percent, behind the growth in net foreign assets of 26 percent. Just like the beginning of the period, the end of it witnessed a boost in monetary aggregates. Narrow and broad money supply rose 33 and 32 percent respectively. The main source of growth was a significant increase in net

foreign assets in the wake of the second oil boom. This component rose by N2,408 million or 43 percent. The other expansionary factor was the rise in the claims of the banking system on the private sector which rose by N1,774 million or 25 percent.

In sum, the main source of expansion in the monetary aggregates in this period was the domestic spending by governments of the Naira counterpart of its enhanced oil receipts following price increases occasioned by the oil shock of 1979. Other contributory factors were heightened capital in-flow and growth in domestic credit.

The 1981-85 era was one of moderate money supply increases. As shown on Table 3.1, the average growth rates of M1 and M2 were 7.6 and 8.4 percent respectively. Net domestic credit followed other assets as the leading sources of growth in narrow money. During this period, money supply grew the most in 1983. The foremost expansionary factor was the banking system's other assets (net) which rose by N3,628 million or 37 percent, reflecting the

rapid increases in the other assets of both the Central Bank and the commercial banks. This was reinforced by the surge in banking system credit to the government sector that expanded by N5,296 million or 33.5 percent. The resultant growth in M1 was moderated by the sharp decline in foreign assets (net) and the increase in quasi-money. For example, net foreign assets fell by N411.5 million or 83 per cent in the aftermath of the oil glut and fall in crude oil prices.

Taking the observation period as a whole, the average growth in M1 and M2 were 23.2 and 16.8 percent respectively. Both components of M1 contributed to the expansion as primary money and demand deposits grew by 13.8 and 18.3 percent respectively. This steep and persistent rise in money supply as well as the trend in the components over the period are illustrated in Fig. 17. The main sources of growth were credit to domestic economy (51.1 percent) which was dominated by credit to the government sector and other assets of the banking system (19.8 percent) as can be

verified from Table 3.2 and Figure 18. Over time, the magnitude and pattern of government fiscal operations have been identified as major sources of ineffective monetary control. Credit to government usually exceeded stipulated targets except for a few years.

3.2 **BANKING SYSTEM CREDIT**

Aggregate banking system credit to the domestic economy leaped from N441 million in 1966 to N32,680 million in 1985, representing an annual growth rate of 26.7 percent. Aggregate banking system claims on the private sector increased from N321 million in 1966 to N13,700 million in 1985, implying an average annual growth rate of 23.1 percent. Credit to the sector by the Central Bank rose from N23.6 million to N1,424 million in 1985, representing an average annual increase of 31.9 percent. The claims of commercial banks

on the private sector expanded from N297 million to N12,277 million, resulting in an average increase of 23.4 percent. Similarly, credit to the government sector skyrocketed from a mere N120 million to N29,118.5 million over the same period, representing an average annual decline of 0.1 percent. Out of this total, Central Bank credit to the government which was N94 million or 78.7 percent in 1966 surged to N18,980.1 million or 65 percent, yielding an average of 85 percent. Commercial bank credit rose from N26 million (21 percent) in 1966 to N10,138 million (31 percent) in 1985, giving an average annual growth of 10 percent (see Tables 3.3, 3.4 and Fig. 18). Credit to the sector by the Central bank rose from N23.6 million to N1,424 million in 1985, representing an average annual increase of 31.9 percent.

Aggregate credit to the domestic economy plummeted both in 1974 and 1975 principally because government turned to a net creditor to the domestic economy as a fall-out of the oil boom of that era. In 1974 for example, net

total credit fell by as much as N1,806 million or 125 percent. Whereas banking system's claims on the private sector increased by over N1 billion or 26.5 percent, claims on the government fell by an unprecedented 412 percent. Government became a net creditor both to the Central Bank and to commercial banks. A similar situation prevailed in 1975. In that year, total credit increased by N951 million almost wholly attributable to the higher claims of commercial banks on government as it remained a net creditor to the Central Bank.

The above scenario was however reversed by 1980 as total banking system credit to the economy grew at a rapid pace despite a short-lived oil boom a year earlier. At year's end, total credit stood at N12,832 million, representing an increase of 92.5 percent, the highest annual increase in all the review years with the exception of 1976 and 1977. Of the increase in total domestic credit, credit to government accounted for 71 percent. The banking system's claims on the government

sector increased during the year by N4,399.4 million or 407 percent. The rate of increase was far greater than the increase recorded in the preceding 14-year period. Furthermore, virtually all the increase in net borrowing to government during the year was from the Central Bank whose outstanding claims increased by N4,399.4 million. Commercial banks claim on government fell by N7.9 million or 4.6 percent (see Tables 3.3 and 3.4). Banking system credit to the private sector also rose significantly during the year above the previous year's level, reflecting sharp increases in credit by commercial banks. Banking system's claims on the sector rose by N1,774 million or 32.8 percent to N7,191 million. This greatly exceeded the above-target expansion of 14.7 percent recorded in the previous year.

It can be seen in Fig. 18 that central bank credit to the government superseded commercial bank credit to the same sector during most of the observation period, though the latter was by no means insignificant. The opposite was

the case with credit to the private sector where commercial banks were predominant.

3.3 **INFLATION TREND**

The Consumer Price Index (CPI) is used to compute the rate of inflation in the Nigerian economy. The CPI is designed to measure movements in the level of retail prices paid by consumers. The CPI computed for Nigeria by the Federal Office of Statistics measures average changes in the level of retail prices of goods and services consumed by households living in both urban and rural areas of the country. In its present form, the CPI dates back to 1975 after a national consumer expenditure survey was conducted in 1974/75. With each successive consumer expenditure survey, the year in which the survey is undertaken is adopted as the base year. The all-item index, arrived at in accordance with the Laspeyres index formula, is the figure

obtained from multiplying each item index by the corresponding item weight, summing up the results of the multiplication over all the items in the CPI basket and dividing the total sum by the sum of the weights. It suffices to mention that many analysts consider the CPI a flawed index. The present measure appears to give too much weight to items that do not rise the fastest in the household's basket of goods and hence are frequently considered under-estimates of actual price movements.

Price increases were quite moderate in the late '6os. In fact, there was a decline in the overall index of prices in 1967 and 1968 as shown on Table 3.7. This was largely attributable to the decline in the prices of food, tobacco and kola. By 1978 however, the inflation rate had reached 17 percent. The price rises were traceable substantially to increases in the cost of clothing, food and transportation. The inflationary rate in 1984 was up to 30 percent, with much of the increase accounted by the hike in the index of food, clothing and other purchases.

As pointed out earlier, the period 1966 - 69 was characterised by relative stability in prices. The major turning-points were 1970, 1975, 1981 and 1983. In 1970, the general price level at 1975 constant prices rose by 13.9 percent. By 1975, the inflation rate hit a record 33.8 percent compared to 13 percent in 1974. The food component rose the most. In 1981, the rate rose to 20.9 percent from 9.9 percent the previous year.

The moderate inflation of the late '60s was largely attributable to import restriction and rising demand. However, the deflationary situation in 1967 and 1968 was a reflection of lower food prices which was in turn made possible by increased food supply notwithstanding the civil war. In the 1970 - 1973 period, inflationary pressures emanated mainly from problems posed by prosecuting the civil war, problems of reconstruction and coping with the pent-up demand released after the war.

In the 1974-80 era, there was a fillip in money supply between 1974 and 1975 due to the

improved revenue position following the Opec - induced oil boom of 1974/75 and 1979. Whereas the federal budget was in surplus in 1974, it changed to a deficit in 1975 because of increased monetization of oil revenue, hence the surge in money supply. Banks became excessively liquid as government became a net creditor to the banking system. Aggregate net credit to the domestic economy rose by N952 million or 195 percent in 1975. In a similar vein, oil revenue in 1980 amounted to N12,354 million. Narrow money supply rose by over N3 billion or 33 percent caused predominantly by changes in net foreign assets and credit to the domestic economy.

Other contributory factors in the inflationary episode of this era were port congestion, low output of agriculture and industry, inefficient distribution network, rising costs of factor inputs and services, unreliability of basic amenities such as electricity, upward reviews of wages and salaries which involved payment of arrears and increase in government spending. Some additional causes were excess

demand for consumer goods in a situation of inadequate supply, high cost of production and imports, upward review of excise duties and a restrictive balance of payments policy. The modest price increase in 1979 was attributed to wage and salary restraint, slow growth in government expenditure and restraint on bank credit.

In the first half of the 1980s decade, the prominent causes of inflation included government deficit financed predominantly by the Central Bank of Nigeria which resulted in excess liquidity in the banking system, reduced level of imports as a consequence of foreign exchange scarcity, a depreciating exchange rate of the domestic currency, insufficient and rising cost of domestic output, hoarding and smuggling, inadequate storage and preservation system for perishable items and bottlenecks in the distribution system.

using cross-correlation analysis, monetary growth rate and inflation were plotted against time to observe whether the turning-points in

the monetary growth preceded, followed or were contemporaneous with turning-points in inflation. This is displayed on Table 3.8.

TABLE 3.8

Cross correlation for growth rate of money supply and inflation rate

Lag	Estimate
-9	-0.234
-8	-0.462
-7	-0.413
-6	-0.133
-5	0.152
-4	0.025
-3	-0.284
-2	-0.163
-1	0.190
0	0.374
1	0.349
2	-0.085
3	-0.151
4	0.118
5	0.035
6	0.017
7	0.033
8	0.203
9	0.181

The results show the contemporaneous effect to be positive. Similarly, future increases in prices were associated with past growth in money supply. Previous changes in price level were only remotely associated with future changes in money supply. If anything, the relationship was mostly negative. It can thus

be concluded that apart from being contemporaneous, the turning-points in monetary growth preceded the turning-points in inflation over the study period.

CHAPTER FOUR

A REVIEW OF PUBLIC DEBT THEORY AND THE IMPACT OF BUDGET DEFICITS ON INFLATION

Three major theories form the framework on which the models relating deficits to inflation reviewed below are based. The connection between deficits and inflation working through perceived real private wealth has its genesis in, for example, Metzler,[21] Modigliani[22] and Patinkin.[23] Monetarists emphasize the link via central bank purchase of government bonds. A self-propelling process of inflation by which anticipated inflation precipitates an increase in the budget deficit features in the works of Barro.[24]

[21]Metzler, Lloyd (1951), "Wealth, saving and the rate of interest," The Journal of Political Economy, 52(2), sec. vi.

[22]Modigliani, Franco (1961), "Long-run implications of alternative fiscal policies and the national debt,"Economic Journal, sec. iv.

[23]Patinkin, Don(1965), Money, interest and prices: an integration of monetary and value theory, sec. xii.4.

[24]See Barro, R. J. (1978), "Comment from an unreconstructed Ricardian," Journal of Monetary Economics, 4, 569-81. Also, "On the determination of the national debt," Journal of Political Economy, 87, 940-71, by the same author.

4.1 WEALTH-SAVING RELATION

The idea that government bonds are regarded as wealth by private individuals plays a crucial role in the theoretical analysis of the impact of monetary and fiscal policies. This view features directly or indirectly in the analysis of the real effects of change in the amount of public debt and in proving non-neutrality of changes in the quantity of money.[25] More generally, the assumption that government debt issue leads, at least partly, to a rise in the representative household's impression about its net worth is central to the argument concerning a positive impact on aggregate demand of "expansionary" fiscal policy, defined by Barro[26] as the replacement of taxation by borrowing for a certain volume

[25]See for example footnote 21, sect. iv and footnote 20 sect. vi.

[26]Barro, R. J. (1974), "Are government bonds net wealth?" Journal of Political Economy, 1095-1117.

of government spending. Essentially, the argument in a full-employment setting is, following Modigliani, [27] that an increase in the public sector debt leads to an increase in perceived private sector wealth, hence, an increase in desired consumption relative to savings. Consequently, there will ensue a rise in interest rates and subsequently, a fall in investment. It is equally true in a non-full employment context that the influence of public debt on aggregate demand depends on the postulated rise in perceived household wealth.

3.1.1 Extension and dissent on wealth-saving relation

Patinkin [28] extends Metzler's analysis of the effects of changes in money supply through the separate channels of deficit financing and open market operations to a four-sector macroeconomic model. He ends up demonstrating

[27] See footnote 22.

[28] See footnote 23 pp. 289-292.

that an increase in money supply via deficit financing will lead to a proportional rise in equilibrium wages and prices. This is because such a condition will make the undiscounted real value of outstanding government bonds less than in the initial equilibrium position, while other effects on commodity demand remain unchanged. The fall in the real value of government bonds causes the demand and supply for them to fall. Hence, the new equilibrium rate of interest will be lower than hitherto. The rate of interest on the bonds will remain unchanged, only if interest payments on them are indexed to the general price level.

The inflexibility of the interest rate no longer prevails if the increase in money supply is due to open-market transactions. Whereas real cash balances will remain unchanged, the real quantity of government debt will fall as a result of the bond purchase. This will be so even if the bond carried an escalator clause linking interest payments to the price level. The new equilibrium point resulting from an

open-market operation will, however, be associated with a lower rate of interest than that resulting from an equivalent monetary increase by means of money creation.

A matter which has gained the attention of economists is whether the future taxes required to defray government interest payments cancels out the positive wealth effect, especially as the capitalization of such taxes implies a reduction in perceived wealth. Barro cites the contributions of Tobin[29] and Bailey [30] (1962) both of which affirm that the future tax liability counter-balances the positive wealth effect. Tobin,[31] for instance, in a paper initially written in 1952, remarks:

> How is it possible that society merely by the device of incurring a debt to itself can deceive itself into believing that it is wealthier? Do not the additional taxes reduce the value of the other components of private

[29]Tobin, J. (1971), (Essays in economics, vol.1) macroeconomics.

[30]Bailey, M. (1962), National income and the price level.

[31]See footnote 29, p.91.

wealth?"

Bailey[32] has gone somewhat further by arguing:

> It is possible that households regard deficit financing as equivalent to taxation. The issue of a bond to finance expenditures involves a liability of future interest payments and possible future repayment of principal, and thus, imply future taxes that would not be necessary if the expenditures were financed by current taxation. If future tax liabilities implicit in deficit financing are accurately foreseen, the level at which tax receipts are set is immaterial. The behaviour of the community will be exactly the same as if the budget were continually balanced.

Two outstanding lines of arguments have been used to justify the idea that the capitalization of the future tax liabilities will be imperfect. Thompson[33] has argued convincingly that unless an infinite horizon for tax liabilities is assumed, Ricardian equivalence will not hold. On his part, Mundell[34] contended that for the theorem to be valid, the rate of discount applied to future tax liabilities must be equal to the rate at

---

[32]See footnote 30, p.75.

[33]Thompson, E. A. (1967), "Debt instrument and capital theory", American Economic Review, (December), p.1200.

[34]See Mundell, Robert A. (1971), "Money, debt and the rate of interest", in Monetary Theory, edited by the same author.

which the public sector can borrow. Besides, absence of liquidity constraint by households and consumer rationality in the formation of expectations about future tax liabilities are assumed.

It is worth mentioning, nevertheless, that some scholars do not think that individuals capitalize future tax liabilities as the following citations show. Musgrave [35] states that:

> there is asymmetry in the accounting rules of lenders and tax payers; lenders find their net worth unchanged after making a loan, while tax payers fail to reduce their net wealth by the present value of the future burden of the debt service.

Vickery (1961) bases his remark on Bowen, Davis and

Koft[36] to assume that

> Individuals pay no attention to their share in the liability represented by the public debt in determining how much of their income they

---

[35]Musgrave, R. (1959), The theory of public finance. p.568.

[36]Bowen W. G., Davis, R. G. and Kopf, D. H. (1961), "The burden of the public debt: reply," American Economic Review, (March), p.142.

will spend.[37]

James Ferguson asserts that:

> Factors inherent in the institution of public debt, which include uncertainty concerning future taxes and limited time horizons, cause people to treat government bonds as assets, but to under-estimate their liability as tax-payers to pay additional taxes in future periods to service and retire their debt.[38]

Barro's paper[39] considers, among others,

> the effect of government bond issue on the calculus of individual wealth in an overlapping generations economy with physical capital where individuals have finite lives.

The model treats an individual's utility as depending on not only his consumption but on the utility of his immediate descendant. Hence, the utility of the present generation is linked indirectly to the utility of all future generations. Bond issue is regarded as an asset for the present generation but a liability for a future generation or

---

[37]Vickrey, William (1961), "The burden of the public debt: comment," American Economic Review (March), p.133.

[38] Ferguson James M. (1964), "Temporal utility and fiscal burden," in Public Debt and Future Generations edited by the same author, p.220.

[39]See footnote 26, p.1097.

generations. It is then argued that the current generation will resent this redistribution of wealth from their descendants to themselves by raising their bequests sufficiently as not to make their descendants suffer. The additional saving for this increased inheritance matches the reduced savings that would otherwise be linked with the government bond purchase. But if before the government bond issue a member of the old generation had made a positive bequest, it is obvious that such a person is faced with the alternative of redistributing income from his heir to himself, but decides to act otherwise, viewing such a shifting of resources at the margin as inefficient. Because the issue of government debt does not change the behaviour of individuals in the sense described, it follows that through the appropriate adjustment of the bequest - "the values of current and future consumption and attained utility will be unaffected."[40] It is also

[40]See footnote 26, p.1103. Also, Feldstein M. (1976), "Perceived wealth in bonds and social security," Journal of Political Economy, 84, p.332.

shown that to the extent that debt issue entails a loan from low-discount rate to high-discount-rate individuals, a positive net wealth results if the government is more efficient than the private market in carrying this sort of loan. Also, the net wealth effect would be positive if the government acts like a monopolist and would be negative if the government is an over-producer of liquidity services. Finally, an analogy is made to social security where it is shown that a change in government debt will not alter the overall risk contained in household balance sheets when relative tax liabilities are known. If relative tax liabilities are uncertain, the effect of government debt issue on the overall risk may be positive or negative depending on the nature of the tax system and on the transactions costs associated with private insurance arrangements.[41]

---

[41]See footnote 26, p.

Barro then sums up his theoretical argument thus:

> The argument for a negative wealth effect seems, *a priori*, to be as convincing as the argument for a positive effect. Hence, the common assertion [42] that the marginal net wealth effect of government bonds is somewhere between zero and one and more likely to lie at some positive intermediate value has no *a priori* foundation. If, in fact, the marginal net wealth effect were negligible, the implications for monetary and fiscal analysis would be far-reaching. In particular, in the case where the marginal net wealth effect of government bonds is close to zero (1) the Metzler-type argument for non-neutrality of changes in the stock of outside money would not be valid, (2) a change in the stock of government debt would have no effect on capital formation, and more generally, (3) fiscal effects involving changes in the relative amounts of tax and debt finance for a given amount of public expenditure would have no effect on aggregate demand, interest rate and capital formation.[43]

Feldstein[44] notes, however, that these conclusions hinge on a core assumption in Barro's analysis, namely, that the economy has a constant population and no economic growth. For example, only in the special case of a

---

[42]As in footnote 22, p.289.

[43]Footnote 26, p.1116.

[44]See footnote 40, p.332.

static economy (characterized by zero growth) is the present value of needed future taxes equal to the present value of the debt itself. In such a case, no discounting of future taxes is involved.

In his comment on Barro's paper, Buchanan[45] draws attention to the fact that it is because the author supposes that tax-payers do capitalise the future obligations implicit in public debt that led him to conclude that government bonds will not increase the perceived net wealth in the economy, since the perceived reduction in wealth will cause consumption to decline.

4.2 MONETARIST ANALYSIS

Monetarist theorizing usually emphasizes the link between budget deficits and inflation

---

[45]Buchanan, J. (1976), "Barro on the Ricardian equivalence theorem," Journal of Political Economy, 84, p.337.

via the purchase by the banking system, but particularly the Central Bank of bonds issued by the treasury. The monetarist framework is shared by the U.S. Council of Economic Advisers[46] and Buchanan.[47] In their analysis, the Council of Economic Advisers note that if a budget is financed through a creation by the Central Bank of additional currency reserves, which augments the money stock, there will be no offset to the inflationary effect of the deficit. The increase in high-powered money expands the money supply which, in turn, raises the price level. If the deficit is financed by selling bonds to non-bank investors, the effect generally is to tighten the money market and raise interest rates. This partially reduces the expansionary effect of the deficit by lowering investment. More specifically, when the government has spent

---

[46]U.S. Council of Economic Advisers (1974), "Financing a federal deficit," in W. L. Smith and R. L. Teigen (1974), Readings in Money, National Income and Stabilisation Policy.

[47]Buchanan, J. (1967), "Debt, public," in International Encyclopaedia for the Social Sciences, vol. 3, 28-34.

the proceeds from the sale of bonds to the non-bank public, the community ends up with the same amount of government bonds. It is this method of deficit financing that is considered as non-inflationary without qualifications.

If the bonds are, however, held by commercial banks the banks pay for them by creating demand deposits for the government, which when spent, add to the public's cash balances. If the total amount of cash reserves to be held against the deposits is assumed to be fixed, then the commercial banks can purchase additional government bonds in either of two ways. First, they might sell to the public an equivalent volume of other financial assets which they hold, thus reducing the public's money holdings. The effect will be to leave the public with the same amount of money, but more of other financial assets that it did before by the exact amount of the deficit. The other option will be for the banks to reduce their lending to other sectors, in which case the public's

liabilities to the banks are reduced, which implies an increase in the public's net financial assets. The Central Bank might also supply additional reserves in an amount that matches the commercial bank purchases of bonds. If it did this by open market purchase, it is obvious that the result will be inflationary.

Buchanan argues that when government borrows from the banking system, no real exchange of present for future debt takes place, which means no real debt is created. Real debt creation takes place only if some individuals or groups in the economy willingly exchange current purchasing power for a government obligation to provide an income return in future periods. In reality, therefore, when government debt is subscribed to by the banking system, no borrowing takes place at all, since no individual or institution gives up any income or liquidity in exchange for the obligations of government. The money transferred to the government in exchange for the debt instruments are created

in the process. The banking system is thus provided with an interest income, not in exchange for any sacrifice of income or liquidity, but rather for creating additional currency. In a full employment economy, any creation of additional purchasing-power inevitably leads to inflation. However, in an economy operating at less than full-employment, currency creation may be beneficial. In such a case, an increase in money supply should raise real income and employment without inflation unless there are constraints which make prices rise before "some acceptable level of employment is reached."[48]

The monetarist analysis in a classical setting considers a full-employment economy and assumes a perfectly inelastic supply of goods. Any increase in money supply will result in an increase in demand for goods in excess of the available supply. The gap can only be bridged by an increase in the price

---

[48]Buchanan, J. (1970), The public finances. 307-9.

level which works to reduce demand by contracting real income.

4.3 SELF-GENERATING INFLATION

The concept of self-generating inflation has increasingly become a subject of theoretical analysis. It may be sufficient to review Barro's contribution to this literature. The starting point of Barro's model of self-perpetuating inflation is the Ricardian Equivalence Theorem - that is the notion that substitution of debt for tax finance for a given volume of public expenditures will not have any "first-order" effect on the rate of interest, capital formation, and other real variables. In a Ricardian setting where individuals are assumed to capitalise the future liabilities which the public debt embodies, the substitution of debt for tax finance is neutral with respect to the level of aggregate demand. It then follows that an increase in the fiscal deficit will have no immediate

impact on the price-level, rate of return, level of output or the capital-labour ratio. Hence, the issue of debt burden is ruled out in a Ricardian context. Any increased future taxes resulting from debt accumulation will not be a burden on future generations because of the income transfer in the form of bequests from the old generation to their heirs.[49] The analysis further assumes that public debt and capitalised future taxes are perfect substitutes in individual portfolios, so that there are no effects on the demand for money, for example.

Given the acceptance of the Ricardian equivalence theorem as a true initial proposition, Barro introduces certain "Second-order" issues bearing on the "excess burden" of taxation to derive "a determinate (optimal) amount of debt creation." He then demonstrates that temporary increases in government spending will have a direct

---

[49]See Ricardo, D. (1951), "Funding systems," (The Works and Correspondence of David Ricardo), 86-7 and footnote 25.

positive impact on the deficit. Similarly, anticipated inflation will have a proportionate effect on the growth of government debt. This means that expected inflation which is influenced by the current price level will lead to changes in the nominal value of outstanding government debt. Temporary changes in income are postulated to exert a negative effect. The level of real government expenditure only has a minimal impact on debt issue, while the debt-income ratio has no effect at all.

The equivalence proposition is beset with a number of theoretical and empirical difficulties, some of which were noted by Barro[50] and many more elaborated by Feldstein,[51] which uphold the view that fiscal policy exerts a positive effect on aggregate demand. Feldstein, for instance, notes that optimal bequest may be negative with

---

[50]See footnote 24.

[51]Feldstein, M. (1982), "Government deficits and aggregate demand", Journal of Monetary Economics, vol.9 (Jan.), 10-20.

expectation of future rise in productivity, a possibility assumed away by Barro. An additional objection to the proposition is the insignificance of bequests compared to say educational investments on children.

4.4 THE EMPIRICAL ANALYSIS OF THE INFLATIONARY IMPACT OF BUDGET DEFICITS: A REVIEW

The literature which will be reviewed in this section can be conveniently divided into three main themes:

(i) the various measures of deficits, highlighting the advantages and shortcomings of each.

(ii) those studies that have evolved specific money supply hypothesis whereby a link is sought between budget deficits and the money supply (usually its rate of change) to show the responsiveness of the Central Bank to

deficits[52] and

(iii) those studies which explicitly relate the rate of change of prices to the budget deficit.[53]

The common view-point of these studies, however, is that inflation is basically a monetary phenomenon irrespective of the economic system or the level of development and can only be understood within that context. Non-monetary theories of inflation such as the structuralist analysis have in general consigned deficit spending to a negligible role of a propagation medium with no potential for initiating inflationary

---

[52]See Barro, R. (1977), "Unanticipated money growth and unemployment in the United States," American Economic Review, 67, March, 101-15; also, footnote 23.

[53]See for example Ahmad N. (1970), Deficit financing, inflation and capital formation: the Ghanaian experience, 1960-65 and Aghevli, B. B. and Khan, M.S. (1978), "Government deficits and the inflationary process in developing countries," Staff Papers, I.M.F., 25(3), 383-416.

impulses.[54].

4.5 MEASUREMENT OF THE FISCAL DEFICIT

A major objective of fiscal policy is to rationalise the use of resources within the public and private sectors of an economy, and in the process, to avoid inflation and balance of payments pressures.[55] The proper measure of the public sector's net use of resources-the

---

[54]See Argy, V. (1970), "Structural inflation in developing countries," Oxford Economic Papers no.1, 73-85; Sunkel O. (1960), "Inflation in Chile: an unorthodox approach," International Economic Papers, no.10, 107-31; Vogel R. C. (1974), "The dynamics of inflation in Chile and Latin America: 1950-69," American Economic Review, , vol. lxiv, (March) Harberger A. C. (1963), "The dynamics of inflation in Chile," in Measurement in Economics edited by Christ C. A. p.23; and Olivera J. H. G. (1964), "On structural inflation and Latin American structuralism," Oxford Economic Papers, (Nov.), 312-2.

[55]See Blejer M. and Cheasty, A.(1992), "How to measure the fiscal deficit", Finance and Development, (Sept.), p.40.

fiscal deficit- is relevant to sound economic management and the analysis of the macroeconomic effects of the deficit. Among other things, the budget deficit measure is concerned with the type of deficit to be measured within a public sector coverage as well as the coverage and size of the public sector and its composition.

There are several measures of fiscal deficit. The standard definition of the fiscal deficit is the so-called conventional deficit which measures the difference between total receipts and total outlays excluding changes in debt. The I.M.F.'s "Draft Manual on Government Finance Statistics" arranges the payment and receipt elements of the government sector accounts as follows:

Fiscal deficit = (Revenue + Grants) - (Expenditure on Goods and Services + Transfer Payments + Net Lending), or alternatively

Fiscal deficit = Borrowing + Net Decrease in Cash Holding - Amortisation

Three defects of the ordinary budget deficit as a measure of deficit financing were

identified by Ahmad.[56] First, its definition varies from country to country. While in some it refers to the gap between recurrent revenue and recurrent expenditure, in others, it denotes the excess of total expenditure over total revenue. Second, the impact of budget deficits on the economy is tied to the method of its creation or financing. Finally, the ordinary budget deficit does not indicate whether the deficit is brought about by an increase in expenditures or a reduction in taxes. Consequently, he advanced two alternative definitions of deficit financing as either net borrowing of the government from the central bank or net borrowing of the government from the banking system as a whole.

In a more recent study, Islam and Wetzel[57] highlight some of the shortcomings of the fiscal deficit. First, the definition stresses cash flows rather than accruals.

---

[56]See footnote 53.

[57]Islam R. and Wetzel L. (1991), "The macro-economics of public sector deficits: the case of Ghana," PRE Working Papers; the World Bank, May. WPS 672, p.9.

Sometimes, the cash flow concept may not exactly mirror underlying trends. For example, if a government buys goods and services and delays payments, the cash concept may not reflect such transaction in the current year. Tanzi and Blejer[58] point out that while capturing the monetary impact of the budget, the cash concept may not capture the income-creating impact. Besides, grants are not a regular source of income and therefore subject to fluctuations. Where as is commonly the practice in developing countries, lending between the various tiers of government is not amortised, it effectively becomes a net transfer which should be included along with revenue and grants. Additionally, when inflation is substantial, it may be difficult in an economic sense to demarcate between amortisation payments and interest payments resulting in an exaggeration of the deficit. Given the afore-mentioned defects of the

[58]Tanzi, V. and Bledjer M. (1984), "Fiscal deficits and balance of payments in IMF adjustment programmes", in J. Muns, ed., Adjustment, Conditionality and International Financing.

conventional deficit, a number of special deficit measures have been developed.[59] For instance, when measured on a pure cash basis, the conventional deficit corresponds to what has become known as the "Public Sector Borrowing Requirements" (PSBR). The PSBR represents the total excess of expenditure over revenue for all government units, all of which must be financed by new borrowing net of repayments of previous debt. This measure is also known as the "consolidated public sector deficit". The completely accrual deficit attempts to capture net resources to be used by the government in the fiscal year. The treatment of capital depreciation, a pure accrual item, is the most important distinction between cash and accrual deficit.

A measure that is commonly used is the "Primary deficit". This deducts all interest payments from the conventional deficit in order to obtain a measure of the current policy posture. The reason is that the

---

[59]See footnote 55, pp. 41-2 for a comprehensive discussion.

interest payments currently made are pre-determined by the size of previous deficits rather than present policy. Another concept of the deficit (the operational deficit) removes only the inflationary component of interest payments in situations where nominal interest rates are indexed to the price level.

The "structural deficit" refers to the balance that would prevail if, ceteris paribus, the economy was neither in recession nor boom but was moving along its normal trend. The "domestic deficit" includes only those components of the conventional deficit that arise from transactions within the domestic economy and leaves out those affecting the balance of payments directly.The measure restricts itself to the direct expansionary effect of government on the domestic economy. Computations of full-employment and cyclically-adjusted deficits try to differentiate between changes in government revenue and expenditure associated with cyclical fluctuations in output and those changes that reflect discretionary policy

decisions. These deficits broadly correspond to the conventional deficit recalculated using potential rather than actual output in the case of full-employment deficit or trend output for the cyclically-adjusted deficit. These measures are however not of much value since they deal with non-observable variables. Recent research has stressed the importance of obtaining a full picture of the public sector claim on resources by encompassing all levels of the public sector such as central, state and local governments as well as public agencies and state-owned enterprises. Consistent with this approach, the public sector is defined for the purpose of this study to embrace federal and state governments, while the type of deficit to be measured corresponds to the "domestic deficit" defined above.

4.6 THE BUDGET DEFICIT-MONEY SUPPLY RELATION: DEVELOPED COUNTRY STUDIES

As noted earlier, most studies on the likely inflationary effect of budget deficits in developed western countries are formulated in the context of the response of money supply to fiscal policy. In Barro's model,[60] for example, expected growth in money supply is determined by the previous year's unemployment rate, the current year's level of federal government expenditures relative to normal and lagged growth in money supply. A positive response of money supply to lagged unemployment is in recognition of the response of monetary policy to business cycles. A positive impact of current government expenditures on growth of money supply is postulated on the premise that money creation is used in combination with taxation to minimize the costs of financing government spending.[61] With M1, as the measure of money

[60]See footnote 52.

[61]Footnote 52.

supply, Barro's final equation for the current rate of growth of money supply (DM) is:

$DM_t = DM\ (UN_{t-1},\ FEDV_t,\ DM_{t-2})$, (1)

where:

DM = growth in money supply

UN = the rate of unemployment

FEDV = a government expenditure measure. The empirical results covering 1961 - 74 for the U.S. show UNt-1 and FEDVt to be both positive and statistically significant. These estimates confirm Barro's hypothesis that government expenditure and lagged unemployment increase the growth rate of money supply. To test for the impact of fiscal imbalances on the growth of money supply, Barro introduced SUR - which he measured as the nominal budget surplus (national income account basis) divided by the product of the GNP deflator and the trend value of the GNP - into his equation. This variable was hypothesized to have a positive effect on money supply. When SUR_t substituted for $FEDV_t$, its coefficient was negative as expected and statistically significant even though the fit was poorer

compared to the first equation. The third equation which has $FEDV_t$ and SUR_t at the same time leads to the inference that the main factor that explains variation in the budget is the expenditure relative to normal variable and not any separate influence by the surplus variable. The same conclusion is upheld if a lagged value of the surplus variable is used instead of (or in addition to) the current value.

Basically, similar results were obtained for the 1946-76 period. Indeed, the SURt variable was insignificant even when the $FEDV_t$ variable was dropped. Both sets of results lead to the conclusion that in the United States during the period covered by the study, the major link from the federal budget to money creation involved departures of government expenditures from normal and not the surplus position or the level of federal spending. The study made use of the surplus position of the budget as a determinant of the money supply level. This should ordinarily contract the money supply in contrast to a

deficit which can be expected to expand it. The model is also about the expected level of money supply and not its actual level. Even though government expenditure was another determinant of the expected growth in money supply, the measure employed was that of federal government expenditure.

In the study by Hamburger and Zwick, [62] the monetarist framework was also adopted. In particular, they assumed the American Federal Reserve Board to be guided by a policy of 'smoothing' interest rate movements. If for instance, interest rate rise following the creation of public debt, the bank intervenes to raise the money supply in order to bring down the rate of interest. Hamburger and Zwick made use of the money supply model originally developed by Barro[63] to test for the effect of budget deficits on money creation exactly as in (1) above. Given this

---

[62]Hamburger, K. J. and Zwick, B. (1981), "Deficits, money and inflation," Journal of Monetary Economics, vol.17, 141-50.

[63]See footnote 52.

specific objective, they introduced DEF as the negative of Barro's SUR to mean the budget deficit relative to GNP.

The study covered 1954-76, with a sub-sample for 1961-74. The data was annual for the U.S. In the estimation, FEDV was replaced with the deficit variable, DEF and both were also included in the same regression. In either case, the results confirmed Barro's hypothesis that government expenditures rather than deficits increase the money supply. The coefficient of DEF was not far from zero when FEDV was excluded and had the wrong sign when FEDV was included. Of particular interest was the increase in the coefficient of FEDV when DEF was included. Some other versions of the original three equations were tested. For example, when FED, measured as government expenditures divided by the product of the GNP deflator and the trend value of GNP substituted for FEDV, the results were still essentially in conformity with what was observed earlier from the first set of equations. DEF had the correct sign in the

second set of equations except where the fiscal policy variables were added. The coefficients of DM_{t-2} approached zero and those of UN_{t-1} became statistically insignificant. The third set of equations reports the results obtained when these two insignificant variables were excluded. As anticipated, the standard errors (or adjusted R2s) remained basically unchanged. More important, the coefficient of DEF became almost significant and had the correct sign, while the coefficient of the government expenditure variable was not much different from previous estimates.

For 1961-74, DEF was significant when alone and nearly significant when combined with FED suggesting that it is DEF rather than expenditures that was mainly responsible for money creation in contrast to Barro's findings. Hamburger and Zwick however advise that these latter results should be interpreted with caution given the small sample size. Their main conclusion nevertheless was that monetary policy is

"strongly affected" by fiscal policy especially by the level of government spending and deficits. The criticisms of Barro's model still apply to their study except for their usage of the deficit instead of the surplus variable.

Niskanen [64] examines the relationship between deficits and inflation with or without the influence of money supply. After admitting that his theory of the money supply was "crude" he nonetheless proceeded to develop a model based on that theorem. The Central Bank in this model is assumed to reduce the money supply to conform to the rates of real economic growth and the rate of inflation in the preceding year and to raise the quantity of money in consonance with the current level of the deficit. A shift variable was also included to test for a claimed change in the direction of monetary policy over the sample period. The other

---

[64]Niskanen, William (1978), "Deficits, government spending and inflation: what is the evidence?" Journal of Monetary Economics, vol.4, 591-602.

analytical postulate was to suggest that federal budget deficits could still be inflationary even without a change in the money supply. If the debt instruments issued following an increase in the federal deficit are acquired not by the Central Bank but by other economic agents, interest rates may rise. A hike in interest rates, in turn may increase the "velocity" of money and reduce real output, both factors leading eventually to an upsurge in the general price level. This probable impact is tested by a relation between the current rates of money growth in past years and the rate of inflation in the previous year.

The relationship between the fiscal deficit and the money supply is tested by the following equation:

$$M_t = (1+a+by_{t-1}-CP_{t-1}+ds)\ M_{t-1} + eD_t \quad \ldots (2)$$

where:

M_t = the level of the money supply in the current year;

M_{t-1} = the level of the money supply in the past year;

Y_{t-1} = the rate of change in the real GNP in the preceding year;

P_{t-1}= the rate of change of the GNP deflator in the past year;

S=a (0,1) dummy variable for an assumed change in the direction of monetary policy;

D = the level of the federal deficit in the current year.

Re-arranging the above expression gives the following test equation:

$$\dot{M}_t = 1+a+by_{t-1}-CP_{t-1} + dS + e(D/M)_{t-1} \quad ...(3)$$

Where,

$\dot{M}_t$ = rate of change of the money supply in the current year.

All other variables are as defined earlier.

Equation (3) was estimated using ordinary least squares method. The combined impact of the federal deficit on the inflation rate working through an increase in the money supply and increase in velocity was tested using the following equation:

$$\Delta InP = bf+ cfg(D/Y_{t-1}) + df\Delta lnM_{t-1} + ef\Delta lnM_{t-2} + (1-f)\Delta lnP_{t-1} \quad ....(4)$$

Where:

P = the actual price level in the current year;

D = federal deficit in the current year;

Y_{t-1} = total nominal income in the past year;

M_{t-1} = the money supply in the past year;

M_{t-2} = the money supply lagged two years;

P_{t-1} = the actual price level in the past year.

The coefficient of the (D/Y_{t-1}) variable represents the combined effect of a deficit on the rate of change of nominal income, the impact of the change in income on the inflation rate and the adjustment parameter. The dependent variable is the change in the log of the implicit price deflator of personal consumption expenditures. The variable, D/y_{t-1}, was measured by the ratio of the current account deficit (on a national income account basis) over total nominal GNP in the previous year.

The data for the first test equation covered 1948-76 and are annual for the United States. Results obtained show Y_{t-1} to be insignificant. P_{t-1} had a negligible negative effect on money supply. For the entire

period, an estimated 15-20% of the deficit was monetized. Niskanen introduced a dummy variable to take account of monetary expansion. In no year did the federal deficit seem to have a significant effect on money growth.

Data for the second test equation spanned the 1954-76 period and is annual. The results obtained were merely suggestive according to the author and not definitive. Only InM_{t-1} and InP_{t-1} were significant. In the long-run, the rate of inflation seems to increase more than proportionately with an increase in the money supply. The federal deficit did not seem to have any significant impact on the rate of inflation. The coefficient of D/y_{t-1} was negative due, possibly, to a lower rate of money growth in recession years. The main conclusion of the work was that federal deficits do not have a considerable impact on the rate of inflation working either through or independent of the money supply. This result may not be too surprising in view of his assertion that the theorem is crude. He also

concentrated on the federal deficit and not even the means of financing it. Besides, measured by the R2s, the money supply function yielded poor results. Only one version had significant coefficients for three variables (P_{t-1}, S and D/M_{t-1}).

4.7 BUDGET DEFICITS AND INFLATION: DEVELOPED COUNTRY STUDIES

Empirical analyses of the impact of deficits on inflation in developed countries that are not restricted to the money supply channel also abound. Dwyer,[65] for instance, considered three mechanisms emphasized in the literature by which budget deficits are expected to affect the rate of inflation. First, budget deficits by raising the

[65]Dwyer, G. P. (1982), "Inflation and government deficits," Economic Inquiry, vol.20 (July), 315-29.

perceived real wealth of security-holders increase total spending and the price level. Second, if borrowing is undertaken through the central bank, high-powered money, the money supply and the price level will be increased. Third, the notion that inflation widens fiscal deficits and results in much higher price levels has been advanced by some studies. This phenomenon has come to be known as 'self-generating' or 'self-perpetuating' inflation.

The variables of his model are the inflation rate, growth rates of income, the money supply, government debt (including its rate of growth) and interest rates. To examine the relationship among these variables, the following vector autoregression was used:

$$Xt = a_o + \Sigma a_k X_{t-k} + E_t \quad \ldots\ldots\ldots (5)$$

where:

X_t = one by six vector of variables;

a_o = a vector of constant terms;

a_k = six by six matrix of coefficients for lag K;

Σ_k = summation over K;

E_t = six by one vector of error terms.

The elements of X_t are DP, DM, I, DF and DB;

Where:

P = the level of prices; Y = the level of nominal income;

M = the nominal quantity of money;

I = the interest rate;

F = three-month treasury bills;

B = the nominal quantity of government debt held by the public;

D = proportional difference operator ($DX_t = (X_t - X_{t-1}/X_{t-1})$.

Tests were conducted as restrictions on the reduced form version of equation (5) above and use was made of quarterly U.S. data for the 1952 - 78 period. The hypothesis that government debt is not regarded as net wealth implies that the debt issued to the public has no effect on any variable in (5) except perhaps its own future values.

It will help in appreciating the results of the study to note that adapting a

well-known proposition of the rational expectation school, Dwyer took the view that predictable changes in real debt does not affect any real variable in the economy such as real wealth. He estimated the vector autoregression for four lags and also applied ordinary least squares in the estimation since the same variables are present in each equation. Estimated autocorrelation function for the residuals does not indicate any serial correlation of the errors. The results confirm the hypothesis that government debt is not real wealth and that deficits have no effect on the Federal Reserve's acquisition of securities. Whether M1 or M2 is used, higher than usual significance levels (75 per cent and 35 per cent respectively) are needed to reject these hypotheses. Also, no evidence of feedback from growth rate of nominal debt held by the public to inflation or any of the variables was found in the vector autoregression.

The hypothesis that there exists a structural representation of the variables on

which there is no feedback of debt purchases by the Federal Reserve to inflation and other variables is rejected at usual significance levels. No evidence is adduced to suggest that massive government budget deficits increase the general price level, spending, interest rates or the money stock. It was demonstrated however that debt issued by the public is determined by past inflation rates and other variables.

The main shortcoming of the test procedure utilized lies in the fact that it is impossible to check if unanticipated changes in the debt affect the relevant variables. Dwyer also wondered whether the results of the reduced form tests should be interpreted to mean that deficits have no place in any policy to combat inflation. Another shortcoming of the study is that only a weak test of the third hypothesis regarding expected inflation is attempted. Finally, his measure of the deficit is not very useful in situations where the debt instruments are largely acquired by the banking system.

Sharp and Flenniken[66] examine the proposition that budget deficits are a major cause of inflation. Since they accept that the postulated positive relationship between budget deficits and inflation is only realistic when full employment is attained, they decided to focus on boom periods as coming closest to such a state of the economy. Their contention is summed up thus: the automatic growth in government revenues is much greater than the increase in expenditures during boom periods and this phenomenon should result in stability or fall in the level of prices and output.

Using United States quarterly data, they discussed the trend in federal debt, bank-held debt, non-bank held debt and the money supply during periods of expansion. The ratio of bank-held debt to increase in money supply was identified by them as the increase in money supply that can be attributed to deficit

---

[66]Sharp A. M. and Flenniken, S.(1978), " Budget deficits: a major cause of inflation?" Public Finance Quarterly, vol.

financing. Sharp and Flenniken similarly examined changes in selected economic variables such as the price level, real output, federal expenditure, unemployment rate and what they referred to as the implicit budget surplus or deficit.

The dependent variable in their regression was the percentage change in the price level, while the independent variables were private demand, output and the budget deficit. They applied generalized least squares technique to estimate the following equation:

$$\%\Delta P_t = K_t + \beta 1\ (C_t + I_t) + \beta 2 X_t + \beta 3 D_t + U_t \ldots\ldots (6)$$

where:

C_t = current consumption;

It = current investment;

Xt = output;

Dt = the current level of the fiscal deficit.

A positive response of the proportionate change in the price level to current deficits was hypothesized. The variables were initially estimated without a lag and then subsequently with lags of one, two, three and

four quarters. A positive and significant relationship between %ΔP and D was observed only after some lag. Otherwise, the relationship was generally negative. They then arrived at the following conclusions. When the economy is operating at less than full employment, budget deficits may not be a major cause of inflation. In particular, they may not generate inflationary impulses if they do not result in an increase in money supply. In addition, budget deficits may not be the only cause of money creation. They are simply a 'causal link' to inflation just like increases in private spending and credit, resource scarcities and similar factors that work through aggregate demand and supply. Changes in budget deficits or surpluses arising from fluctuations in economic activity will tend to stabilize prices and output. If the effect of the automatic fiscal stabilizers (such as corporation income tax, personal income tax and excise) are strong, the budget will have a big surplus or a small deficit in contractionary periods. Budget deficits will

only be inflationary if the impact of these automatic stabilizers are "outweighed" by those of "discretionary" fiscal policies. These conclusions, they point out, are reasonably accurate for an economy operating at less than full employment.

One obvious limitation of their study is that it considered only periods of expansion. It also directly related the deficit to price level and not through the means of creating or financing it which are the only ways through which the deficit could have an impact on any macro-economic variables. There was also no transmission mechanism from the deficit to price level such as through the channel of money supply. In addition, only federal debt was considered to the neglect of the indebtedness of lower levels of government.

