THE PORTFOLIO BEHAVIOUR OF INSURANCE AND

MERCHANT BANKING FIRMS IN NIGERIA

BY

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CERTIFICATION

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To

MARY ABIOYE MAKINDE
(1936-1979)

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ABSTRACT

The primary purpose of this thesis is to provide an understanding of the portfolio behaviour of financial institutions in Nigeria. In particular, using the insurance and merchant banking case, the study seeks to establish a conceptual framework, and perform an empirical analysis that will inform and assist monetary and overall macroeconomic policy formulation as well as further applied research on financial intermediary behaviour.

In order to achieve this we reviewed developments in the literature on bank behaviour with emphasis on the modelling approaches on the subject-matter. The survey indicates that the models of subjective risk aversion have a critical role to play in developing a 'more complete model' of financial institutions' behaviour. The desirability of models with an explicit utility function was also highlighted. However, as was observed, studies of this nature are very few in developing countries, including Nigeria.

Also, prior to model specification and estimation, an attempt was made to develop the conceptual basis for the study based on an elaborate overview of the Nigerian financial environment. The main thrust of the exposition was to the effect that an understanding of the interlinkages between portfolio selection on the one hand and monetary policy, regulation of financial institutions, financial market development, etc. on the other hand require an empirical clarification.

Three main complementary models, two of which are based on the theory of subjective risk aversion, were developed and

estimated. The first two are, respectively, variants of the Tobin-Markowitz and Tobin-Brainard choice theoretic models of portfolio selection under uncertainty adapted to the Nigerian environment. The third is a simultaneous equation model developed to evaluate the impact of institution portfolio composition on economic activity and growth. A supportive analysis was conducted to illuminate on specific aspects of the portfolio of the insurance and merchant banks. For instance, apart from various financial ratios calculated, the analysis of variance (anova) was used to investigate the extent and significance of asset diversification as well as the pattern of asset holding of these institutions. Furthermore, a new empirical approach was developed to analyse the nature of term transformation of the institutions.

Our summary of findings comprises the following:

(i)   that there was continuing divergence in asset holding patterns as well as the maturity structure of overall portfolio holdings over the time period;

(ii)   that the term transformation was found to be negative in these institutions;

(iii) that the narrowness of the financial market as well as credit availability were found to be major and significant determinants of overall portfolio behaviour in the institutions;

(iv)   portfolio response to interest rate expectations was found to be both institution- and asset-specific. A number of 'specialized' substitute and complementary relationships were identified for each institution type.

Portfolio adjustment process was also found to be non-rapid (slow);

(v)   the civil war and monetary authorities' regulation of financial institutions using various monetary instruments did not affect portfolio selection in these institutions;

(vi)   portfolio holdings, irrespective of the structure or institution concerned, had no significant impact on economic activity or growth;

(vii)   portfolio behaviour was found to have an adverse impact on the effectiveness of monetary policy. Also, the institutions' contributions to financial market development was lower than expected during the period covered.

(viii)   the model provided a simple and useful framework for understanding portfolio behaviour in financial institutions. However, non-satisfaction of a priori restrictions and the indicated divergent behavioural pattern especially, in terms of response to different interest rate expectation proxies, suggest that further research and policy should be based on models encompassing the entire financial sector.

The major contributions of the study to knowledge have been in three key dimensions. First, it provides a pioneering and extensive empirical insight into merchant bank and insurance company portfolio behaviour in Nigeria. Second, the study develops a new empirical approach for assessing term transformation in financial

institutions and adopts this for analysing term behaviour in Nigerian insurance and merchant banking firms. Lastly, the study has been able to generalize earlier results on the impact of commercial bank portfolio composition on economic activity for institutions with different and divergent portfolio structure and to effectively show that portfolio composition has no impact on economic activity irrespective of the institution concerned.

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CHAPTER ONE

INTRODUCTION

1.1   Introduction

The desire for rapid growth in many developing countries as crystallized in the visible drive for agricultural, industrial, manpower and technological progress is specifically tied to attainment of high levels of monetization of an economy and invariably, financial development. This is in realisation that both sectoral and overall national economic development will not occur in a vacuum. Finance constitutes, among other factors, a major constraint and an indispensable element in transforming a developing economy into a modern industrial society.

Financial institutions channel financial resources into productive investment. These institutions contribute markedly, to economic development by making finance available to households and business enterprises for investment and capital formation. Broadly, financial institutions provide services associated with three key activities - provision of a means of payment, mobilisation of funds, and allocation of funds, in sum, getting borrowers and lenders together. It is obvious that without these institutions, a country is limited to a barter economy, which is clearly an inefficient system because markets cannot develop nor can specialization take place. Intermediation provides a varied menu of financial assets particularly suited to the needs and/or the desires of the surplus units, and encourages investment by providing a variety of available sources of funds for deficit units. Hence, financial institutions contribute to the real productivity of the economy and

to the overall standard of living since they are able to satisfy simultaneously the needs and preferences of both surplus and deficit units. In essence, the institutions act as conduits for converting savings into investment - an activity vital for promoting economic growth and development.

Apart from the intermediation process, which involves reduction of risks and transformation of maturities, financial institutions complement the efforts of monetary authorities in providing non-inflationary support to the economy. Today, these institutions constitute an important source of capital for long term development.

The important role of financial institutions in the growth process has been recognised in many developing countries. In recent years, efforts have been made to monetize these economies and increase the number of financial instruments available. As will be shown in the case of Nigeria in chapter two, there has been an increase in the outlets for deposits and use of funds. However, in the process of intermediation, financial institutions, being rational, have to buy and/or sell an optimal mix from the available menu of financial assets. In deciding on the appropriate (optimal) portfolio structure, the institutions are constrained by three conflicting economic requirements namely, solvency, liquidity and yield (earnings). Basically, the financial firm is liquid when it is able to exchange its assets for cash rapidly enough to meet the demands made upon it for cash payments. The firm is solvent, when the realizable value of its assets is at least sufficient to cover its liabilities. Yield is important to the banker, as it determines the profitability of the institution to its stockholders. Moreover, the

earnings of the institution measure the success with which the institutions can attract the resources they need for efficient operations both as a private profit venture and as an important segment of the monetary structure. The issue here for the financial firm is that the attainment of any (or an appropriate combination) of these requirements involve some trade-offs. For instance, it is most likely that the more liquid the firm, the less profitable will be its asset portfolio. Therefore a financial firm must decide on the appropriate type and proportion of asset and liabilities to