4.8 THE BUDGET DEFICIT - INFLATION RELATION: DEVELOPING COUNTRY STUDIES

Prior to 1970, fiscal deficits among the generality of developing countries was not of such a magnitude that posed a serious policy challenge or elicited much academic interest. One of the pioneer studies in this field was conducted by Ahmad[67] with its focus on the Ghanain experience. The study utilised an Organisation for Economic Co-operation and Development system of monetary analysis to arrive at the following expression:

$$m + Ko(Y - Yo) - Y(Ko - K) = Ko(X - Xo)Po + Ko(P-Po)\ X - Y(Ko - K) \quad ....(7)$$

where:

Yo, Y = Gross National Product at current prices of preceding and current year;

Xo, X = Gross National Product at constant prices of preceding and current year;

Ko, K = Money-income ratio of preceding and current year;

Po, P = Price level of preceding and current year;

[67]See footnote 53.

The equation was used to statistically describe the Ghanaian experience with deficit financing over the 1960 - 65 period. Passing references are made to "mounting inflationary pressures". However in other places, he noted certain factors that dampened the inflationary pressures. These included the virtual freeze on the money personal income, increased availability of consumer goods, introduction of price control on some goods and improvement in domestic food supply. The theoretical shortcomings of the equation (not a behavioral equation) and the small sample size apart, the discussion did not convincingly show how and whether deficit financing was a major cause of inflation in the Ghanaian economy.

Oyejide's[68] case study on the Nigerian economy covered the period 1957 - 70. After noting the theoretical and empirical inadequacies of the ordinary budget deficit as a useful analytical tool, he then considered other measures that were mostly related to the

---

[68]See footnote 13.

means of financing the deficit as the principal means by which the impact of the fiscal deficit gets transmitted to the rest of the economy. These measures which his estimation showed to be highly-correlated are: (1) the change in the narrow definition of money (M1), (2) domestic credit creation which is defined as additional borrowing by both the government and the public from the banking system, non-bank financial intermediaries and the non-bank public, (3) internal credit monetisation which refers to the increase in money supply plus the decrease in net gold and foreign assets of the banking system and (4) draw-down of external reserves.

The author worked from the simple Fisherian quantity theory identity to derive an expression for change in the money supply, the latter assumed to connote money-creation. His results imply a strong positive relationship between deficit financing and inflation. Univariate equation estimation such was used in this pioneer work is hardly adequate in explaining the vital

inter-relationships in a systemic framework. Even though the model was in the tradition of monetarist analysis, it excluded certain important variables which it had earlier identified from the regression. These variables include real income, government expenditure and revenue. It did not also consider the role of state financing of their deficit. Finally change in money supply was equated to the deficit which does not cover the different deficit financing sources available to the governments of the federation.

The focus of the papers by Aghevli and Khan [69] was to explain the inflationary impact of deficit financing in the liht of the experience of some developing countries. Their 1977 paper on Indonesia had the stated objective of developing a dynamic model of

---

[69]Aghevli, B. B. and Khan, M. S. (1977), "Inflationary finance and the dynamics of inflation: Indonesia, 1955-72," American Economic Review.
Also, "Government deficits and the inflationary process in developing countries," Staff Papers, I. M. F., 25(3), 383-416.

inflation in a continuous time framework. It should be noted that one objection to the quantity theory of money typified by the seminal study of Philip Cagan[70] is the treatment of money supply as an exogenous variable causing and perpetuating price increases. A marked departure from this tradition has been other studies that indicated money supply could be an endogenous variable leading to the proposition that there exists a two-way casualty between money supply and prices. Aghevli and Khan, then put forward the argument that many developing countries hard-pressed for resources to implement their development programmes have frequently resorted to credit creation. This form of financing by increasing the money supply generates inflation. Moreover, with inflation, expenditures tend to rise faster than revenues because revenues are generally fixed in the short-run, while government

---

[70]Cagan, p. (1957), "The monetary dynamics of hyper-inflation," in Studies in the Quantity Theory of Money, edited by M. Friedman. pp.

expenditure commitments are mostly in real terms. This implies that nominal government expenditure will rise with an increase in the general price level.

Their theoretical model was a disequilibrium system specified in the form of a differential equations system, in which money balances, government expenditure and revenue adjust with a lag to their desired levels. They take the view that inflation in Indonesia was essentially a monetary phenomenon and justified this assertion by reference to earlier studies of developing countries such as that by Haberger[71] and Diz.[72] They further argued that the monetary expansion itself is linked to the rate of inflation through the government budget and is therefore treated as endogenous. Two assumptions made in connection with movements in the money supply are: first, the monetary

---

[71]See footnote 54.

[72]Diz-Adolfo, C. "Money and prices in Argentina," in Varieties of Monetary Experience edited by D. Meiselman.

authority determines the nominal stock of money, while the public determine the real quantity with price adjusting to clear any disequilibrium in the money market. Second, there is no instantaneous adjustment of actual to desired balances by the public.

The endogenous variables of the model were rates of change of prices, real government expenditure, nominal taxes and money supply. The exogenous variables on the other hand were the money multiplier, real income, budget deficit, and the lagged endogenous variables. Since inflation and not real money balances is made a dependent variable, this avoids the problems characteristic of Cagan - type money demand functions identified by Jacobs. [73] In the analyses of hyper-inflation by Cagan and Barro for example, one dependent variable, the log of real money balances is expressed as a function of another dependent variable, the

---

[73]Jacobs, R. I. (1975), "A difficulty with monetarist models of hyper-inflation," Economic Inquiry, vol.3, 337-60.

rate of change of prices. Consequently, price movements that are not connected to changes in the money supply working through the dynamic structure of the model will falsely yield a good fit of the data. This occurs because a sudden jump in prices will by definition raise expectations and simultaneously lower real money balances.

Use was made of annual data for Indonesia covering 1951 - 72 for the estimation. The authors employed the full information maximum likelihood technique. In the price equation, the value of the constant term implied that the desired velocity of money consistent with no inflation is about ten and the inflation elasticity is similar to the values obtained by Cagan. The partial adjustment coefficients for inflation, real government expenditure and revenue imply average time lags of 1.4,1.5 and 4.5 months respectively showing that the lag of revenues is about twice that for expenditures. Aghevli and Khan claimed that this longer lag of response of revenue compared to expenditure in relation to changes

in the price level has not been included in models of inflation before. Their formulation makes it possible to estimate the lags instead of imposing them a priori like in previous studies. Marginal income elasticities of desired government expenditures and taxes are almost the same, a further evidence that the differential response to inflation is the principal cause of the deficit. The estimated coefficient of the money multiplier indicates that budget deficits affect money supply almost proportionately.

The same theme of two-way causation between money supply and prices was advanced with more vigour by the authors in their more encompassing 1978 study. They made reference to studies which have shown the pivotal role of government fiscal operations in expanding the money supply and hence of being an inflationary factor. In particular, they emphasized the point made in those studies to the effect that government borrowing from the banking system, especially the central bank, is instrumental in expanding the monetary base

and heightening inflationary pressures. The stated objective of their paper was to demonstrate that two-way causation exists between money supply and inflation and further that this is caused by the response of the government budget deficit to inflation.

The endogenous variables of their model were the price level, nominal government expenditure, nominal government revenue, money supply and expected rate of inflation. The exogenous variables were real income, money multiplier and a residual item containing the change in international reserves, changes in central bank claim on the private sector, the stock of high-powered money in the previous period and the error involved in change in central bank claims on the government being different from the fiscal deficit.

The model developed had four behavioral equations all in log form, with log P_t, log G_t, log R_t, log M_t as the dependent variables. There was finally a definitional equation concerning expected rate of inflation and it followed the adaptive expectation mechanism

similar to that devised by Cagan[74] but here specified in discrete form. The independent variables for the price equation were real income, expected rate of inflation and lagged real money supply. In the case of the government expenditure equation, these were real income and lagged real government expenditure. The independent variables for the revenue function were nominal income and its own lagged value. The regressors for the money supply equation were the fiscal deficit plus a residual term. Finally, expected rate of inflation was shown to be dependent on the current rate of inflation and its own lagged values. Estimation was carried out using the technique of three-stage least squares.

The lags in government spending and revenues were not imposed but estimated within the model just as in their 1977 study. The authors point out the superiority of their adjustment function for real balances, when compared to the nominal money variant

---

[74] See footnote 70.

suggested by White[75] since the latter implies the public can collectively determine the nominal quantity of money. The adjustment function for real balances assumes (with the money supply exogenous) that prices adjust to the excess demand for money.

The period of the study was 1961 - 74 for Columbia, Dominican republic and Thailand and 1964 - 74 for Brazil. The causality tests showed current inflation to be highly-correlated with past and future growth rates of money supply but contemporaneously, the relationship was insignificant. Regarding the model, the S.E.s were low and the R2s high even though the authors draw attention to the ambiguity of these estimates in simultaneous equation models. For all the countries, most of the coefficients had the expected signs and were significant except lagged real expenditure in the government expenditure equation. Expected rate of inflation was insignificant

[75]White, William (1978), "Improving the demand for money in moderate inflation," Staff Papers, vol.25 564-607.

for both Dominican Republic and Thailand and in the latter, lagged revenue was also not significant.

The long-run income elasticities of the demand for money were in general greater than unity except for Brazil. Both expenditure and revenue were positively responsive to changes in income. Adjustment coefficient for government expenditure was almost unity in all cases confirming the hypothesis that government expenditure adjusts much faster to inflation. Adjustment coefficients for revenue was not only less than that for government expenditure but was also negatively related to the average rate of inflation in all the countries. The income elasticities of government expenditure and revenue was not much different from unity, as anticipated, implying that in the long run, both government expenditure and revenue would move proportionately with inflation. The value of the coefficient of expectation was fixed based on the criterion of maximizing the likelihood function of the price equation when it was

estimated separately for each country using ordinary least squares. Expectation of inflation appeared to be rapidly changed as the adjustment coefficient was above 0.9 in all cases.

The average time lags in the adjustment of actual to desired values of the endogenous variables were also obtained. For real balances, it took an estimated seven quarters, in Dominican Republic, about two quarters in Brazil and Thailand and about one quarter in Columbia for actual balances to adjust to the desired level. The lag was almost zero for real government expenditure in all cases, while that of revenue was longer, further evidence of two-way causality between money and prices. Aghevli and Khan observed that the higher the average rate of inflation, the longer the mean time lags and conversely. The average lags in the revision of expectations were generally short.

Their study equated net claims of Central Bank on the government with the fiscal deficit. They did not also consider the lower

tiers of government. Relating the money supply to only high-powered money precludes other relevant factors such as net claims of commercial banks and the private sector on government. Their model is more appropriate to the study of hyper-inflation, a phenomenon associated with monetary chaos in which the government is relying on money creation as the principal means of financing its expenditures. This is a far cry from the moderate inflation in the Nigerian economy during the period of study.

A recent World Bank-sponsored research project laid much emphasis on seigniorage.[76] To determine the impact of domestic deficit financing on inflation and real interest rates for the ten sample countries, the authors applied a portfolio-balance model for the demand for money and public debt instruments,

---

[76]See the synthesis paper by Easterly, W. and Klaus Schmidt-Hebbel. (1993), "Fiscal policy and macroeconomic performance." The World Bank Research Observer, 3(2:July), 225-37. The ten country case studies are on Argentina, Chile, Columbia, Cote d'Ivoire, Ghana, Mexico, Morocco, Pakistan Thailand and Zimbabwe.

relating it to the budget constraint. Econometric estimations of demand for money balances and domestic debt, which reflect substitution between these two assets and a third asset (usually foreign currency or foreign interest-bearing assets) in the portfolio of wealth-owners form the bedrock for evaluating the effects of domestic financing of the fiscal deficit on money and capital markets. Policy simulations are employed to assess the effects of bigger deficits funded by either money creation or the sale of domestic debt instruments, on inflation and real interest rates. The studies find that over the medium run, seigniorage produces higher inflation, while debt financing results in "higher real interest rates or increased repression of financial markets."[77] The studies generally assumed away the possibility of debt financing being inflationary. The effect of issuance of public debt instruments on investment is traced through the mechanism of the real rate of

[77]See article in footnote 76, p.211.

interest. But over the period of this study, the nominal rate of interest in the Nigerian economy was insensitive to public debt-holding, nor was there a credit crunch.

Most of the papers that dwelt on the causes of inflation in the volume Inflation in Nigeria[78] stressed the role of money supply, the nature of government expenditure, excess demand and limitations in real output as the major factors determining the trend in price movements in Nigeria. None of the papers specifically treated the relationship if any between budget deficits and inflation and the reason for that could not be that budget deficits though relatively small were not an ubiquitous aspect of fiscal policy in Nigeria by 1974 when the conference was held. The same can be said of the report of the Anti-Inflation Task Force.[79] In the case of the volume "Deficit Financing and the Nigerian

---

[78]See footnote 11.

[79]Federal Ministry of Information (1975), First report of the anti-inflation task force.

Economy,"[80] none of the authors evolved a model of the inflationary process that is linked to budget deficits. A positive linkage between the two series was either taken for granted or hints given about the possible transmission mechanism from deficits to inflation in the economy.

[80]See Nigerian Economic Society (1982), Deficit Financing and the Nigerian Economy.

CHAPTER FIVE

THEORETICAL FRAMEWORK FOR THE STUDY

This chapter considers how budget deficits affect inflation in Nigeria. A model is developed to consider the effect on money supply of financing government deficits through the separate mechanisms of money creation and bank borrowing. Various tests of causality are undertaken primarily with a view to determining any reciprocal influence. The probable inflationary effect of government borrowing from the non-bank public through the different channel of aggregate demand effect is also examined.

5.1 THE BASIC FRAMEWORK

The main hypothesis of the research will be studied by a model that is inspired by the monetarist analysis of inflation. The choice of the monetarist framework is informed by the view that all standard theories of inflation regard expansion in the money supply as either a "precondition" or an accompaniment of inflation and minimal growth in the money supply as a useful antidote. Keynesian analysis, as well as the neoclassical synthesis are agreed that expansion in the money supply is both a necessary and sufficient condition for an increase in the general price level. Another attraction of the quantity theory approach to inflation noted by Laidler and Parkin[72] is that it can be considered either an analysis of the price

[72]See footnote 4, p.144

of money in terms of goods or the general price level of goods in terms of money which is what the study of inflation is about.

The essence of the monetarist framework, as outlined by Friedman and others, is that the demand for money is proportional to the price level or equivalently a demand for real balances. The demand for real balances is, however, considered a stable function of a few arguments. Given this function and the requirement for the nominal demand for money to be equal to the supply, the price level is uniquely determined and proportional to the supply, with the consequence that changes in the money supply results in an equiproportionate increase in the price level.[72]

[72]See Friedman, M. (1970), "A theoretical framework for monetary analysis," Journal of Political Economy, 78, 193-238; and Laidler, W. (1981), "Monetarism: an interpretation and an assessment," Economic Journal, 91, 1-28; also footnotes 4 and 5.

5.2 THE THEORETICAL MODEL

In conformity with the research objectives, hypotheses related to the various methods of financing a deficit would be stipulated. First, it is argued that unless there is at least a commensurate increase in the level of output, government borrowing from the Central Bank by expanding the stock of high-powered money supply will tend to raise the price level. If the borrowing is undertaken through commercial banks, the deficit-financed increase in government expenditure ultimately raises the money supply due to its positive effect on bank deposits. Though no new reserves are created, there is no tightening of the money market due to a combination of such factors as the fixed interest rate policy then in existence, rediscounting of government debt instruments,

and the positive yield from lending to both government and the private sectors made possible by the moderate inflation of that era. It is thus implied that public borrowing from the banking system, whether or not it involves creation of additional reserves would raise the nominal stock of money.

In comparative statics, to be inflationary an increase in the money stock should not be in response to an increase in the level of output which would dampen any inflationary pressures. It is thus implicitly assumed that output is at full employment or cannot be varied in the short run. White[73] points out correctly that regarding the budget as inflationary merely because the debts are acquired by the Central Bank carries it with the implication that the apex bank is not obliged to vary credit to others since if it does, that might act as an offset to its financing of the deficit.

---

[73]White, J. (1951), "Measuring the inflationary significance of a government budget." Staff papers, I. M. F., p.356.

Financing the deficits through money creation means that any money that is not demanded at the existing level of prices must be forced on the public by inflation. In an expanding economy, some additional real money balances are demanded so as to finance the rising level of transactions. But beyond that, the demand for nominal money increases only to the degree that inflation diminishes the purchasing-power of existing real balances. To restore at least some of the real balances, the public must raise its nominal money holdings. In this way, inflationary finance instantly creates a demand for the money issue that finances the deficit.[74] The seignorage revenue realised includes both the rising money demand to keep up with the growth of the economy as well as the inflation tax on the holdings of money. The foregoing provides a major explanation for the prevalence of inflation and is generally known as "the public finance approach to inflation". For

[74]See footnote 8.

quite a long time, economists have realised that money creation was one avenue for financing budget deficits. Dornbusch and Fischer [75]cite a number of high and moderate inflation cases where inflationary money creation was responsible for a high proportion of government revenues. The seigniorage argument led Cagan[76] to introduce the idea of a revenue-maximizing rate of inflation and demonstrated that most countries experiencing hyper-inflations were inflating at well beyond revenue-maximizing rates. Friedman[77] added growth-induced increases in money demand as another source of seigniorage revenue. Bailey[78] was the first to investigate the notion of an optimal inflation tax rate which is invariably lower than the revenue-maximizing rate. The optimal inflation rate is

---

[75]See Dornbusch, R. and Fisher S. (1993), "Moderate inflation," The World Bank Economic Review, 7(1, Jan): 15-39.

[76]See footnote 70.

[77]See Friedman, M. (1971), "Government revenue from inflation," Journal of Political Economy, 79(4, Jul./Aug): 846-56.

[78]Bailey, M. (1956), "The welfare cost of inflationary finance," Journal of Political Economy, 64(2, April): 93-110.

obtained by equating the marginal social cost of raising government revenue through inflation with the marginal social cost of alternative sources of revenue. The analysis implied that inflation rates will be higher in countries where alternative sources of revenue are costly. In Nigeria, seigniorage revenue (defined as the ratio of change in high-powered money to Gross Domestic Product) averaged only one per cent over the period of this study. Seigniorage revenue as a percentage of consolidated government revenue averaged 12 percent which is fairly high. Thus, unless tax reforms are instituted and tax evasion tackled to boost revenue, the fiscal cost of foregoing the inflation tax will be considerable. The relationship between inflation and seignorage over the period of the study resembles the typical "Laffer curve", where the average revenue to the government from money creation initially rises and subsequently declines. In general,the trend line shows the higher the inflation rate, the higher is seignorage, implying a

long-run association between inflation and money creation (see Figure 4).The obvious implication is that avoidance of money printing will have a salutary effect on prices as it minimizes macro-economic uncertainty and relative price variability. The seigniorage argument is however not explored in this study. The main emphasis of the research is to investigate the impact of deficit financing on inflation, including any possible feedback from inflation to the budget. In the main, hypotheses are set out to describe the various channels through which alternative methods of financing deficits in Nigeria affect the price level.

As net borrowing from the commercial banks can only be sustained if the Central Bank continues to create high-powered money, monetisation of the deficit, by raising reserves of the banking system, may lead to multiple expansion of deposits and credit in order to restore the reserve-deposit ratio. The commercial banks are assumed to have excess reserves. This implies that the banks

do not have to reduce or recall existing loans to the non-government sector. Neither do they have to sell equivalent financial instruments to their customers. Reserve replenishment from the Central Bank will be needed only after the banks have exhausted their lending capacity. If commercial banks have excess reserves, then borrowing from them has exactly the same effect on aggregate demand as borrowing from the Central Bank with the important difference that borrowing from the latter involves creation of additional reserves on which further lending can be made possible.[79]

The extent of the inflationary effect of the deficit financed by borrowing from the banking system may also be affected by the way the proceeds of the loan are utilised. If the borrowed funds are employed by government to produce investment goods, there will be an upward pressure on prices in the near-term given the long gestation of this type of

[79]See footnote 1, p.759.

spending. But in the long-run, when goods and services are produced by the projects, there will be a contractionary effect on prices. The government may however spend the proceeds of its borrowing on final goods and services as well as on transfers, neither of which is revenue-yielding. In addition, when government spends on consumption goods, infrastructure and transfer payment, the income of many individuals with a high propensity to consume is raised. Consequently, aggregate demand is boosted and given the fixed supply of goods and services, an upward pressure is exerted on the price level. When government spends on consumption goods, the outcome is a substantial reduction in private consumption if private consumption and government consumption are substitutes and a much greater increase in private consumption if the two are complementary. It has been suggested that commercial banks in Nigeria may consider their investment in government securities as an investment that can be rediscounted anytime without much capital

loss. This assured liquidity position may encourage them to increase lending and thus exacerbate inflationary pressures in the economy.[80]

When individuals acquire government securities, money is transferred from their bank accounts to the government's account at the central bank. When government spends the proceeds, money returns to the banks. The cash base remains unchanged. Ultimately, there is neither a contractionary nor expansionary effect on bank deposits and so on the money supply.

5.3 DESCRIPTION OF THE VARIABLES IN THE MODEL

The model of the inflationary process to be developed assumes that inflation in Nigeria is essentially a monetary phenomenon and that the

[80]See footnote 12.

monetary stimulus is similarly linked to the rate of inflation through the budget and is thus treated as endogenous. This is in line with the studies by Aghevli and Khan reviewed earlier. The budget constraint is incorporated into the analysis to serve as the link between the budget and expansion in money supply through the major means of financing the deficit. Hence, in setting up the model below, net claims of Central bank and commercial banks government are explicitly considered as the links between the government budget and growth in money supply.

5.3.1 **Price determination**

The Cambridge version of the Quantity Theory of Money analyses the demand for money from the point of view of motives, the reasons for wanting to hold money. One of such motives is convenience since money can be used to purchase goods and services. In addition, money can be used to meet any unforeseen contingencies. Debts could also be repaid with the use of money. The more an individual's income the greater the likelihood of his

satisfying some or all of the above motives. A time will come however, whereby the individual has to consider the need for holding his wealth in forms other than money, such as in stocks and shares for a possible interest income. But to do so, he has to sacrifice some of his desires for holding money. There is therefore always an opportunity cost of holding money, the foregone income. This ordinarily can be represented by the rate of return on such assets as bonds, equities or the liabilities of financial intermediaries.[81] But in a developing country, the more appropriate measure of the opportunity cost of money may be the expected rate of inflation.

The expected rate of inflation, which may be approximated by a weighted average of current and past inflation rates, is preferred to the rate of return because of the paucity of financial assets that can serve as alternatives to money. The cost of holding cash balances with respect to other

---

[81]Laidler, W. (1977), The demand for money: theories and evidence, p.108.

alternatives is the difference between the money return on a cash balance and the money return on an alternative that is equivalent in value to the cash balance. Monetarists would consider that the only cost of holding cash balances that seems to vary widely to account for the drastic changes in real cash balances during hyper-inflation is the rate of change in prices. Thus, changes in real balances in hyper-inflation can be hypothesized to be the outcome of the expected rate of inflation.[82] If the transmission mechanism is the extent to which money is a substitute for other financial and physical assets,[83] then the expected rate of inflation, which is a proxy for the opportunity cost of holding money serves the purpose in the absence of data on the rate of return.

The demand for money would also change in an exact proportion to price changes. This is

---

[82]Footnote 70.

[83]Ojo, O.(1974), "The demand for money in Nigeria," The Nigerian Journal of Economic and Social Studies

because the convenience of holding money originates from its usefulness in carrying out transactions necessary to obtain goods and services. If the prices of these commodities increase by a certain percentage, then the amount of money an individual would have to hold to achieve the same convenience as before would also have to increase by a similar percentage. The monetarist position is that the ratio which people wish to maintain between their cash balances and their income is fairly stable over long periods. If this is so, it takes care of hoarding, that is, the holding of inactive balances which usually affects income velocity and thus the price level.

Finally, it has been mentioned before that the Cambridge economists did postulate that "other things being equal, the demand for money in nominal terms would be proportional to the level of nominal income of each individual and hence for the economy as a

whole ."[84] Thus, the equation below shows the demand for real balances to be a function of the level of real income and the expected rate of inflation:

$$Md/P = \alpha y/\pi^{\beta} \quad (8)$$

where:

Md = demand for money

P = price level

y = real income

π = expected rate of inflation

α = proportion of real income held in the form of money

β = coefficient of expectation

α and β are constants.

Applying logarimths to both sides of (8) gives:

$$\log(Md/p)_t = \log\alpha + k\log y_t - \beta\log\pi_t \quad (9)$$

This can be re-written as :

$$\log P_t = \log\alpha + k\log Y_t - \beta\log\pi_t + \log Md \quad (10)$$

which can be estimated by regression methods as:

[84]Footnote 82.

$$\log P_t = \alpha_0 + \alpha_1 \log Y_t - \alpha_2 \log \pi_t - \alpha_3 \log MS_t \quad (11)$$

It should be noted that at equilibrium, md = ms, where ms is the money supply.

While real income is exogenously-determined, the expected rate of inflation, π, in equation (9) is assumed to be a function of the actual rate of change in prices. Changes in the rate of inflation alter expectations about the future course of prices. If the changes in prices from P_{i-t} to P_t in t years is assumed to occur continuously at a rate c per year, then $P_i = P_{i-t}\ e^{ct}$. If the log of the preceding equation is taken, it becomes:

$$\log P_i = \log P_{i-t} + \log e^{ct}$$

$$= \log P_{i-t} + C_t \quad (12)$$

Therefore:

$$\log P_i - \log P_{i-t} = C_t \quad (13)$$

The expected rate of inflation is not only dependent on Ct as mentioned above, but is assumed to be revised each period of time in proportion to the difference between the actual rate of inflation and the rate that was

expected.[85] This assumption can be written as:

$$\triangle\pi_t = \beta(C_t - \pi_{t-1}) \qquad (14)$$

Substituting (13) into (14) yields:

$$\pi_t = \beta\triangle\log P_i - (1-\beta)\pi_{t-1} \qquad (15)$$

ß is a constant which represents the coefficient of expectation. Its magnitude determines the rapidity with which expected rate of change in prices adjusts to actual rates. A lag between the expected and actual rate of price rise occurs because it may take some time after a change in price before individuals expect the new rate to continue long enough to justify making adjustments to their balances. The smaller is β, the slower is the adjustment.

5.3.2 **Government sector**

In treating government expenditure, it is assumed that nominal expenditures of the government, G, are related to the level of government revenue. Symbolically:

[85]Footnote 62.

$$G_t = \theta_0 RV_t \quad (16)$$

Taking logs of both sides, this becomes:

$$\log G_t = \theta_0 + \theta_1 \log RV_t : \theta_1 > 0 \quad (17)$$

Lagged government expenditure can be included because some government expenditure this period may be used to maintain or service previous spending. In addition, public debt charge is included as an argument of the function as the rising government expenditure has occasionally been attributed to the escalating debt service payments. Thus, the equation for nominal government expenditure becomes:

$$\log G_t = \theta_0 + \theta_1 \log RV_t + \theta_2 \log PDC_t + \theta_3 \log G_{t-1} \quad (18)$$

The equation for government revenue starts with the assumption that desired nominal revenue of the government are functionally related to the level of nominal income. Symbolically:

$$RV_t = \Omega o \, (yp) \Omega 1 \quad (19)$$

Taking logs, the above function becomes:

$$\log RV_t = \Omega_0 + \Omega_1 (\log y_t + \log p_t), \quad (20)$$

There might also be collection lags in revenues as some taxes due for collection last

year may not be earned until the current year. Therefore, lagged government revenue is added as a regressor.

Equation (20) can then be augmented thus:

$$\log RV_t = \Omega_0 + \Omega_1(\log y_t + \log p_t) + \Omega_2 \log RV_{t-1} \quad (21)$$

5.3.3 Money supply

The money supply, MS, can be multiplicatively related through the money multiplier, m, to the stock of high-powered money, B:

$$MS_t = mB_t , \quad (22)$$

where m is a constant.

Applying logarithms to (22), the above expression becomes:

$$\log MS_t = \log m_t + \log B_t \quad (23)$$

Equation (23) can be augmented to include the exchange rate and lagged money supply. Monetisation of the external reserves has been a portent factor in the expansion of money supply in Nigeria. Besides, it is observed that monetary policy in Nigeria usually targets a maximum growth rate of the money supply which often exceeds the past year's

level.[86] Equation (23) can thus be re-written as:

$$\log MS_t = \log m_t + k_0 + k_1 \log Bt + k_2 \log ER_t + k_3 \log MS_{t-1} \quad (24)$$

where:

ER = external reserves. All other variables are as defined previously.

5.3.4 **Base money**

Base money is made endogenous instead of regarding it as exogenously determined as is common in monetary models.[87] In this respect, base money is made dependent on the reserves of commercial banks and net claims of the entire banking system on the government. Acquisition of government securities may increase banks borrowed reserves or they may have excess reserves to effect the transaction. Not only that, purchase of government securities by the banks will

[86]This can be verified from the monetary and credit policy guidelines issued by the Central Bank of Nigeria at the beginning of each fiscal year.

[87]See Goodhart, C. A. E. (1975), Money, information and uncertainty, p.153.

normally reduce their balances held with the central bank. Eventually, there will be an increase in bank deposits when the proceeds of the loan is spent by government. The increased deposits allow banks to lend by a multiple of their reserves. The outcome is an increase in base money supply equivalent to the amount of government borrowing from the banks.[88] These factors alongside the lagged value of base money are expected to exert a direct influence on the current value. Thus:

$$\log B_t = \tau_0 + \tau_1 \log BR_t + \tau_2 \log GSB_t + \tau_3 \log BR_{t-1} \quad (25)$$

where:

BR = reserves of commercial banks less rediscounts and advances from the central bank

GSB = net claims of commercial banks on the government.

5.3.5 Public sector borrowing

Government borrowing is assumed to be

[88]See Arestis, P. "The crowding-out of private expenditure by fiscal actions: an empirical investigation," Public Finance, vol. xxxiv, no.1.

related to government expenditure, net claims of central bank and its own lagged value. The greater the level of government spending, the more likely will there be an increase in government borrowing from the banking system because of the relative ease of this deficit financing source compared to the capital market. Also, government borrowing from the central bank acts as a catalyst for a general rise in government indebtedness to the banking system. The lagged variable is supposed to account for the fact that part of the debt commitments entered in the past may only be actualised during the current period. The foregoing relationships may be expressed in log-linear terms as follows:

$$\log GSB_t = \delta_0 + \delta_1 \log G_t + \delta_2 \log GSC_t + \delta_3 \log GSB_{t-1} \quad (26)$$

where:

GSC = net claims of central bank on government

All other variables are as defined earlier.

5.3.7 **Budget constraint**

Finally, the government budget constraint is defined as:[89]

$$G-R = \Delta(TG) + (\Delta B) + \Delta B^* \quad (27)$$

where:

TG = claims of commercial banks and non-bank public on government

B = claims of central bank on the government

B* = external debt

Δ = change

The expression says that a deficit must be financed by domestic debt, high-powered money or external debt. Due to the assumption that the external debt is not monetised domestically over the period of the study, the budget constraint can be re-written specifically for situations in which the entire deficit is financed by domestic debt and base money as the framework within which inflation can be generated in the system. The net claims of the non-bank public on government is

[89]See footnote 10, p.

however excluded. Hence, (27) becomes:

$$G-R = \Delta(TG) + \Delta B \equiv GSC + BR \qquad (28)$$

5.4 SPECIFICATION OF THE COMPLETE MODEL

The analytical model consists of behavioural equations explaining the price level, money supply, base money, net claims of the banking system on the government, public sector expenditure and revenues. There are two identities: one on the formation of expectations about inflation and the other on the government budget constraint.

Let:

B = Base money

ER = External reserves

GSB = Net claims on Government by the Banking System

GSC = Net claims on Government by the Central Bank

PDC = Public debt charges

P = Price level

MS = Money supply

Y = Real income

G = Consolidated Government expenditure

RV = Consolidated government revenue

BR = Reserves of commercial banks less Rediscounts and Advances from the Central Bank.

π = Expected rate of inflation

G-RV = Deficit

Y+P = Nominal Income

With the above notations, the following system of equations comprises the model to be used in testing the research hypothesis.

$$LogP_t = \alpha_0 + \alpha_1 logY_t + \alpha_2 logMS_t + \alpha_3 \pi_t + \mu_{1t}: \alpha_1<0, \quad \alpha_2, \alpha_3 >0 \qquad (29)$$

$$LogMS_t = k_0 + k_1 logB_t + k_2 logER_t + k_3 logMS_{t-1} + \mu_{2t} : k_1, k_2, k_3 >0 \qquad (30)$$

$$LogB_t = \tau_0 + \tau_1 logBR_t + \tau_2 logGSB_t + \tau_3 log\ B_{t-1} + \mu_{3t}: \tau_1, \tau_2, \tau_3 >0 \qquad (31)$$

$$LogGSB_t = \delta_0 + \delta_1 logG_t + \delta_2 logGSC_t + \delta_3 logGSB_{t-1} + \mu_{4t} : \delta_1 >0, \quad \delta_2 >0, \quad \delta_3 >0 \qquad (32)$$

$$LogG_t = \Theta_0 + \Theta_1 logRV_t + \Theta_2 logPDC_t + \Theta_3 log\ G_{t-1} + \mu_{6t}: \Theta_1, \Theta_2, \Theta_3 >0 \qquad (33)$$

$$\text{Log } RV_t = \Omega_0 + \Omega_1 \log Y_t + \Omega_2 \log P_t + \Omega 3 \log RV_{t-1} + \mu_{5t}$$

$$: \quad \Omega_1, \ \Omega_2, \ \Omega_3, \ > 0 \qquad (34)$$

$$\pi_t = \beta \Delta \log Pt + (1-\beta)\pi t-1 \qquad (35)$$

$$G_t - Rv_t \equiv \Delta(TG) + \Delta B\triangle \equiv BRt + GSCt \qquad (36)$$

$$\pi_t \equiv P_{t-1} \qquad (37)$$

The endogenous variables of the model are P_t, MS_t, B_t, GSB_t, RV_t and G_t, while the exogenous variables are Y_t, BR_t, GSC_t, PDC_t, and ER_t. P_t-1, MS_{t-1}, B_{t-1}, GSB_{t-1}, G_{t-1} and RV_{t-1} are the lagged endogenous variables.

The inflationary process inherent in the model can be described thus: An unsustainable growth government expenditure necessitates government borrowing from the banking system and the central bank. The primary effect is to raise high-powered money which directly augments the money supply. The increase in money supply in turn results in an upsurge in the general price level. The model was identified using the rank and order condition of identification (see Appendix One).

5.5 ANALYSIS OF THE TAX DISCOUNTING HYPOTHESIS

Since the inflationary effect of non-monetary forms of financing a deficit may depend on whether or not government debt is regarded as net wealth, this study intends to test the hypothesis that individuals anticipate their future tax obligation for servicing the debt. This will be done by estimating a suitable consumer expenditure function. If it is found that individuals generally do not capitalise the future tax obligations implicit in public debt, that strengthens the case for regarding interest-bearing public debt along with money creation as inflationary and thus incorporating it in the model to be estimated. The issue of whether government debt constitutes a portion of private wealth is

related to the larger question of whether and how fiscal policy affects income.

It is conceivable that acquisition of government debt by individuals and households will raise perception about real wealth. The perceived increase in real private sector wealth in turn leads to an increase in current consumption that is accommodated by an increase in the demand for real balances. The expansionary effect on aggregate demand puts an upward pressure on prices if production is stagnant. More importantly, however, if those individuals discount the future tax liabilities implied by government debt, there will be no wealth effect. If there is an imperfect discounting of future tax liability or individuals pay scant attention to their obligation in paying the debt, then there will be a positive wealth effect. As put by Barro,[90]

> Government bonds will be perceived as net wealth only if their value exceeds the capitalised value of the implied stream of future tax liability.

[90]Footnote 26.

It is also generally agreed[91] that if the rate of return on government debt, r, is at least equal to the rate of growth of national income, g, government debt will be perceived as net wealth and, hence raise aggregate demand. If for example, r is greater than g, it means that the stock of government debt is greater than the government collateral and hence will raise perceived real private wealth. If, however, individuals discount the future tax liability they will tend to reduce their consumption and make greater bequests to their heirs who ultimately will bear the greater burden of the debt. In that case, there will be no expansionary effect on aggregate demand currently.

The test suggested by the foregoing hypothesis pertains to whether individuals discount the future tax liabilities implied by government debt. The usual approach to modelling private sector consumption-saving

[91]See Feldstein, M. (1976), "Perceived wealth in bonds and social security," Journal of Political Economy, vol. 84, 331-6; and footnote 44, 317-42.

behaviour rests on a rather asymmetric set of assumptions as to how the private sector perceives the diverse effects of government fiscal policy.

Private consumption and saving are known to respond to fiscal policy through two main channels: disposable income and rate of return (real rate of interest).[92] An increase in the deficit resulting from a lowering of current taxes stimulates private consumption by increasing disposable income in accordance with the Keynesian hypothesis that an increase in current income raises consumption. If the increase in disposable income is transitory, the impact will be negligible in line with the permanent income hypothesis which argues that only permanent changes in disposable income affect consumer expenditure. The Ricardian equivalence theorem differs from both theories in its assertion that consumers do not change their behaviour whether the government finances its expenditure through debt or taxes, since they are forward-looking to know

[92]See footnote 76, 225-6.

that a tax cut now made possible by a deficit and borrowing will result in a tax hike in the future. The expectation of the future tax increase makes them to save rather than spend the income from the tax cut. Therefore, a tax reduction that merely substitutes debt for tax finance of a constant level of government expenditure would leave consumer spending constant-and lower it as a share of a now higher disposable income.

Tests will be conducted on Nigerian data over the study period using a standard specification. The equation to test the tax discounting hypothesis (or the Ricardian equivalence theorem) is the following consumer expenditure function relating consumption to a number of fiscal policy and other relevant variables:

$$C_t = \alpha_0 + \alpha_1 Y_t + \alpha_2 Y_{t-1} + \alpha_3 G_t + \alpha_4 W_t + \alpha_5 T_t + \alpha_6 b_t + \alpha_7 tr_t + \alpha_8 Z_t \quad (38)$$

Where:

C_t = real per Capita Private Consumption expenditure

Y_t = real per capita income

G_t = real per capita government expenditure at federal and state levels

W_t = real per capita private wealth

T_t = real per capita government revenues at federal and state levels

b_t = real per capita net debt of federal and state governments

tr_t = real per capita transfer payments

Z_t = variables not related to government budget.

5.6 CAUSALITY TESTS BETWEEN MONEY SUPPLY AND PRICES

The relationship between money supply growth and deficits or surpluses in Nigeria is to be investigated along the lines suggested by monetarist analysis with a view to establishing any possible correlation between

the two series. Thereafter, tests of mutual causation between money supply and the price level will be carried out. In this connection, tests of causality attributed to Granger,[93] Sims[94] and Haugh-Pierce[95] in addition to co-integration analysis would be applied to Nigerian data. The purpose of the tests essentially, is to determine whether the money supply is endogenous or simply exogenous. Money supply can be endogenous but not necessarily with respect to the price level for which some studies have established a feedback relationship.

The money supply - price linkage will first be investigated using the Granger[96]

---

[93]Granger, W. W. J. (1969), "Investigating causal relations by econometric models and cross-spectral methods," Econometrica, 37(3).

[94]Sims, Christopher (1972), "Money, income and causality," American Economic Review, 62, 540-52.

[95]Pierce, and Haugh, L. (1977), "Causality in temporal systems: characterisations and a survey," Journal of Econometrics, vol.5, 295-98.

[96]See footnote 94.

test as developed by Haugh[97] in this form:

$$\log P_t = a_0 + \Sigma\phi_i \log P_{t-i} + \Sigma\sigma \log M_{t-i} + E_t \quad (39)$$

$$\log M_t = b_o + \Sigma c_j \Delta P_{t-j} + \Sigma d_j \Delta M_{t-j} + \eta_j \quad (40)$$

So long as some $\sigma_j \neq 0$, then Mt is causing Pt. Similarly, Pt causes Mt if some $C_j \neq 0$. If both occur, then there is feedback relationship between the price level and money supply. In this particular test, no pre-whitening of the series is required because of the presence of lagged endogenous variables.

In the case of the Sims' procedure, quarterly data for a selected number of years will be used to regress the rate of inflation against past and future values of change in the money supply while the latter is run against past and future price changes after correcting for any serial correlation using the filter below:

---

[97]Haugh, L. D. (1976), "Checking the independence of two covariance stationary time series: a univariate residual cross correlation approach," Journal of American Statistical Association, 71, 378-85.

$$M_t = (1-.75L)^2 \text{Log} M_t \quad (41)$$

$$P_t = (1-.75L)^2 \text{Log} P_t \quad (42)$$

Sims claims that the above filter "approximately flattens the spectral density of most economic time series". There will be regressions of the log of P on future and lagged log M and reverse regressions of log M on past and future log P with another set of equations that omit the future variables to test if M causes P and if P causes M respectively:

$$\triangle \log P = f(\triangle \log M, 4 \text{ future}, 8 \text{ past lags}) \quad (43)$$

$$\Delta \log P = f(\triangle \log M, 8 \text{ past lags}) \quad (44)$$

$$\triangle \log M = f(\triangle \log P, 4 \text{ future}, 8 \text{ past lags}) \quad (45)$$

$$\triangle \log M = f(\triangle \log P, 8 \text{ past lags}) \quad (46)$$

From these regressions, the explanatory power of the future values of the endogenous

variables will be obtained and this is important if money supply is endogenous in the analytical model. The regressions provide an F - statistic with which the statistical significance of the future values of a variable can be verified.[98] Significant coefficients on future M lead to the rejection of the null hypothesis (no feedback from price level to money supply) and the inference, that money supply causes price changes in the "Granger Sense". Also, if causality runs only from changes in money supply to changes in prices, values of money supply coefficients will be insignificantly different from zero.

For the sake of comparison, the leads/lags approach formalised by Pierce[99] and Pierce and Haugh[100] will be adapted. Using

---

[98]See Ajayi, S. I. (1983), "On the directional causality between money and prices," The Nigerian Journal of Economic and Social Studies, 5(3), 319-25.

[99]Pierce, D. A. (1977), "Relationships and the lack thereof between economic time series with special reference to money and interest rates," Journal of American Statistical Association, 72, 11-22.

[100]See footnote 96.

pre-filtered data, the lagged and future values of the transformed series are cross-correlated. Feige and Pearce[101] note however that the Haugh-Pierce approach is strictly appropriate only as a test of independence between two variables and is based on the cross-correlation function of the univariate innovations of the two series.

To complement the foregoing, a weak test of the hypothesis which states that an increase in the money supply is a necessary and sufficient condition for increase in the price level will be implemented. This involves observing whether whenever there is a price rise, money supply increases and that whenever there is a price fall, money supply falls too. This is because as pointed by Lipsey:[102] "Monetarists by linking money directly to nominal income sometimes

[101]Feige, and Pearce, (1979), "The casual causal relationship between money and income: some caveats for time series," The Review of Statistics, no.4, 521-33.

[102]Lipsey, R. (1981), "The understanding and control of inflation: is there a crisis in macro-economics?" Canadian Journal of Economics, xiv(4), p.65.

implicitly assume a symmetrical influence".

CHAPTER SIX

DATA AND ESTIMATION METHODS

In this chapter, the measurement of the variables utilised in the study, including refinements, as well as the data sources are outlined. The weaknesses of the data are also highlighted. In addition, the estimation procedure adopted is discussed extensively.

6.1 DEFINITION AND MEASUREMENT OF THE VARIABLES IN THE MODEL

The money supply measure used is that of

narrow money (MI) at the end of December. The price level is measured by the composite consumer price index, that is; combined rural and urban centres as well as income groups indices with 1975 as base year. Expected rate of inflation is proxied by past actual rate of inflation.

The real income measure is the Gross Domestic Product at 1973 constant factor costs. Initially, the series for GDP had 1973, 1977 and 1984 as bases. By splicing the data, a uniform series was obtained having 1973 as the base year.

Total national expenditure and revenue are summations of the respective budget figures of the federal and state governments for each calendar year. The April-March fiscal year was equated to the calendar year for the early periods on the assumption that the fiscal year figure was representative of the calendar year. Prior to the oil boom when economic activities were dominated by subsistence agriculture, this method could be rationalised on the grounds that the bulk of production

took place during the last three quarters of any year corresponding to cropping and harvesting periods. The budget deficit is the domestic deficit as defined in chapter four. Both federal and state governments are included in the definition of the public sector.

Net Credit to Government by the Central and Commercial Banks as well as non-bank public is the end-December amount of change in public internal debt outstanding owed the various groups which gives the flow of financing. Credit to government by the banking system is a summation of loans and advances to the governments by the Central Bank of Nigeria and commercial banks. Total, internal and external debts of the federal government are the end of December figures for the respective variables.

The population figures are derived from the 1991 national population census as reported in the 1991 Central Bank of Nigeria annual report using an average yearly growth rate of 2.1 per cent. Wealth is proxied by

changes in the debt and money holding of the public. Transfer payments are also proxied by pensions and gratuities paid by the federal government to its retired employees. Consumption is measured by private consumption expenditures. The import figures used are the Naira value of imports as at end-December.

6.2 DATA SOURCES AND THEIR LIMITATIONS

The major sources of data used in the empirical analysis are the Central Bank of Nigeria's "Annual Report and Statement of Accounts (AR&SA)" as well as "Economic and Financial Review (E&FR)". Data on money supply and credit to government by the Central Bank of Nigeria and commercial banks as well as non-bank public were obtained from AR&SA for the various years. Data on the other variables were either derived or obtained from hybrid sources. Various issues of the "Economic and Financial Review" as well as

"Digest of Statistics" (December 1979) had data on the price level. Information on Federal and State Governments revenues and expenditures was extracted from AR&SA, E&FR and Digest of statistics (1974). Various issues of "Digest of Statistics", "Nigeria's Principal Financial and Economic Indicators" and the "Economic and Statistical Review" (1987) published by the Ministry of National Planning contained figures on real Gross Domestic Product.

Besides the problem of data lacunae, the reliability and credibility of some statistical data on the Nigerian economy has remained a subject of debate. A case in point is the inflation rate which in recent years many people believe is grossly underestimated. Frequent revision of data and the hybrid sources of some put their accuracy and comparability to severe test. The fact also that some of the variables have to be proxied calls for caution in reaching firm conclusions from the regression results.

6.3 ESTIMATION PROCEDURE

If the structural form of a model is over-identified as with the present model, solution of the reduced form will not give unique estimates of the coefficients. In other words, the system of coefficient relationships will consist of more equations than the number of the unknown structural parameters. Two-stage least squares has been found to be a very helpful estimation procedure for getting the values of structural parameters in over-identified equations. It uses the information available from the set-up of a model to derive a distinct estimate for each structural parameter. Intuitively, the first stage of 2SLS involves the creation of an instrument, while the second stage is a variant of instrumental-variables estimation.[103]

---

[103]Pindyck, and Rubinfeld, (1981), Econometric models and economic forecasts.

Ordinary least squares is regarded as an inappropriate estimation procedure in over-identified equations because the simultaneous nature of the model ensures that the endogenous variable and error term will be correlated irrespective of sample size. A reasonable estimation process is instrumental variables(IV), since the proper selection of instruments guarantees that consistent parameter estimates will be used. With the IV technique, there will be an option between a minimum of two estimators of the parameter, each choice associated with the use of a different predetermined variable as instrument. The two estimators will not converge in the sample. A decision rule has to be made that permits a choice between the two. Since both parameter estimators are consistent (that is, as the sample size tends to infinity, the two estimators would coincide). A helpful criterion is to select as an instrument the predetermined variable which is most highly correlated with the endogenous variable. This criterion ensures that the

instrument selected will result in parameter estimators with the least variance among the set of parameter estimators linked with each predetermined variable taken singly. This makes sense intuitively because an instrument that is highly correlated with a right-hand endogenous variable would be expected to yield more accurate results than an instrument with a much lower correlation with it.

The foregoing criterion is somehow restrictive since the choice of instruments was limited to a set of predetermined variables. A more plausible (and more reliable) procedure would be one which selects as an instrument a weighed average of the available predetermined variables, the weights being assigned in order to maximize the correlation between the single instrument and the right-hand side endogenous variable. To get such an instrument, what is done is merely to regress the right hand side endogenous variable on the predetermined variables to compute the fitted values, which is the first stage of 2SLS. It is evident therefore, that

the 2SLS estimator is an IV estimator, where the instrument is selected to maximize its correlation with the endogenous variable and indirectly to minimize the variance of the estimated parameter.[104]

The other multi-equation techniques not utilised due to some of the factors discussed above include Full Information Maximum Likelihood(FIML) and Three-stage Least Squares(3SLS). FIML is more sensitive to multicollinearity and specification errors. The 3SLS on its part uses all the information in the system to estimate all the parameters (and determine the errors) simultaneously. Estimates obtained from 3SLS are biased but consistent. It is more efficient than 2SLS and reduces to the latter if the random variables are contemporaneously related.

Fisher[105] shows that the improvement

---

[104]Ibid, p.191.

[105]Fisher, F. M. (1965), "Dynamic structure and estimation in economy-wide econometric models," in D. S. Duesenberry, G. Fromm, L. R. Klein and E. Kuh (eds.), Brookings Quarterly Econometric Model of the United States.

afforded by these more complex techniques over OLS is no more than 5-10 per cent. The benefits would therefore have to be weighted against the costs.

In the procedure adopted, the variables are partitioned into exogenous, endogenous and lagged endogenous variables. The exogenous variables of the model are BR, GSC, Y, PDC and ER, while the endogenous variables are P_t, MS_t, B_t, G_t, GSBt and RV_t. The lagged endogenous variables are πt, MS_{t-1}, B_{t-1}, GSB_{t-1}, G_{t-1} and RV_{t-1}. Next, the reduced form equations for each endogenous variable was estimated using ordinary least squares (OLS). This is commonly achieved by running an ordinary regression of the endogenous variables as functions of the exogenous and lagged endogenous variables to obtain the fitted (that is, predicted) values. By this technique, a variable is obtained which is linearly related to the predetermined model variables (through least squares estimation) and which is free from any correlation with the error term in the other equations.

In the next stage, the endogenous variables are replaced by the predicted values which are then estimated using OLS to get the final coefficient estimates. The use of OLS in this stage will produce consistent estimates of the parameters (both endogenous and predetermined).

The estimation was carried out on a Time Series Processor (Micro TSP Version 7.0) developed by Lillen.[106] With this software, the fitted values are obtained by estimating the endogenous variables as dependent on their own predetermined variables and those of any right-hand side exogenous variables. The fitted values obtained in this way are used to replace the endogenous variables in the structural equations which are then estimated using OLS to arrive at the model coefficients. The multiple regression equations for the causality tests and the tax discounting hypothesis were estimated on a "Statgraphics" software. The same statistical package was

[106]Hall, R. E. and Lillen, D. (1990), Micro TSP users manual: version 7.0.

used to obtain the cross-correlation coefficients between money supply and prices.

CHAPTER SEVEN

EMPIRICAL ANALYSIS OF THE RELATIONSHIP BETWEEN BUDGET DEFICITS AND INFLATION

The mechanisms through which budget deficits in Nigeria are expected to generate inflationary impulses are discussed in the following order: First, the empirical results of the Tax Discounting Hypothesis and various causality tests are presented and discussed as a prelude to the analysis of the model fitting results.

7.1 ANALYSIS OF THE TAX DISCOUNTING HYPOTHESIS

Despite the quantitative insignificance of individual holding of government debt, its effect on aggregate demand was investigated. The test pertains to whether individuals discount the future tax liabilities implied by government debt. In the case of bond financing, the future tax liability is usually considered to have a present value that is equal to the market value of the bond. Evidence supporting the tax discounting hypothesis using United States data is found in Kochin,[107] Kormendi,[108] Seater and Mariano[109] and Tanner.[110] Contrary evidence

---

[107]Kochin, L. (1974), "Are future taxes anticipated by consumers?" Journal of Money, Credit and Banking, 6, 385-395.

[108]Kormendi, Roger (1983), "Government debt, government spending and private sector behaviour," American Economic Review, vol. 73, 994-1010.

[109]Seater, J. J. and Mariano, R.S . (1985), "New tests of the life cycle and tax discounting hypotheses," Journal of Monetary Economics, 15, 195-215.

[110]Tanner, J. E. (1979), "Fiscal policy and consumer behaviour," Review of Economics and Statistics, vol.61, 317-21.

is, however, reported by Blinder and Deaton, Feldstein[111] , Modigliani, Modigliani and Sterling and Reid.[112] The few studies conducted on developing economies have generally failed to confirm the hypothesis.[113] The conflicting evidence suggests, among other things, the need to test the hypothesis in economies different from that of the United States. This study has therefore adapted the standard specification of these tests to Nigerian data over the study period.

The equation to test the tax discounting hypothesis is the following consumer expenditure function relating per capita

---

[111]Feldstein, M. (1982), "Government deficits and aggregate demand," Journal of Monetary Economics, vol.9, 10-20.

[112]The unreferenced authors are cited in Leiderman, L. and Bledjer, M. K. (1988), "Modelling and testing Ricardian equivalence," Staff Papers, I. M. F., 35(1), pp.

[113]See Corbo, Vittorio and Klaus Schmidt-Hebbel (1991), "Public policies and saving in developing economies", Journal of Development Economics, 36(1): 89-116. Also Haque, N.U. and P. Montiel (1989), "Consumption in developing countries: tests for liquidity constraints and finite horizons", Review of Economics and Statistics, 71(3): 408-15.

consumption to income, wealth and a number of fiscal variables:

$$C_t = a_0 + a_1y_t + a_2y_{t-1} + a_3g_t + a_4w_t + a_5rv_t + a_6b_t + a_7tr_t \quad (47)$$

Where:

c_t = real per capita consumption expenditure

y_t = real per capita income

g_t = real per capital government expenditure at federal and state levels

w_t = real per capita private wealth

rv_t = real per capital government revenues at federal and state levels

b_t = real per capita net debt of the federal government

tr_t = real per capita transfer payments.

Ordinary least squares method was used for the estimation. The use of this technique suggests that all the independent variables are exogenous. This however may not be true of the tax revenue variable. As pointed out

by Feldstein,[114] changes in consumption affects certain taxes, particularly sales and profit taxes . If $a_5 = a_6 = a_7 = 0$ in the above equation, then Ricardian equivalence is upheld as a valid proposition. However, since government debt is included in our definition of wealth, the hypothesis will be more accurately tested by the restriction: a5 = a7 = 0 and a4 = a6. The coefficient of tax revenue is expected to be zero if government expenditure and transfer payments are constant since tax revenue is considered equal to government expenditure and transfers. The coefficient of transfer payments is also expected not to be different from zero because while a debt-financed transfer payment raises disposable income, the debt implies a future tax liability that leaves consumption unchanged.

7.2.1 **Coefficient Estimates**

[114]Footnote 51, p.12.

The OLS results obtained from running a regression of equation (47) is presented in four different versions on Table 7.1 below. The t-ratios are in parentheses below their respective coefficients.

TABLE 7.1

Coefficient estimates for private consumer expenditures

Eq	Const	$Logy_t$	$Logy_{t-1}$	$Logg_t$	$Logt_t$	$Logtd_t$	$Logid_t$	$Logw_t$	$Logtr_t$	R^2	F	D-W
I	-1.01	-0.02	0.08	0.03	0.02	-	0.05	-0.09	-0.02			
	(-1.15)	(-0.3)	(2.06)	(0.83)	(0.53)	-	(3.85)	(-1.08)	(-1.39)	0.91	28.12	1.23
II	-0.02	-0.05	0.05	0.04	0.04	1.3	-0.9	-.001	-.02			
	(-0.27)	-1.02)	(1.49)	(1.47)	(1.25)	(2.73)	(-1.69)	-0.14)	(-2.29)	0.95	39.96	1.47
III	-0.07	-0.03	0.07	0.03	0.03	0.05	-	-0.01	-0.02			
	(-0.93)	(-0.64)	(2.01)	(1.0)	(0.99)	(4.91)		-	(-0.83)	-1.88)	0.94	38.76 1.26

In the first equation, the explanatory power of the model is fairly high as given by the adjusted R2 of 91 percent . Contrary to expectation, transfer payments, wealth, and real income are negatively-related to consumption. Lagged income, internal debt, government revenue and government expenditure have positive coefficients with only the first two having significant effects on consumption. The coefficients of government revenue, and transfer payments are significantly different from zero while those of internal debt and wealth are very unequal and hence fail to confirm the Ricardian equivalence theorem.

The addition of total debt among the regressors in the first equation yields the result in version two. There is a slight improvement in the coefficient of determination to 95 percent. Nevertheless, per capita government expenditure, revenue, lagged income, and total debt bear a positive relationship with the dependent variable, with all of them significant at the ten percent

level.

In the third version of the test equation, internal debt is dropped from equation one and replaced by total debt. The outcome is an improvement in the coefficient of determination . Current income, wealth and transfers are negatively-related to consumption. The coefficients of lagged income and total debt are at least double their standard error. Broad wealth, per capita government expenditure and revenue bear a positive but insignificant relationship with consumption at the five per cent though not at the ten percent level. The coefficients of taxes, debt and transfers are significantly different from zero, again failing to validate the proposition under investigation. Neither does the combination of wealth and any of the debt variables yield a coefficient which is not different from zero.

The results analysed above are at variance with the tax discounting hypothesis and in harmony with the traditional view that government debt has similar macroeconomic

effects as private wealth. The results further suggest that Nigerians do not or inadequately discount the future tax liability implied by government borrowing or perhaps suffer from a public debt illusion. A recent World Bank study suggests bottlenecks in borrowing, uncertainty about future incomes and the lack of foresight as probable causes of the failure of the Ricardian hypothesis.[115] The phenomenon of Wealth Savings Relation is however not incorporated in the model due primarily to the insignificance of this source of deficit financing in the economy.

[115]See footnote 2, p.3.

7.2 ANALYSIS OF CAUSALITY BETWEEN MONEY SUPPLY AND PRICES

The test that is suggested by the main hypothesis of the study concerns the causal direction between money supply and prices. Given the established positive linkage between money supply and prices, it is often imperative to determine the direction of causation. More specifically if the two series are positively correlated, which leads the other and whether there is any feedback relationship (i.e. bi-directional causality). Unidirectional causality may for example imply exogeneity of a variable or variables while bi-directional causality may mean joint dependence.[116]

---

[116]Singh, and Sahni, (1984), "Causality between public expenditure and national income," The Review of Economics and Statistics, no.4, p.632.

7.2.1 **The Data**

It is generally recognised that pre-filtering purges a time series of serial correlation and endows it with "white-noise" property. The data on money supply and prices used later in the Sims and Haugh-pierce causality tests were transformed using the filter proposed by Sims,[117] which involves taking the quasi-second difference of natural logarithms of the variables, M (money supply) and P (price level) thus:

$$Mt = (1-0.75L)2\log Mt \quad (48)$$

$$Pt = (1-0.75L)2\log Pt \quad (49)$$

Sims claims that the above filter "approximately flattens the spectral density of most economic time series".[118] The data used are quarterly series spanning the first quarter of 1972 to the fourth quarter of 1984

[117]See footnote 95.

[118]See footnote 99, p.543.

(49 observations in all).

7.2.2 Granger causality test

The first major attempt at testing causality is associated with the work of Granger.[119] The Granger test as developed by Haugh[120] is adapted to the present study in the form of the two equations that follow:

$$\Delta \log Pt = a_0 + \Sigma \psi \log P_{t-i} + \Sigma \sigma \log M_{t-i} + \epsilon t \quad (50)$$

It is then hypothesized: $\Sigma \sigma i = 0$

A second equation relates money supply to its own lagged value and lagged price level:

$$\Delta \log M_t = b_0 + \Sigma C_j P_{t-j} + \Sigma d_j M_{t-j} + \eta_j \quad (51)$$

The null hypothesis is: $\Sigma C_j = 0$

The following condition also holds:

$$E\epsilon_t \epsilon_{t'} = E\eta_t \eta_{t'} = 0, \quad t \# t' \quad (52)$$

So long as some σi are non-zero while the ϕs are zero, then money supply is causing price changes. Similarly, inflation brings about a change in money supply if some $Cj \neq 0$

[119]See footnote 94.

[120]See footnote 103.

while all the djs are zero. If both conditions prevail, there is a feedback between money supply and prices.

The main problem with the Granger test revolves on the choice of appropriate lag length for both the dependent and independent variables on the right hand side. As noted by Feige and Pearce,[121] the exclusion of lagged exogenous variables "whose underlying population coefficient" is non-zero may lead to serial correlation and bias the hypothesis test. In the ensuing empirical analysis, lag lengths of four and eight quarters were chosen a priori for the independent and dependent variables respectively.

7.2.3 **Empirical evidence on Granger causality**

The results of the Granger test using Nigerian data over the sample period are presented and analysed below beginning with Table 7.2.

[121]Footnote 101.

TABLE 7.2

Regression estimates for Granger causality with price as the dependent variable

P = f(MS-1, MS-2, MS-3, MS-4, P-1, P-3...P-8)

Variable	Coefficient	t-value
Constant	.01	1.82
P-1	.02	0.59
P-2	.03	0.71
P-3	.03	0.82
P-4	.02	0.76
P-5	.03	0.88
P-6	-.01	-0.32
P-7	.06	1.8
P-8	.03	0.79
MS-1	-.05	-2.91
MS-2	-.02	-1.3
MS-3	-.01	-0.2
MS-4	.02	1.22

R_2 = 0.25

F = 2.37

It can be observed that one of the lagged price terms is negatively-related to the current price level. This goes contrary to expectation. The other coefficients though positive are not statistically significant.

Similarly, lagged independent money supply coefficients are negative in all but one instance and are relatively more significant than the price level coefficients.

It is hypothesized that all independent variables have zero coefficients against the alternative that at least some of the coefficients are non-zero. Acceptance of the null hypothesis implies no causality between price level and money supply (money supply does not cause changes in price level).

At the five per cent significance level, the F-statistic calculated on the hypothesis that all coefficients on lagged independent variables are zero gives 2.37 which is greater than the critical F-value (2.08) at 12 and 33 degrees of freedom. By this result, the null hypothesis is rejected. This implies that there was causality between money supply and prices in the Nigerian economy over the study period.

With regards to the money supply, the coefficient estimates are presented below.

TABLE 7.3

Regression estimates for Granger causality with money supply as the dependent variable

MS = f(P-1, P-2, P-3, P-4, MS-1 MS-2, ...MS-8)

Variable	Coefficient	t-value	R^2 F
Constant	.01	2.31	
P-1	.03	1.16	
P-2	.01	0.45	0.40 3.
P-3	.01	0.2	
P-4	-.01	0.1	
MS-1	-.05	-4.15	
MS-2	-.04	-2.17	
MS-3	-.01	-0.56	
MS-4	.03	1.62	
MS-5	.05	2.86	
MS-6	.03	1.7	
MS-7	.01	0.49	
MS-8	.03	1.61	

Most of the variables have non-zero coefficients suggesting some influence of lagged price level on current money supply. It is however remarkable that some of the variables have negative coefficients.

The hypothesis that all regressors have zero coefficients is tested against the alternative that at least some of the coefficients are non-zero. Acceptance of the

null hypothesis implies no causality between money supply and prices (price level does not cause changes in money supply)

At the five per cent level, the F-statistic calculated on the hypothesis that all coefficients on lagged independent variables are zero (3.52) is greater than the critical F-value (2.08). This implies that there was causality between price level and money supply in the Nigerian economy over the sample period. Both tests therefore imply reciprocal influence between money and prices.

7.2.3 **Sims' test**

The second causality test is an adaptation of Sims test[122] for uni-directional causality. Pre-filtered quarterly data over the sample period was used to regress the rate of inflation against past and future values of change in the money supply and reverse regression of the rate of inflation on the money supply. Hence, to test if changes in money supply cause changes in the price level,

[122]Footnote 95.

a regression is run of Price level on future and lagged money supply with another equation that omits the future variable:

DlogP = f(DlogMS, 4 future, 8 past lags) (53)

DlogP = f(DlogMS, 8 past lags) (54)

To test if changes in prices affect money supply, regressions of money on past and future price level is run, with an accompanying equation that excludes the future variable:

DlogMS = f(DlogP, 4 future, 8 past lags) (55)

DlogMS = f(DlogP, 8 past lags) (56)

If for example, causality runs only from changes in money supply to changes in the price level, values of money supply coefficients will be insignificantly different from zero. The converse will be the case if causality runs only from prices to money. The regressions also provide an F-statistic with which the statistical significance of the future values of a variable can be verified. In the first set of equations, significant coefficients on future money supply leads to the rejection of the null hypothesis of no

feedback from price level to money supply and the inference that money causes inflation in the "Granger" sense. The results of Ajayi's test[123] of two-way causality between money supply and prices in Nigeria using Sims' procedure imply that money supply influences inflation but that the influence of inflation on subsequent money creation was harder to track. F-tests for the future variables in the price and money equations were both significant but much more in the latter instance. Thus, uni-directional causality was not unambiguously demonstrated.

7.2.3 **Empirical analysis based on Sims' test**

The model-fitting results for the price on money regression are presented below beginning with the one containing past and future lags followed by the case where future lags are excluded. The t-statistics are besides the respective coefficients.

[123]Footnote 97.

TABLE 7.4

Coefficient estimates of the price on money regression

Indept. variable	Coefficient	t-value	R_2	F
Constant	-0.002	-0.42	0.38	3.30
MS-1	0.02	1.86		
MS-2	0.02	1.68		
MS-3	0.02	1.16		
MS-4	0.03	2.19		
MS-5	0.01	1.24		
MS-6	0.003	0.28		
MS-7	-0.02	-1.58		
MS-8	0.02	-2.07		
MS1	0.001	0.17		
MS2	0.001	0.01		
MS3	0.003	-0.43		
MS4	0.002	0.20		

It can be observed that the coefficients of current and lagged money supply are much more significant than those of future money supply. An odd result is the negative coefficient of lagged money supply (7 and 8 quarters) showing the longer the lag length the less the positive impact of money supply on prices which could even become negative. The over-all explanatory power of the model is reasonable, with adjusted coefficient of determination of 38 percent.

When the future level of money supply was dropped from the regression, the adjusted R2 rises to 44 percent. Most of the variables bear the correct sign and are fairly significant until after the fifth lag as depicted in the table below.

TABLE 7.5

Coefficient estimates of the price on money regression

Independent variable	Coefficient	t-value	R^2	F
constant	-1.72	-0.62	0.44	5.2
MS	0.18	2.03		
MS-1	0.18	1.80		
MS-2	0.18	1.69		
MS-3	0.24	2.33		
MS-4	0.01	1.03		
MS-5	0.01	1.39		
MS-6	0.003	0.34		
MS-7	-0.01	-1.57		
MS-8	-0.02	-2.17		

The impact of money supply on prices has positive and significant coefficients the shorter the lags. The coefficients turn negative at much longer lags.

The model fitting results for the money on price regression are presented and discussed below, beginning with the equation containing current, future and lagged money supply as independent variables.

TABLE 7.6

Coefficient estimates of the money on price regression

Independent Variable	Coefficient	T-value	
Constant	0.02	2.38	
P	0.01	0.44	R2 = 0.20
P-1	0.02	0.62	F = 1.91
P-2	0.03	0.83	
P-3	0.02	0.68	
P-4	0.002	0.07	
P-5	0.005	0.16	
P-6	-0.04	-1.28	
P-7	1.69	2.73	
P-8	-0.05	-0.16	
P1	-0.03	0.89	
P2	-0.04	-1.41	
P3	-0.08	-2.35	
P4	-0.07	-2.04	

The above results lead to the conclusion that at longer lag lengths, price level has an appreciable impact on the money supply. The results also show that the current and lagged values of price level do not have as much explanatory power as the future price level though much of it is negative. Thus, when prices are anticipated to rise in future, money supply will be reduced. Hence, it can be concluded that money supply was primarily affected by future inflation rates in the

Nigerian economy over the sample period in comparison to the lagged and current values. However, the explanatory power of the equation is low with an R2 of only 20 per cent. When future price level was omitted from the regression, the overall explanatory power of the model becomes 8.5 per cent. Though the coefficients mostly have the correct positive signs, only the price level lagged seven quarters significantly affects the money supply. The results are summarised below.

TABLE 7.7

Coefficient estimates of the money on price regression II

Independent variable	Coefficient	t-value	
constant	6.48	1.19	
P	1.66	0.48	
P-1	1.42	0.47	R2=0.085
P-2	1.64	0.52	F=1.498
P-3	0.58	0.50	
P-4	-0.001	-0.0	
P-5	0.01	0.3	
P-6	-0.01	-0.43	
P-7	0.07	1.87	
P-8	-0.01	-0.27	

7.2.4 Sims' Causality Tests - F Statistics

The F-Statistics for the Sims' test are presented below:

Regression	F-Statistics
Price on Money	3.30
Money on Price	1.91

Notes:

1. Filter used is the Sims' Filter $(1-.75L)2$.
2. F-Statistics computed under the hypothesis that the coefficients of the four future lags are jointly zero.
3. All regressions use eight past lags and four future lags.

The hypothesis that feedback exists is tested against the alternative that there is uni-directional causality between money and prices. The regression results for the price on money equation show that computed F (3.30) is greater than the critical value of F (having 12 and 33 degrees of freedom) which is 2.08. This is significant at the five percent level. We therefore reject the null hypothesis and accordingly conclude that the relationship between money and prices in the Nigerian economy is uni-directional from

money supply to prices.

The results for the money supply on price regression yield an F-value of 1.91 which is less than the critical F value both at the 5 percent and 1 percent levels. Thus, the null hypothesis is not rejected and the conclusion is reached that inflation does not cause a change in money supply in Nigeria. These results are in conformity with the earlier findings of Ajayi.[125]

7.2.5 **Cross correlation test**

Turning to the Cross-Correlation function or the leads/lags approach formalised by Pierce[126] and Pierce and Haugh[127] the results are presented and discussed below. The method involves pre-filtering the data and then cross-correlating the lagged and future values of the transformed series. A lag length of 8

[125]See footnote 97.

[126]See footnote 99.

[127]See footnote 96.

was chosen a priori. If for instance lagged values of money supply are significant whereas the lead values are insignificant, this will imply one-way causality.

TABLE 7.8

Estimated Cross-correlations between P and MS with P as the dependent variable

Lag	Estimate
-8	.098
-7	.152
-6	.405
-5	.355
-4	.193
-3	.331
-2	.334
-1	.464
0	.311
1	.293
2	.373
3	.398
4	.238
5	.266
6	.174
7	.437
8	.095

First, it can be observed that past changes in money supply are positively related to future changes in price level except at lag

two. Thus for example, past increases in the money supply will be associated with increases in future price level. Price can then be said to lag behind money supply. Second, future changes in money supply are also positively-related to past changes in the price level. An increase in money supply next period will be linked to an increase in price level in the past. In this sense, price level leads money supply. Both outcomes show that bi-directional causality existed between money supply and prices during the period of the study. Finally, it is observed that the contemporaneous effect is positive. Therefore, current money supply and current price level would change in the same direction. An increase in money supply currently will directly affect the other series (price level).

The Cross-Correlation plot shows that money supply level is positively correlated with price level in all quarters in the past. Similarly, money supply today is positively

correlated with price level in all future periods. However, it is argued by Feige and Pearce [128] that the Haugh-Pierce procedure is only applicable as a test of independence and not as a causality test. Consequently, the results are not strictly comparable with those of the earlier tests.

To complement the foregoing tests, a weak test of the hypothesis that increase in the money supply is both a necessary and sufficient condition for increase in the price level was undertaken. This involved observing whether whenever there is a price rise, money supply increases and that whenever there is a fall in price, money supply falls too. As can be consulted on tables 6.9 and 6.10, both annual and quarterly data over the sample period exhibit a fairly sustained rise in money supply together with an equally sustained rise in prices. Since periods of falling prices or money supply were few, it is

[128]See footnote 101.

difficult to reach firm conclusions regarding the effect of a fall in money supply or prices on the related series.

7.2.9 **Co-integration analysis**

For this analysis, a test was performed which involved estimating the equilibrium regression that is fitted to quarterly price level on money supply. From the results, the Dickey-Fuller t-statistic, (assuming the existence of a constant term and a trend variable for 8 lags) is -3.31. Since the absolute value of the t-statistic is greater than the Mackinnon critical values of -4.62, -3.96 and -3.63 at 1 percent, 5 percent and 10 percent levels respectively for samples of 55, the null hypothesis of non-stationarity is rejected while co-integration is accepted. The same test carried out using four lags yielded t-statistic value of -3.30 which falls within the critical region. Once again, the null hypothesis of non-stationarity is rejected and consequently, co-integration between price level and money supply upheld.

Turning to annual data for a sample size of 18, the computed Dickey-Fuller "t" value is -2.90 which is greater than the Mackinnon critical values of -5.29, -4.35 and -3.91 at the 1 percent, 5 percent and 10 percent levels respectively. Therefore, the null hypothesis of non-stationarity is rejected and thus co-integration between price level and money supply confirmed.

The t-statistic for the unit root test (for the order of integration) for quarterly money supply yields 10.94 and 5.63 for eight and four lags respectively. In the case of annual data with one period lag, the t-statistic is -2.90. It can therefore be concluded based on the above evidence that a long-run relationship exists between price level and money supply. A change in money supply can be expected to lead to a corresponding change in price level.

7.3 ANALYSIS OF THE INFLATIONARY IMPACT OF DEFICIT FINANCING

The two-stage least squares results computed on a Time-Series Processor is presented and discussed below. T-ratios are in parentheses below the respective coefficients.

$$\text{Log } P_t = 2.09 + 0.67\log MS_t - 0.52\log Y_t + 0.15\pi_t$$

(2.65) (14.49) (-2.54) (0.85)

S.E. = 0.01 R2 = 0.96 (55)

$$\text{Log}MS_t = 0.03 + 0.53\log B_t + 0.02\log ER_t + 0.48\log MS_{t-1}$$

(0.62) (4.45) (0.57) (5.13)

S.E. = 0.001 R2 = 0.99 (56)

$$\text{Log}B_t = 0.69 + 0.37\log BR_t + 0.26\log GSB_t + 0.23\log B_{t-1}$$

(10.29) (11.52) (4.16) (2.32)

S.E. = 0.001 R2 = 0.99 (57)

$$\text{Log}GSB_t = 0.03 + 0.16\log G_t + 0.10\log GSC_t + 0.74\log GSB_{t-1}$$

(0.26) (2.34) (1.56) (7.34)

S.E. = 0.01 R2 = 0.98 (58)

$$\text{Log } G_t = -0.18 + 0.68\log RV_t + 0.03\log PDC_t + 0.39\log G_{t-1}$$

(-1.23) (3.5) (0.60) (2.03)

S.E. = 0.01 R2 = 0.97 (59)

$$\text{Log}Rv_t = -5.69 + 0.31\log P_t + 1.62\log Y_t + 0.45\log RV_{t-1}$$

(-4.87) (2.11) (5.16) (3.47)

S.E. = 0.01 R2 = 0.98 (60)

$$\pi_t = 0.75\ d\log P_t + 0.25\log \pi t\text{-}1 \qquad (61)$$

Most of the equations of the model

exhibit a high coefficient of determination suggesting that the explanatory variables combined significantly explain the dependent variables. In the equation for price determination, the coefficient of the money supply variable is more than twice its standard error, a result that is consistent with the Quantity Theory of Money. The estimated coefficient of the real income variable is negative and large. The price level is lower the higher the level of output. The variable is significantly related to the price level. The coefficient of price expectation has the correct positive sign but is small in magnitude. Nonetheless, the t-value for the variable indicates that it is significantly related to the price level at the 10 percent level. The result suggests that an increase in expected rate of inflation will lead to a rise in demand for real money balances which is the rational response.

The result for the money supply equation is as expected. Money supply is positively

related to base money, external reserves and money supply lagged one period. An increase in base money and the monetisation of external reserves can be expected to raise the stock of money by 53 and 2 percent respectively, with the former significantly related to the money supply at the five percent level. Lagged money supply has the correct positive sign but is significant only at the 10 percent level. The adjusted coefficient of determination at 0.97 is very high suggesting that the regressors appreciably explain changes in the dependent variable.

Base money is directly influenced by the reserves of commercial banks and net claims of the banking system on government. An increase in the reserves of commercial banks and banking system credit to government will lead to an increase in high-powered money by 37 and 26 per cent respectively.

Government borrowing from the banking system is directly affected by the level of government expenditure and its own lagged

value. As government expenditure grows over time, there is a high probability of its resorting to borrowing from the banking system due to the acknowledged deficient tax base, excessive reliance on petroleum-derived revenues and collection lags in tax revenue among others. The inclusion of the lagged dependent variable is premised on the fact that once locked in debt to the banking system, it becomes difficult to disentangle from the trap as time goes on.

The result for the government expenditure equation is as expected. The coefficients have the correct signs and are significant. Government expenditure is positively related to both government revenue and its own lagged value. As government revenue rises, it is expected that government expenditure will also rise since government budget constraint would have eased, other things being equal. However, the need to service or maintain past expenditures constantly requires some recurrent spending by the government which

consequently adds to total expenditure. Public debt charges are significant only at the 10 percent level.

Government revenues are mainly determined by the level of nominal income. Price level bears the correct positive sign and is significant at the five per cent level. A rise in the price level will result in a 30 percent increase in overall government revenue. Lagged government revenue which takes account of collection lags in revenue is also of considerable importance.

A dynamic simulation was carried out with the main goal of making comparison between actual and simulated values of endogenous variables which will be a test of the goodness-of-fit of the entire model. Additionally, the size of simulation errors would determine the reliability of the model. Table 7.11 in the appendix and the accompaying graphs in the appendix show the historical simulation results for the period 1970-80. The results prove that the model does track

the historical values of the endogenous variables very well. It is evident from the table and graphs however, that the variables of greater interest (price level and money supply) performed relatively better in tracking the historical data. Theil's inequality coefficient was computed for the endogenous variable and the results are tabulated below.

TABLE 7.12

Summary of dynamic simulation experiment

Variable	Theil's inequality	Bias	Variance	Covariance
Price	0.015483	0	0.016568	0.983432
Money	0.011201	2.79E-14	.009206	0.990794
Base	0.006749	0	0.002519	0.997481
GSB	0.009056	2.30E-13	0.003859	0.996141
Exp.	0.012657	2.18E-14	0.012056	0.987944
Rev.	0.005403	1.17E-12	0.002809	0.997191

The fact the bias components are tending towards zero implies that there is no systematic error in the estimation. The variance component which is an indicator of the discrepancy between the forecast and actual values of the endogenous variables are tending to zero.

The covariance proportions are tending to one in all cases meaning a near perfect correspondence between predicted and actual values. The simulation statistics have thus confirmed that the estimated equations model reality well.

Having obtained and analysed the results of the baseline or control solution, new simulation results were generated by introducing shock changes to some exogenous variables to examine their impact on the key endogenous variables. The disturbed solutions are then compared to the baseline solution for the selected target variables. The ratio of the difference between the two solutions , controlled and disturbed, and the two sets of

exogenous variables are subsequently used to derive multiplier effects for a number of dynamic simulations. This is with a view to determining the impact of different methods of financing the deficit on the price level.The first experiment considered what would have been the money supply and price level profile of the economy over the sample period if net claims of the central bank and commercial banks on the governments were to have varied by 10 percent in the upward direction. A 10 percent rise in the net claims of the central bank raised the money stock and the price level further, the former much more significantly. In the case of changes in net claims of the central bank, the resulting percentage change for money supply began from 2.1 percent in 1970, declined to 1.7 percent in 1975 and rose steadily to 2.1 percent in 1983. This compared favourably with the effect of changes in commercial bank holding of government debt, which started from 1.2 percent in 1970, fell to 1.1 percent the

following year before climbing to 1.5 percent in 1976. Not surprisingly, the effect on the price level of changes in the debt holdings of the central bank was higher, taking off with 2.6 percent in 1970 before declining to 2.1 percent in 1975 and stabilising at 2.4 percent in 1982 and 1983. (See Table 7.13 below). In the case of commercial bank reserves, the price level change began with 1.5 percent in 1970, peaked at 1.9 percent in 1975, before tapering off to 1.7 percent by 1983.

TABLE 7.13

Impact of 10% increase in commercial bank reserves and debt-holding of the central bank

	dBR		dGSC	
Year	Price	Money supply	Price	Money supply
1970	1.5	1.2	2.6	2.1
1971	1.3	1.1	2.6	2.1
1972	1.4	1.1	2.6	2.0
1973	1.3	1.1	2.4	1.9
1974	1.8	1.4	2.2	1.8
1975	1.9	1.4	2.1	1.7
1976	1.9	1.5	2.2	1.8
1977	1.8	1.4	2.3	1.8
1978	1.8	1.4	2.4	1.9
1979	1.7	1.4	2.4	1.9
1980	1.9	1.5	2.3	1.8
1981	1.8	1.5	2.3	1.9
1982	1.9	1.5	2.4	2.0
1983	1.7	1.5	2.4	2.1

7.4 MAJOR FINDINGS AND IMPLICATIONS OF THE RESULTS

The main findings and implication of the regression results can be summarised as follows.

(i) Money supply is a more important determinant of the price level than either real income or expected rate of inflation, an outcome that is in harmony with the quantity theory of money.

(ii) Government borrowing from the banking system as well as the level of commercial bank reserves are the principal determinants of changes in the money supply in Nigeria through their impact on high-powered money.

(iii) Growth in government expenditure strongly influences government borrowing from the banking system. This is evidence in sup-

port of the proposition that monetary policy in Nigeria accommodates fiscal policy.

(iv) The major determinants of government expenditure are the level of government revenue and its own lagged value, the latter a testimony to the incremental approach to budgeting that is in vogue.

(v) The level of nominal income exerts great influence on government revenue besides its own lagged value.

(vi) The tax discounting hypothesis was applied to Nigerian data to find out if holding of government debt by individuals affected the level of aggregate demand in accordance with "Wealth-Saving Relation". The OLS regression result proved that individuals do not or inadequately discount the future tax liability implied by government debt. Therefore, consumption demand gets boosted by individual acquisition of government securities. In view of the quantitative insignificance of the tax discounting hypothesis, it was not incorporated in the

final model.

(vii) The Granger causality test between money supply and prices suggested reciprocal influence between the two series. However, money supply influences prices greater than vice versa. Applying the Sims' test to the same set of data also confirmed reciprocal influence between money and prices. Bi-directional causality was shown to exist using the Haugh-Pierce procedure or lead/lag approach. A co-integration analysis also led to the conclusion of a long-run relationship between money supply and price level. Nonetheless, the F-tests conducted leads to the conclusion that the relationship is essentially uni-directional flowing from money supply to prices.

CHAPTER EIGHT

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter highlights the major conclusions and policy implications of the results of the analysis carried out in this study. The shortcomings of the study as well as suggestions for further research are indicated.

8.1 SUMMARY OF THE STUDY

The desirability or otherwise of deficit budgeting is not within the scope of this study. Neither was the specified inflation model intended to be an exhaustive study of

the causes of inflation in Nigeria. Instead, deficit financing was isolated for analysis to determine the channels by which it could generate inflation. The analytical model is thus a partial equilibrium one. Besides, experience in Nigeria and some African countries has shown that a reduction in the fiscal deficit is not sufficient to bring about a drastic fall in the general price level due to other underlying causes.

Chapter one of the thesis was concerned with setting the background for the study, identifying the research problem and stating the objectives. The research problem centres round the formulation of a model that considers the inflationary impact of money creation and domestic debt financing of a deficit which is applicable to the various tiers of governments. The local government fiscal variables were not included because over the period covered by the research the data was either scanty or insignificant. The specific objectives of the study were to set

up a monetarist model that explains the inflationary effects of deficit financing in Nigeria that is not restricted to money creation by the Central Bank. Additionally, the study examined the causal relationship between money supply and prices in the economy using standard causality tests.

Chapter two focused on Nigeria's experience with deficit budgeting, stressing the genesis and magnitude of the problem. The distinction between internal and external debt was underlined while the significance of the various means of financing the deficit was brought out. Various measures of debt-service burden proved that Nigeria has long become a debt-distressed nation. The heavy reliance on bank borrowing internally was a pointer to inflationary consequences. Chapter three discussed the trends in money supply, banking system credit to the domestic economy and inflation. Linkages were shown to exist among the three variables.

Chapter four was devoted to a review of

the theoretical and empirical literature. The theoretical review which is closely related to the channels through which budget deficits affect inflation were identified as "Wealth-Savings Relation", "Monetarist Analysis" and "Anticipated Inflation" models. The review of empirical studies were segmented into developed and developing country cases as well as those that linked deficits to inflation via the money supply and those that merely related deficit to changes in the money supply.

The theoretical framework for the study was the subject-matter of chapter five. The research hypotheses were stated followed by the specification of the models. Granger, Sims and Haugh-Pierce causality tests were also adapted for the purpose of the study. The research hypothesis sought to link budget deficits to inflation through changes in the money supply occasioned by government borrowing from the central bank and commercial banks.

The measurement, sources and limitations of the data used in the empirical analysis was discussed in chapter six. The main sources of data are published statistics from the Central Bank of Nigeria and the Federal Office of Statistics whereas a few variables were either proxied or computed by the author.

In chapter seven, the regression results were presented and discussed. The causality tests and co-integration analysis indicated some close though not very significant relationship between money supply and prices in Nigeria. The model results showed that public sector borrowing from the banking system significantly affects the money supply. The money supply, in turn, was shown to have a direct and significant effect on the price level. The other explanatory variables (real income and expected inflation) were not of comparable significance.

8.2 CONCLUSIONS AND POLICY IMPLICATIONS

The main conclusion to be drawn from the empirical analysis undertaken in this study is that to varying degrees, net claims of the central and commercial banks as well as the non-bank public positively affect the level of prices in the Nigerian economy. The test of the tax discounting hypothesis leads to the conclusion that Nigerians do not or inadequately discount the future tax liability implied by government borrowing. Consequently, the perception of increased real wealth by bond-holders should result in higher consumption relative to saving.

The following policy implications can be derived from the research findings.

(i) Financing options for capital projects

Due to the finding that all forms of domestic debt financing in the Nigerian economy are bound to generate inflationary

impulses, the research findings imply that governments should desist from overspending. Instead, greater reliance should be placed on tax revenues, especially consumption-based taxes, to fund government programmes. The results of the tax discounting hypothesis, for instance, implies that higher taxation -lower fiscal deficit- is more conducive for increase in national savings. The negative wealth effect on consumption of higher taxes would be deflationary. The inrease in taxation will only have the desired effect of lowering the deficit if expenditure remains constant or does not increase commensurately. Therefore, it will be prudent to constitutionally mandate balanced budgets especially at lower levels of government. Government capital projects that cannot be tax-financed may be funded by floating Revenue Anticipation Bonds through the capital market. For example, financing of the Third Mainland Bridge in Lagos could have been undertaken by a Revenue Anticipation Bond guaranteed by the Federal Government. With an

estimated cost of N1.0 billion, it could have been financed by a 30-year Bond to be redeemed by proceeds of toll collections of ₦2 per vehicle for an estimated 50,000 vehicles per day. Not only would it have reduced pressure on government finances, it would have increased the depth of the capital market with salutary effect on the economy.

If however governments must borrow from the banking system and from the non-bank public but want to minimise inflationary consequences, the findings of this study suggest that borrowing from the central bank must be the last resort. The first recourse should be borrowing from the non-bank public followed by commercial banks.

(ii) Monetary accommodation of fiscal actions

Since it was found that monetary policy has tended to accommodate fiscal policy, it may be necessary to take measures aimed at delinking monetary policy from fiscal actions by creating conditions for more autonomous monetary policy (for example, by plugging all

fiscal loopholes and ensuring independence of the Central Bank). The recently enacted Central Bank of Nigeria Decree [129] for example, gives government the leeway to behave irresponsibly. The same applies to section 33 of the same decree. Advocacy of more autonomy to central bank as a means to achieve price stability has been gaining prominence in recent times. It is argued that the credibility of monetary policy, and hence its ability to achieve and sustain longer-run price stability would be enhanced if policy formulation is the prerogative of an

[129]Under Central Bank of Nigeria Decree 24 of 1991 section 27, paragraph f, the Bank can purchase, sell, discount or rediscount treasury bills of up to 184 days maturity and certificates whose maturity may be determined by the federal government. In addition, the C.B.N. can purchase and sell federal government securities maturing in not more than 25 years provided that the total amount of such securities with maturity exceeding two years shall not at any time be greater than 75% of the total liabilities of the Bank. Also under section 33, the Bank may extend temporary advances to the federal government in respect of deficiency of revenue at such interest rate as the Bank may decide so long as the aggregate amount of any such advances outstanding at any time shall not be higher than 12.5% of the estimated recurrent revenue of the federal government for the year in which the advances are made.

independent central bank free from political pressures. In general, the framework for independent central bank suggests the single-minded pursuit of price stability as the prime goal of monetary policy. However, the idea of unelected central bankers determining a major aspect of economic policy is sometimes regarded as antithetical to democratic norms. Also, costs of potential disharmony with other elements of policy, especially fiscal and exchange rate policies give cause for concern. Perhaps more fundamentally, central bank autonomy may not actually deliver lower rates of inflation. Although a number of studies confirm that central bank independence is favourable to better inflation record, the evidence is not conclusive.[130] Besides, there are exceptional cases where inflation performance has been better despite the lack of a central bank with significant legal

[130]See Cassello-Branco M. and Swinburne M. (1992), "Central bank independence", Finance and Development, (March), 19-21.

TABLE 7.9

Annual money supply and prices

Year	Money supply Nm	Price level %
1966	345	43.7
1967	376.8	40.6
1968	328.2	41.6
1969	426.8	46
1970	608.3	52.4
1971	628.9	60.8
1972	700.1	62.5
1973	827.1	65.9
1974	1178.3	74.7
1975	2044	100
1976	3481.8	123
1977	4793.6	143
1978	5089.7	167
1979	6146.6	186
1980	9226.8	204.8
1981	9744.9	247.6
1982	10048.6	266.5
1983	11282.4	328.5
1984	12204.1	458.4
1985	13267.8	483.7

Source: C. B. N., Annual Report and Statement of Account; various issues.

TABLE 7.10

Quarterly money supply and price level, 1970–85					
Year	Money supply (Nm	Price level(%)	Year	Money supply(Nm)	Price level(%)
1970	490.4	56	1979	5231.3	186.8
ii	492.8	59.2	ii	5859.7	196.2
iii	528.8	59.8	iii	6374.6	200.8
iv	608.2	60.1	iv	6146.6	203.8
1971	638.4	64.2	1980	7150.7	191.6
ii	583.8	70.4	ii	6600	194.8
iii	572.8	68.5	iii	7492.6	214.1
iv	629	69.4	iv	9226.8	219.5
1972	629	71.3	1981	8237.8	235.1
ii	598.6	71.6	ii	8604.5	248.1
iii	626.8	67	iii	8998.1	257.1
iv	700.2	66.7	iv	9744.9	257.5
1973	757.6	70.4	1982	8879.2	260.6
ii	727.6	75	ii	8826.3	265.6
iii	736.9	73.1	iii	9098.5	269.8
iv	827.2	78.7	iv	10048.5	275.7
1974	898	79.6	1983	9330.6	297.5
ii	976.9	84.3	ii	9944	321.6
iii	1049.4	84.7	iii	11025.9	349.4
iv	1178.4	86.4	iv	11282.4	382.5
1975	1630.2	100	1984	11102.4	408.7
ii	1799.2	113.2	ii	10748.5	465.9
iii	1901.5	117.2	iii	11540.1	505.1
iv	2044.1	122.6	iv	12204.1	469.1
1976	2508.9	129.6	1985	11502.6	490.2
ii	2507.1	132.6	ii	11974.1	492.2
iii	2739.8	135.8	iii	13180.8	480.2
iv	3293	138.9	iv	13267.8	474.1
1977	3941.8	145.2			
ii	3709.4	157.2			
iii	4369.5	172.2			
iv	4794.4	177			
1978	5514	166.3			
ii	5352.1	182.9			
iii	4989.8	180.4			
iv	5089.7	182.7			

Source: C. B. N; Annual Report and Statement of Account various issues.

TABLE 7.11

Dynamic simulation results (baseline solution)												
ear	Base money		money supply		Price level		Bank credit to govt.		Government revenue		Government expenditure	
	Actual	Simulated	Actual	Simulated	Actual	Simulated	Actual	Simulated	Actual	Simulated	Actual	Simulated
1970	6.032846	5.79959	7.31034	6.65447	3.95890	3.62387	6.53785	6.45548	6.93361	6.82190	7.34265	6.945498
1971	6.051854	5.94680	7.33060	7.10923	4.10759	3.79760	6.50817	6.62703	7.39209	7.26058	7.35487	7.499033
1972	6.128397	6.17022	7.58054	7.31009	4.13516	3.82076	6.36595	6.5755	7.50966	7.38892	7.58517	7.595128
1973	6.313729	6.41967	7.71841	7.83231	4.18813	4.10896	6.41378	6.53418	7.69875	7.79513	7.74871	7.957265
1974	6.877399	7.01716	8.37094	8.58128	4.31348	4.52483	6.66975	6.60572	8.58949	8.59615	8.37094	8.581986
1975	7.592971	7.42859	9.33410	9.01007	4.60517	4.87119	7.01661	6.91714	8.90177	8.71355	9.33057	8.881346
1976	7.876259	7.87313	9.57213	9.51246	4.81284	5.07747	7.41246	7.39243	9.09436	9.05689	9.57213	9.457483
1977	8.011156	7.96131	9.80008	9.58482	4.96284	5.01495	8.12216	7.79888	9.28468	9.23389	9.80008	9.668416
1978	8.046581	8.01476	9.71747	9.51604	5.11799	5.08988	8.36492	8.46412	9.21485	9.10047	9.71143	9.650628
1979	8.160718	8.22961	9.51287	9.83562	5.22574	5.24378	8.51028	8.67875	9.41547	9.52798	9.51287	9.926675
1980	8.541223	8.41499	10.0592	10.0455	5.32203	5.31537	8.67217	8.80055	9.77667	9.78760	10.0591	10.04366
1981	8.652389	8.65935	9.98818	10.1513	5.51181	5.63199	9.00966	9.04359	9.47531	9.70903	9.98790	10.17652
1982	8.814465	8.88379	10.1677	10.0896	5.58537	5.50186	9.32286	9.28681	9.45191	9.46018	10.1677	9.977171
1983	8.78966	8.90113	10.0437	10.0820	5.79453	5.81775	9.72955	9.55353	9.27296	9.28357	10.0437	9.914207

The data are in logarithms

TABLE 7.14

Data for inflation model													
Year	Price level %	Money supply Nm	Base money Nm	Net claim govt. Nm	Govt. revenue Nm	Govt. exp. Nm	Bank reserves Nm	External reserves Nm	Real income Nm	Nominal income Nm	Expecte inflatior %	Public Debt Charges Nm	Cent. Bank Credit to Govt Nm
1966	43.7	345	246.4	373.8	503	486.4	29.2	184.6	13868.93	6060.722	0	62.4	112.2
1967	40.6	376.8	232.4	436	457.1	435.6	25	102.18	11662.51	4734.979	−3.1	44.2	150.9
1968	41.6	328.2	214.4	456.6	444.8	517.7	31.2	101.9	11662.51	4851.604	1	49.5	86.7
1969	46	426.8	289.4	589.2	532.2	770.2	36.8	109.24	14814.54	6814.688	4.4	72.6	93.7
1970	52.4	608.3	416.9	690.8	1026.2	1544.8	46.5	144.6	19227.38	10075.15	6.4	224.8	169.2
1971	60.8	628.9	424.9	670.5	1623.1	1563.8	38.5	199	21433.8	13031.75	8.4	409.4	231.4
1972	62.5	700.1	458.7	581.7	1825.6	1968.8	44.7	243.6	22694.62	14184.14	1.7	528.4	194.3
1973	65.9	827.1	552.1	610.2	2205.6	2318.6	65.8	878	23955.43	15786.63	3.4	93.9	222.4
1974	74.7	1178.3	970.1	788.2	5374.9	4319.7	331.4	3460.8	26161.85	19542.9	8.8	90.3	22.2
1975	100	2044	1984.2	1115	7345	11277.	828.7	3448.5	26792.25	26792.25	25.3	95.1	313.7
1976	123	3481.8	2634	1556.5	8905	14359.	1094	3122.5	29313.88	36056.07	23	134.8	459.7
1977	143	4793.6	3014.4	3368.3	10771.	18035.	851.8	2592.5	31520.3	45074.03	20	188.6	1683.1
1978	167	5089.7	3123.1	4293.8	10045.	16505.	741.4	1305.6	29212.4	48784.71	24	256.1	3197.3
1979	186	6146.6	3500.7	4965.6	12276.	13532.	797.3	3043.2	29948	55703.28	19	546.8	2549.3
1980	204.8	9226.8	5121.6	5838.2	17618	23368.	1532.1	5445.6	31546.8	64607.85	18.8	839.6	2859.3
1981	247.6	9744.9	5723.8	8181.8	13034	21761.	1376.1	2424.8	28899.2	71554.42	42.8	818	6046.6
1982	266.5	10048.6	6730.9	11191	12732.	26048.	2002	1043.3	27974.1	74550.98	18.9	1427.4	8022.5
1983	328.5	11282.4	6566	16807.	10646.	23010.	1266.7	798.5	26217.9	86125.8	62	1525.8	11347.4
1984	458.4	12204.1	6379.3	19699.	11520.	18751.	1032.1	1096.8	24845.5	113891.8	129.9	1528.9	10701.4
1985	483.7	13267.8	6180.2	22191	15443.	21846.	805.2	1657.9	26158.7	126529.6	25.3	1981	11521.9

Sources: i) Annual Report and Statement of Accounts; 1966–85, C.B.N.
ii) Economic and Financial Review; vol.8, Dec. 1970, CBN.
iii) GDP and Allied Macro–Aggregates, F.O.S., 1982.
iv) Economic and Social Statistics Bulletin, Jan., 1981; F.O.S.
v) Economic Indicators. vol.9, no.7, July, 1973; F.O.S.
vi Nigeria's Principal Economic and Financial Indicators; 1970–78, 1970–85; F.O.S.

TABLE 7.15

Data for the consumption model										
Year	Internal debt Nm	Total debt Nm	Wealth Nm	Transfe Nm	Nominal G.D.P. Nm	Expendit Nm	Revenue Nm	Real cons Nm	populatic millions	Price level %
1966	144.4	284.8	97.94	9.4	3374.8	487.4	503	3386.2	61.4	43.7
1967	368.4	536.4	14.49	8.6	2752.6	435.6	457.1	3164.1	63	40.6
1968	557.4	729	50.69	10.8	2656.2	517.7	444.8	2775.5	64.6	41.6
1969	841.3	1017.8	127.45	6.6	3549.3	770.2	532.2	3330.7	66.2	46
1970	1019.6	1195	219.6	19.5	5205.1	1544.8	1026.2	3719.2	67.8	52.4
1971	1047.2	1225.8	76.56	11.6	6570.7	1563.8	1623.1	4829.5	69.5	60.8
1972	845.3	1108.7	125.32	13.5	7208.3	1968.8	1825.6	4980	71.2	62.5
1973	930.6	1207.5	109.12	13.4	10990.7	2318.6	2205.6	5551.1	73.2	65.9
1974	940.7	1263.1	336.1	15.4	18298.3	4319.7	5374.9	9108.6	75	74.7
1975	1368.4	1718.3	1328.4	23.3	20957	11277.	7345	12378.4	76.9	100
1976	2429.4	2804	1767.3	15.4	26656.3	14359.	8905	15265.4	78.6	123
1977	4213.6	4578.7	1958.2	23.3	31520.3	18035.	10771.	19061.2	80.6	143
1978	3167.1	4419.2	677.29	42	34540.1	16505.	10045.	19365.2	82.6	167
1979	4967.4	6578.9	1644.2	30.1	41947.7	13532.	12276.	16343	84.7	186
1980	7952.4	9819.2	3364.2	104.8	49732.3	23368.	17618	16646.9	84.9	204.
1981	8698.9	11030.	802.1	95.7	50456.6	21761.	13034	16595	86.6	247.
1982	11800.	18601.	507.7	136.3	51570.3	26048.	12732.	17744.4	88.8	266.
1983	18877.	27454.	1517.8	99.2	56709.8	23010.	10646.	16520.7	90.3	328.
1984	22328.	34405.	853.7	61.6	63006.2	18751.	11520.	14412.9	93.3	458.
1985	24338.	38300.	1599.7	220.4	71368.1	21846.	15443.	15366	95.7	483.

Sources: i) Nigeria's Principal Economic and Financial Indicators, 1970–85; C.B.N.
ii)Digest of Statistics; F.O.S. various issues
iii) Economic and Social Statistics Bulletin; 1987, FMNP.

FIG. 1

PRICE LEVEL(ACTUAL&SIMULATED)

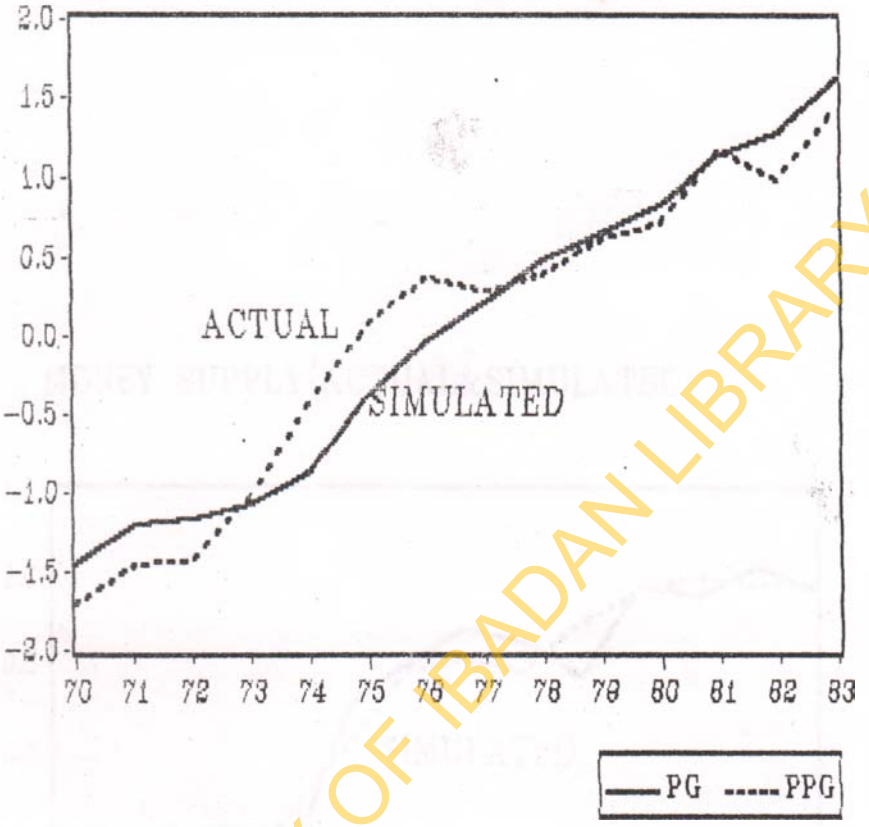


FIG.2

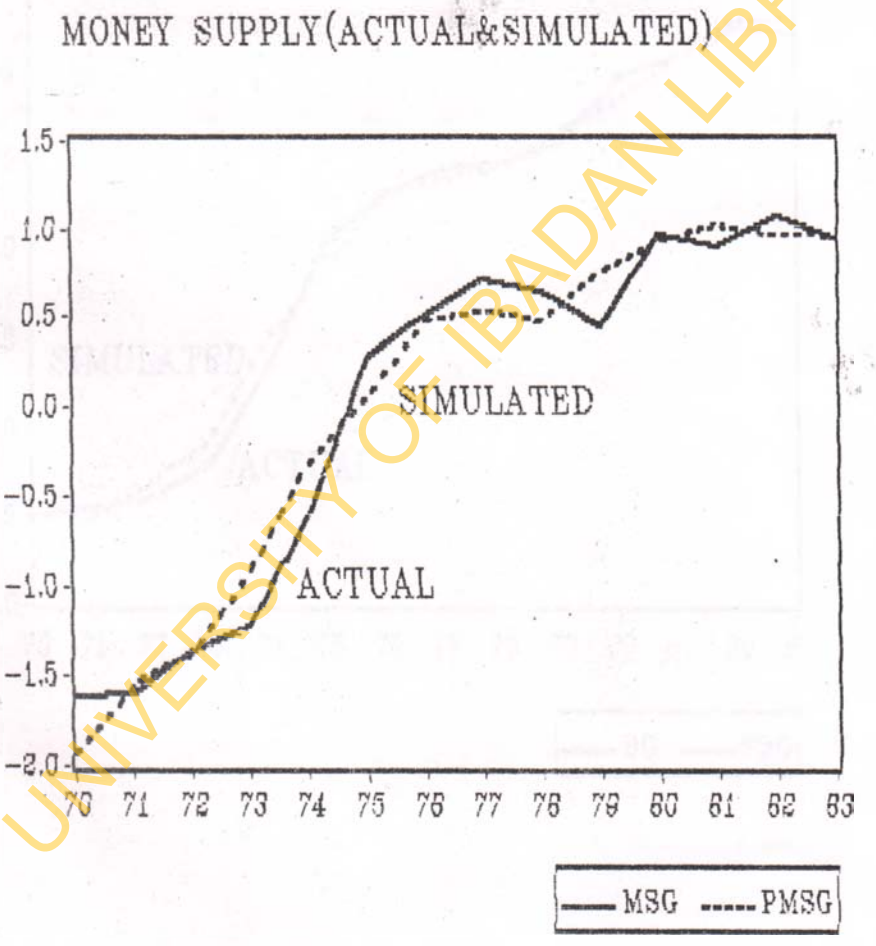


FIG.3

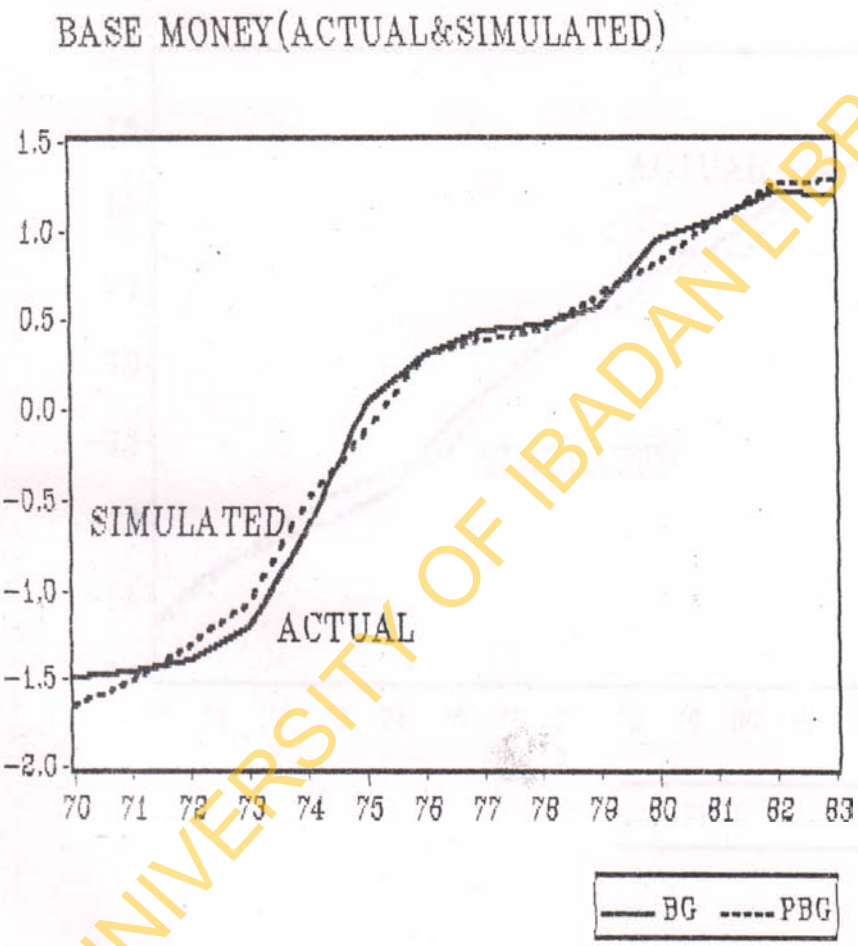


FIG.4

PRIVATE SECTOR CREDIT(ACTUAL&SIM)

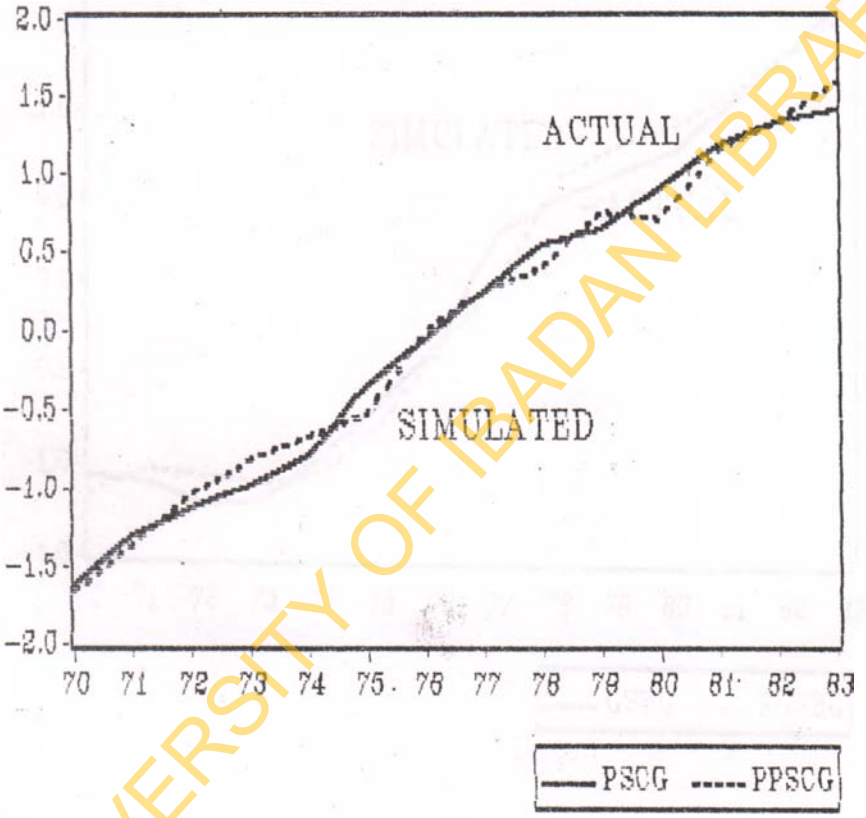


FIG. 5.

BANKING SYSTEM CREDIT TO GOVERNMENT

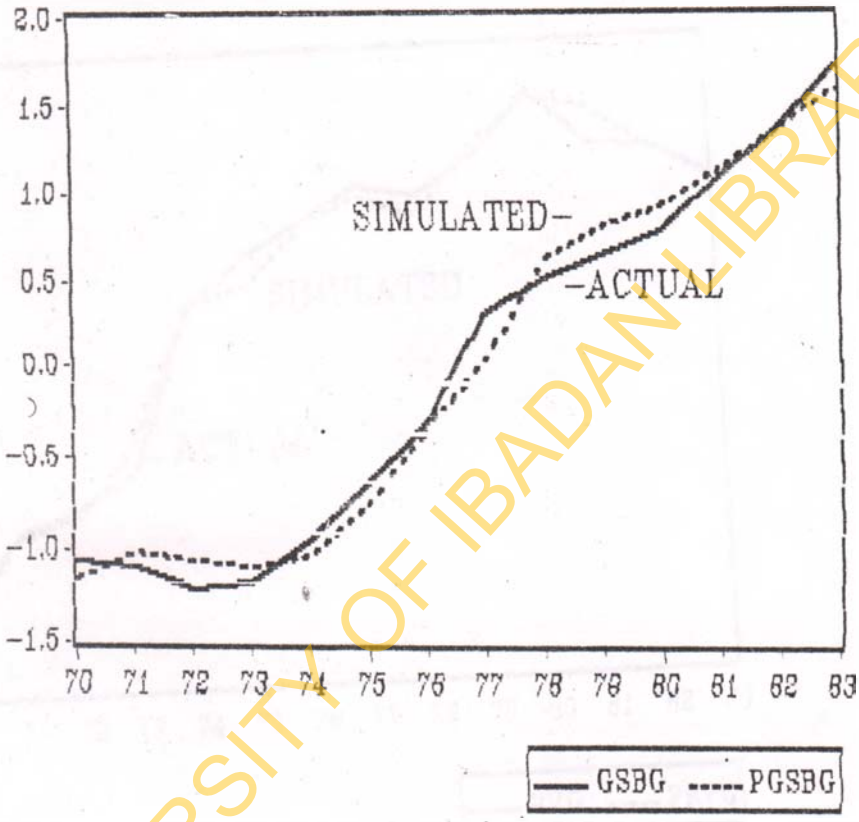


FIG. 6

REVENUE(ACTUAL&SIMULATED)

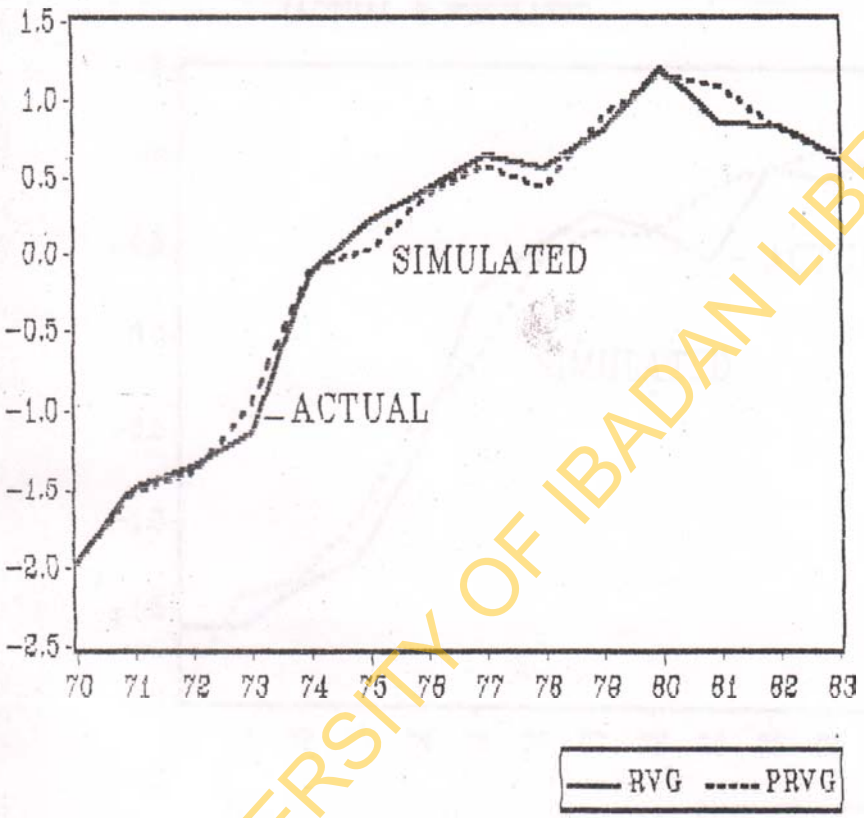


FIG. 7

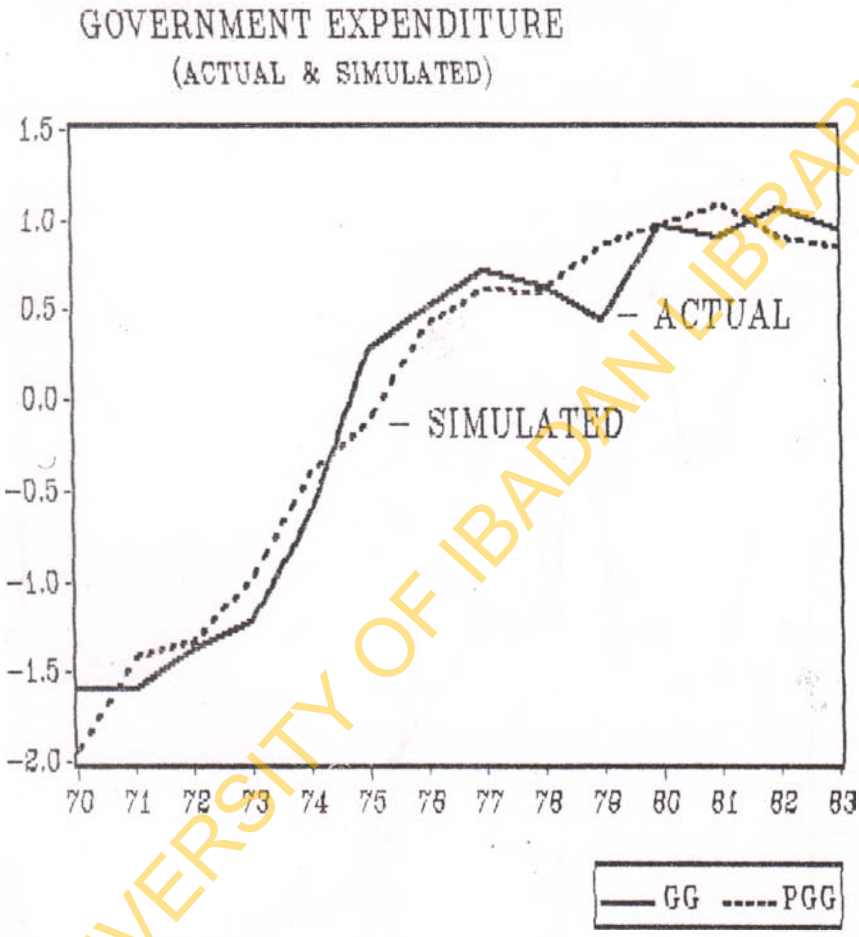


Fig.8 Federal Government Revenue, Expenditure and Deficit, 1966-85

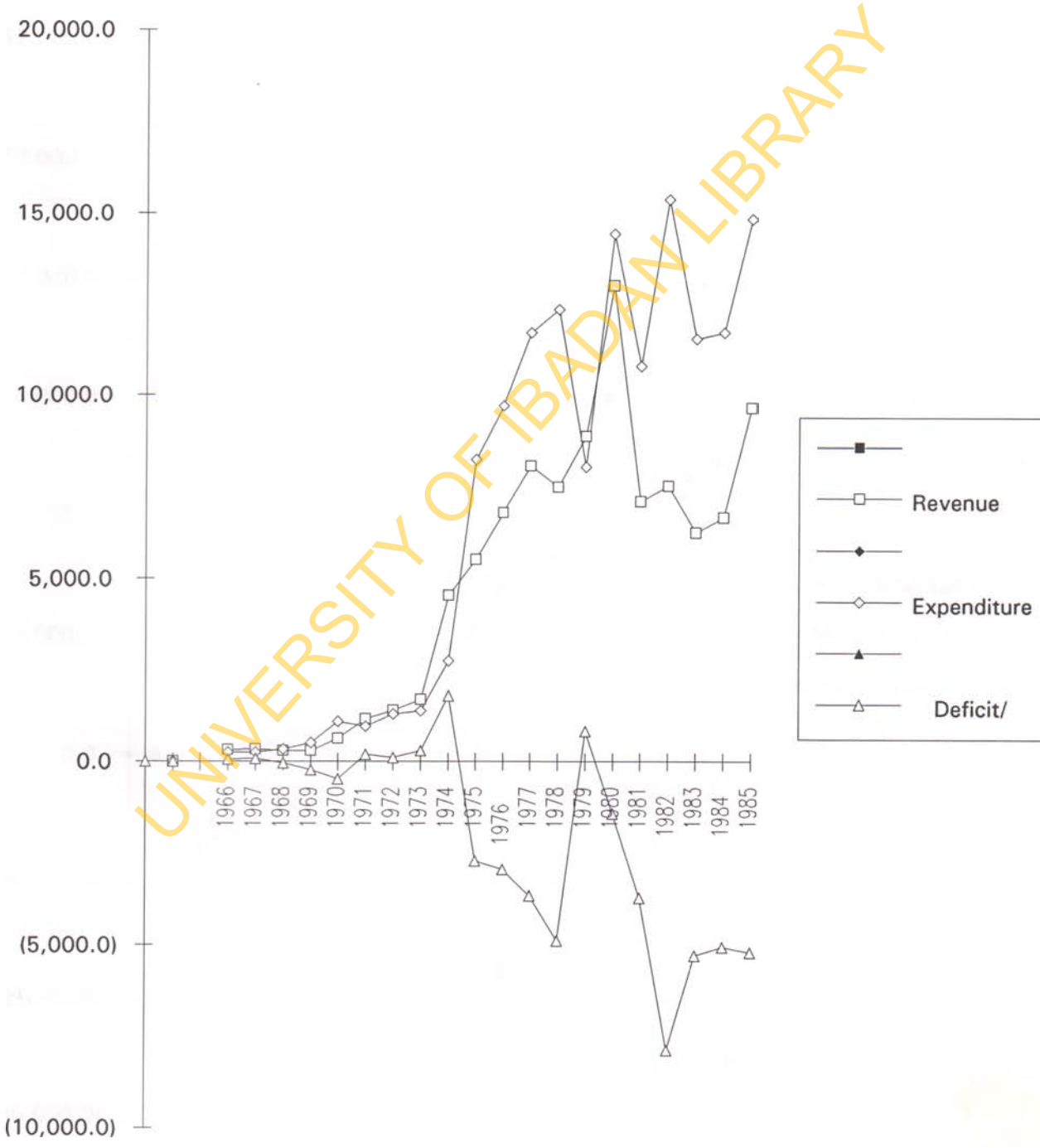


Fig.9 States Government Revenue, Expenditure and Deficit, 1967-85

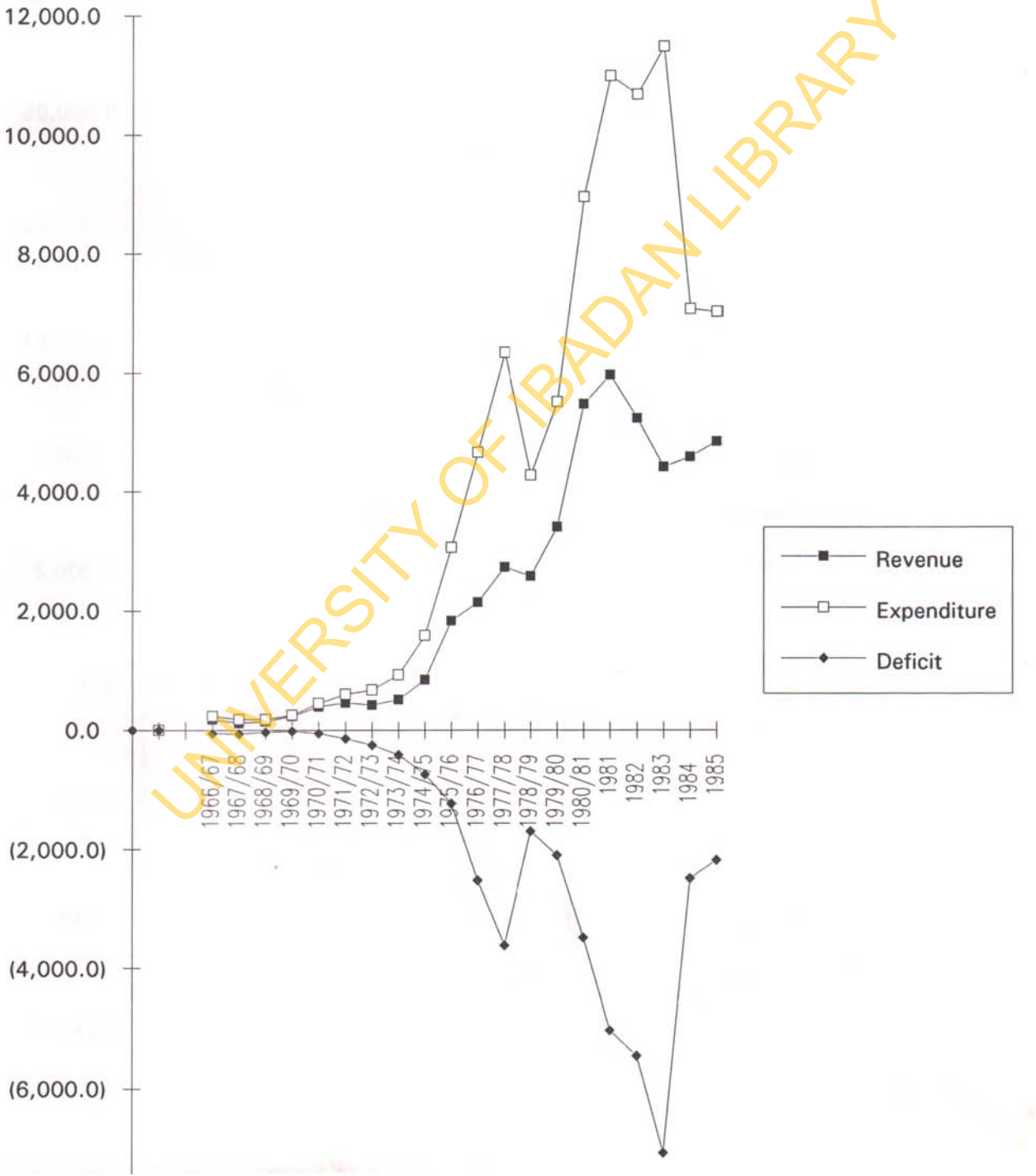


Fig.10 Total National Revenue, Expenditure and Deficit, 1966-85

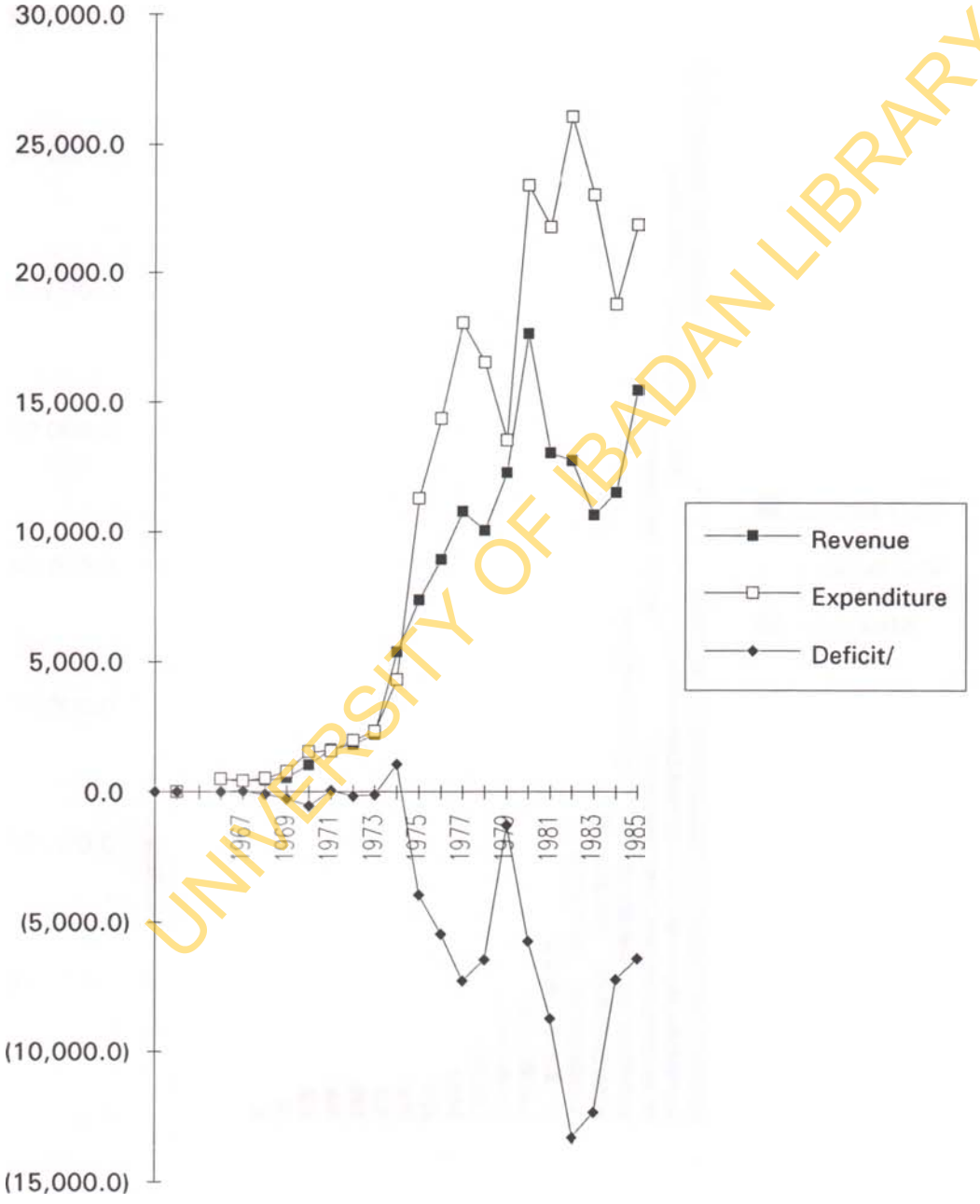


Fig.11 Federal Government Total, External and Internal Debts, 1966-85

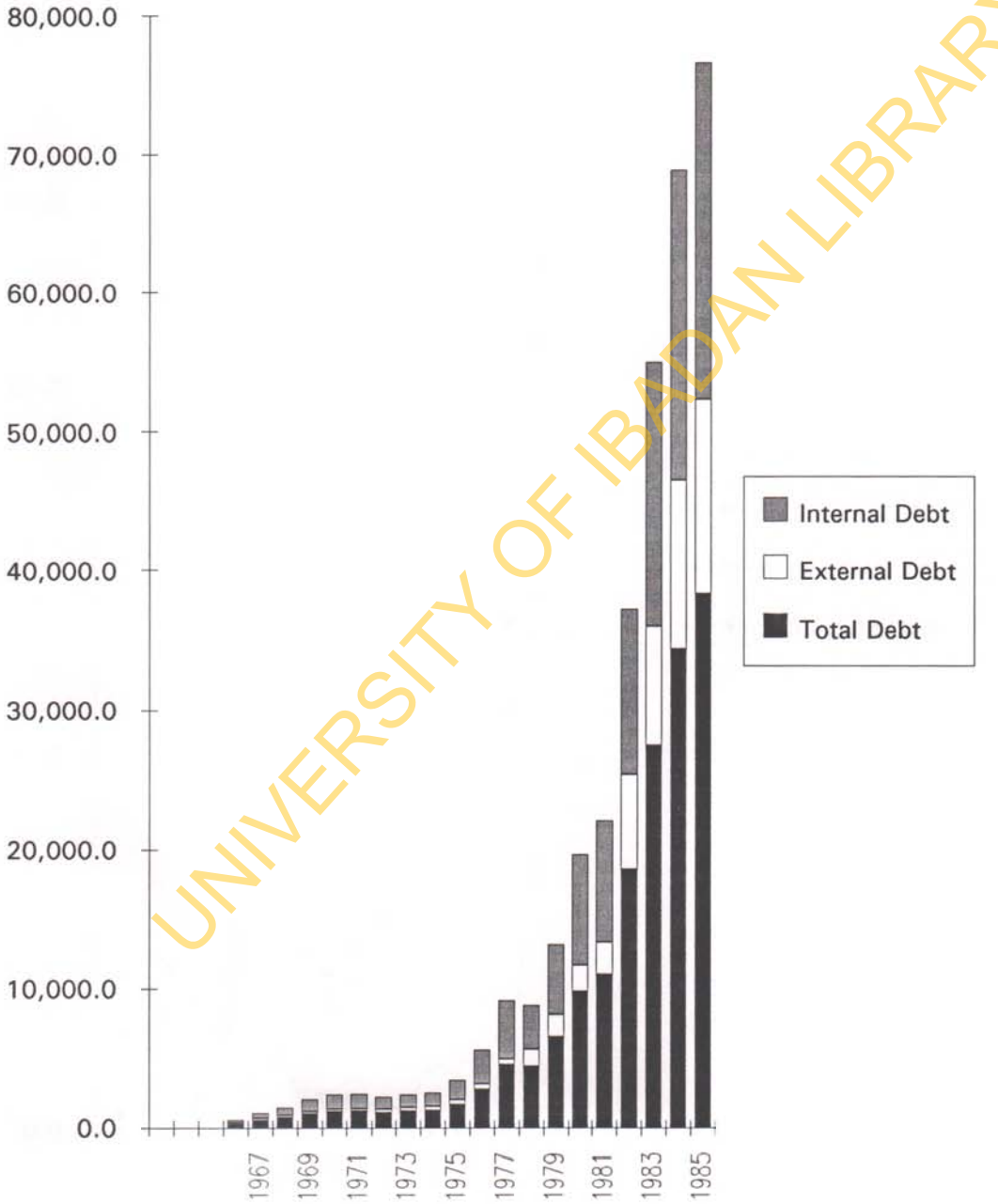


Fig.12 Share of Total, External and Internal Debts in GDP, 1966-85

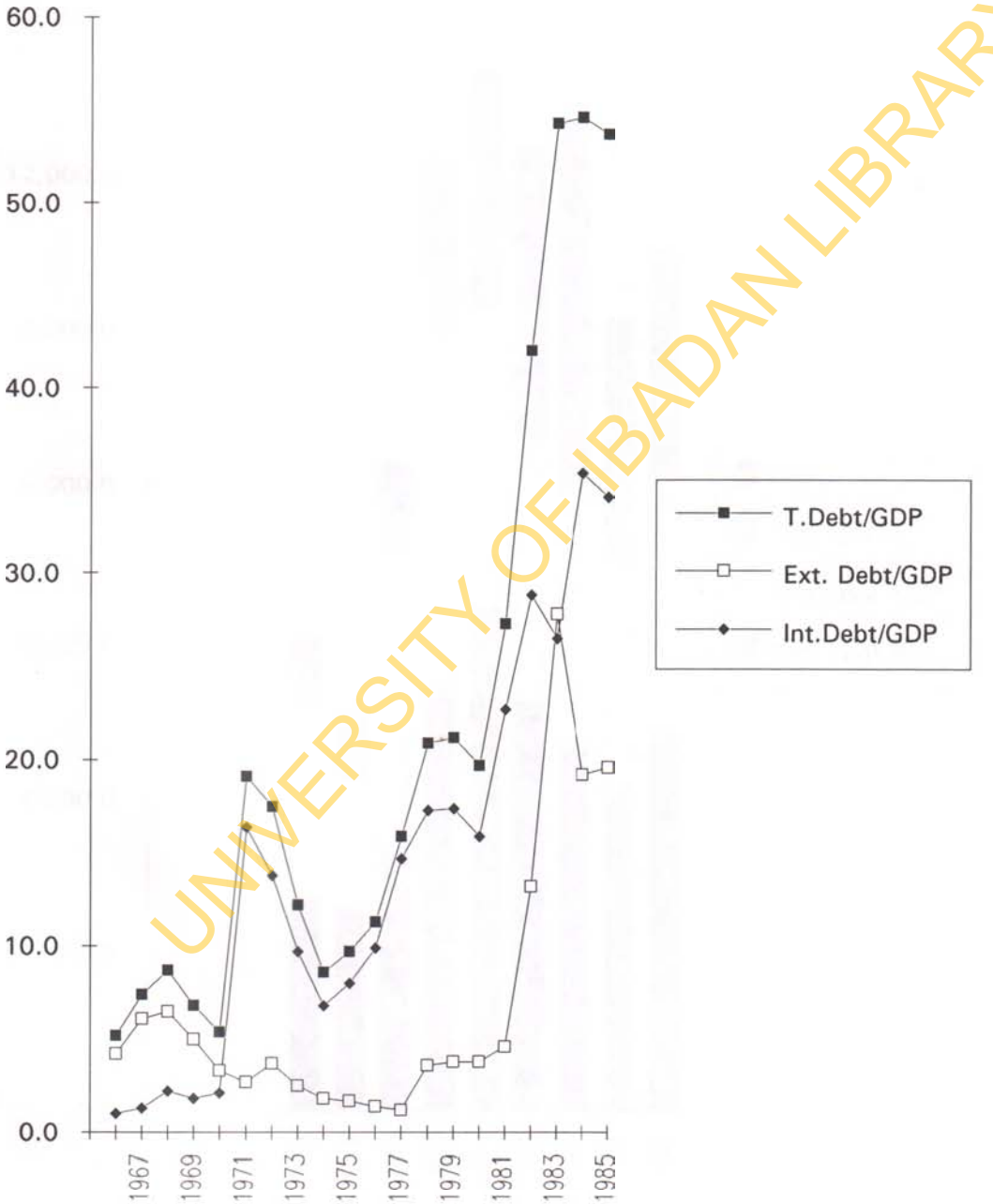


Fig.13 Components of States Government Revenue, 1977/78-85

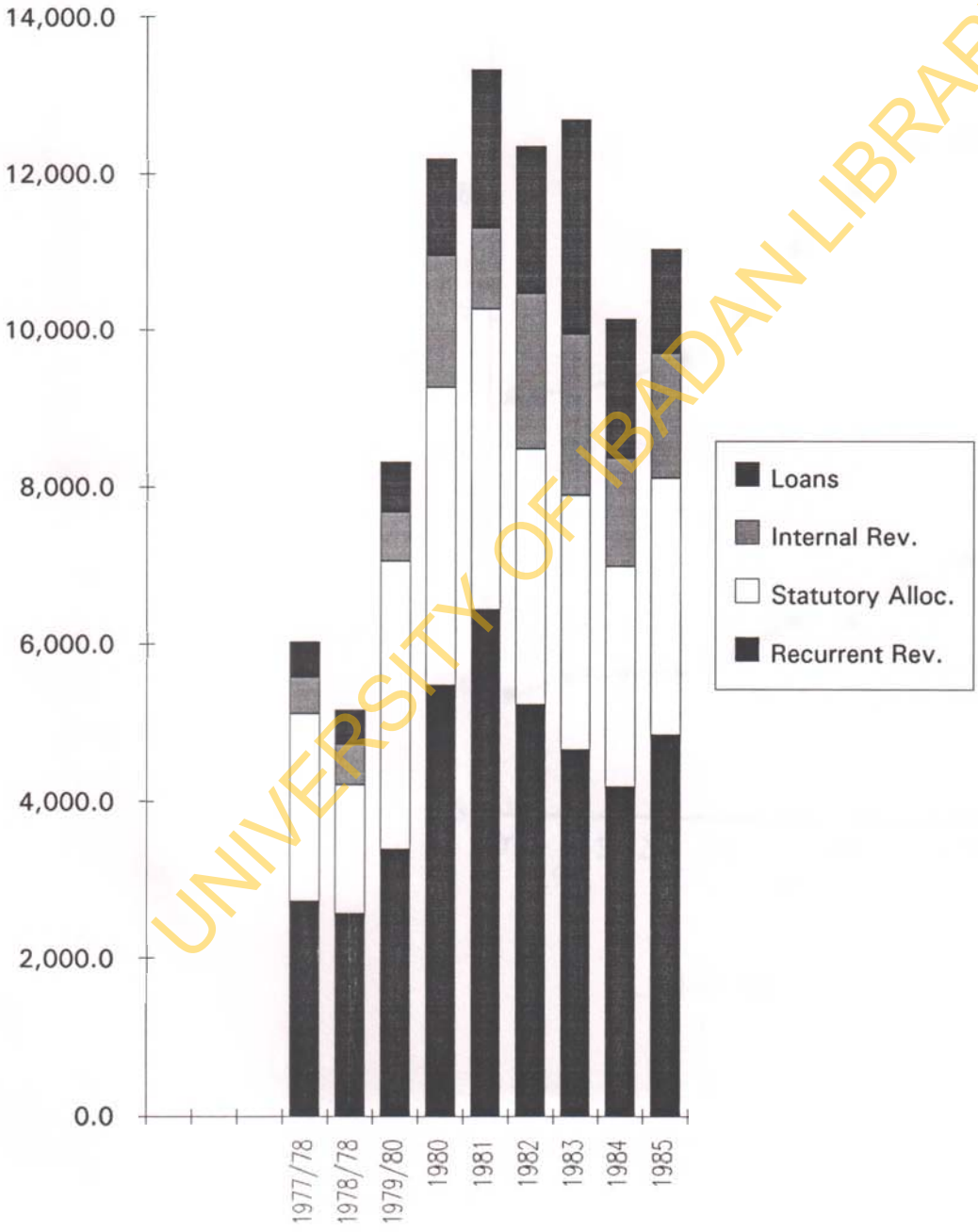


Fig.14 Annual Money Supply and Price Level, 1970–83

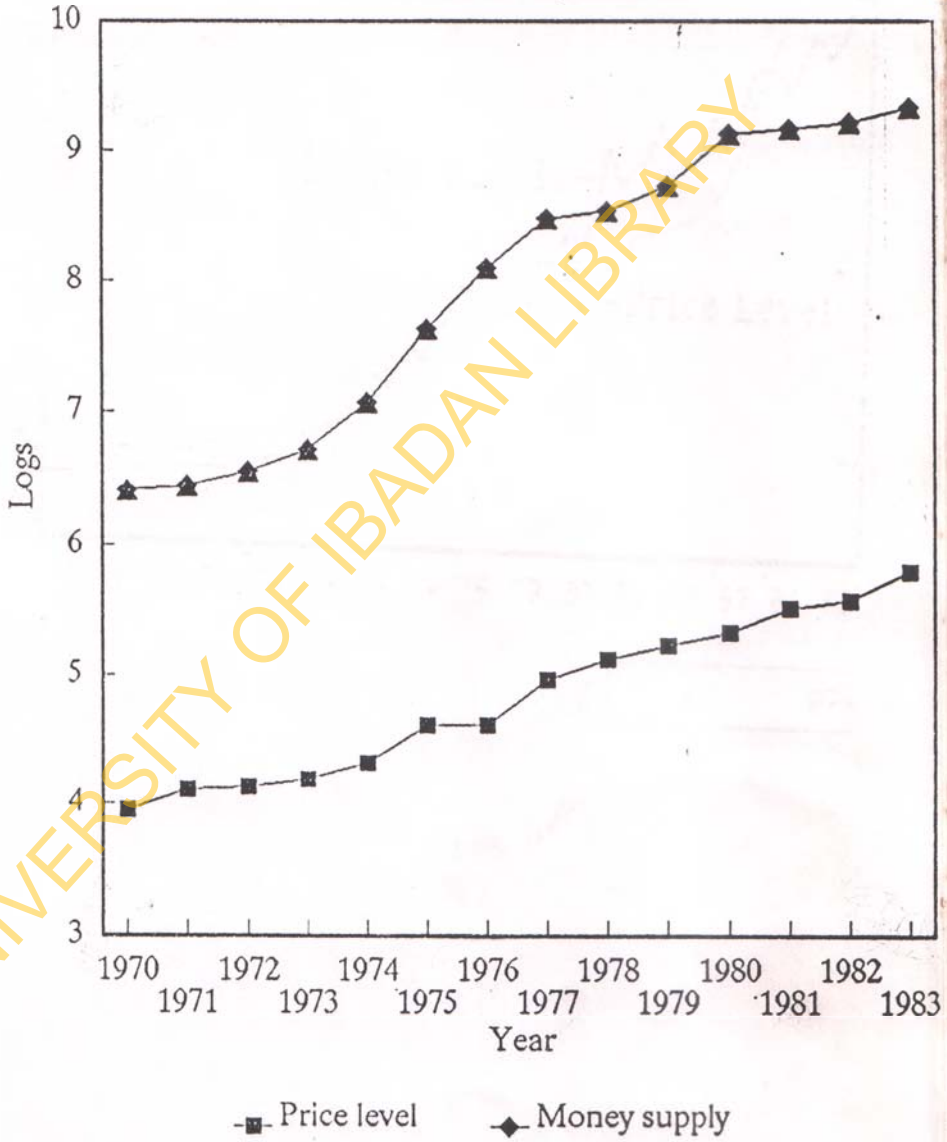


Fig.15 Money Supply and Prices (Quarterly Se

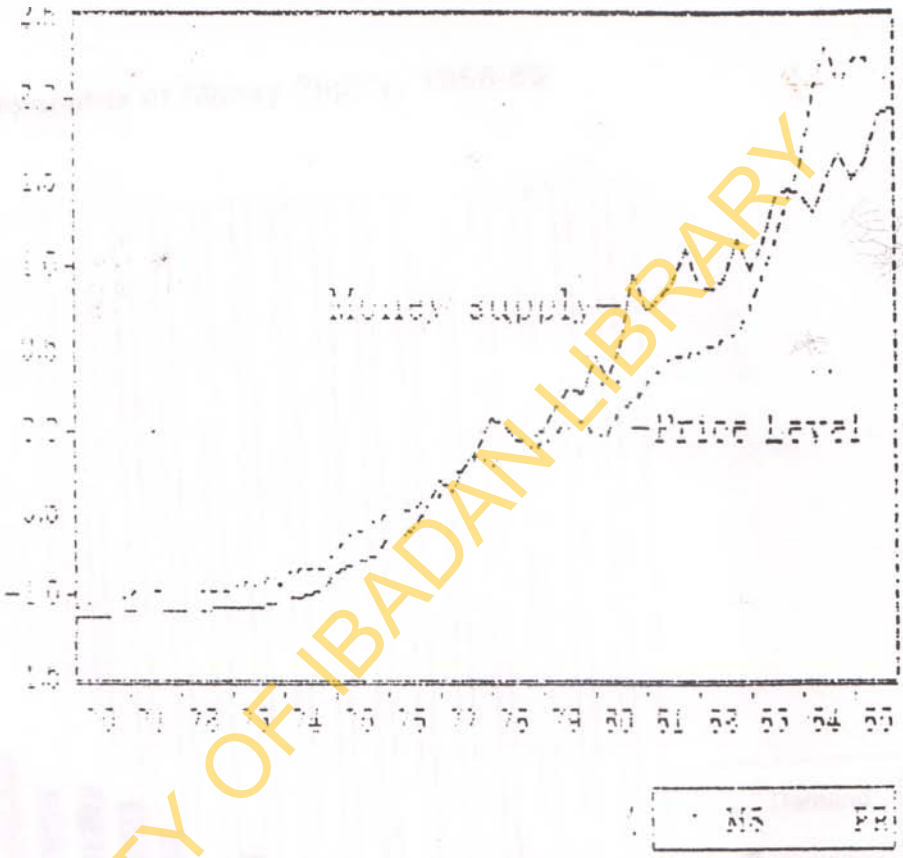


Fig.16 Components of Money Supply, 1966-85

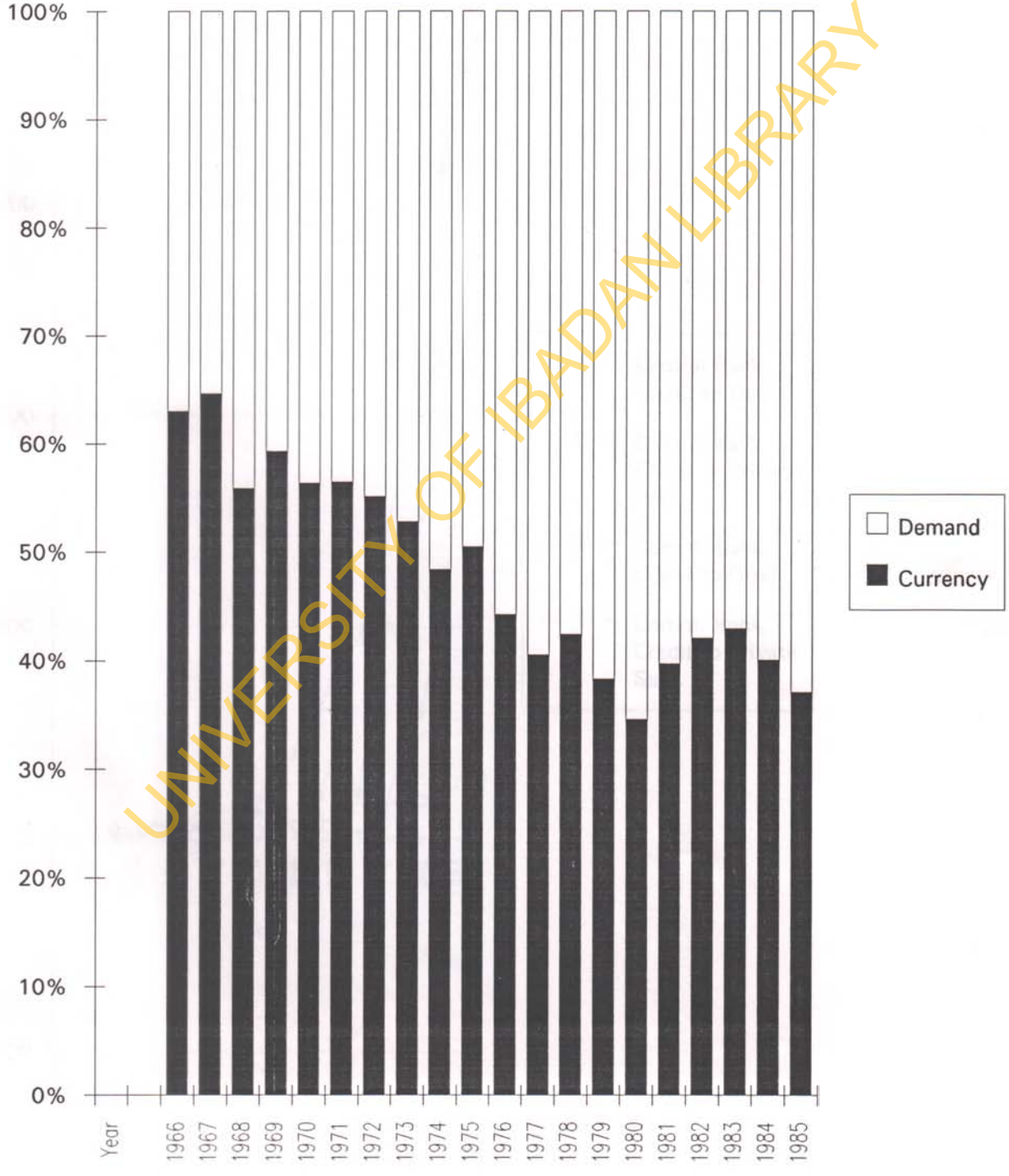


CHART17.XLC

Fig.17 Banking System Credit, 1966-85

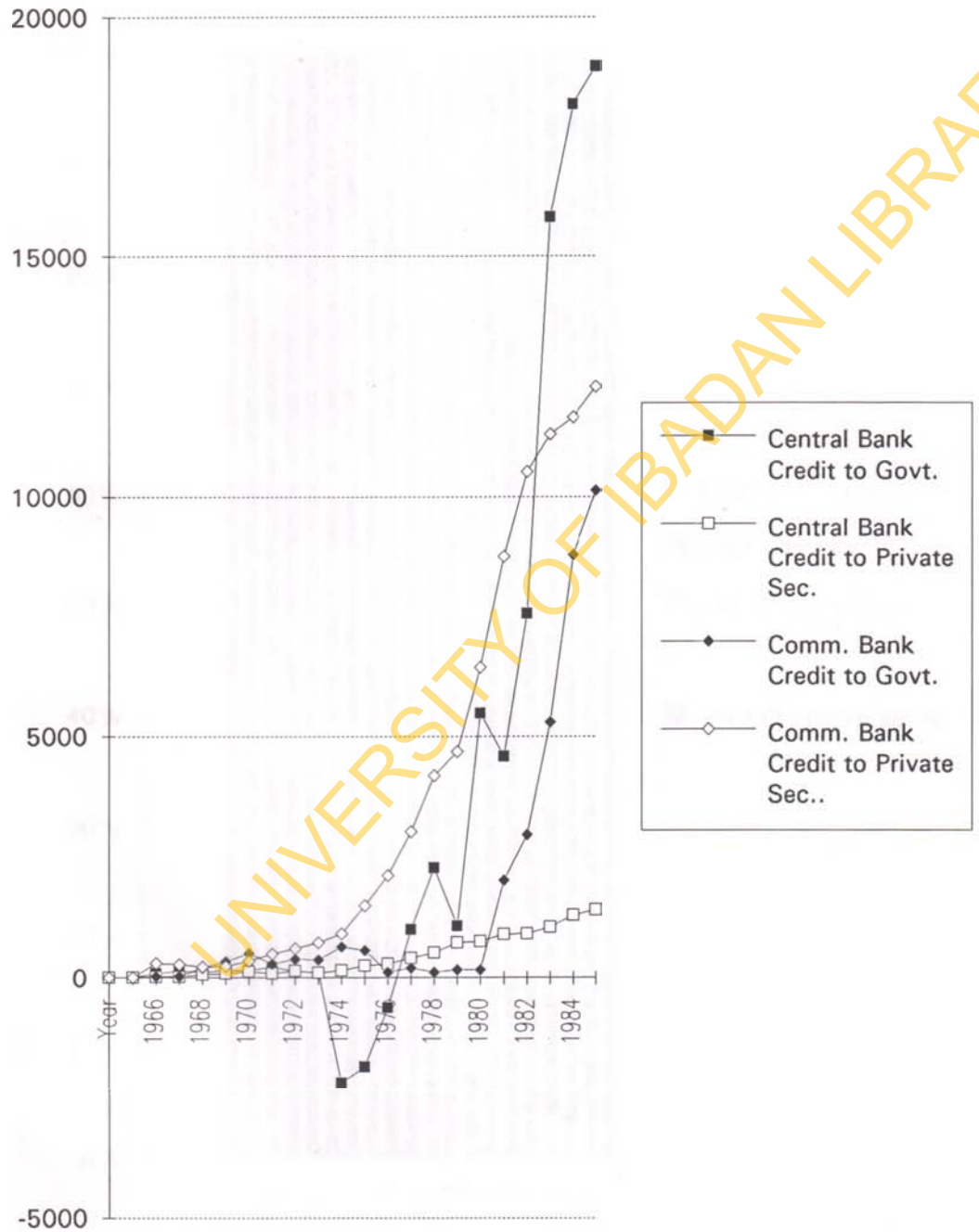


CHART18.XLC

Fig.18 Debt Charges as a Percent of Recurrent Exp., Exports and GDP, 1966-85

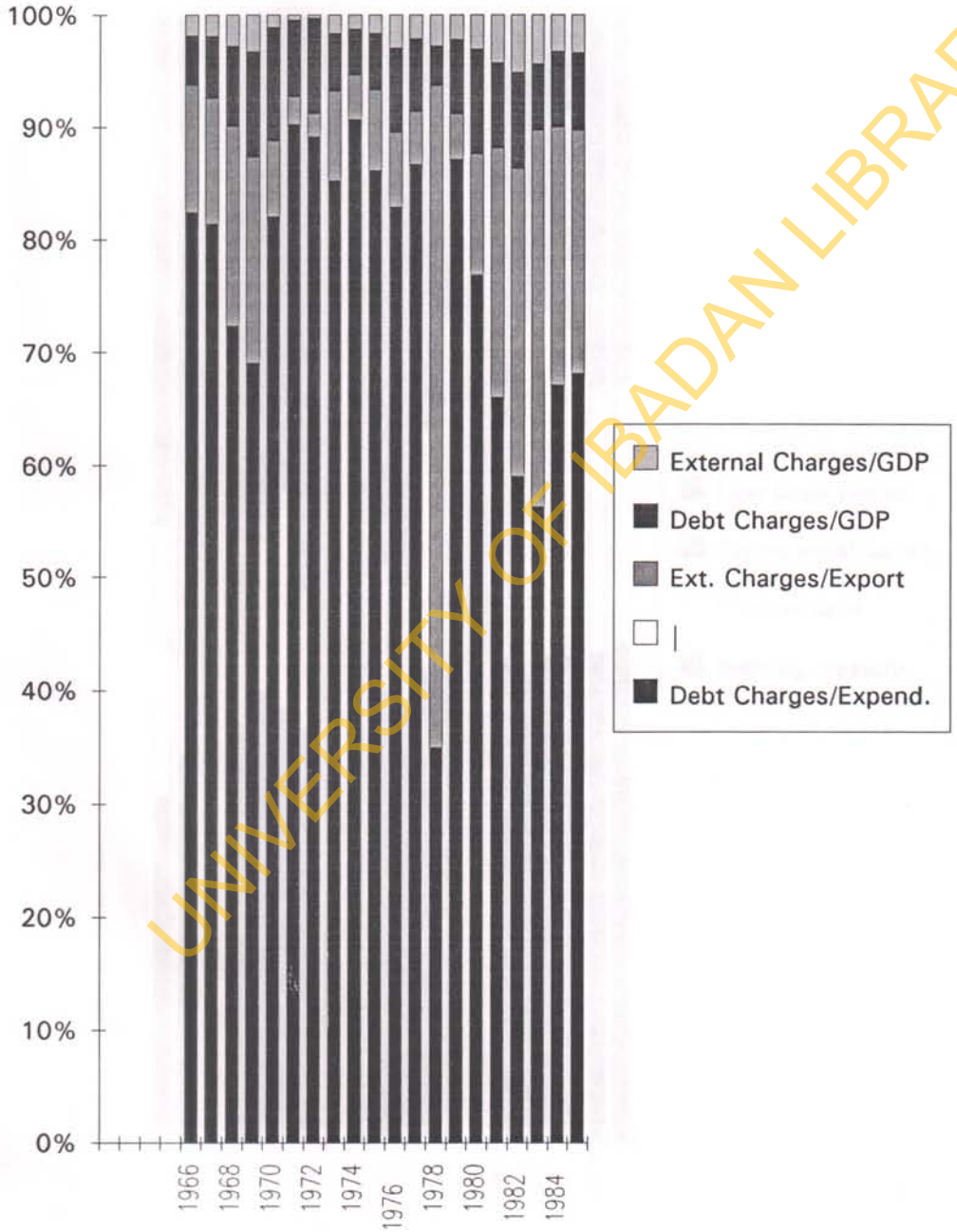


CHART19.XLC

Fig19. Ownership of Domestic Public Debt Outstanding, 1966-85

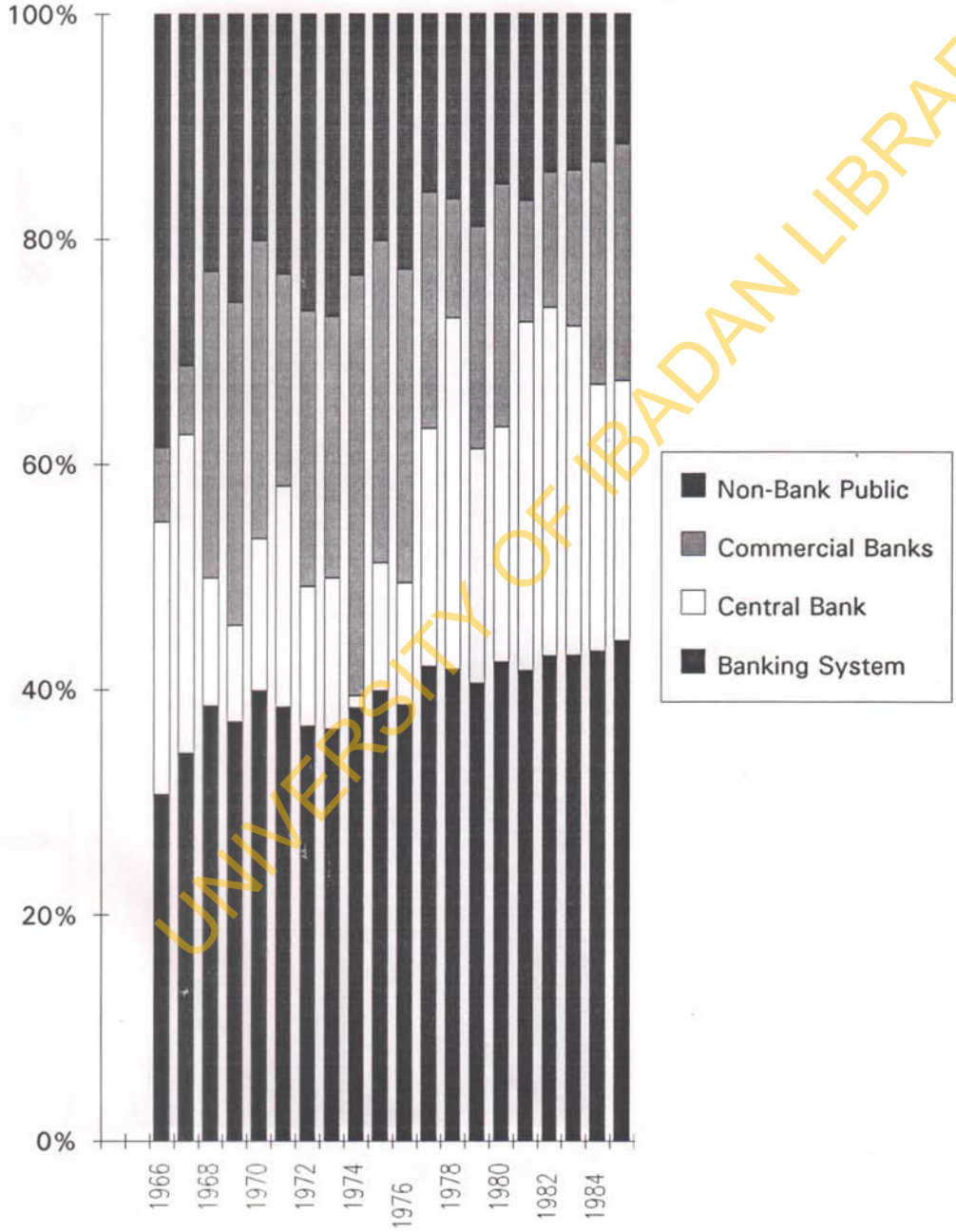


CHART20.XLC

Fig.20 Sources of Financing Federal Deficit, 1966-82

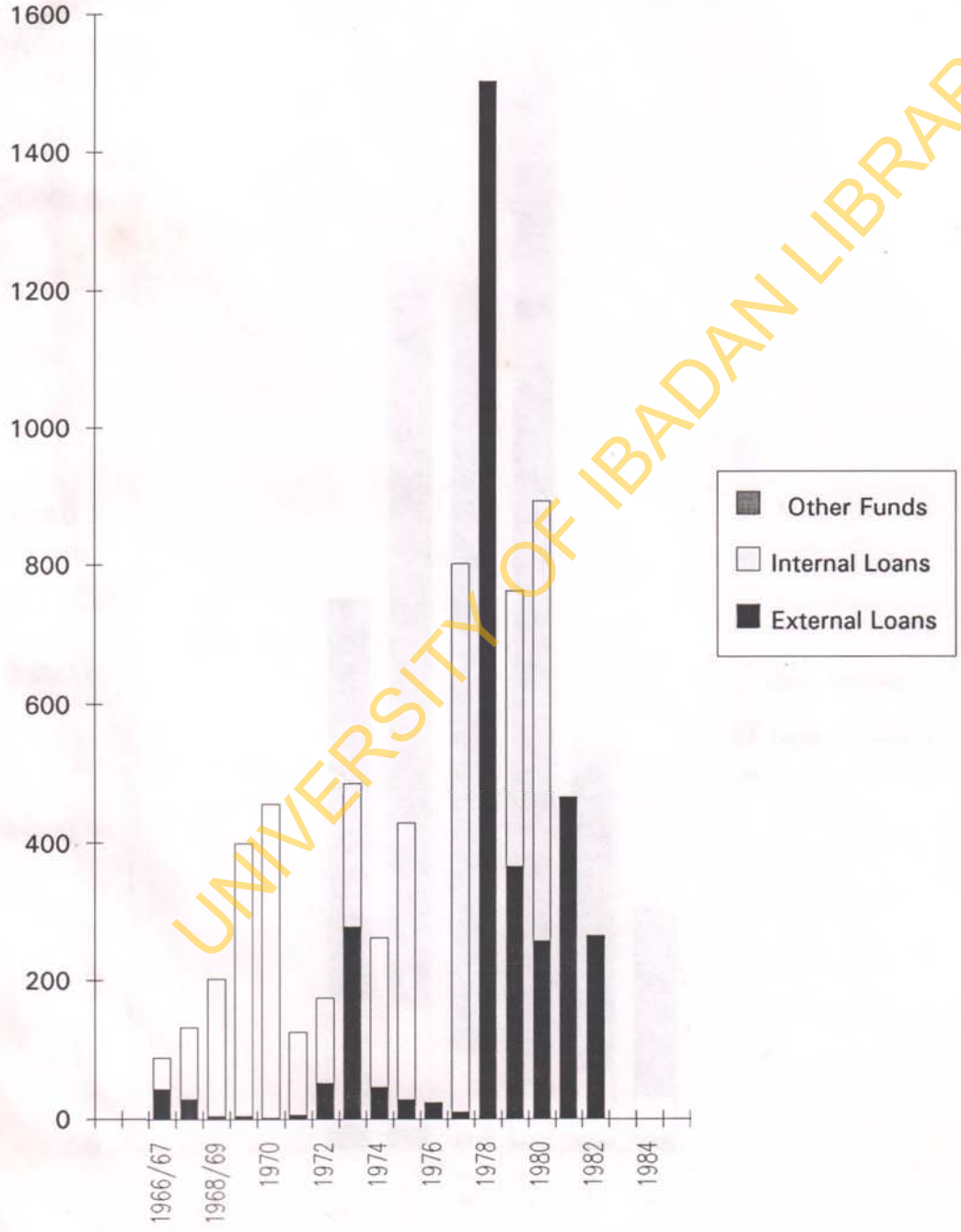
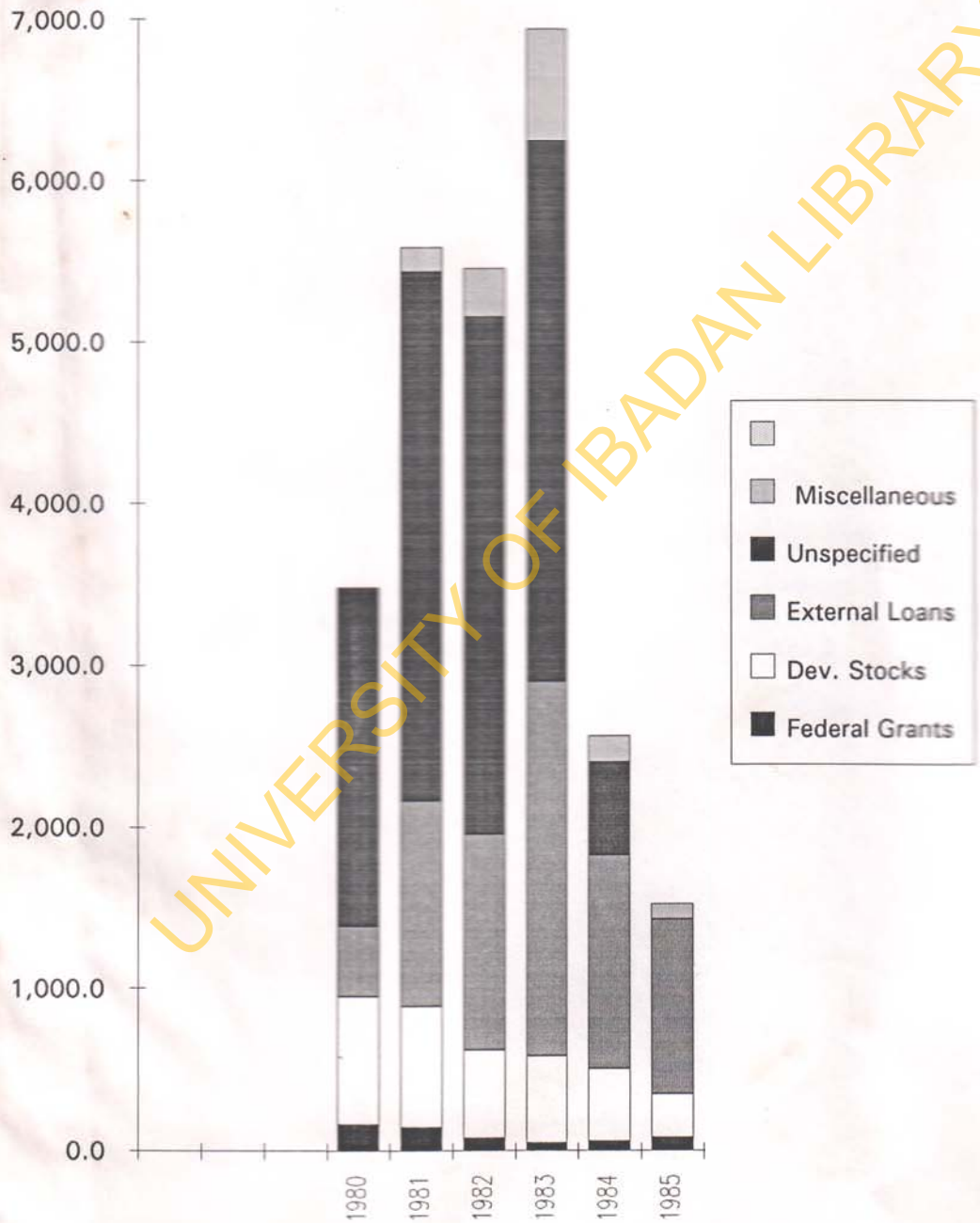


Fig.21 Sources of Financing States Government Deficits, 1980-85



autonomy. Japan and France are cases in point. Further, it cannot be ruled out that in countries with independent central banks, deep-seated social preferences for low inflation are the main reason behind their enviable fiscal restraint and more impressive inflation performances.

(iii) Deficits and the return on government securities

To further discourage deficit financing from the banking system, all government borrowing including Bond, Treasury Bills and Treasury Certificates should be at market rates. Compelling banks and other investors to invest their surplus liquidity into Treasury Bills and Treasury Certificates at below market rates means that the government deficit is being subsidised by the productive sector of the economy and the necessary fiscal discipline will be hard to come by. The magnitude of the deficit cannot be accurately quantified unless this is financed at market interest rates. If private investors are

attracted to acquire government debt instruments, this will considerably reduce the need to resort to money creation to finance the deficit, with salutary effect on the price level. However a World Bank economist[131] has in a recent article listed four crucial conditions that have to be fulfilled before market forces can effectively discipline government borrowing. First, lenders should have the option of investing their funds elsewhere if a particular borrowers' credit-worthiness is in jeopardy. This rules out directed lending of any sort most especially the requirement to invest a certain proportion of a bank's assets in government securities. Second, information about the borrowers' credit standing such as total outstanding stock of debt should be available to prospective lenders to enable them

---

[131]Lane, Timothy (1993), "Can market forces discipline vernment borrowing?" Finance and Development, 30(1:March), .26-9. In the context of the article, market discipline ans that financial markets can send signals which will make rrowers behave in a manner consistent with their solvency.

discriminate among different categories of borrowers. Third, there should be no expectation of a rescue in case the borrower is unable to service its debt. If the defaulting borrower is a government, the rescue could come from the central bank, which could relieve the real burden of debt-servicing by monetising some of the public debt. Alternatively, assistance could come from a foreign government or from a multilateral organisation. Lastly, market discipline is facilitated if the borrower is responsive to rising interest rates. In sum, co-ordination and legal restrictions on deficits may need to be supplemented by the correct use of market forces to stop unsustainable policies. Already, the federal government announced in the 1993 budget its intention to deregulate the market for government securities. In particular, the return on government debt instruments is to be made attractive enough to the non-bank public as a way to reduce reliance on high-powered

money with its attendant inflationary effect.

(iv) Fiscal deficits and private consumption

The rejection of the tax discounting hypothesis means that private consumption increases relative to saving when the public subscribes to government debt. By implication therefore, higher public saving-lower fiscal deficit- is the most reassuring contribution fiscal policy can make to raise national saving.

8.3 CONTRIBUTION AND LIMITATIONS OF THE STUDY

The study's contribution to the empirical analysis of the inflationary impact of deficits on inflation lies in treating financing forms other than money creation (viz. net claims of commercial banks and the non-bank public on government) as potentially

inflationary too. Besides, government borrowing from commercial banks and the central bank were distinctly incorporated as variables in the model unlike in previous studies.In addition, states fiscal variables were consolidated with those of the Federal Government to get more reliable aggregates for the federation.

The data coverage of this study terminated in 1985. Due to fundamental policy changes undertaken from 1986 to the present (especially the massive devaluation of the domestic currency), dynamic changes in the financial system as well as in inter-governmental relations, the present model may be inadequate for analysing the inflationary effect of government deficits in Nigeria which has become more substantial since the onset of the Structural Adjustment Programme.

While the non-bank public comprises some institutional investors, parastatals, individuals and even states and local

governments, the study did assume that this group was coextensive with only individuals. This could have distorted the results since in terms of holding of government debt instruments, individuals constituted a negligible segment.

The contribution of this study would have been more clear-cut if it were possible to show that state fiscal variables are affected by different factors and more importantly that they exert inflationary pressures through separate mechanisms from public finance at the federal level.

Recent years have seen steady increases in revenue allocation to local governments which makes their inclusion in the defition of the public sector imperative. Data on the revenue allocated to this tier of government which accounts for the bulk of their revenue is available form the '80s. A comprehensive view of the finances of the local governments nation-wide is however hampered by lack of data on their expenditure.

8.4 SUGGESTIONS FOR FURTHER RESEARCH

The present study which terminated in 1985 can be updated to the present when fundamental changes in the structure of the economy and inter-governmental fiscal relations have taken place. The policy reforms refer mainly to the structural adjustment programme, the most important element of which has been the substantial devaluation of the naira. Additionally, the number of states has risen from 21 to 30 recently, while the revenue allocation formula has also been changed in favour of the state and local governments.

Further refinements need to be made to the data series on money supply and prices with the likelihood that the causality tests would yield different results. For example, the results may have been different if broad

money was used and GDP deflator was adopted. The ineffectiveness of several monetary control measures (including those to curtail deficit financing) may be partly attributed to the fact that even the broad defition of money supply (M2) seems to under-estimate reality.Perhaps also, better results could be obtained using annual data instead of quarterly data. The tax discounting hypothesis may also be tested using non-durable consumption instead of total consumer expenditure if the former becomes available in future. The possibility of obtaining actual data on government fiscal operations with which to compare with budgeted amounts may be explored. The budget out-turn will certainly yield budget balances different from what is contained in the budget.

BIBLIOGRAPHY

Abdullahi, S.H. (1985), Deficit Financing and Nigeria's Economic Development: 1966-83, M.Sc (Econ) Thesis, A.B.U., Zaria

Aboyade, O. (1983), Integrated Economics: A Study of Developing Economies, London, Addison-Wesley. 568p.

Aghevli, B.B. and M.S.Khan. (1977), "Inflationary finance and the dynamics of inflation: Indonesia, 1951-72." American Economic Review, Vol. 67, (June), 390-403.

_____ (1978), "Government deficits and the inflationary process in developing countries." IMF Staff Papers, Vol. 25, No. 3 (September), 383-416.

Ahmad, N. (1970), Deficit financing, inflation and capital formation: the Ghanaian experience, 1960-65; Walt Forum, Verlag, Munchen. 156p.

Ajayi, S.I. (1978), "Money, prices and interest: the Nigerian paradigm." The Nigerian Journal of Economic and Social Studies, Ibadan, Vol. 20, No. 2. 175-94.

_____ (1983), "On the directional causality between money and prices." The

Nigerian Journal of Economic and Social Studies, Ibadan, Vol. 25, No. 3, November. 319-25.

Alberro-Semenera, José (1991), "The macroeconomics of the public sector deficit in Mexico during the 1980s." World Bank, Country Economics Department, Washington D.C.

Arestis, P. (1979), "The crowding-out of private expenditure by fiscal actions: an empirical investigation." Public Finance, Vol. XXXIV, 36-50.

Ariyo, A. & M.I. Raheem. (1990), "Deficit financing and economic development: empirical perspectives from Nigeria." African Economic Research Consortium research report. AERC, Nairobi.

_____ (1991), "Effect of fiscal deficit on some macro-economic aggregates in Nigeria." Final report to African Economic Research Consortium, Nairobi.

Argy, V. (1970) "Structural inflation in developing countries." Oxford Economic Papers, No. 1. 1973-85

Awosika, K. (1980), "Nigeria's anti-inflationary policies in the 1970s" in The Nigerian economy under the military, Proceedings of the 1980 Conference of the Nigerian Economic Society. 275-307.

Bailey, M.(1956), "The welfare cost of inflationary finance." Journal of Political Economy, 64(2,April): 93-110.

----------(1962), National income and the price level, first edition, New York, McGraw-Hill. 278p.

Barro, R.J. (1977), "Unanticipated money growth and unemployment in the United States."

American Economic Review, 67, March, 101-115.

_____ (1974), "Are government bonds net wealth?" Journal of Political Economy (November/December), PP. 1095-1117.

_____ (1976), "Reply to Feldstein and Buchanan." Journal of Political Economy, 84, 343-9.

_____ (1978), "Comment from an unreconstructed Ricardian." Journal of Monetary Economics, 4, 569-581.

_____ (1979), "On the determination of the public debt." Journal of Political Economic, 87, 940-71.

_____ (1978), "Unanticipated money, output and the price level in the United States." Journal of Political Economy (August) 599-80.

Bledjer, M.I. and A. Cheasty. (1992), "How to measure the fiscal deficit." Finance and Development, The World Bank, Washington D.C., Sept. 40-2.

Blinder, A.S. and R.H. Solow. (1974), "Analytical foundations of fiscal policy" in The Economics of Public Finance, by A. S. Blinder, R. M. Solow, et al., The Brookings Institution, 3-115.

Bowen, W.G., Davis, R.G. and Kopf, D.H. (1961), "The burden of the public debt: reply." American Economic Review (March). 141-3.

Buchanan, J.M. (1968), "Debt, public" in International Encyclopaedia of the Social Sciences, Collier-Macmillan, London, Vol. 3, 28-34.

_____ (1976), "Barro on the Ricardian equivalence theorem." Journal of Political

Economy, 84, 317-42.

_____ (1979), The public finances, Richard D. Irwin, Inc., Homewood, Illinois. 584P.

_____ and Wagner, R.E. (1977), Democracy in deficit: the political legacy of Lord Keynes, Academic Press, New York.

Burkhead, J. (1955), "The balanced budget" in A. Smithies and J.K. Butters (eds), Readings in Fiscal Policy, George Allen and Unwin Limited, London.

Cagan, P. (1956), "The monetary dynamics of hyper-inflation." in Studies in the Quantity Theory of Money by Milton Friedman (ed), University of Chicago Press, 25-117.

Cassello-Branco, M. and M. Swirnburne. (1992), "Central bank independence." Finance and Development, (March), 19-21.

Cavalco-Silva, Anibal A. (1977), Economic effects of public debt, Martin Robertson and Co., London.

Central Bank of Nigeria, Annual Report and Statement of Accounts, 1966-85, Lagos.

_____ The Economic and Financial Review, 1966-85.

_____ Nigeria's Principal Economic and Financial Indicators: 1970-85, Lagos.

Chamley, C. and Hadez, Ghanem (1991), "Fiscal Policy with fixed nominal exchange rates: Côte d'Ivoire." WPS 658. World Bank, Country Economics Department, Washington D.C.

Chelliah, R.J. (1973), "Significance of alternative concepts of budget deficit." IMF Staff Papers, 742-84.

Colclough, W.G. & M.D. Lange. (1982), "Empirical evidence of causality from consumer to wholesale prices." Journal of Econometrics.

Corbo, Vittorio and Klaus Schmidt-Hebbel (1991), "Public policies and saving in developing countries." Journal of Development Economics, 36(1): 89-116.

Diz-Adolfo, C. (1970), "Money and prices in Argentina, 1935-62", in Varieties of Monetary Experience, by David Meiselman (ed), University of Chicago Press, 71-162.

Dornbusch, R. (1992), "Lessons from experiences with high inflation." The World Bank Economic Review, 6 (1) January. 13-31.

---------- and Stanley Fischer. (1993), "Moderate inflation." The World Bank Economic Review, 7(1,Jan.): 1-44.

Dwyer, G.P. (1982), "Inflation and government deficit." Economic Inquiry, Vol. 20 (July), 315-29.

Easterly, W. (1991), "The macroeconomics of the public sector deficit: the case of Columbia." WPS 626. World Bank, Country Economics Department, Washington D.C.

------- and Klaus Schmidt-Hebbel. (1993a), "Fiscal accounts and macro-economic performance." World Bank Policy Research Bulletin, 4(3:May-July), 2-6.

----------(1993b), "Fiscal deficits and macroeconomic performance in developing countries." The World Bank Research Observer, 8(2:July),211-37.

Egwaikhide, F.O. (1991), "Determinants of fiscal deficits in a developing economy: evidence from Nigeria." The Nigerian Journal

of Economic and Social Studies, 33(3: Nov.), 177-89.

Faini, Ricardo (1991), "The macroeconomics of the public sector deficit: the case of Morocco." WPS 631. World Bank, Country Economics Department, Washington D.C.

Federal Office of Statistics, Economic and social statistics bulletin, Lagos, January 1984.

Federal Republic of Nigeria Report of the study group on the Nigerian budgetary system.

_____ GDP and allied macro aggregates (1981), Lagos.

Feldstein, Martin (1976), "Perceived wealth in bonds and social security." Journal of Political Economy, Vol. 84, 331-6.

_____ (1982), "Government deficits and aggregate demand." Journal of Monetary Economics, Vol. 9 (January), 10-20.

Feige, E.L. and D.K. Pearce (1979), "The casual causal relationship between money and income. some caveats for time series analysis." The Review of Economics and Statistics No. 4 521-33

Ferguson, James M. (1964), "Temporal utility and fiscal burden" in J.M. Ferguson (ed), Public Debt and Future Generations, Chapel-Hill, North Carolina, University of North Carolina Press.

Friedman, M. (1966), "What price guideposts?" in George P. Schultz and Robert Z. Aliber (eds), Guidelines, Informal Controls and the Market Place, (Chicago University Press), 1966.

_____ (1970), "A theoretical framework for monetary analysis." Journal of Political Economy 78, 193-238.

----------(1971), "Government revenue from inflation." Journal of Political Economy, 79 (4,July/Aug.)

_____ (1972), "Comments on the critics." Journal of Political Economy 80, 906-950.

Granger, W.W.J. (1969), "Investigating causal relations by econometric models and cross-spectral methods." Econometrica, Vol. 37, No. 3 (July). 424-38

Gordon, R.J. (1976), "Recent developments in monetary theory." Journal of Monetary Economics.

Hall, R.E. and David M. Lillen (1990), Micro TSP user's manual Version 7.0 (TSP International, Irvirie, California.

Haque, N.U. and P. Montiel (1989), "Consumption in developing countries: tests for liquidity constraints and finite horizons." Review of Economics and Statistics, 71(3): 408-15.

---------- (1991), "The macroeconomics of the public sector deficit: the case of Pakistan." WPS 673. World Bank, Country Economics Department, Washington D.C.

Hamburger, K.J. & Zwick, B. (1981), "Deficits, money and inflation." Journal of Monetary Economics, Vol. 17, 141-50, North-Holland Publishing Co.

Harberger, Arnold C. (1963), "The dynamics of inflation in Chile" in Measurement in Economics: Studies in Mathematical Economics and Econometrics in Memory of Yehuda Grunfeld

(Standford University Press), 219-50.

Haugh, L.D. (1972), "Causality in temporal systems: characterisations and a survey." Journal of Econometrics, Vol. 5 (March), 295-93.

Islam, R. and Deborah Wetzel (1991), "The macroeconomics of public sector deficits: the case of Ghana." PRE working papers, The World Bank, Washington D.C. May. WPS 672.

Jacobs, R.I. (1975), "A difficulty with monetarist models of hyper-inflation." Economic Inquiry (September), Vol. 3, 337-60.

Johnson, H.G. (1972), Inflation and the monetarist controversy, North-Holland Publishing Company, Armsterdam. 108p.

_____ (1978), Selected essays in monetary economics, Chapter III, Alden Press, Oxford.

Kirkpatrick, C.H. and F.F. Nixson (1976), "The origins of inflation in less developed countries: a selective review", in M. Parkin and G. Zis, eds. (1976) Inflation in Open Economies. Manchester university press, 126-74.

Kochin, L. (1974), "Are future taxes anticipated by consumers?" Journal of Money, Credit and Banking, 6, 385-395.

Kormendi, Roger C. (1983), "Government debt, government spending and private sector behaviour." American Economic Review, Vol. 73, 994-1010.

Koutsoyianis, A. (1981), Theory of econometrics, second edition, London, Macmillan. 681p.

Laidler, W. (1981), "Monetarism: an

interpretation and an assessment." The Economic Journal, 91 (March), 1-28.

_____ (1978) "Money and money income: an essay on the transmission mechanism." Journal of Monetary Economics 4(2),151-91.

_____ (1977), The demand for money: theories and evidence. International textbook Co., Scranton, Pennsylvania.

_____and Parkin, M. (1975), "Inflation: a survey." Economic Journal. Vol. 85, 741-809, (December).

Lane, Timothy (1993), "Can market forces discipline government borrowing?" Finance and Development, 30(1:March), 26-9. The International Monetary Fund and World Bank, Washington D.C.

Leiderman, L. and Blejer, M.I. (1988), "Modelling and testing Ricardian equivalence: a survey." IMF Staff Papers, Vol. 35, no. 1 (March).

Marshall, J. and Klaus, Schmidt-Hebbel (1991), "Macroeconomics of public sector deficits: the case of Chile." WPS 696. World Bank, Country Economics Department, Washington D.C.

Mbanefoh, G. (1982), "Sources and consequences of deficit financing in the Nigerian economy," paper presented at the workshop on Deficit Financing and the Nigerian Economy, University of Ibadan.

Metzler, Lloyd A. (1951), "Wealth, saving and the rate of interest." The Journal of Political Economy, 52, 2 (April).

Modigliani, Franco (1961), "Long-run implication of alternative fiscal policies and the burden of the national debt." Economic Journal (December). 92-109.

Morandé, F. and Klaus, Schmidt-Hebbel. (1991), "Macroeconomics of public sector deficits: the case of Zimbabwe." World Bank, Coutry Economics Department, Washington D.C.

Mundell, Robert A. (1971), "Money, debt and the rate of interest", in Monetary Theory, edited by R. Mundell, Pacific Palisades, California, Goodyear.

Musgrave, Richard (1959), The theory of public finance, New York, McGraw-Hill. 628p.

Ndekwu, C. (1979), Government borrowing, money supply and monetary policy in Nigeria: government's monetary impact in a mixed economy, Ibadan, NISER. 270p.

Nigeria. Federal Ministry of Information (1975), First report of the anti-inflation task force. 100p

Niskanen, William A. (1978), "Deficits, government spending and inflation: what is the evidence?" Journal of Monetary Economics, Vol. 4, 591-602.

Odedokun, M.O. (1990), "Flow of funds models as a tool for analysing behaviour of Nigerian State Governments: evidence from the civilian era." World Development, London (May) 8 (5), 743-52.

Ojo, Oladeji (1974), "The demand for money in the Nigerian economy: some comments." The Nigerian Journal of Social and Economic Studies, 16(1) 149-52.

Okunrounmu, T.O. (1992), "A review of developments in domestic debt in Nigeria, 1960-1991." Lagos, Central Bank of Nigeria, Research Department Occasional Paper, no.4. 28p.

Olivera, J.H.G. (1964), "On structural inflation and Latin American structuralism." Oxford Economic Papers November), 6(3), 321-32.

Omorogiuwa, P.A. (1983), "Deficit financing with special reference to Nigeria", Paper presented at the Workshop on Deficit Financing, Ibadan.

Onitiri, A.M. & Awosika, K. (1982), Inflation in Nigeria, NISER, Ibadan. 390p.

Oyejide, T.A. (1972), "Deficit financing, inflation and capital formation: an analysis of the Nigerian experience, 1957-70." The Nigerian Journal of Economic and Social Studies, Vol. 14, No. 1 (March). 27-42.

Patinkin, Don (1965), Money, interest and prices:an integration of monetary and value theory, New York, Harper and Row. 708p.

Pierce, D.A. (1977), "Relationships and the lack thereof between economic time series with special reference to money and interest rates." Journal of the American Statistical Association, Vol. 72 (March), PP. 11-22.

Pindyck, R.S. & D.L. Rubinfeld (1981), Econometric models and economic forecasts. Second edition; Auckland, McGraw-Hill. 630p.

Ramangkura, V. and Bhanupongse Nidhiprabha. (1991), "The macroeconomics of the public sector deficit: the case of Thailand." WPS 633. World Bank, Country Economics Department, Washington D.C.

Ricardo, David (1951), "Funding system", (Works and Correspondence of David Ricardo), edited by P. Sraffa, Cambridge University Press, London, Vol. IV.

Rodriguez, Carlos A. (1991), "The

macroeconomics of the public sector deficit: the case of Argentina." WPS 632. World Bank Country Econmics Department, Washington D.C.

Seater, John J. (1982), "Are future taxes discounted?" Journal of Money Credit and Banking, 14, 3 (August), 376-89.

Seater, John J. and Roberto S. Mariano (1985), "New tests of the life cycle and tax discounting hypotheses." Journal of Monetary Economics, 15, 195-215.

Sharp, A.M. and Flennikan, P.S. (1978), "Budget deficits: a major cause of inflation?", Public Finance Quarterly, 6(1).

Sims, Christopher A. (1972), "Money, income and causality." American Economic Review, 62, (September), PP. 540-52.

Singh, B. and Sahni, B.S. (1984), "Causality between public expenditure and national income." The Review of Economics and Statistics, November, no. 4, 630-44.

Sunkel, O. (1960), "Inflation in Chile: an unorthodox approach." International Economic Papers , no. 10 107-31.

Tanner, J.E. (1979), "Fiscal policy and consumer behaviour." Review of Economics and Statistics, August. 61, 317-21.

Tanzi, V. and Bledjer M.(1984), "Fiscal deficits and balance of payments disequilibrium in IMF adjustment programmes", in J. Muns, ed., Adjustment, Conditionality and International Financing. IMF, Washington D.C.

Thompson, E.A. (1967), "Debt instrument and capital theory." American Economic Review (December), 1196-1210.

Tobin, James (1971), Essays in Economics, Vol. 1, Macroeconomics, Amsterdam, North-Holland. 526p.

Ubogu, R.E. (1983), "Deficit financing and the Nigerian economy", Paper presented at the Workshop on Deficit Financing, University of Ibadan.

Ubok-Udom, U.E. (1978), "Development through debt: rationalising the cost of external borrowing." The Nigerian Journal of Economic and Social Studies, Vol. 20, No. 2, (July), Nigerian Economic Society, Ibadan, 212-18.

US Council of Economic Advisers (1974), "Financing a federal deficit" in W.L. Smith and R. L. Teigen (1974), Readings in Money, National Income and Stabilisation Policy, Richard D. Irwin, Inc., Homewood, Illinois, 312-15.

Usman, S. (1983), "The constitutional, economic and other implications of deficit financing at the federal, state and local government levels in Nigeria", Paper presented at the Workshop on Deficit Financing, University of Ibadan.

Vickery, William (1961), "The burden of the public debt: comment." American Economic Review (March). 132-37.

Vogel, R.C. (1974), "The dynamics of inflation in Latin America, 1950-69." American Economic Review, Vol. LXIV, (March).

White, William H. (1951), "Measuring the inflationary significance of a government budget." Staff Papers, I.M.F. 355-78.

---------- (1978), "Improving the demand for money in moderate inflation." Staff Papers, I.M.F. Vol. 25 (September). 564-607.

World Bank (1974), Nigeria: options for long-term development. Baltimore, John Hopkins university press. 256p.

APPENDIX ONE

Model identification

The existence of right-hand side endogenous variables in a simultaneous equation model makes it inevitable that ordinary least squares (OLS) estimates of the structural model will be inconsistent. Nonetheless, ols estimates of the reduced form will be consistent. since only pre-determined variables appear on the right hand- side of the reduced form model. the task of expressing the coefficients of the explanatory variables in terms of the reduced form coefficients (the πs) is the identification problem. A structural parameter is said to be identified if and only if it can be uniquely determined from the set of reduced form parameters.

Since the theoretical model of this study

comprises of a number of equations thereby requiring estimation by an appropriate simultaneous equation technique, it is necessary to first identify the model as done below using the rank and order conditions for identification. The task of model identification is made easier if a distinction is made between endogenous and exogenous variables as well as between the structural and reduced forms of the model. The model under investigation consists of six behavioural equations.

Let:

Y_{it} = endogenous variables

X_{it} = pre-determined variables

β_{ij} = Coefficients of endogenous variables

γ_{ij} = Coefficients of predetermined variables

The variables in the structural model can thus be represented thus:

Endogenous	Pre-determined
$P_t = Y_{1t}$	$Y_t = X_{1t}$
$MS_t = Y_{2t}$	$BR_t = X_{2t}$
$B_t = Y_{3t}$	$PDC_t = X_{3t}$

$GSB_t = Y_{4t}$ $GSC_t = X_{4t}$

$G_t = Y_{5t}$ $ER_t = X_{5t}$

$RV_t = Y_{6t}$ $MS_t-1 = X_{6t}$

$\pi_t = X_{7t}$

$B_t-1 = X_{8t}$

$GSB_t-1 = X_{9t}$

$RV_{t-1} = X_{10t}$

$G_{t-1} = Xt-1$

With these notations, the structural form of the model can be represented thus:

$$Y_{1t} + \beta_{11}Y_{2t} + \gamma_{12}X_{1t} + \gamma_{13}X_6t = \mu_{1t}$$

$$Y_{2t} + \beta_{21}Y_{3t} + \gamma_{22}X5_t + \gamma_{23}X_6t = \mu_{2t}$$

$$Y_{3t} + \beta_{31}Y_{4t} + \gamma_{32}X_{2t} + \gamma_{33}X_7t = \mu_{3t}$$

$$Y_{4t} + \beta_{41}Y_{5t} + \gamma_{42}X_4t + \gamma_{43}X9t = \mu_{4t}$$

$$Y_{5t} + \beta_{51}Y6_t + \gamma_{52}X_3t + \gamma_{53}X11_t = \mu_{5t}$$

$$Y_{6t} + \beta_{61}Y_1t + \gamma_{62}X_{1t} + \gamma_{63}X_{10}t = \mu_{6t}$$

The reduced form of the model is as below where the πs are the reduced form coefficients:

$$Y1 = \pi 12X_1 + \pi_{13}X_6$$

$$Y_2 = \pi_{22}X_5 + \pi_{23}X_6$$

$$Y_3 = \pi_{32}X_2 + \pi_{33}X7$$

$$Y_4 = \pi_{42}X4 + \pi_{43}X9$$

$$Y_5 = \pi_{52}X3 + \pi_{53}X_{11}$$

$$Y_6 = \pi_{62}X_1 + \pi_{63}X_{10}$$

The complete table of reduced form coefficients is formed below:

Table of reduced form coefficients

Eqn	X_{1t}	X_{2t}	X_{3t}	X_{4t}	X_{5t}	X_{6t}	X_{7t}	X_{8t}	X_{9t}	X_{10t}	X_{11t}
1	π_{12}	0	0	0	0	0	π_{13}	0	0	0	0
2	0	0	0	0	π_{22}	π_{23}	0	0	0	0	0
3	0	π_{32}	0	0	0	0	0	π_{33}	0	0	0
4	0	0	0	π_{42}	0	0	0	0	π_{43}	0	0
5	0	0	π_{52}	0	0	0	0	0	0	0	π_{53}
6	π_{61}	0	0	0	0	0	0	0	0	π_{63}	0

The rank conditon for identification states that:

> in a system of equations, any particular equation is identified if and only if it is possible to construct at least one non-zero determinant of order (G-1) from the coefficients of variables excluded from that particular equation but contained in other equations of the model.[132]

This condition will now be applied to our model equation by equation. In doing this, the rows corresponding to the endogenous variables excluded as well as the columns referring to

[132]Footnote 98, p.

exogenous variables included in the structural form of the equation being examined for identification are ruled. Thus in the first equation, the excluded endogenous variables are Y_3-Y_6 while the included exogenous variable is X_1. In the second equation, the excluded endogenous variables are Y_1 and Y_4-Y_6, whereas the included exogenous variable is X_5. In the third equation, the excluded endogenous variables are Y1, Y2, Y5 and Y6, while the included exogenous variable is X_2. In the fourth equation, the excluded endogenous variables are Y_1-Y_3 and Y_6 , with X_4 as the included exogenous variable. The fifth equation has Y_1-Y_4 as the excluded endogenous variables with X3 as the included exogenous variable. In the last equation, the excluded endogenous variables are Y_2-Y_5, whereas the included exogenous variable is X_1.

To identify the first equation using the rank condition, strike out the first row and the first and seventh columns to get a table of coefficients of reduced form coefficients of exogenous variables absent from the structural

equation:

	0	0	π_{22}	$\pi 23$	0	0	0	0
	0	0	0	0	π_{33}	0	0	0
	0	π_{42}	0	0	π_{43}	0	0	0
	π_{52}	0	0	0	0	0	0	π
	0	0	0	0	0	0	$\pi 63$	0

With these coefficients, the following G-1 = leterminants can be formed:

$$\begin{vmatrix} 0 & 0 \\ 0 & \pi_{22} \end{vmatrix} \quad \begin{vmatrix} 0 & 0 \\ 0 & \pi 23 \end{vmatrix} \quad \begin{vmatrix} \pi_{32} & 0 \\ 0 & \pi 22 \end{vmatrix} \quad \begin{vmatrix} \pi_{32} & \pi_{33} \\ 0 & 0 \end{vmatrix} \quad \begin{vmatrix} \pi_{32} & 0 \\ 0 & \pi 43 \end{vmatrix}$$

From the above, the highest non-zero determinant is of order 1 * 1. Given that the number of endogenous variables in the equation, G* = 2, the order of the largest non-zero determinant is equal to G*-1. The rank condition is thus satisfied for equation one. Similar steps taken with respect to equations 2-6 yield the same outcome.

The order condition which is necessary but not sufficient for a model to be identified states that the number of pre-determined variables

excluded from an equation should be at least equal to the number of included endogenous variables minus one. Symbolically, this condition is expressed as:

$K - M \geq G-1$

where:

G = total number of equations

K = total number of variables in the model

M = total number of variables in an equation

The order condition is satisfied in all cases as the following results show:

Y1 : 17 - 4 > 5

Y2 : 17 - 4 > 5

Y3 : 17 - 4 > 5

Y4 : 17 - 4 > 5

Y5 : 17 - 4 > 5

Y6 : 17 - 4 > 5

By the order condition, all the equations were found to be over-identified.

Table 2.1

Federal government revenue, expenditure and deficit/surplus, 1966–85			
Year	Revenue =N=M	Expenditure =N=M	Deficit/ Surplus =N=M
1966	321.8	251.3	70.5
1967	339.2	257.9	81.3
1968	300.2	336.1	(35.9)
1969	300.0	522.7	(222.7)
1970	633.2	1,100.8	(467.6)
1971	1,169.0	969.8	199.2
1972	1,404.8	1,298.3	106.5
1973	1,695.3	1,398.2	297.1
1974	4,537.0	2,740.6	1,796.4
1975	5,514.7	8,218.3	(2,703.6)
1976	6,765.9	9,701.5	(2,935.6)
1977	8,042.4	11,695.4	(3,653.0)
1978	7,469.3	12,337.1	(4,867.8)
1979	8,868.4	8,024.6	843.8
1980	12,993.3	14,417.6	(1,424.3)
1981	7,068.3	10,770.8	(3,702.5)
1982	7,500.0	15,368.2	(7,868.2)
1983	6,234.1	11,525.0	(5,290.9)
1984	6,638.5	11,686.4	(5,047.9)
1985	9,640.3	14,828.6	(5,188.3)

Sources: (i) Annual Report and Statement of Accounts

(ii) Budget Speeches

TABLE 2.2

Consolidated states government revenue, expenditure and deficit, 1966–85

Year	Revenue =N= M	Expenditure =N= M	Deficit =N= M
1966/67	181.2	235.1	(53.9)
1967/68	117.9	177.7	(59.8)
1968/69	144.6	181.6	(37.0)
1969/70	232.2	247.5	(15.3)
1970/71	393.0	444.0	(51.0)
1971/72	454.1	594.0	(139.9)
1972/73	420.8	670.5	(249.7)
1973/74	510.3	920.0	(409.7)
1974/75	837.9	1,579.1	(741.2)
1975/76	1,830.3	3,059.2	(1,228.9)
1976/77	2,139.1	4,657.6	(2,518.5)
1977/78	2,729.4	6,339.9	(3,610.5)
1978/79	2,575.9	4,268.1	(1,692.2)
1979/80	3,408.5	5,508.2	(2,099.7)
1980/81	5,479.3	8,952.1	(3,472.8)
1981	5,965.7	10,990.9	(5,025.2)
1982	5,232.5	10,680.5	(5,448.0)
1983	4,412.2	11,485.4	(7,073.2)
1984	4,582.4	7,064.9	(2,482.5)
1985	4,844.9	7,017.7	(2,172.8)

Sources: (i) Annual Report and Statement of Accounts, CBN, various isues
(ii) Budget Speeches

TABLE 2.3

Total national revenue, expenditure and deficit, 1966–85

Year	Revenue =N= M	Expenditure =N= M	Deficit/ Surplus =N= M
1966	503.0	486.4	16.6
1967	457.1	435.6	21.5
1968	444.8	517.7	(72.9)
1969	532.2	770.2	(238.0)
1970	1,026.2	1,544.8	(518.6)
1971	1,623.1	1,563.8	59.3
1972	1,825.6	1,968.8	(143.2)
1973	2,205.6	2,318.6	(113.0)
1974	5,374.9	4,319.7	1,055.2
1975	7,345.0	11,277.6	(3,932.6)
1976	8,905.0	14,359.1	(5,454.1)
1977	10,771.8	18,035.2	(7,263.4)
1978	10,045.2	16,505.2	(6,460.0)
1979	12,276.9	13,532.8	(1,255.9)
1980	17,618.0	23,368.6	(5,750.6)
1981	13,034.4	21,761.7	(8,727.3)
1982	12,732.5	26,048.7	(13,316.2)
1983	10,646.3	23,010.4	(12,364.1)
1984	11,520.9	18,751.3	(7,230.4)
1985	15,443.2	21,846.3	(6,403.1)

Source: Calculated From Tables 2.1 and 2.2

TABLE 2.4

State governments' revenue, expenditure as a percentage of total national revenue and expenditure 1966–85

Year	REVENUE			EXPENDITURE		
	National =N= M	Federal =N= M	Federal/ National %	National =N= M	Federal =N= M	Federal/ National %
1966	503.0	321.8	64.0	486.4	251.3	51
1967	457.1	339.2	74.2	435.6	257.9	59
1968	444.8	300.2	67.5	517.7	336.1	64
1969	532.2	300.0	56.4	770.2	522.7	67
1970	1,026.2	633.2	61.7	1,544.8	1,100.8	71
1971	1,623.1	1,169.0	72.0	1,563.8	969.8	62
1972	1,825.1	1,404.8	77.0	1,968.8	1,298.3	65
1973	2,205.6	1,695.3	76.9	2,318.6	1,398.2	60
1974	5,374.9	4,537.0	84.4	4,319.7	2,740.6	63
1975	7,345.0	5,514.7	75.1	11,277.6	8,218.3	72
1976	8,905.0	6,765.9	76.0	14,359.1	9,701.5	67
1977	10,771.8	8,042.4	74.7	18,035.2	11,695.4	64
1978	10,045.2	7,469.3	74.4	16,505.2	12,337.1	74
1979	12,276.9	8,868.4	72.2	13,532.8	8,024.6	59
1980	17,618.0	12,993.3	73.8	23,368.6	14,417.6	61
1981	13,034.0	7,068.3	54.2	21,761.7	10,770.8	49
1982	12,732.5	7,500.0	58.9	26,048.7	15,368.2	59
1983	10,646.3	6,234.1	58.6	23,010.4	11,525.0	50
1984	11,520.9	6,638.5	57.6	18,751.3	11,686.4	6
1985	15,443.2	9,640.3	62.4	21,846.3	14,828.6	6

Source: calculated from tables 2.2 and 2.3

TABLE 2.4

State governments' revenue, expenditure as a percentage of total national revenue and expenditure 1966–85

Year	REVENUE			EXPENDITURE		
	National =N= M	Federal =N= M	Federal/ National %	National =N= M	Federal =N= M	Federal/ National %
1966	503.0	321.8	64.0	486.4	251.3	51.7
1967	457.1	339.2	74.2	435.6	257.9	59.2
1968	444.8	300.2	67.5	517.7	336.1	64.9
1969	532.2	300.0	56.4	770.2	522.7	67.9
1970	1,026.2	633.2	61.7	1,544.8	1,100.8	71.3
1971	1,623.1	1,169.0	72.0	1,563.8	969.8	62.0
1972	1,825.1	1,404.8	77.0	1,968.8	1,298.3	65.9
1973	2,205.6	1,695.3	76.9	2,318.6	1,398.2	60.3
1974	5,374.9	4,537.0	84.4	4,319.7	2,740.6	63.4
1975	7,345.0	5,514.7	75.1	11,277.6	8,218.3	72.9
1976	8,905.0	6,765.9	76.0	14,359.1	9,701.5	67.6
1977	10,771.8	8,042.4	74.7	18,035.2	11,695.4	64.8
1978	10,045.2	7,469.3	74.4	16,505.2	12,337.1	74.7
1979	12,276.9	8,868.4	72.2	13,532.8	8,024.6	59.3
1980	17,618.0	12,993.3	73.8	23,368.6	14,417.6	61.7
1981	13,034.0	7,068.3	54.2	21,761.7	10,770.8	49.5
1982	12,732.5	7,500.0	58.9	26,048.7	15,368.2	59.0
1983	10,646.3	6,234.1	58.6	23,010.4	11,525.0	50.1
1984	11,520.9	6,638.5	57.6	18,751.3	11,686.4	62.3
1985	15,443.2	9,640.3	62.4	21,846.3	14,828.6	67.9

Source: calculated from tables 2.2 and 2.3

TABLE 2.5

State governments' revenue and expenditure as a percentage of total national revenue and expenditure, 1966–85

	REVENUE			EXPENDITURE		
Year	National =N= M	States =N= M	States/ National %	National =N= M	States =N= M	States/ National %
1966	503.0	181.2	36.0	486.4	235.1	48.3
1967	457.1	117.9	25.8	435.6	177.7	40.8
1968	444.8	144.6	32.5	517.7	181.6	35.1
1969	532.2	232.2	43.6	770.2	247.5	32.1
1970	1,026.2	393.0	38.3	1,544.8	444.0	28.7
1971	1,623.1	454.1	28.0	1,563.8	594.0	38.0
1972	1,825.1	420.8	23.1	1,968.8	670.5	34.1
1973	2,205.6	510.3	23.1	2,318.6	920.0	39.7
1974	5,374.9	637.9	11.9	4,319.7	1,579.1	36.6
1975	7,345.0	1,830.3	24.9	11,277.6	3,059.2	27.1
1976	8,905.0	2,139.1	24.0	14,359.1	4,657.6	32.4
1977	10,771.8	2,729.4	25.3	18,035.2	6,339.9	35.2
1978	10,045.2	2,575.9	25.6	16,505.2	4,268.1	25.9
1979	12,276.9	3,408.5	27.8	13,532.8	5,508.2	40.7
1980	17,618.0	5,479.3	31.1	23,368.6	8,952.1	38.3
1981	13,034.0	5,965.7	45.8	21,761.7	10,990.9	50.5
1982	12,732.5	5,232.5	41.1	26,048.7	10,680.5	41.0
1983	10,646.3	4,412.2	41.4	23,010.4	11,485.4	49.9
1984	11,520.9	4,582.4	39.8	18,751.3	7,064.9	37.7
1985	15,443.2	4,844.9	31.4	21,846.3	7,017.7	32.1

Source: calculated from tables 2.2 and 2.3

TABLE 2.7

rcentage changes in states government venue, expenditure and deficit, 1966–85.

ear	Revenue (%)	Expenditure (%)	Deficit/ Surplus (%)
966	0.0	0.0	0.0
967	(35.3)	24.4	10.9
968	22.6	2.2	(38.1)
969	60.6	36.3	508.9
970	69.3	79.4	(77.4)
971	15.5	33.8	174.3
1972	7.3	12.9	78.5
1973	21.3	37.2	64.1
1974	64.0	71.6	81.0
1975	118.0	94.0	66.0
1976	17.0	52.0	105.0
1977	28.0	36.0	43.0
1978	(6.0)	(32.7)	(53.0)
1979	32.0	29.0	24.0
1980	60.8	62.5	65.4
1981	8.9	22.8	40.6
1982	(12.3)	(2.8)	10.0
1983	15.7	3.8	31.6
1984	3.9	(38.5)	(64.9)
1985	5.7	(0.6)	(12.5)

Source: Computed From Table 2.2

TABLE 2.9

Fuctional distribution of federal government capital expenditure 1966–85				
Year	Admin. =N= M	Economic Servces =N= M	Social & Comm. Serv. =N= M	Transfers =N= M
1966	16.4	44.6	6.0	37.8
1967	69.6	49.2	3.8	15.2
1968	67.0	36.6	1.8	32.4
1969	118.0	35.2	3.4	18.4
1970	145.1	43.3	3.2	29.3
1971	63.1	58.1	13.2	39.3
1972	108.8	132.9	42.0	167.6
1973	133.8	249.5	40.4	142.0
1974	268.4	465.9	358.2	456.9
1975	747.8	1,314.1	927.4	528.3
1976	795.4	2,231.4	899.7	292.9
1977	1,013.4	3,124.5	824.9	479.5
1978	989.9	2,949.9	1,090.8	166.4
1979	769.5	2,812.1	613.3	642.6
1980	1,288.5	5,448.7	1,324.0	334.4
1981	720.1	3,548.4	1,380.0	48.4
1982	763.2	3,036.4	1,399.7	2,751.0
1983	801.8	2,475.1	729.1	1,862.6
1984	4,103.6	1,625.3	493.4	3,705.3
1985	5,047.7	2,283.9	1,337.7	3,409.7

Source: Economic and Financial Review, CBN, Various Issues

TABLE 2.8

Functional distribution of federal government recurrent expenditure, 1966–85				
Year	Admin.(1) =N= M	Economic Servces (2 =N= M	Social & Comm.Serv =N= M	Transfers (4) =N= M
1966	75.3	22.6	19.0	71.0
1967	92.4	21.0	19.4	51.8
1968	153.5	21.2	11.0	73.0
1969	320.0	20.8	15.8	123.6
1970	458.7	24.3	16.5	138.8
1971	338.5	31.4	20.4	102.6
1972	498.3	46.2	29.5	107.5
1973	454.3	52.4	31.1	118.4
1974	522.6	74.4	94.9	182.1
1975	1,060.5	131.8	287.5	215.2
1976	913.5	141.8	634.6	982.6
1977	1,040.4	192.1	368.1	747.4
1978	1,259.5	206.4	529.6	432.2
1979	999.5	113.4	511.0	1,563.2
1980	1,917.4	468.6	807.7	2,828.3
1981	2,993.8	484.9	984.9	1,275.5
1982	2,346.1	415.1	787.0	3,869.7
1983	2,841.9	389.3	433.6	2,241.2
1984	2,677.3	326.9	768.0	2,503.5
1985	2,638.2	315.4	1,132.2	3,129.5

(1) General Administration, Defence, Internal Security.
(2) Agriculture, Construction, Transport And Communication, Other Economic Services.
(3) Education, Health, Others
(4) Public debt charges, Pensions and Gratuities, non–statutory appropriation to states, Others

Source: Economic and Financial Review; CBN, Various Issues

TABLE 2.10

Federal government sources of revenue, 1966–85

Year	Direct Taxes (1) =N= M	Indirect Taxes (2) =N= M	Other Revenue (3) =N= M
1966	22.6	113.0	70.3
1967	36.4	186.3	77.0
1968	35.4	202.6	60.6
1969	59.3	277.8	163.5
1970	144.6	369.3	93.4
1971	451.1	491.0	266.7
1972	624.4	481.1	299.1
1973	852.9	516.2	326.2
1974	3,032.1	498.2	1,006.5
1975	2,990.2	760.7	1,763.3
1976	3,852.4	882.8	2,030.7
1977	4,839.2	1,142.4	2,057.4
1978	3,962.3	1,698.3	1,710.5
1979	5,753.7	1,143.9	4,014.3
1980	9,161.1	1,813.5	4,259.4
1981	6,827.3	2,535.5	2,817.4
1982	5,608.0	2,482.7	3,673.7
1983	4,330.9	1,985.2	4,192.5
1984	5,581.0	1,616.0	4,569.8
1985	7,789.8	2,183.5	4,707.5

Profit Tax, Capital Gains and Other Taxes,
Capital Gains, Casino and Other Taxes.

and Miscellaneous (Fees, Licences, ETC)

Various Issues.

(ii) Annual Report and Statement of Accounts;
CBN. Various Issues.

(iii) Nigeria's Principal Economic &
Financial Indicators 1970–85. CBN

Summary of federal and state governments' actual capital expenditure. 1975/76 – 1979/80

	Federal =N= M	States =N= M
Economic Services (1)	14,578,321 (65%)	2,608,918 (37%)
Social Services (2)	2,215,593 (10%)	1,832,437 (26%)
Regonal Dev. (3)	1,099,996 (5%)	2,014,390 (28%)
Administration (4)	22,333,660 (20%)	646,355 (9%)
TOTAL	22,333,660	7,102,100

(1) Econonmic Sector includes Agriculture, Mining and Quarrying, Manufacturing, Commerce, Transport, Power, Communication, etc
(2) Social Services comprises Education,
(3) Regional Development refers to provision of water, Housing, Community Development, Sewerage Disposal, Town/ Country Pla
(4) Administration here includes Security and Defence

Source: Fouth National Development Plan, Federal Ministry National Planning, 1981, P.29.

TABLE 2.12

Components of states government revenue, 1977/78–1985

Year	Recurrent Revenue(1) =N= M	Statutory Allocat.(2) =N= M	Internal Revenue(3) =N= M	Loans (4) =N= M	3 as % of 1 (5)
1977/78	2,729.4	2,390.5	463.0	448.5	17.0
1978/78	2,575.9	1,637.1	518.0	437.2	20.0
1979/80	3,391.0	3,657.0	627.0	640.0	18.0
1980	5,479.3	3,776.0	1,703.3	1,221.0	31.1
1981	6,432.3	3,825.7	1,049.0	2,016.0	16.3
1982	5,232.5	3,245.7	1,986.8	1,878.0	37.9
1983	4,647.1	3,239.8	2,050.3	2,749.8	25.9
1984	4,180.3	2,799.0	1,381.3	1,765.1	62.2
1985	4,844.9	3,260.8	1,584.1	1,343.9	40.7

(1) Net of any deductions arising from loan or other obligations to the Federal Government

(2) Personal Income Tax, Interests and Dividends, Re–imbursements, Earnings etc.

Sources: (i) Annual Report and Statement of Accounts, CBN.

(ii) Okigbo Commission Report, Table 5.2, 1980

TABLE 2.13

Recurrent revenues of the federal government, 1961–70

Year	Import duties Nm	Export duties Nm	Excise duties Nm	Corp. income tax Nm	Petroleum profits tax Nm	Mining rents & royalties Nm	Other tax revenues Nm	Other non–tax revenue Nm	Total recurrent revenues Nm	Revenues transferred to states Nm	Revenues retained by FG Nm
1961	120.4	27	12.8	9.2	n.a.	8.6	5.8	39.8	223.6	66.8	156.8
1962	118	25	13	12	n.a	26.2	5.4	39.2	238.8	72	166.8
1963	122.6	27	18.6	12.4	n.a.	17	4.4	47	249	75.6	173.4
1964	151.6	29.8	24.4	9.6	0.8	19.8	4.8	36.8	277.6	113	164.6
1965	169.6	31.6	33	13	2.6	25.6	5.6	40	331	130.8	200.2
1966	117	28.6	67.4	16.8	5.8	20.8	3.6	46.4	306.4	121.4	185
1967	107.2	30	49.6	24.2	12.2	34	8	35	300.2	122.8	177.4
1968	116.4	29.8	56.4	30.2	5.2	21.8	0.4	39.6	299.8	106	193.8
1969	161.4	38.4	78	36	23.8	45.8	0.8	51.6	435.8	179.4	256.4
1970	231	41	131.8	55.4	132.8	72.8	1.2	89.6	755.6	286.8	468.8

Sources: (i) Central Bank of Nigeria and Official Gazettes of FRN
(ii) Nigeria: Options for Long–term Development;

Washington D. C. the World Bank, 1974, p.229.

TABLE 2.14
'Federal government finances, 1966/67–1970/71

	1966/67	1967/68	1968/69	1969/70	1970/71
Recurrent Revenue	339.2	300.2	299.8	435.8	754.0
(Taxes on International–trade) (=N=)	(141.8)	(137.2)	(146.2)	199.8	(274.0)
(Oil Revenues) (=N=M)	(42.6)	46.2	(27.0)	(79.6)	(205.6)
(Others) (=N=M)	(154.8)	(116.6)	(126.6)	(148.2)	(231.2)
Transfers to the States (=N=M)	137.2	122.8	106.0	179.4	286.8
Revenues Retained (N=M)	202.0	177.4	193.8	256.4	468.8
Recurrent Expenditures (=N=M	199.6	252.0	323.0	592.2	542.8
(Defence and Internal–Security) (=N=)	(47.6)	(123.6)	(183.0)	(38.4)	(345.6)
Current Surplus/Deficit (+/–)	2.4	(74.6)	(129.2)	(335.8)	(74.0)
Capital Expenditures (=N=M)	93.6	70.4	74.6	63.0	84.0
Overall Budget Deficit (+/–)	(91.2)	(145.0)	(203.8)	(398.8)	(158.0)

a. Includes capital expenditures on defence and internal security
B. Excludes defence and internal security but includes capital transfers to states

Source: Same as Table 2.13

::

TABLE 2.15

	1961	1962	1963	1964	1965	1966
Recurrent Revenues	117.2	130.4	135.4	169.8	194.0	181.2
(Of Which Transfers From Fed. Govt.)	(66.8)	(72.0)	(75.6)	(113.0)	(130.8)	(121.4)
Recurrent Expenditures	115.6	138.2	127.4	143.8	167.6	172.2
Current Surplus/ Deficit	1.6	(7.8)	8.0	26.0	26.4	9.0
Federal Capital– Loan/Grants	89.0	234.8	18.0	10.4	20.4	29.2
Capital Expenditures	56.8	56.2	55.6	62.6	41.0	64.0
Overall Budget – Deficit (–)	(46.2)	(29.2)	(29.6)	(14.2)	(14.2)	(14.2)

Source: Same as Table :

TABLE 2.16

Source of financing federal government budget deficit, 1966–85

Year	External Loans =N=M	Internal Loans =N=M	Other Funds =N=M	Deficit (–) Surplus (+) =N=M
1966/67	42.8	46.2	2.2	(91.2)
1967/68	27.6	105	2.4	(145)
1968/69	3.6	197.8	2.2	(203.6)
1969/70	3.4	394.8	0.6	(398.8)
1970	1	454.1	18	(473.1)
1971	4.9	120.5	324.6	196
1972	51.1	123.4	270.5	96
1973	276.9	208.4	782	296.7
1974	45.5	215.4	2,057.7	1,796.8
1975	27	400.4	–	(427.4)
1976	24.1	1,064.1	–	(1,068.2)
1977	9.5	790.9	(91.6)	(901.5)
1978	1,500	1,257.0	368	(2,389.0)
1979	363.8	397.3	2,222.8	1,461.7
1980	255.3	636.2	1,083.7	(1,975.2)
1981	464.4	3,527.0	(282.9)	(3,708.5)
1982	263.5	3,402.0	1,222.6	(4,888.1)
1983	1,106.9	7,376.8	(5,119.2)	(3,364.5)
1984	1,184.5	3,450.2	(5,830.5)	(10,465.2)
1985	1,045.9	2,277.0	18,656.6	(5,188.5)

Source: Annual Report and Statement of Account, CBN, various issues

TABLE 2.17

Federal deficit as a percentage of federal expenditure &GDP

Year	Revenue =N=M	Expenditure =N=M	Deficit/ Surplus =N=M	Real Income =N=M	Deficit/ Expend. %	Deficit/ Income %
1966	321.8	251.3	70.5	13,868.9	28.1	0.5
1967	339.2	257.9	81.3	11,662.5	31.5	0.7
1968	300.2	336.1	(35.9)	11,662.5	(10.7)	(0.3)
1969	300.0	522.7	(222.7)	14,814.5	(42.6)	(1.5)
1970	633.2	1,100.8	(467.6)	19,227.4	(42.5)	(2.4)
1971	1,169.0	969.8	199.2	21,433.8	20.5	0.9
1972	1,404.8	1,298.3	106.5	22,694.6	8.2	0.5
1973	1,695.3	1,398.2	297.1	23,955.4	21.2	1.2
1974	4,537.0	2,740.6	1,796.4	26,161.9	65.5	6.9
1975	5,514.7	8,218.3	(2,703.6)	26,792.3	(32.9)	(10.1)
1976	6,765.9	9,701.5	(2,935.6)	29,313.9	(30.3)	(10.0)
1977	8,042.4	11,695.4	(3,653.0)	31,520.3	(31.2)	(11.6)
1978	7,469.3	12,337.1	(4,867.8)	29,212.4	(39.5)	(16.7)
1979	8,868.4	8,024.6	843.8	29,948.0	10.5	2.8
1980	12,993.3	14,417.6	(1,424.3)	31,546.8	(9.9)	(4.5)
1981	7,068.3	10,770.8	(3,702.5)	28,899.2	(34.4)	(12.8)
1982	7,500.0	15,368.2	(7,868.2)	27,974.1	(51.2)	(28.1)
1983	6,234.1	11,525.0	(5,290.9)	26,217.9	(45.9)	(20.2)
1984	6,638.5	11,686.4	(5,047.9)	24,845.5	(43.2)	(20.3)
1985	9,640.3	14,828.6	(5,188.3)	26,158.7	(35.0)	(19.8)

Source: computed from Tables 2.1 and 7.14

TABLE 2.18

Means of financing state governments' deficits*

Year	Deficit	Federal Grants =N= M	Dev. Stocks =N= M	External Loans =N= M	Unspecifie =N=M	Misce– llaneous =N=M
1980	3,472.8	161.9	787.4	433.6	2,089.9	–
1981	4,882.6	142.6	748.6	1,267.4	3,267.5	152.4
1982	5,373.1	74.9	546.8	1,331.2	3,192.0	303.1
1983	6,838.3	44.5	538.7	2,311.1	3,342.8	692.2
1984	2,561.4	58.8	446.9	1,318.2	570.1	167.4
1985	1,518.2	78.1	270.8	1,073.1		96.2

*Excludes the federal territory, Abuja.

Source: Annual Report and Statement of Acounts;
CBN various issues.

TABLE 2.19

Federal government total, external and internal debt, 1966–85

Year	Total Debt =N=M	External Debt =N=M	Internal– Debt =N=M
1966	284.8	140.4	144.4
1967	536.4	168.0	368.4
1968	729.0	171.6	557.4
1969	1,017.8	176.5	841.3
1970	1,195.0	175.4	1,019.6
1971	1,225.8	178.6	1,047.2
1972	1,108.7	263.4	845.3
1973	1,207.5	276.9	930.6
1974	1,263.1	322.4	940.7
1975	1,718.3	349.9	1,368.4
1976	2,804.0	374.6	2,429.4
1977	4,578.7	365.1	4,213.6
1978	4,419.2	1,252.1	3,167.1
1979	6,578.9	1,611.5	4,967.4
1980	9,819.2	1,866.8	7,952.4
1981	11,030.1	2,331.2	8,698.9
1982	18,601.9	6,801.0	11,800.9
1983	27,454.5	8,576.8	18,877.7
1984	34,405.9	12,077.2	22,328.7
1985	38,300.7	13,962.0	24,338.7

(ii) Nigeria's principal economic and financial indicators 1970–1985

TABLE 2.20

Share of total, internal andexternal debt
of federal government in nominal GDP (%)

Year	TD/Q	ED/Q	ID/Q
1966	5.2	4.2	1.0
1967	7.4	6.1	1.3
1968	8.7	6.5	2.2
1969	6.8	5.0	1.8
1970	5.4	3.3	2.1
1971	19.1	2.7	16.4
1972	17.5	3.7	13.8
1973	12.2	2.5	9.7
1974	8.6	1.8	6.8
1975	9.7	1.7	8.0
1976	11.3	1.4	9.9
1977	15.9	1.2	14.7
1978	20.9	3.6	17.3
1979	21.2	3.8	17.4
1980	19.7	3.8	15.9
1981	27.3	4.6	22.7
1982	42.0	13.2	28.8
1983	54.3	27.8	26.5
1984	54.6	19.2	35.4
1985	53.7	19.6	34.1

NOTATIONS

TD= Total debt
ED= External debt
ID= Internal debt
Q= Nominal income

TABLE 2.22

Nigeria's External Debt Outstanding (End of Period) 1970 – 1985

CATEGORY/SOURCE	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
1. Bilateral	100.2	106.1	124.0	150.9	182.8	200.1	233.1	350.3	210.6	405.9	483.8	656.1	163.2	179.3	263.4	323.8
2. Multilateral	37.9	37.9	102.1	107.1	122.0	126.0	129.4	140.2	154.3	163.9	181.6	181.9	530.4	566.4	1,271.4	4,376.2
3. I. C. M.	–	–	–	–	–	–	–	–	641.0	1,027.8	1,090.2	1,317.5	5,474.4	5,026.5	4,630.7	5,400.0
4. Refinanced	–	–	–	–	–	–	–	–	–	–	–	–	–	1,524.6	1,155.9	2,300.0
5. Unrefinanced Arrears	–	–	–	–	–	–	–	–	–	–	–	–	1,981.7	2,758.8	5,443.4	6,164.3 a
6.Others (unguaranteed – State/Private Loans	350.7	70.5	37.3	18.9	17.6	23.2	22.1	6.4	259.8	13.9	111.2	175.7	669.7	522.1	312.6	500.0
Total	488.8	214.5	263.4	276.9	322.4	349.9	374.6	496.9	1,265.7	1,611.5	1,866.8	2,331.2	8,819.0	10,577.7	13,077.2	19,063.4 b
TYPE																
1. Medium & Long Term	429.0	214.5	263.4	276.9	322.4	349.9	374.6	496.9	1,265.7	1,611.5	1,866.8	2,331.2	6,837.0	7,818.9	7,599.6	12,900.0
2. Short Term	59.8	–	–	–	–	–	–	–	–	–	–	–	1,981.0	2,758.8	5,387.6	6,164.3 a
Total	488.8	214.5	263.4	276.9	322.4	349.9	374.9	496.9	1,265.7	1,611.5	1,866.8	2,331.2	8,819.0	10,577.7	13,077.2	19,063.4 b

a/ The figure of short term trade arrears

b/ Total external debt out standing at the end of 1985 included the backlog of foreign exchange approvals, put at =N=6,164.3 million yet to be verified.. Excluding the outstanding backlog of approvals, total outstanding stands at =N=12,900.0 million.

Source: Ahmed A. "Debt Management and Nigeria's Balance of Payment", Public Lecture, Lagos, November 4, 1986.

TABLE 2.21

YEAR	Recurrent Exp. =N=M	Exports =N=M	Nominal GDP =N=M	Public Debt Charges =N=M	Internal Public d charge =N=M	External debt charges =N=M	4 as % of 1	6 as % of 2	4 as % of 3	6 as % of 3
1966	177.2	557.4	3,374.8	62.4	35.2	27.2	35.2	4.9	1.8	0.8
1967	184.6	483.6	2,752.6	44.2	28.2	16.0	23.9	3.3	1.6	0.6
1968	258.6	422.2	2,656.2	49.5	29.6	19.9	19.1	4.7	1.9	0.7
1969	480.2	635.8	3,549.3	72.6	46.0	25.6	15.1	4.0	2.0	0.7
1970	638.2	885.6	5,205.1	224.8	44.8	25.8	35.2	2.9	4.3	0.5
1971	492.9	1,293.4	6,570.7	409.4	99.4	29.9	83.1	2.3	6.2	0.5
1972	681.4	1,434.2	7,208.3	528.4	61.2	26.2	77.5	1.8	7.3	0.3
1973	656.2	2,277.4	10,990.7	93.9	67.7	30.8	14.3	1.4	0.9	0.3
1974	874.0	5,794.8	18,298.3	90.3	67.7	29.1	11.2	0.5	0.5	0.2
1975	1,695.0	4,925.5	20,957.0	95.1	62.4	32.7	7.9	0.7	0.5	0.2
1976	2,672.5	6,751.1	26,656.3	134.8	104.4	30.4	5.6	0.5	0.5	0.2
1977	2,348.1	7,630.7	31,520.3	188.6	155.2	33.4	8.0	0.4	0.6	0.2
1978	3,427.8	6,064.4	34,540.1	256.1	155.3	100.8	7.5	12.6	0.7	0.6
1979	3,187.2	10,836.8	41,947.7	546.8	363.7	183.1	17.2	0.8	1.3	0.4
1980	6,022.0	14,186.7	49,632.3	839.6	561.3	278.3	13.9	2.0	1.7	0.6
1981	5,739.1	10,876.3	50,456.6	818.0	346.9	471.1	14.3	4.8	1.6	0.9
1982	7,417.9	8,722.5	51,570.3	1,427.4	553.0	874.4	19.2	8.9	2.8	1.7
1983	5,916.0	7,502.5	56,709.8	1,525.8	378.4	********	25.8	15.3	2.7	2.0
1984	6,275.7	9,088.0	63,006.2	1,528.9	769.3	759.6	24.4	8.4	2.4	1.2
1985	7,215.3	11,214.8	71,368.1	1,981.0	********	980.5	27.5	8.7	2.8	1.4

(ii) Nigeria's Principal Economic and Financial Indicators, 1970–1985

TABLE 2.23

Trends in the composition of domestic public debt: 1966–85.

Year	Treasury bills =N= M	Treasury–Certs. =N= M	Dev. stocks =N= M	Others* =N= M	Total
1966/67	128.0	0.0	198.0	20.4	346.4
1967/68	170.0	0.0	238.0	18.0	426.0
1968/69	260.0	100.0	264.0	24.2	648.2
1969/70	400.0	212.0	300.8	25.2	938.0
1970	556.0	236.0	356.7	77.8	1,226.5
1971	616.0	210.4	356.8	25.2	1,208.4
1972	368.6	207.9	410.8	13.4	1,000.7
1973	401.9	262.4	392.9	4.0	1,061.2
1974	616.0	268.6	377.8	4.2	1,266.6
1975	616.0	219.0	840.5	3.4	1,678.9
1976	616.0	652.0	1,358.9	3.1	2,630.0
1977	691.0	900.0	1,815.7	1,229.3	4,636.0
1978	816.0	1,800.0	2,197.7	2.9	4,816.6
1979	2,119.0	2,310.0	2,785.0	2.9	7,216.9
1980	2,119.0	2,727.6	3,069.0	2.9	7,918.5
1981	5,782.0	2,307.6	3,353.0	2.9	11,445.5
1982	9,619.0	1,668.6	3,557.0	2.9	14,847.5
1983	13,476.0	4,894.4	3,851.0	2.9	22,224.3
1984	15,476.0	6,413.1	3,783.0	2.9	25,675.0
1985	16,976.0	6,654.1	4,319.0	2.9	27,952.0

*Loans from Marketing Board, National Reconstruction & Development Savings Sheme e.t.c

Source: (i) Same as Table 2.13

TABLE 2.24

Ownership of domestic public debt outstanding: 1966–85

Year	Banking System	Central Bank	Commercial Banks	Non–Bank Public	Total Int–ernal Debt
1966	127.8	100.4	27.4	160.4	288.2
1967	191.0	157.6	33.4	175.0	366.0
1968	308.6	90.4	218.2	183.6	492.2
1969	439.0	100.6	338.4	304.0	743.0
1970	690.8	231.8	459.0	349.2	1,040.0
1971	670.6	342.6	328.0	404.2	1,074.8
1972	581.7	194.3	387.4	419.0	1,000.7
1973	610.2	222.4	387.8	451.0	1,061.2
1974	788.2	22.2	766.0	478.4	1,266.6
1975	1,115.0	313.7	801.3	563.9	1,678.9
1976	1,656.5	459.7	1,196.8	973.5	2,630.0
1977	3,368.3	1,683.1	1,685.2	1,267.7	4,636.0
1978	4,293.8	3,197.3	1,096.5	1,689.3	5,983.1
1979	4,965.6	2,549.2	2,416.4	2,316.7	7,282.3
1980	5,838.2	2,859.3	2,978.9	2,080.3	7,918.5
1981	8,182.4	6,046.6	2,135.2	3,263.1	11,445.5
1982	11,191.0	8,022.5	3,168.5	3,656.5	14,847.5
1983	16,807.1	11,347.4	5,459.7	5,417.2	22,224.3
1984	19,699.1	10,701.4	8,998.2	5,975.4	25,674.5
1985	22,191.0	11,521.9	10,609.1	5,761.0	27,952.0

Sources: CBN; (i) Annual Report & Statement of Accounts, Various Issues.
(ii) Statistical Bulletin, Vol. 1 Nos 1 & 2.

TABLE 2.25

Ownership of domestic public debt outstanding: 1966 – 85(%)				
Year	Banking System(%)	Central Bank (%)	Commercial Banks (%)	Non–Bank Public (%)
1966	44.3	34.8	9.5	55.7
1967	52.2	43.1	9.1	47.8
1968	62.7	18.4	44.3	37.3
1969	59.1	13.5	45.5	40.9
1970	66.4	22.3	44.1	33.6
1971	62.4	31.9	30.5	37.6
1972	58.1	19.4	38.7	41.9
1973	57.5	21.0	36.5	42.5
1974	62.2	1.8	60.5	37.8
1975	66.4	18.7	47.7	33.6
1976	63.0	17.5	45.5	37.0
1977	72.7	36.3	36.4	27.3
1978	71.8	53.4	18.3	28.2
1979	68.2	35.0	33.2	31.8
1980	73.7	36.1	37.6	26.3
1981	71.5	52.8	18.7	28.5
1982	75.4	54.0	21.3	24.6
1983	75.6	51.1	24.6	24.4
1984	76.7	41.7	35.0	23.3
1985	79.4	41.2	38.0	20.6

Source: Computed from Table 2.24.

TABLE 3.2

Monetary and credit developments, 1966-85

Year	Aggregate Credit Nm	Credit to Private Nm	Credit to Govt. Nm	Foreign Assets Nm	Other Assets Nm	Monetary Assets Nm	Quasi-money Nm	Money Supply Nm	Currency in Circ. Nm	Demand Deposits Nm	Monetary Liabs. Nm
1966	440.6	320.6	120	145.6	-53.2	533	162.4	345	217.2	127.8	878
1967	462.2	296	166.2	62.2	-79.8	444.6	131.2	376.8	243.4	133.4	821.4
1968	613	296.8	316.2	85.8	-182.2	516.6	188.4	328.2	183.2	145	844.8
1969	826	325.8	500.2	98.9	-277.4	647.5	220.6	426.8	252.8	174	1074.3
1970	1140.4	478	662.4	157.6	-348	950	341.6	608.3	342.3	266	1558.3
1971	1122.6	591.2	531.4	285.2	-402.4	1005.4	376.4	628.9	354.5	274.4	1634.3
1972	1269.2	750.2	519	251	-358.8	1161.4	461.2	700.1	385.2	314.9	1861.5
1973	1343.5	846.4	497.1	299.1	-346.9	1295.7	586.9	827.1	435.9	391.2	2122.8
1974	-463.9	1070.2	-1534.1	3190.7	-958.6	1768.2	977.9	1178.3	569.8	608.5	2946.5
1975	488.6	1770.1	-1281.5	3489	-706.1	3271.5	1578.4	2044	1030.7	1013.3	5315.5
1976	2617.3	2417.8	199.5	3254	-741.5	5129.8	1985.9	3481.8	1540	1941.8	8611.6
1977	5537.4	3443	2094.4	2817.5	-1502.9	6852	2263.1	4793.6	1940	2853.6	11645.6
1978	8059.9	4723	3336.9	1428.3	-1785.9	7702.3	2609.8	5089.7	2157.2	2932.5	12792
1979	8855.3	5416.8	3438.5	3238.2	-2242.2	9851.3	3710.6	6146.6	2350.8	3795.8	15997.9
1980	10780.1	7190.9	3589.2	5646.3	-2031	14395.4	5170.6	9226.8	3185.9	6040.9	23622.2
1981	16261.4	9654.4	6607.2	2593.6	-3299.7	15555.3	5803.2	9744.9	3861.9	5883	25300.2
1982	21178.4	11371.5	10528.2	906.9	-6079.8	16005.5	6845.4	10048.6	4222.4	5826.2	26054.1
1983	28178.4	12353.9	15824.5	495.4	-9708	18965.8	8086.5	11282.4	4842.8	6439.6	30248.2
1984	32136.5	12942	18194.5	1125.8	-11037.6	22224.7	9306.4	12204.1	4883.5	7320.6	34428.8
1985	32680.3	13700.2	18980.1	1492.4	-10138.4	24034.3	10550.8	13267.8	4909.9	8357.9	37302.1

Source: CBN: Annual Report and Statement of Accounts, 1966-70;
Statistical Bulletin, vol.1, nos 1 & 2, December 1990

TABLE 3.3

Monetary and credit developments, 1966-85 (% growth rate)

Year	Aggregate Credit	Credit to Private	Credit to Govt.	Foreign Assets	Other Assets	Monetary Assets	Quasi-money	Money Supply	Currency in Circ.	Demand Deposits	Monetary Liabs.
1966											
1967	4.67	-8.31	27.80	-134.08	33.33	-19.88	-23.78	8.44	10.76	4.20	-6.89
1968	24.60	0.27	47.44	27.51	56.20	13.94	30.36	-14.81	-32.86	8.00	2.77
1969	25.79	8.90	36.79	13.25	34.32	20.22	14.60	23.10	27.53	16.67	21.36
1970	27.57	31.84	24.49	37.25	20.29	31.84	35.42	29.84	26.15	34.59	31.06
1971	-1.59	19.15	-24.65	44.74	13.52	5.51	9.25	3.28	3.44	3.06	4.65
1972	11.55	21.19	-2.39	-13.63	-12.15	13.43	18.39	10.17	7.97	12.86	12.21
1973	5.53	11.37	-4.41	16.08	-3.43	10.37	21.42	15.35	11.63	19.50	12.31
1974	389.61	20.91	132.40	90.63	63.81	26.72	39.98	29.81	23.50	35.71	27.96
1975	194.94	39.54	-19.71	8.55	-35.76	45.95	38.04	42.35	44.72	39.95	44.57
1976	81.33	26.79	742.36	-7.22	4.77	36.23	20.52	41.29	33.07	47.82	38.28
1977	52.73	29.78	90.47	-15.49	50.66	25.13	12.25	27.37	20.62	31.95	26.05
1978	31.30	27.10	37.24	-97.26	15.85	11.04	13.28	5.82	10.07	2.69	8.96
1979	8.98	12.81	2.95	55.89	20.35	21.81	29.67	17.19	8.24	22.74	20.04
1980	17.86	24.67	4.20	42.65	-10.40	31.57	28.24	33.38	26.21	37.16	32.28
1981	33.71	25.52	45.68	-117.70	38.45	7.46	10.90	5.32	17.50	-2.68	6.63
1982	23.22	15.10	37.24	-185.99	45.73	2.81	15.22	3.02	8.54	-0.97	2.89
1983	24.84	7.95	33.47	-83.06	37.37	15.61	15.35	10.94	12.81	9.53	13.87
1984	12.32	4.54	13.03	56.00	12.05	14.66	13.11	7.55	0.83	12.03	12.14
1985	1.66	5.53	4.14	24.56	-8.87	7.53	11.79	8.02	0.54	12.41	7.70

Source: computed from TABLE 3.2

Table 3.4

Banking system credit to the economy, 1966-85

Year	Aggregate Credit Nm	Credit to Private Nm	Credit to Govt. Nm	Central Bank Credit t Govt. Nm	Private Nm	Comm. Bank Govt. Nm	Credit to Private Nm
1966	440.6	320.6	120	94.4	23.6	25.6	297
1967	462.2	296	166.2	137.8	21.2	28.4	274.8
1968	608	296.8	311.2	113.8	72.8	197.4	224
1969	821	325.8	495.2	157.8	86.2	337.4	239.6
1970	1135.4	478	657.4	148.4	129	509	349
1971	1118	591.2	526.8	232.4	93.6	294.4	497.6
1972	1264.8	750.2	514.6	124.2	141	390.4	609.2
1973	1337.9	845.4	492.5	115.3	108.5	377.2	736.9
1974	-468.6	1070.2	-1538.8	-2189.7	150.4	650.9	919.8
1975	482.5	1770.1	-1287.6	-1858.7	258	571.1	1512.1
1976	1900.7	2417.8	-517.1	-629.9	289.3	112.8	2128.5
1977	4658.2	3443	1215.2	1015.2	415.3	200	3027.7
1978	7127.6	4723	2404.6	2290.7	530.4	113.9	4192.6
1979	6666.2	5416.8	1249.4	1079.7	734.3	169.7	4682.5
1980	12831.8	7190.9	5640.9	5479.1	756.4	161.8	6434.5
1981	16261.4	9654.2	6607.2	4580.9	910.4	2026.3	8743.8
1982	21974.4	11446.2	10528.2	7557	918	2971.2	10528.2
1983	33474.2	12353.9	21120.3	15824	1062.8	5296.3	11291.1
1984	39921.7	12942	26979.7	18194.5	1302.2	8785.2	11639.8
1985	42818.7	13700.2	29118.5	18980.1	1423.6	10138.4	12276.6

Source: CBN Annual Report and Statement of Accounts, 1966-85

TABLE 3.5
Banking System Credit to the Economy

(% growth rate)

TABLE 3.5

Banking System Credit to the Economy (% growth rate)

Year	Aggregate Credit	Credit to Private	Credit to Govt.	Central Bank Credit to Govt.	Central Bank Credit to Private	Comm. Bank Credit to Govt.	Comm. Bank Credit to Private
1966							
1967	4.90	-7.67	38.50	45.97	-10.17	10.94	-7.47
1968	31.54	0.27	87.24	-17.42	243.40	595.07	-18.49
1969	35.03	9.77	59.13	38.66	18.41	70.92	6.96
1970	38.29	46.72	32.75	-5.96	49.65	50.86	45.66
1971	-1.53	23.68	-19.87	56.60	-27.44	-42.16	42.58
1972	13.13	26.89	-2.32	-46.56	50.64	32.61	22.43
1973	5.78	12.69	-4.29	-7.17	-23.05	-3.38	20.96
1974	-135.03	26.59	-412.45	-1999.13	38.62	72.56	24.82
1975	-202.97	65.40	-16.32	-15.12	71.54	-12.26	64.39
1976	293.93	36.59	-59.84	-66.11	12.13	-80.25	40.76
1977	145.08	42.40	-335.00	-261.17	43.55	77.30	42.25
1978	53.01	37.18	97.88	125.64	27.71	-43.05	38.47
1979	-6.47	14.69	-48.04	-52.87	38.44	48.99	11.68
1980	92.49	32.75	351.49	407.47	3.01	-4.66	37.42
1981	26.73	34.26	17.13	-16.39	20.36	1152.35	35.89
1982	35.13	18.56	59.34	64.97	0.83	46.63	20.41
1983	52.33	7.93	100.61	109.40	15.77	78.25	7.25
1984	19.26	4.76	27.74	14.98	22.53	65.87	3.09
1985	7.26	5.86	7.93	4.32	9.32	15.40	5.47

Source: computed from Table 3.4

TABLE 3.6

Composite consumer price index, 1966-85

Year	Food	Drinks	Tobacco & Kola	Accomodati Fuel/ight	H/h Goods & Other Products	Clothing	Transport	Other Services	All Items
1966	130.5	127.3	89.4	n.a.	111.6	133.3	128.6	152.5	129.6
1967	120.1	123.5	87.5	n.a.	117.4	129.8	124.5	121.5	120.8
1968	112.6	135.1	88.9	n.a.	129.8	137.7	130.2	121.5	120.3
1969	133.9	137.5	92.2	n.a.	134.8	148.4	132	121.3	132.3
1970	164.4	140.1	97.1	n.a.	151.5	160.6	143.4	125.7	150.6
1971	211.4	146.1	98.8	n.a.	n.a.	166.8	144	127	174.1
1972	216.6	151.9	102.7	n.a.	n.a.	167.4	149.4	130.6	179.6
1973	223.6	179.9	99.2	n.a.	n.a.	192.9	164.2	142.4	189.3
1974	258.7	182.2	106.1	n.a.	n.a.	225.4	214.3	155.9	214.7
1975	367.2	254.7	110.1	n.a.	n.a.	286.1	247.2	179.6	287.4
1976	122	131.8	142.7	108.6	120.9	128.1	116.1	118	123.9
1977	146	140.1	183.1	127.3	136.9	141.4	141.4	145.5	143
1978	171.9	n.a.	186	131.4	147.1	176.3	158.4	155.7	166.7
1979	185.7	n.a.	202.9	166.9	156	219.1	195.5	177.7	186.3
1980	199.9	n.a.	229.2	177.3	181.5	270.2	197.3	235.2	204.8
1981	250.2	193	264.8	173.2	194.6	313.7	201.9	282.7	247.5
1982	272.4	207.1	278.5	180	213.4	334.6	223.9	296.1	266.5
1983	335.6	235.7	318.4	239.5	328.1	397.5	271.2	357.3	328.4
1984	479.7	290.2	436	270.1	516.1	559.7	315.8	496.4	458.4
1985	498.5	380	548.7	257.9	542	610.3	357.2	612.2	483.7

Notes: Figures from 1966 to 1975 have 1960 as the Base Year;
those from 1976 to 1985 have 1975 as Base Year.
n.a. = not available

Source: CBN Annual Report and Statement of Accounts, 1966-70
Statistical Bulletin, vol.1, nos 1 & 2, December 1990.

TABLE 3.7
Composite consumer price index, 1966-85 (% change)

Year	Food	Drinks	Tobacco & Kola	Accomodati Fuel/ight	H/h Goods & Other P	Clothing	Transport	Other Services	All Items
1966									
1967	-7.97	-2.99	-2.13	ERR	5.20	-2.63	-3.19	-20.33	-6.79
1968	-6.24	9.39	1.60	ERR	10.56	6.09	4.58	0.00	-0.41
1969	18.92	1.78	3.71	ERR	3.85	7.77	1.38	-0.16	9.98
1970	22.78	1.89	5.31	ERR	12.39	8.22	8.64	3.63	13.83
1971	28.59	4.28	1.75	ERR	-100.00	3.86	0.42	1.03	15.60
1972	2.46	3.97	3.95	ERR	ERR	0.36	3.75	2.83	3.16
1973	3.23	18.43	-3.41	ERR	ERR	15.23	9.91	9.04	5.40
1974	15.70	1.28	6.96	ERR	ERR	16.85	30.51	9.48	13.42
1975	41.94	39.79	3.77	ERR	ERR	26.93	15.35	15.20	33.86
1976	-66.78	-48.25	29.61	ERR	ERR	-55.23	-53.03	-34.30	-56.89
1977	19.67	6.30	28.31	17.22	13.23	10.38	21.79	23.31	15.42
1978	17.74	-100.00	1.58	3.22	7.45	24.68	12.02	7.01	16.57
1979	8.03	ERR	9.09	27.02	6.05	24.28	23.42	14.13	11.76
1980	7.65	ERR	12.96	6.23	16.35	23.32	0.92	32.36	9.93
1981	25.16	ERR	15.53	-2.31	7.22	16.10	2.33	20.20	20.85
1982	8.87	7.31	5.17	3.93	9.66	6.66	10.90	4.74	7.68
1983	23.20	13.81	14.33	33.06	53.75	18.80	21.13	20.67	23.23
1984	42.94	23.12	36.93	12.78	57.30	40.81	16.45	38.93	39.59
1985	3.92	30.94	25.85	-4.52	5.02	9.04	13.11	23.33	5.52

Source: computed from Table 3.6

TABLE 7.9

Annual money supply and prices

Year	Money supply Nm	Price level %
1966	345	43.7
1967	376.8	40.6
1968	328.2	41.6
1969	426.8	46
1970	608.3	52.4
1971	628.9	60.8
1972	700.1	62.5
1973	827.1	65.9
1974	1178.3	74.7
1975	2044	100
1976	3481.8	123
1977	4793.6	143
1978	5089.7	167
1979	6146.6	186
1980	9226.8	204.8
1981	9744.9	247.6
1982	10048.6	266.5
1983	11282.4	328.5
1984	12204.1	458.4
1985	13267.8	483.7

Source: C. B. N., Annual Report and Statement of Account; various issues.

TABLE 7.10

Quarterly money supply and price level, 1970–85					
Year	Money supply (Nm	Price level(%)	Year	Money supply(Nm)	Price level(%)
1970	490.4	56	1979	5231.3	186.8
ii	492.8	59.2	ii	5859.7	196.2
iii	528.8	59.8	iii	6374.6	200.8
iv	608.2	60.1	iv	6146.6	203.8
1971	638.4	64.2	1980	7150.7	191.6
ii	583.8	70.4	ii	6600	194.8
iii	572.8	68.5	iii	7492.6	214.1
iv	629	69.4	iv	9226.8	219.5
1972	629	71.3	1981	8237.8	235.1
ii	598.6	71.6	ii	8604.5	248.1
iii	626.8	67	iii	8998.1	257.1
iv	700.2	66.7	iv	9744.9	257.5
1973	757.6	70.4	1982	8879.2	260.6
ii	727.6	75	ii	8826.3	265.6
iii	736.9	73.1	iii	9098.5	269.8
iv	827.2	78.7	iv	10048.5	275.7
1974	898	79.6	1983	9330.6	297.5
ii	976.9	84.3	ii	9944	321.6
iii	1049.4	84.7	iii	11025.9	349.4
iv	1178.4	86.4	iv	11282.4	382.5
1975	1630.2	100	1984	11102.4	408.7
ii	1799.2	113.2	ii	10748.5	465.9
iii	1901.5	117.2	iii	11540.1	505.1
iv	2044.1	122.6	iv	12204.1	469.1
1976	2508.9	129.6	1985	11502.6	490.2
ii	2507.1	132.6	ii	11974.1	492.2
iii	2739.8	135.8	iii	13180.8	480.2
iv	3293	138.9	iv	13267.8	474.1
1977	3941.8	145.2			
ii	3709.4	157.2			
iii	4369.5	172.2			
iv	4794.4	177			
1978	5514	166.3			
ii	5352.1	182.9			
iii	4989.8	180.4			
iv	5089.7	182.7			

Source: C. B. N; Annual Report and Statement of Account various issues.

TABLE 7.11

Dynamic simulation results (baseline solution)												
ear	Base money		money supply		Price level		Bank credit to govt.		Government revenue		Government expenditure	
	Actual	Simulated	Actual	Simulated	Actual	Simulated	Actual	Simulated	Actual	Simulated	Actual	Simulated
1970	6.032846	5.79959	7.31034	6.65447	3.95890	3.62387	6.53785	6.45548	6.93361	6.82190	7.34265	6.945498
1971	6.051854	5.94680	7.33060	7.10923	4.10759	3.79760	6.50817	6.62703	7.39209	7.26058	7.35487	7.499033
1972	6.128397	6.17022	7.58054	7.31009	4.13516	3.82076	6.36595	6.5755	7.50966	7.38892	7.58517	7.595128
1973	6.313729	6.41967	7.71841	7.83231	4.18813	4.10896	6.41378	6.53418	7.69875	7.79513	7.74871	7.957265
1974	6.877399	7.01716	8.37094	8.58128	4.31348	4.52483	6.66975	6.60572	8.58949	8.59615	8.37094	8.581986
1975	7.592971	7.42859	9.33410	9.01007	4.60517	4.87119	7.01661	6.91714	8.90177	8.71355	9.33057	8.881346
1976	7.876259	7.87313	9.57213	9.51246	4.81284	5.07747	7.41246	7.39243	9.09436	9.05689	9.57213	9.457483
1977	8.011156	7.96131	9.80008	9.58482	4.96284	5.01495	8.12216	7.79888	9.28468	9.23389	9.80008	9.668416
1978	8.046581	8.01476	9.71747	9.51604	5.11799	5.08988	8.36492	8.46412	9.21485	9.10047	9.71143	9.650628
1979	8.160718	8.22961	9.51287	9.83562	5.22574	5.24378	8.51028	8.67875	9.41547	9.52798	9.51287	9.926675
1980	8.541223	8.41499	10.0592	10.0455	5.32203	5.31537	8.67217	8.80055	9.77667	9.78760	10.0591	10.04366
1981	8.652389	8.65935	9.98818	10.1513	5.51181	5.63199	9.00966	9.04359	9.47531	9.70903	9.98790	10.17652
1982	8.814465	8.88379	10.1677	10.0896	5.58537	5.50186	9.32286	9.28681	9.45191	9.46018	10.1677	9.977171
1983	8.78966	8.90113	10.0437	10.0820	5.79453	5.81775	9.72955	9.55353	9.27296	9.28357	10.0437	9.914207

The data are in logarithms

TABLE 7.14

Data for inflation model													
Year	Price level %	Money supply Nm	Base money Nm	Net claim govt. Nm	Govt. revenue Nm	Govt. exp. Nm	Bank reserves Nm	External reserves Nm	Real income Nm	Nominal income Nm	Expecte inflatior %	Public Debt Charges Nm	Cent. Bank Credit to Govt Nm
1966	43.7	345	246.4	373.8	503	486.4	29.2	184.6	13868.93	6060.722	0	62.4	112.2
1967	40.6	376.8	232.4	436	457.1	435.6	25	102.18	11662.51	4734.979	−3.1	44.2	150.9
1968	41.6	328.2	214.4	456.6	444.8	517.7	31.2	101.9	11662.51	4851.604	1	49.5	86.7
1969	46	426.8	289.4	589.2	532.2	770.2	36.8	109.24	14814.54	6814.688	4.4	72.6	93.7
1970	52.4	608.3	416.9	690.8	1026.2	1544.8	46.5	144.6	19227.38	10075.15	6.4	224.8	169.2
1971	60.8	628.9	424.9	670.5	1623.1	1563.8	38.5	199	21433.8	13031.75	8.4	409.4	231.4
1972	62.5	700.1	458.7	581.7	1825.6	1968.8	44.7	243.6	22694.62	14184.14	1.7	528.4	194.3
1973	65.9	827.1	552.1	610.2	2205.6	2318.6	65.8	878	23955.43	15786.63	3.4	93.9	222.4
1974	74.7	1178.3	970.1	788.2	5374.9	4319.7	331.4	3460.8	26161.85	19542.9	8.8	90.3	22.2
1975	100	2044	1984.2	1115	7345	11277.	828.7	3448.5	26792.25	26792.25	25.3	95.1	313.7
1976	123	3481.8	2634	1556.5	8905	14359.	1094	3122.5	29313.88	36056.07	23	134.8	459.7
1977	143	4793.6	3014.4	3368.3	10771.	18035.	851.8	2592.5	31520.3	45074.03	20	188.6	1683.1
1978	167	5089.7	3123.1	4293.8	10045.	16505.	741.4	1305.6	29212.4	48784.71	24	256.1	3197.3
1979	186	6146.6	3500.7	4965.6	12276.	13532.	797.3	3043.2	29948	55703.28	19	546.8	2549.3
1980	204.8	9226.8	5121.6	5838.2	17618	23368.	1532.1	5445.6	31546.8	64607.85	18.8	839.6	2859.3
1981	247.6	9744.9	5723.8	8181.8	13034	21761.	1376.1	2424.8	28899.2	71554.42	42.8	818	6046.6
1982	266.5	10048.6	6730.9	11191	12732.	26048.	2002	1043.3	27974.1	74550.98	18.9	1427.4	8022.5
1983	328.5	11282.4	6566	16807.	10646.	23010.	1266.7	798.5	26217.9	86125.8	62	1525.8	11347.4
1984	458.4	12204.1	6379.3	19699.	11520.	18751.	1032.1	1096.8	24845.5	113891.8	129.9	1528.9	10701.4
1985	483.7	13267.8	6180.2	22191	15443.	21846.	805.2	1657.9	26158.7	126529.6	25.3	1981	11521.9

Sources: i) Annual Report and Statement of Accounts; 1966–85, C.B.N.
ii) Economic and Financial Review; vol.8, Dec. 1970, CBN.
iii) GDP and Allied Macro–Aggregates, F.O.S., 1982.
iv) Economic and Social Statistics Bulletin, Jan., 1981; F.O.S.
v) Economic Indicators. vol.9, no.7, July, 1973; F.O.S.
vi Nigeria's Principal Economic and Financial Indicators; 1970–78, 1970–85; F.O.S.

TABLE 7.15

Data for the consumption model										
Year	Internal debt Nm	Total debt Nm	Wealth Nm	Transfe Nm	Nominal G.D.P. Nm	Expendit Nm	Revenue Nm	Real cons Nm	populatic millions	Price level %
1966	144.4	284.8	97.94	9.4	3374.8	487.4	503	3386.2	61.4	43.7
1967	368.4	536.4	14.49	8.6	2752.6	435.6	457.1	3164.1	63	40.6
1968	557.4	729	50.69	10.8	2656.2	517.7	444.8	2775.5	64.6	41.6
1969	841.3	1017.8	127.45	6.6	3549.3	770.2	532.2	3330.7	66.2	46
1970	1019.6	1195	219.6	19.5	5205.1	1544.8	1026.2	3719.2	67.8	52.4
1971	1047.2	1225.8	76.56	11.6	6570.7	1563.8	1623.1	4829.5	69.5	60.8
1972	845.3	1108.7	125.32	13.5	7208.3	1968.8	1825.6	4980	71.2	62.5
1973	930.6	1207.5	109.12	13.4	10990.7	2318.6	2205.6	5551.1	73.2	65.9
1974	940.7	1263.1	336.1	15.4	18298.3	4319.7	5374.9	9108.6	75	74.7
1975	1368.4	1718.3	1328.4	23.3	20957	11277.	7345	12378.4	76.9	100
1976	2429.4	2804	1767.3	15.4	26656.3	14359.	8905	15265.4	78.6	123
1977	4213.6	4578.7	1958.2	23.3	31520.3	18035.	10771.	19061.2	80.6	143
1978	3167.1	4419.2	677.29	42	34540.1	16505.	10045.	19365.2	82.6	167
1979	4967.4	6578.9	1644.2	30.1	41947.7	13532.	12276.	16343	84.7	186
1980	7952.4	9819.2	3364.2	104.8	49732.3	23368.	17618	16646.9	84.9	204.
1981	8698.9	11030.	802.1	95.7	50456.6	21761.	13034	16595	86.6	247.
1982	11800.	18601.	507.7	136.3	51570.3	26048.	12732.	17744.4	88.8	266.
1983	18877.	27454.	1517.8	99.2	56709.8	23010.	10646.	16520.7	90.3	328.
1984	22328.	34405.	853.7	61.6	63006.2	18751.	11520.	14412.9	93.3	458.
1985	24338.	38300.	1599.7	220.4	71368.1	21846.	15443.	15366	95.7	483.

Sources: i) Nigeria's Principal Economic and Financial Indicators, 1970–85; C.B.N.
ii)Digest of Statistics; F.O.S. various issues
iii) Economic and Social Statistics Bulletin; 1987, FMNP.

FIG. 1

PRICE LEVEL(ACTUAL&SIMULATED)

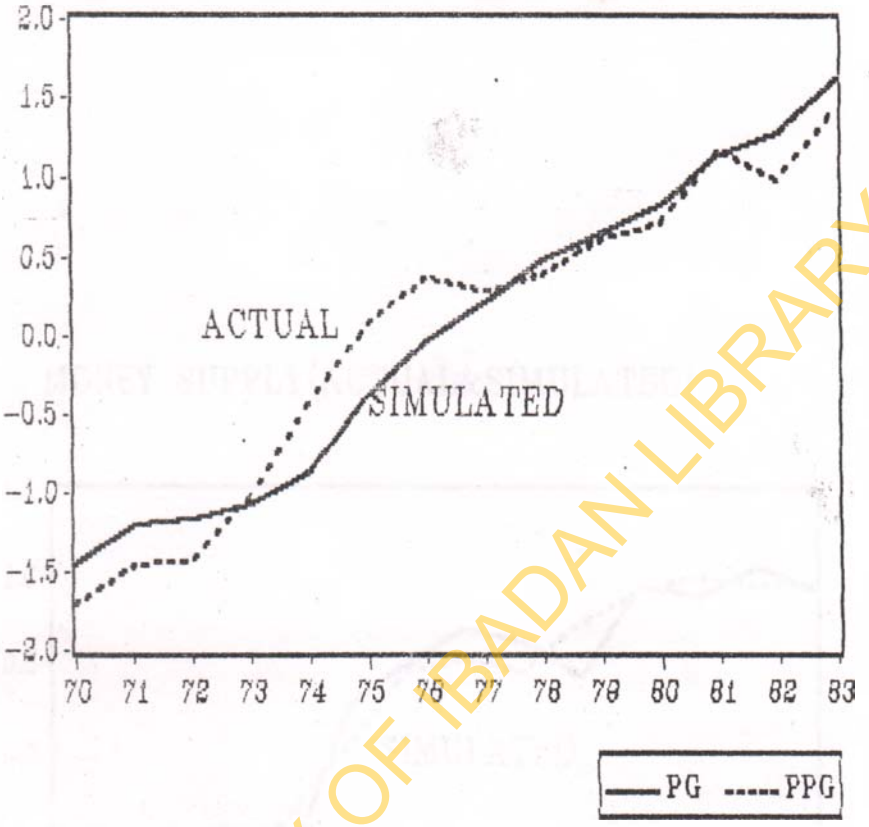


FIG.2

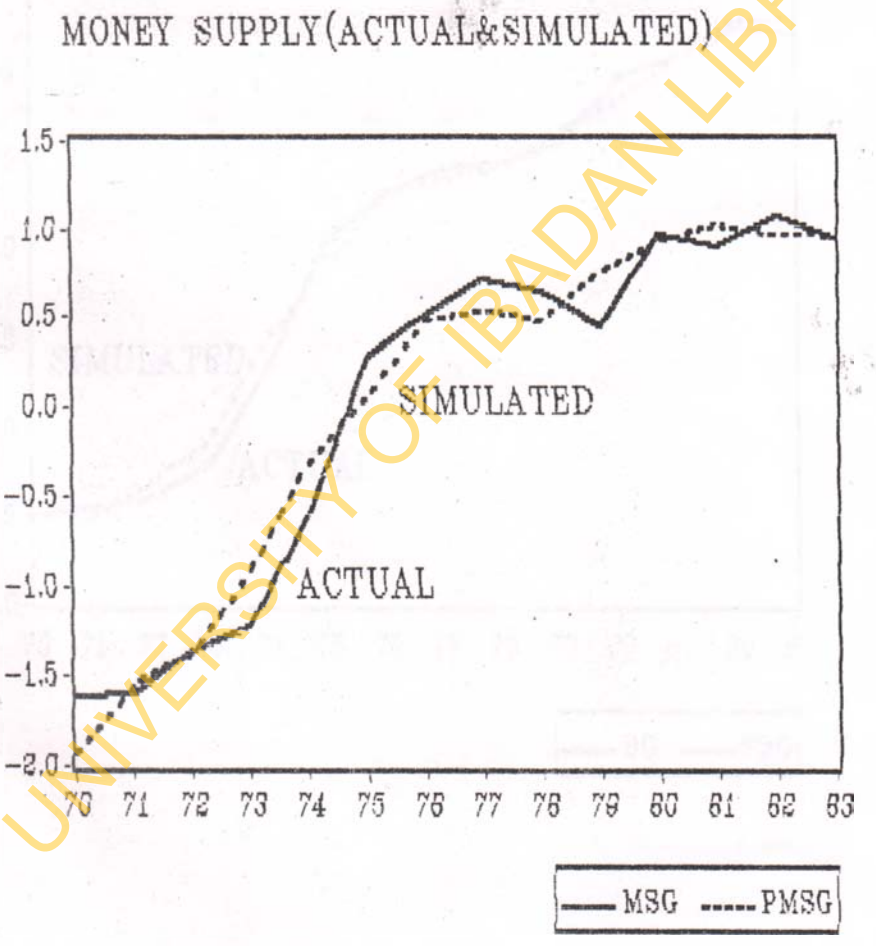


FIG.3

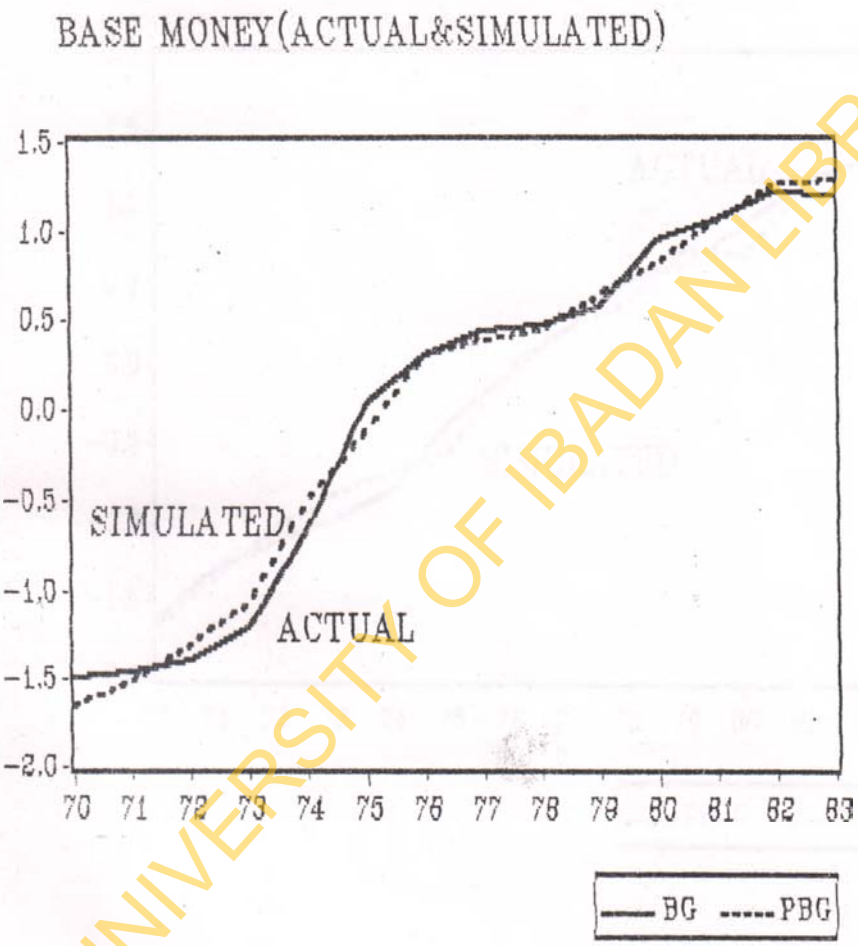


FIG.4

PRIVATE SECTOR CREDIT(ACTUAL&SIM)

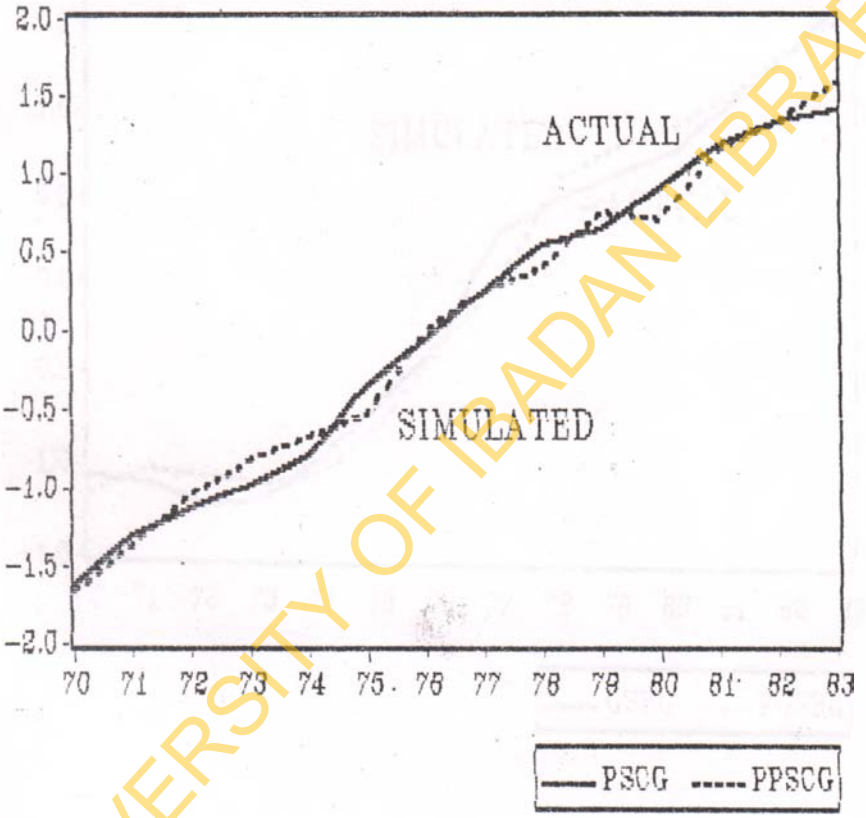


FIG. 5.

BANKING SYSTEM CREDIT TO GOVERNMENT

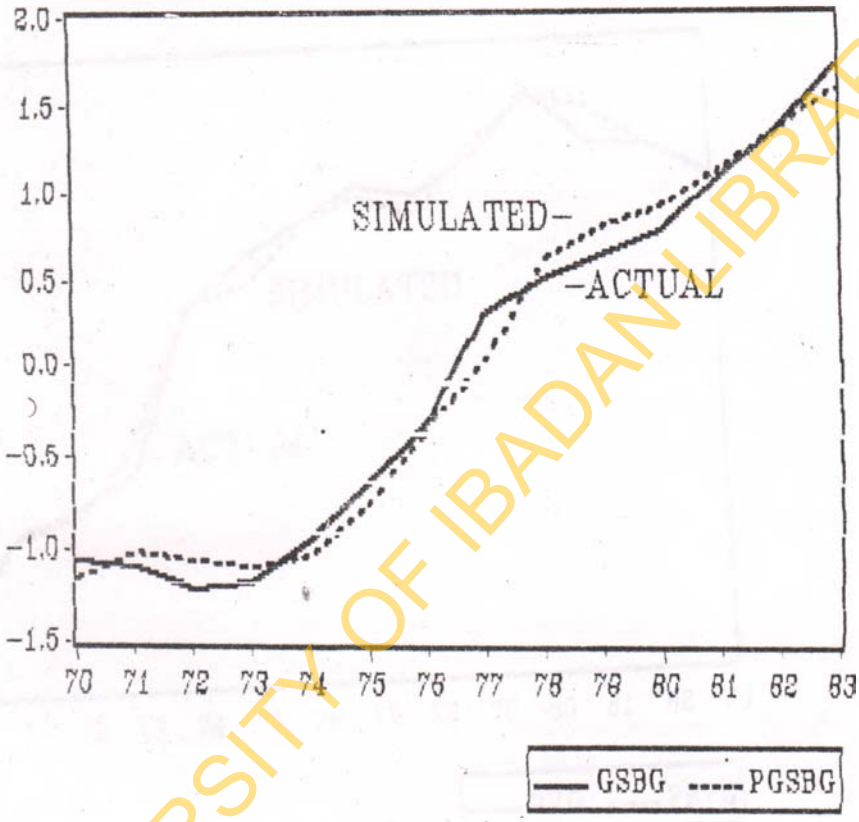


FIG. 6

REVENUE(ACTUAL&SIMULATED)

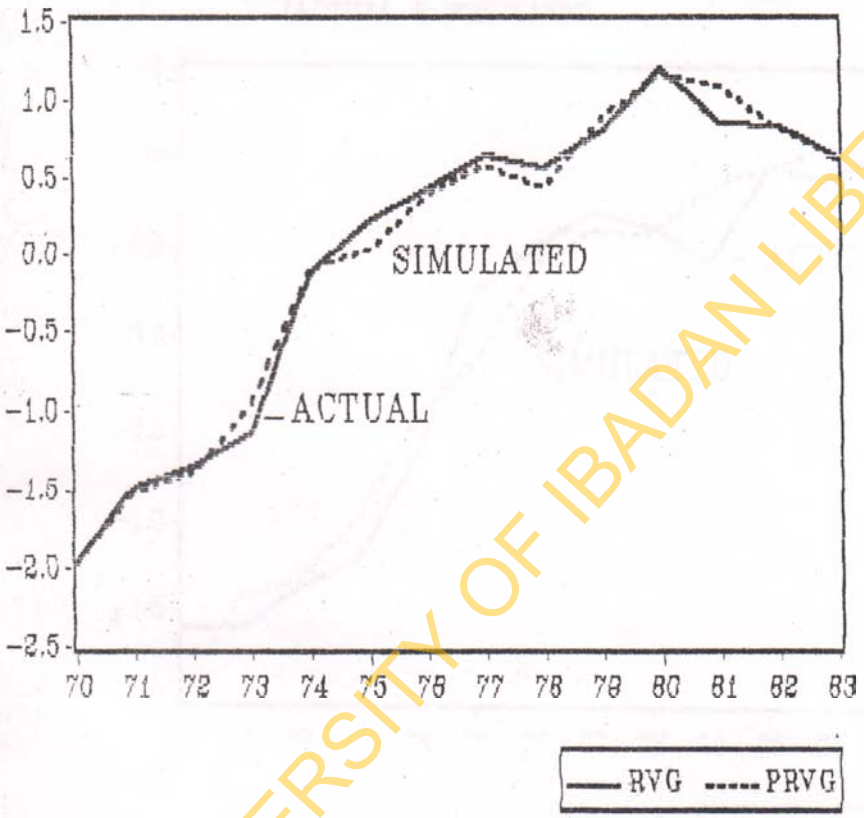


FIG. 7

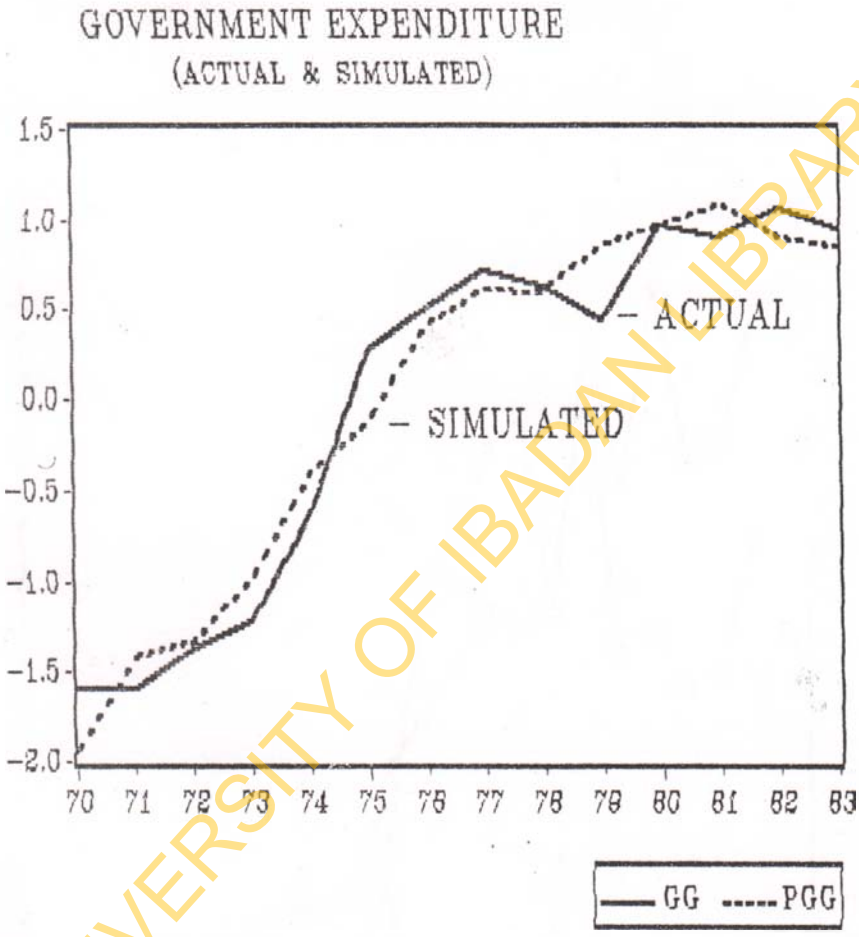


Fig.8 Federal Government Revenue, Expenditure and Deficit, 1966-85

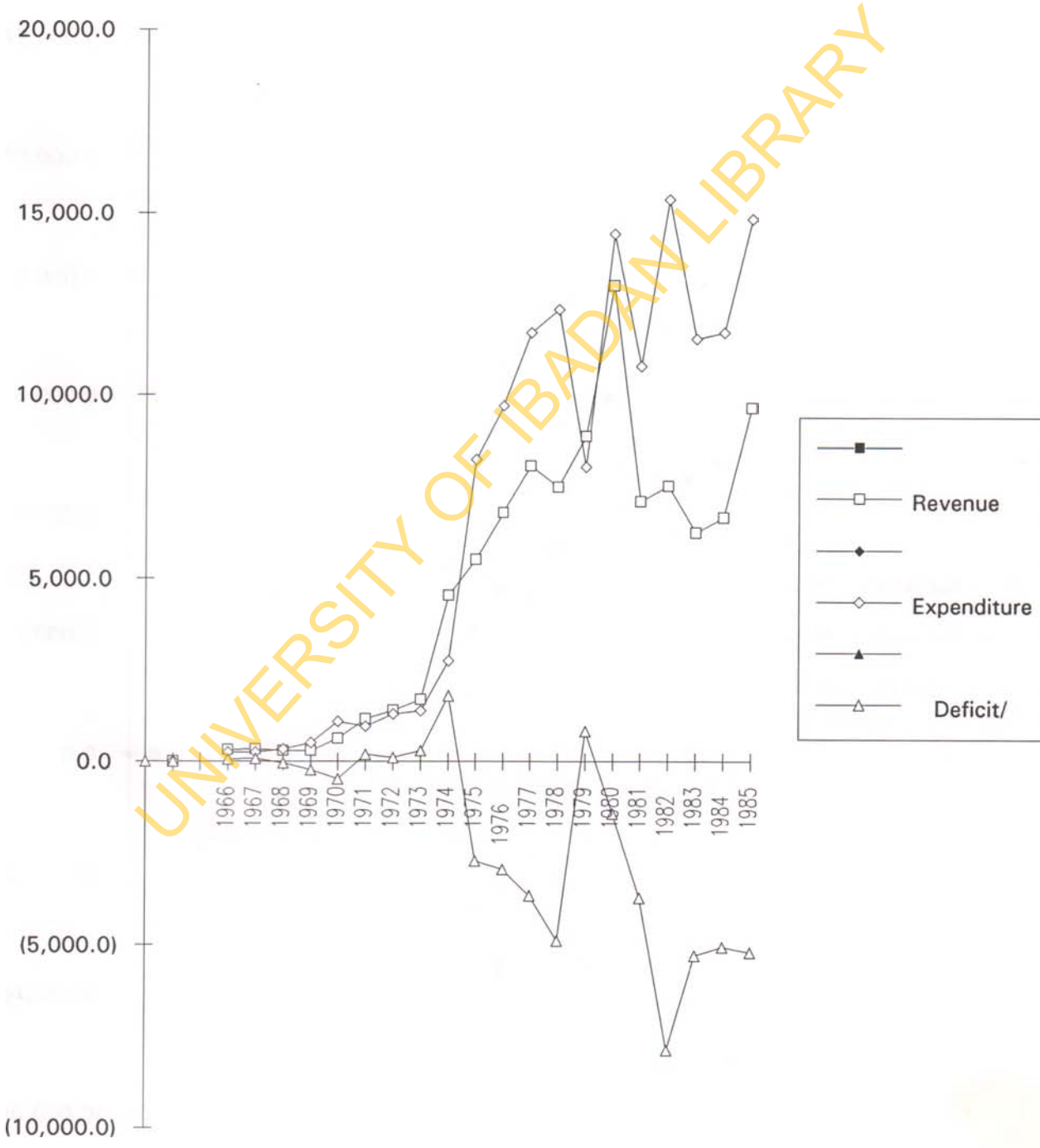


Fig.9 States Government Revenue, Expenditure and Deficit, 1967-85

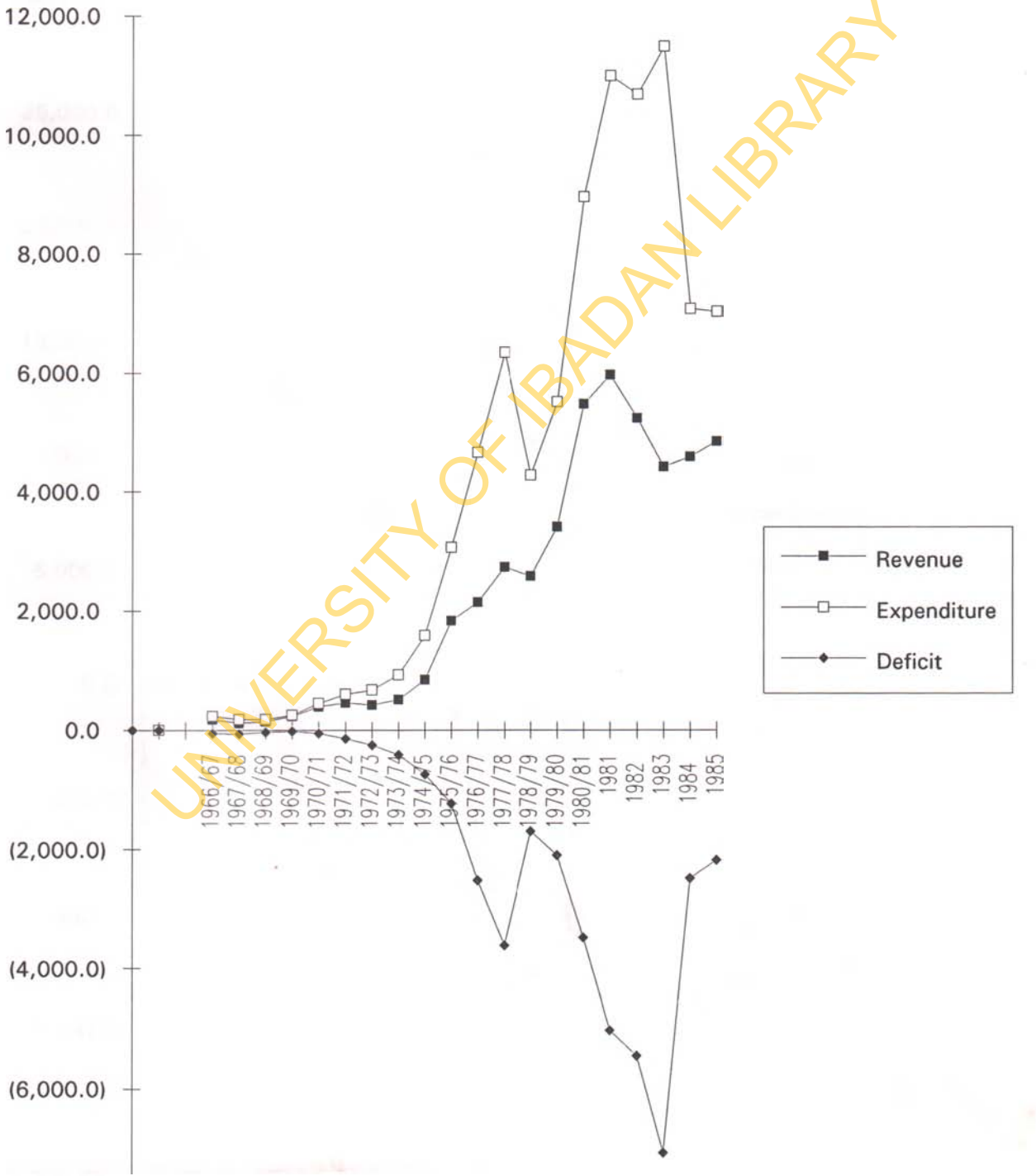


Fig.10 Total National Revenue, Expenditure and Deficit, 1966-85

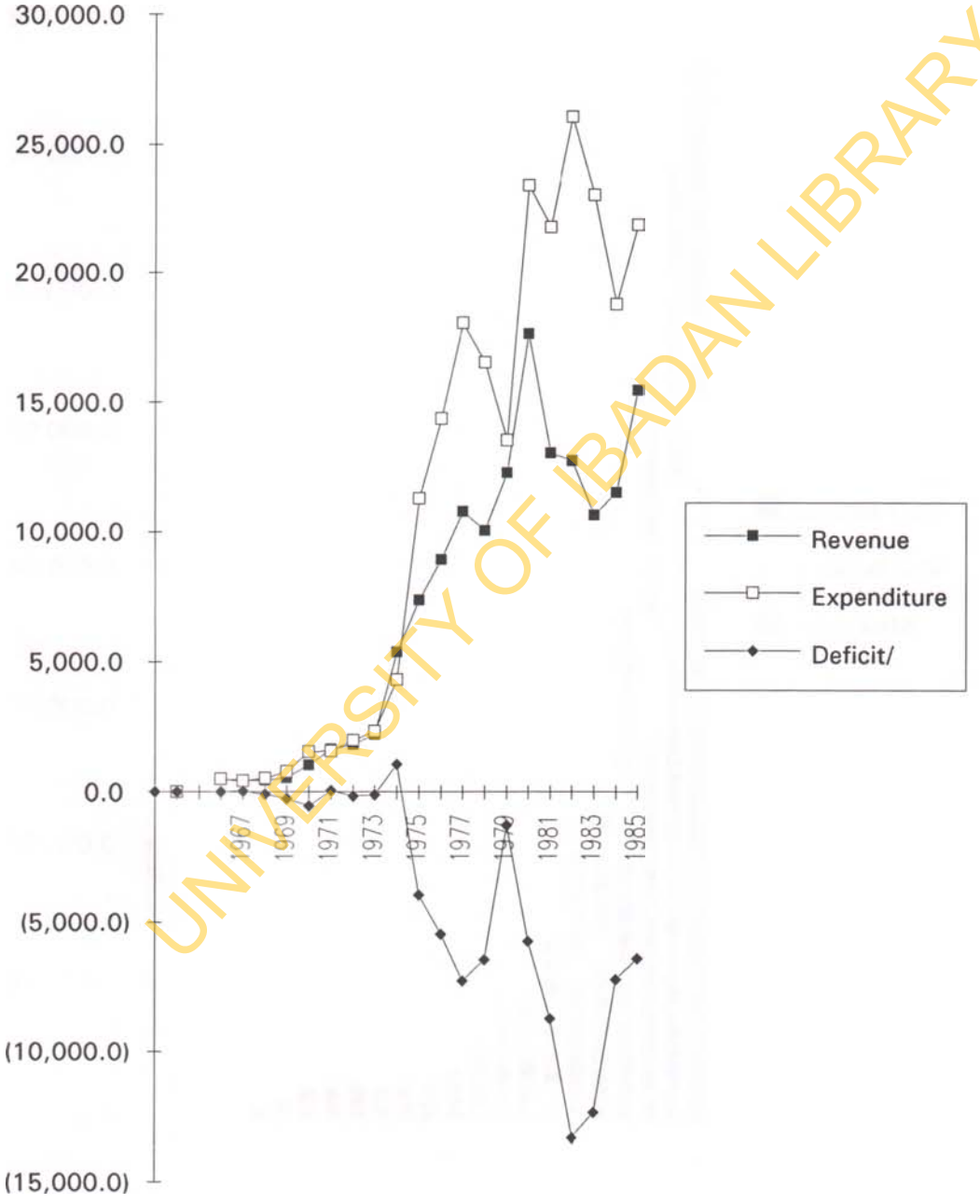


Fig.11 Federal Government Total, External and Internal Debts, 1966-85

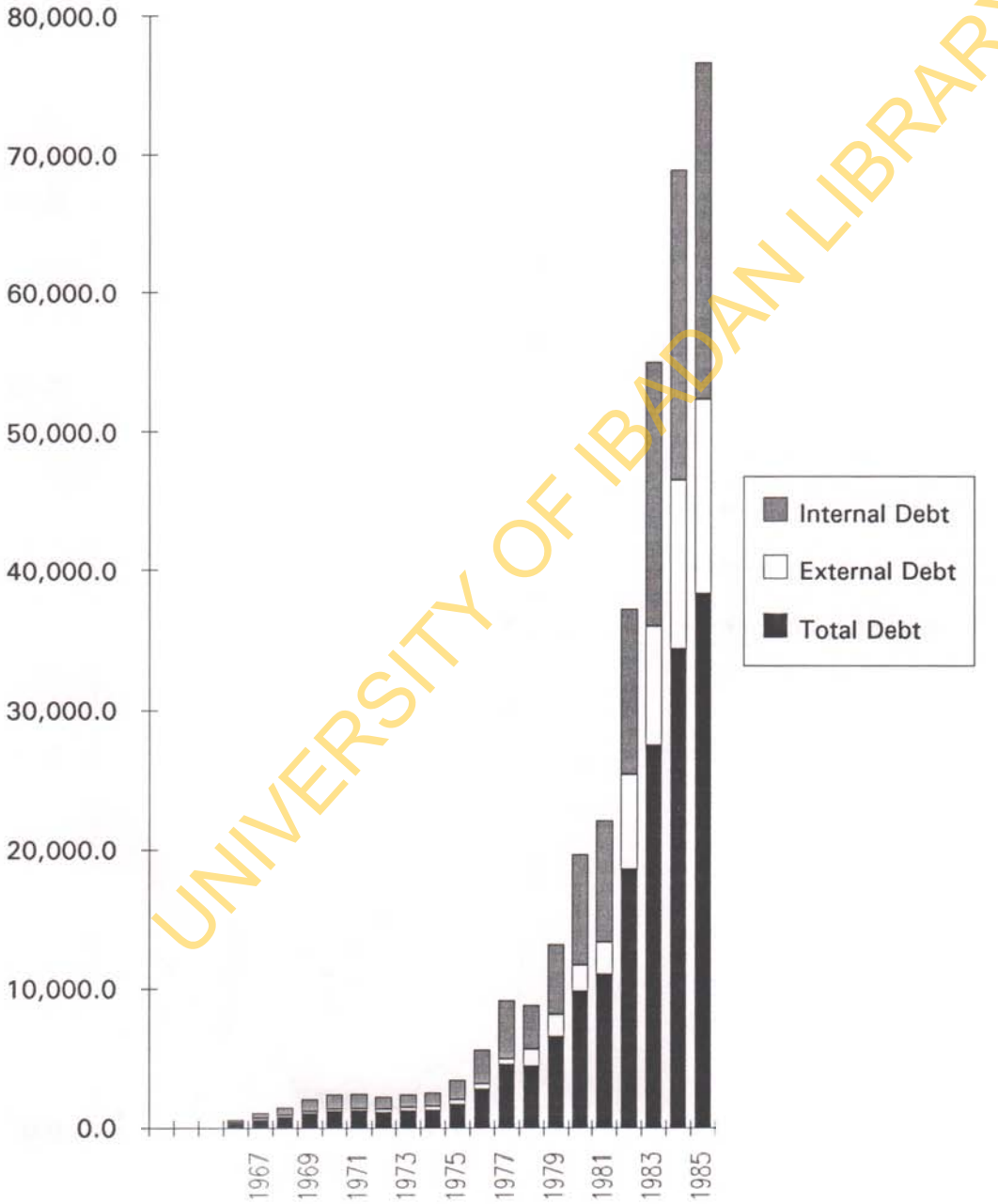


Fig.12 Share of Total, External and Internal Debts in GDP, 1966-85

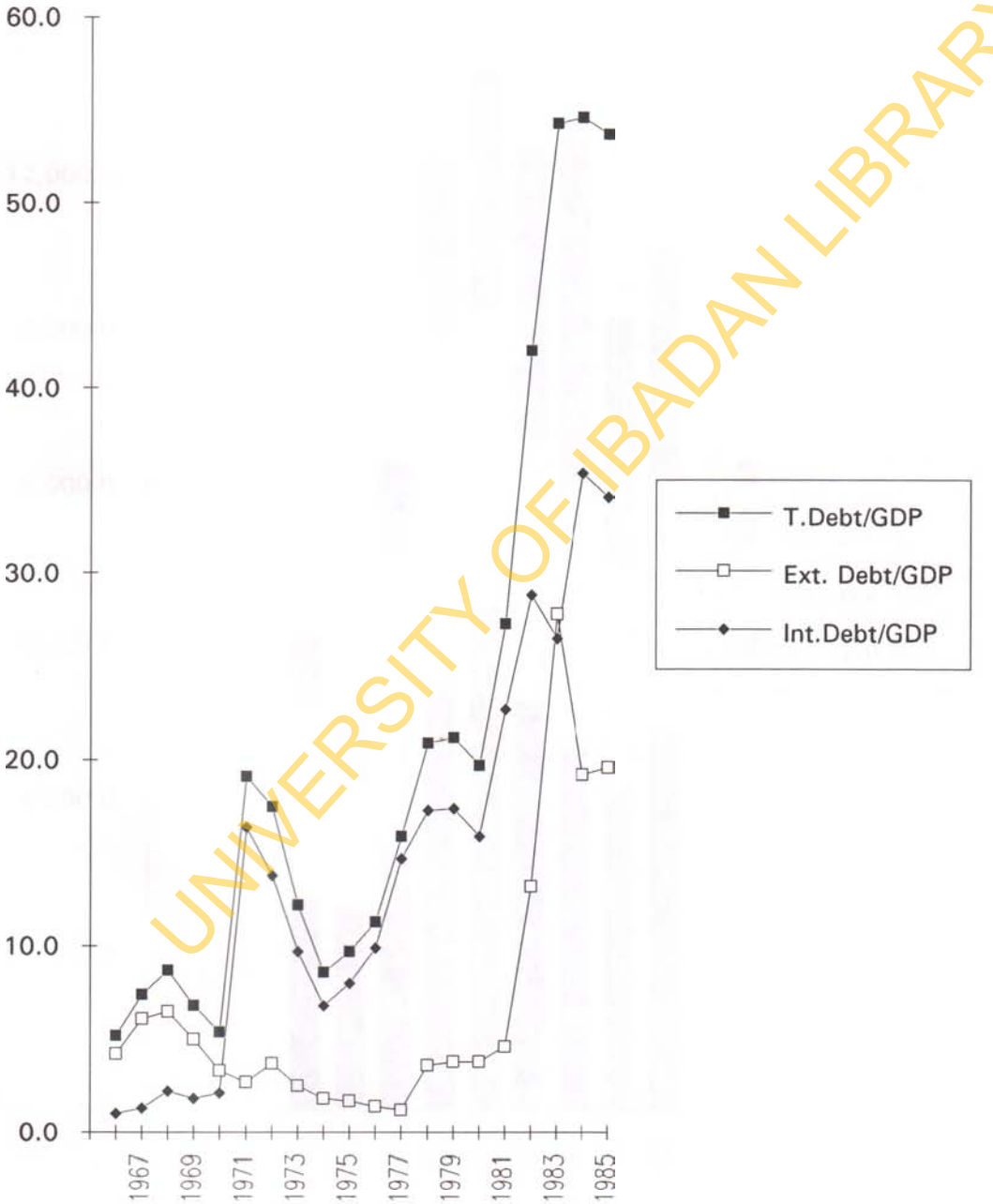


Fig.13 Components of States Government Revenue, 1977/78-85

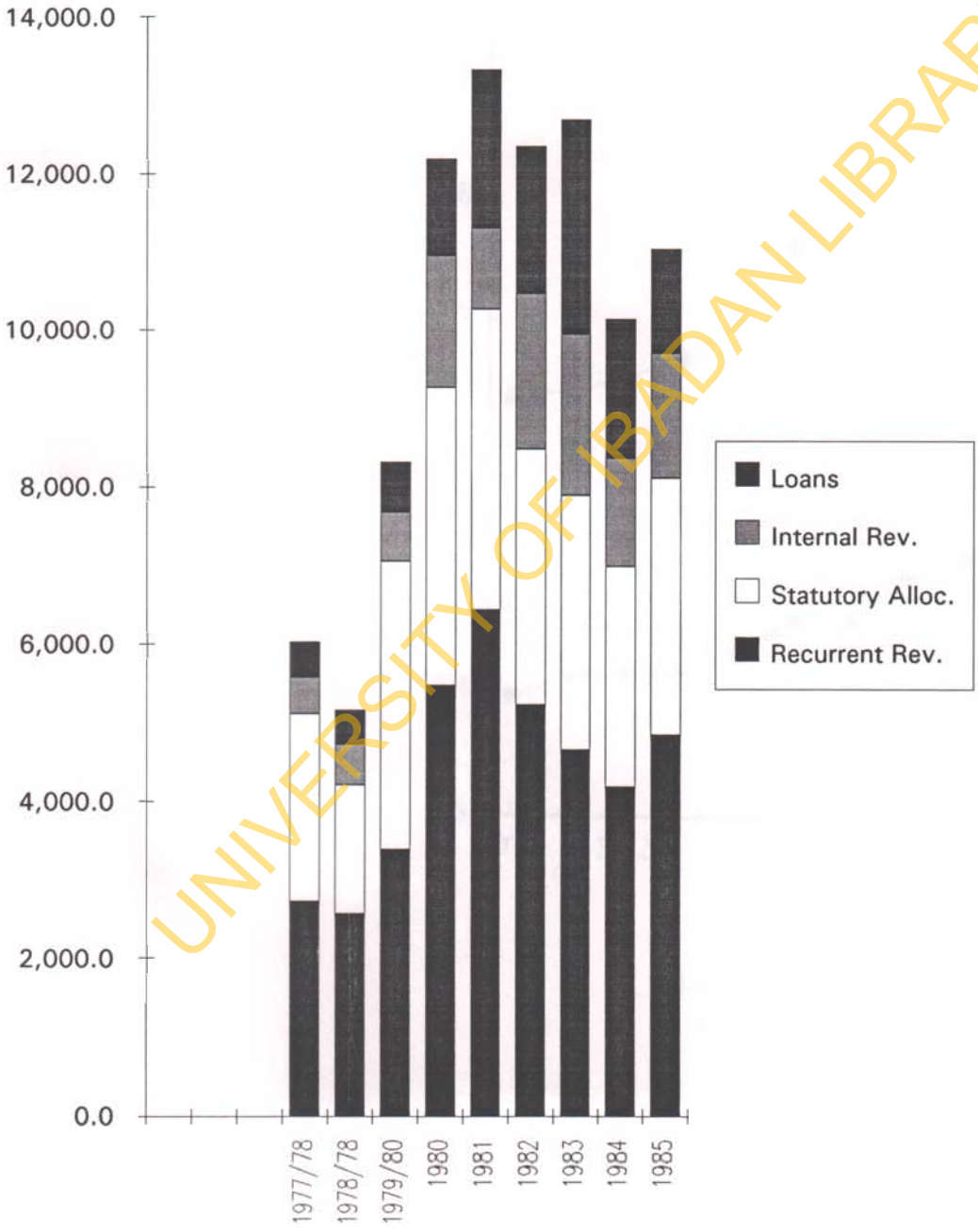


Fig.14 Annual Money Supply and Price Level, 1970–83

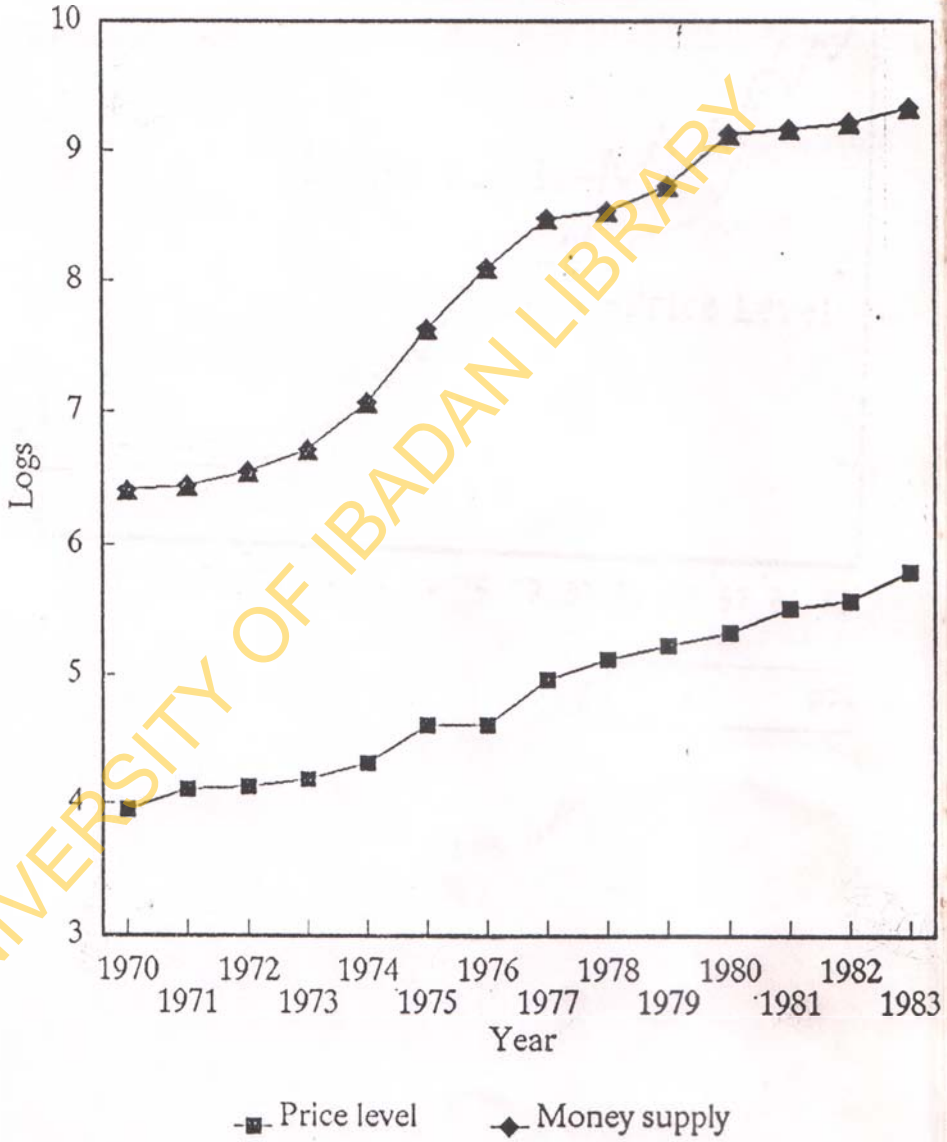


Fig.15 Money Supply and Prices (Quarterly Se

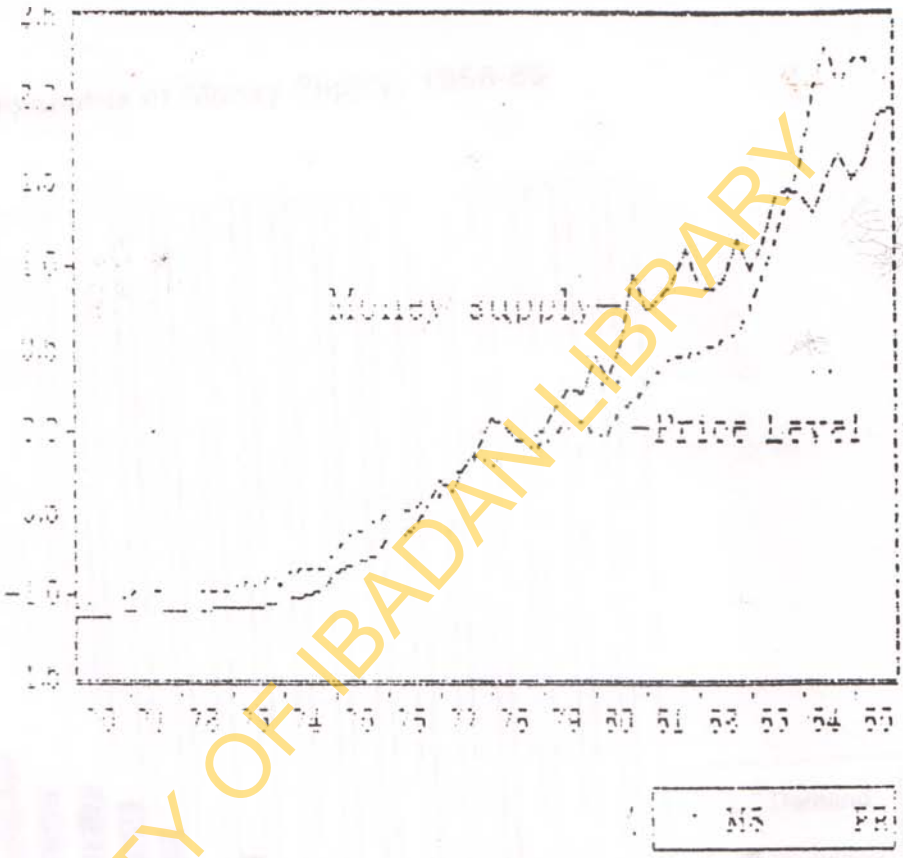


Fig.16 Components of Money Supply, 1966-85

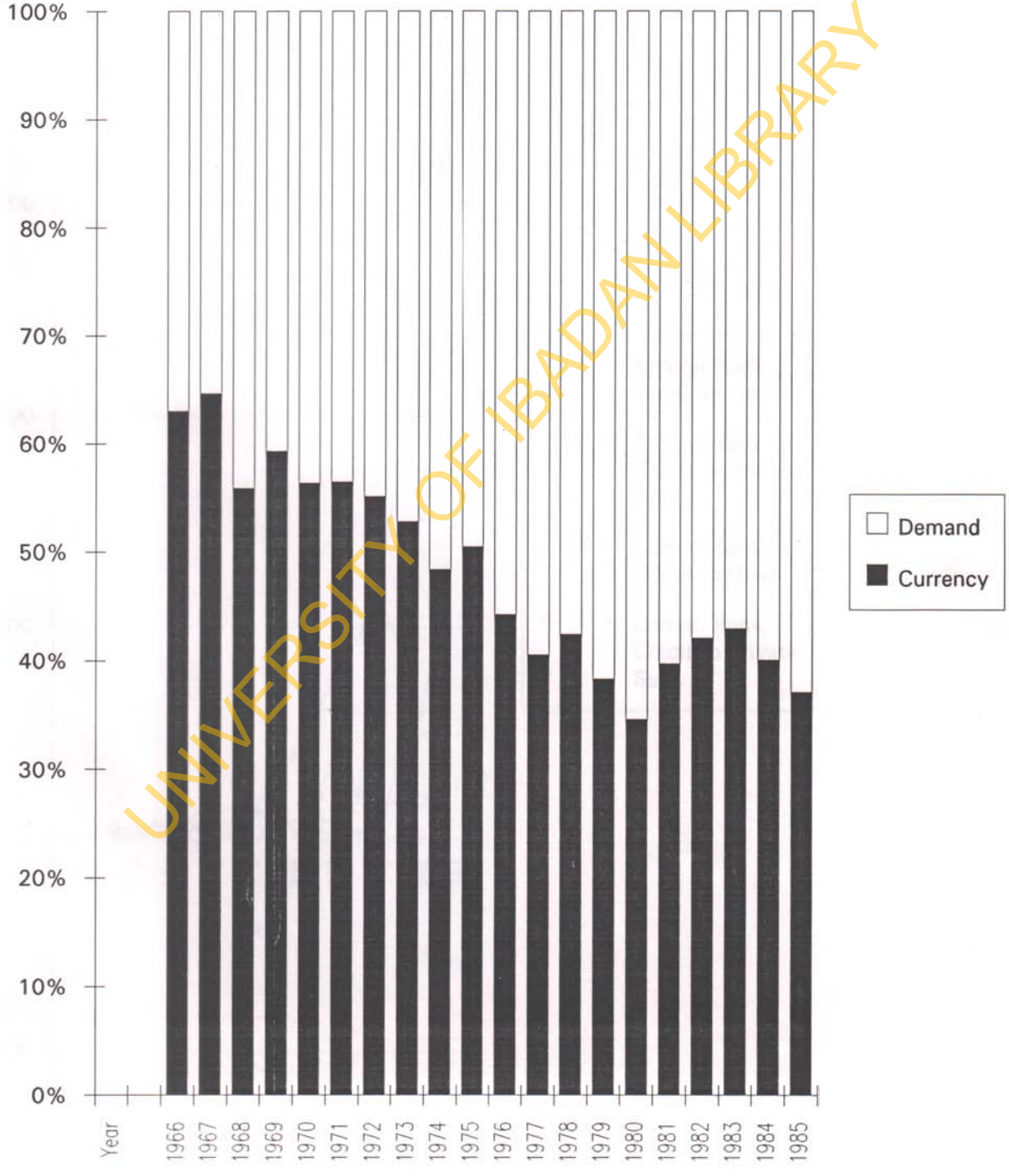


CHART17.XLC

Fig.17 Banking System Credit, 1966-85

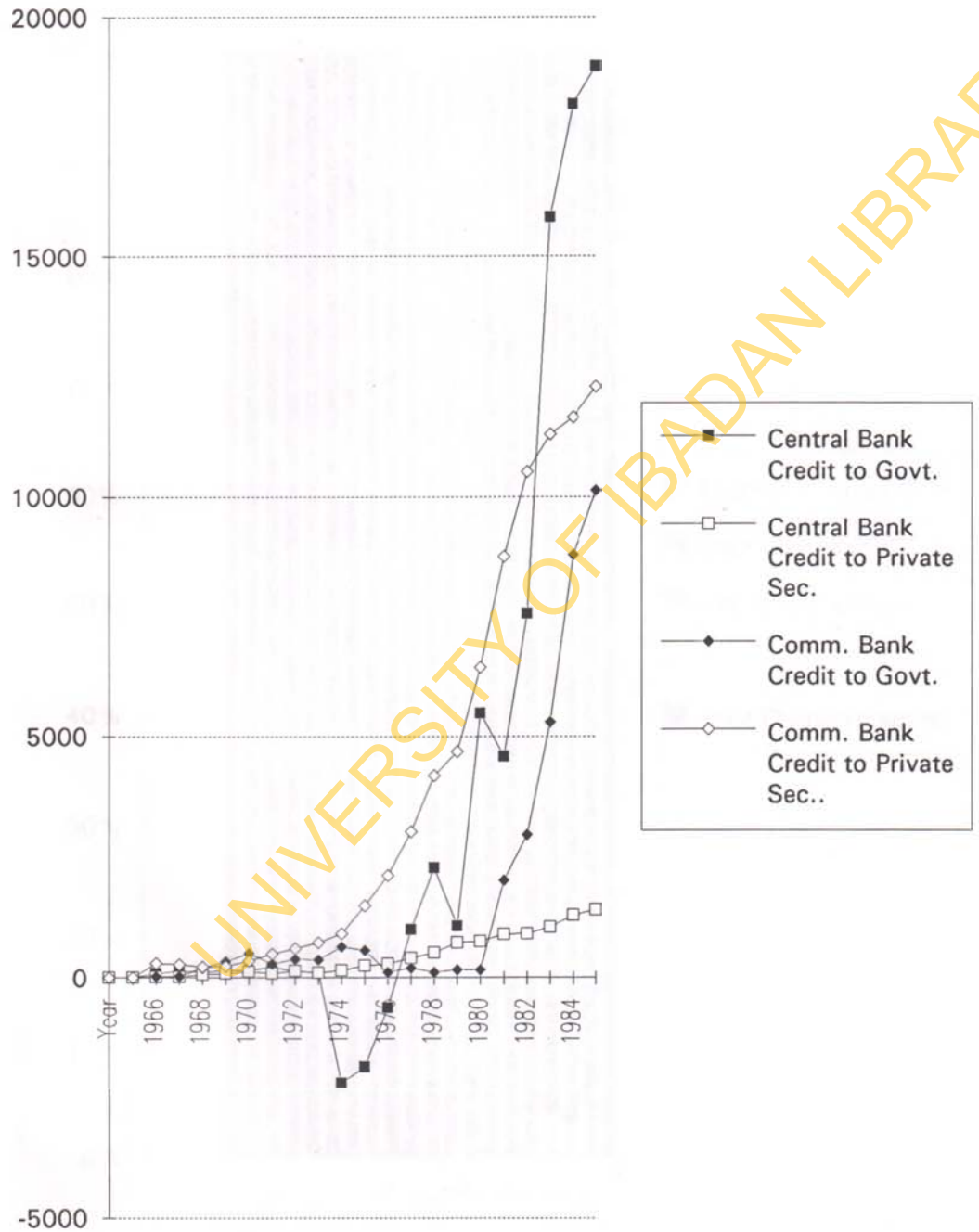


CHART18.XLC

Fig.18 Debt Charges as a Percent of Recurrent Exp., Exports and GDP, 1966-85

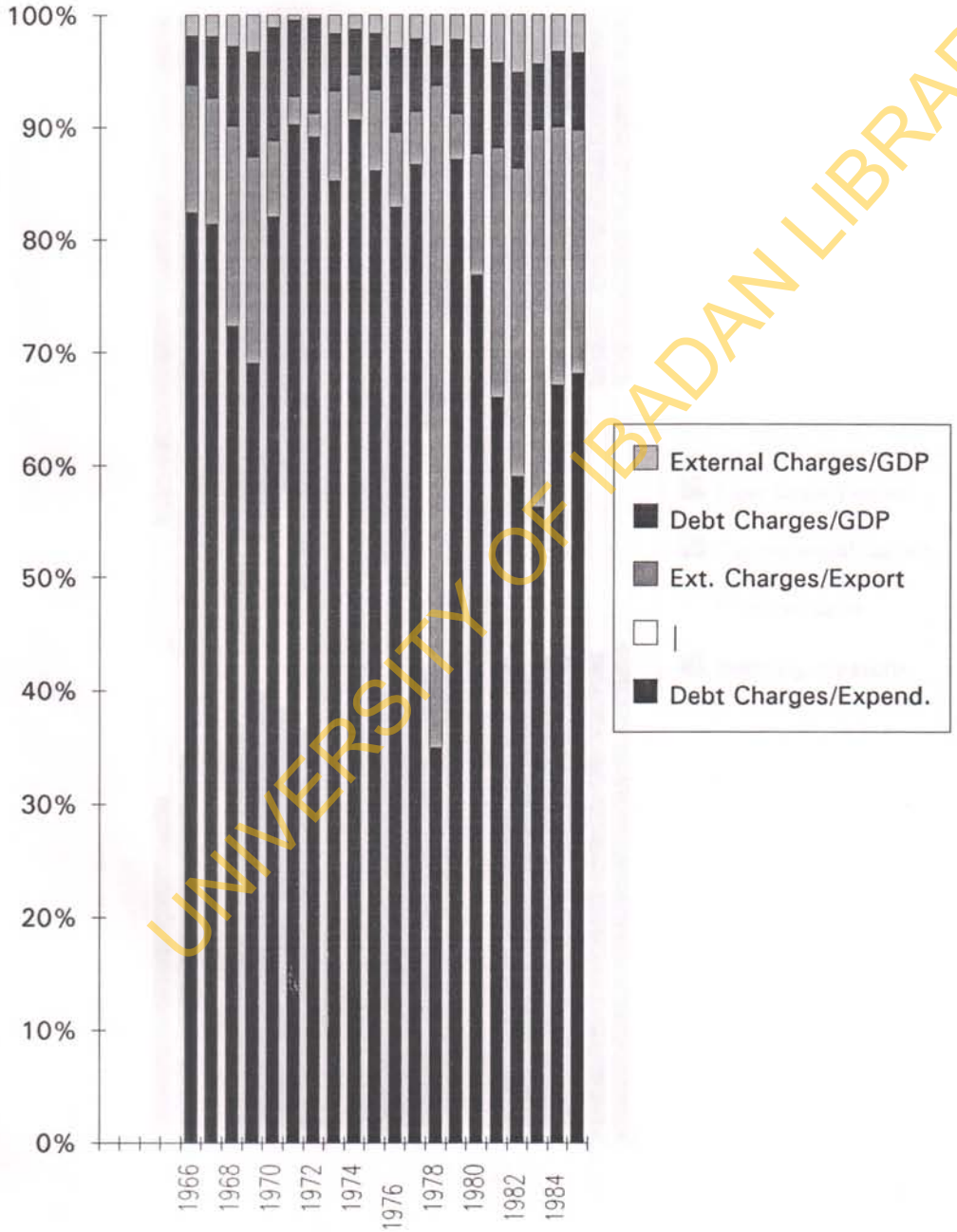


CHART19.XLC

Fig19. Ownership of Domestic Public Debt Outstanding, 1966-85

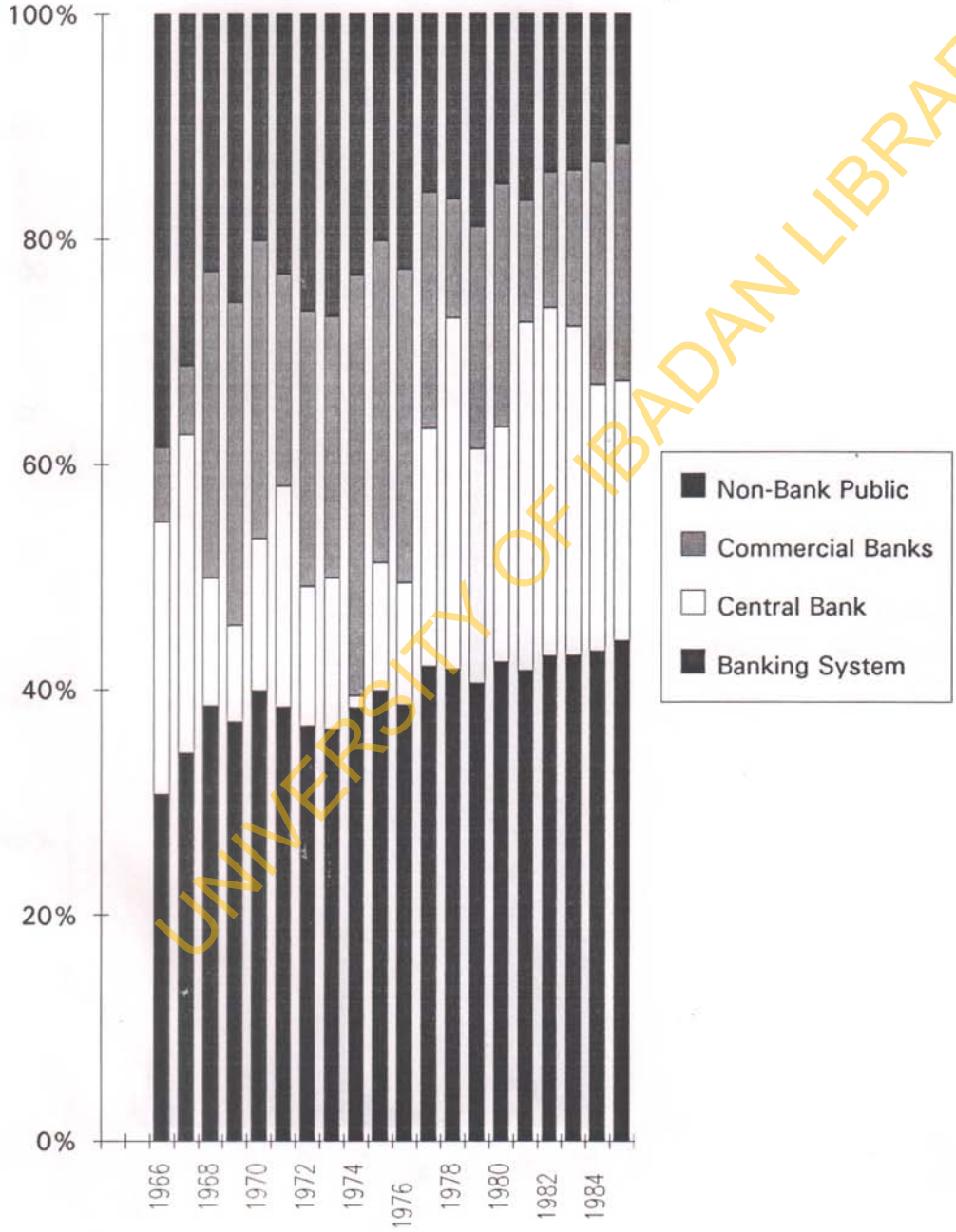


CHART20.XLC

Fig.20 Sources of Financing Federal Deficit, 1966-82

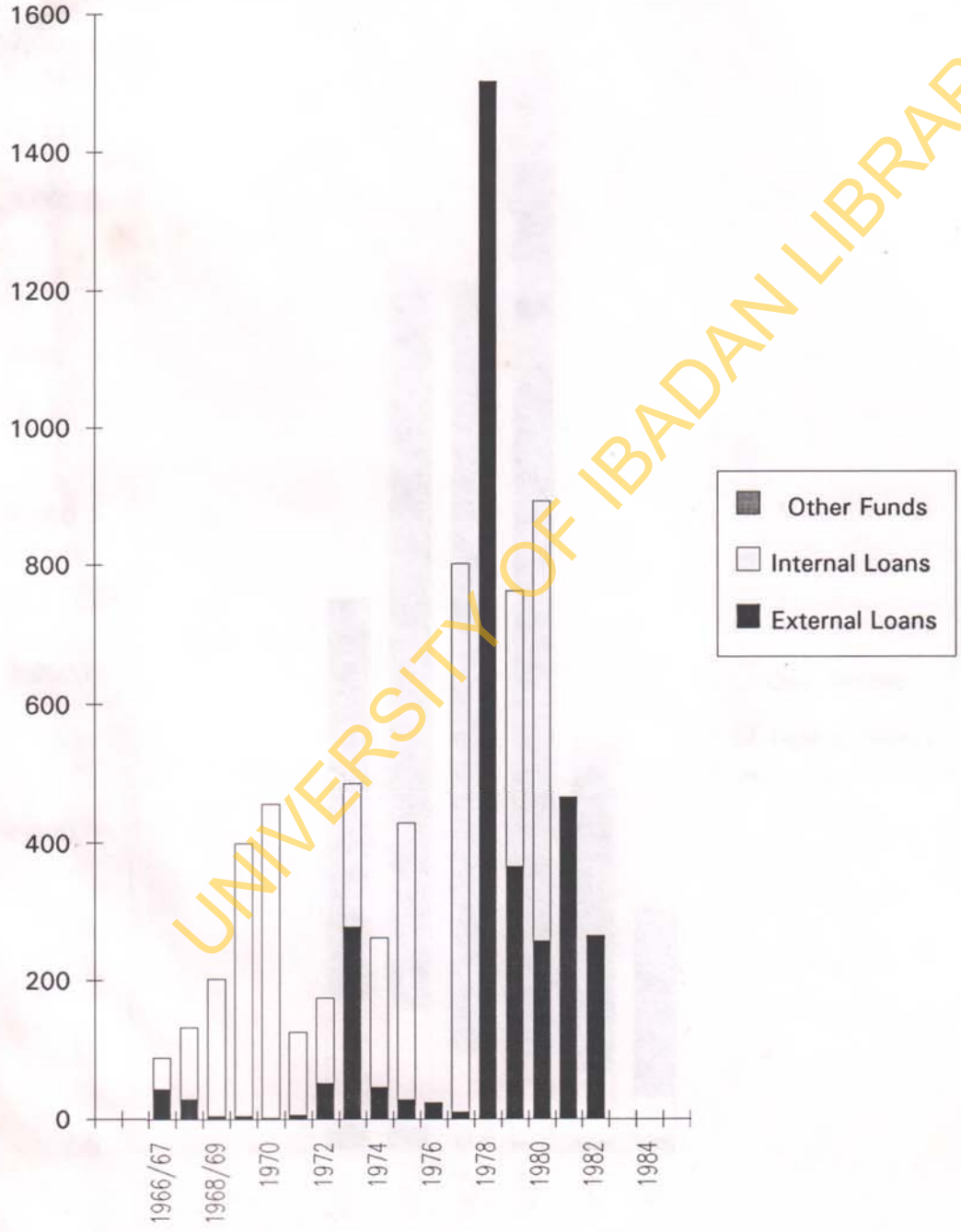


Fig.21 Sources of Financing States Government Deficits, 1980-85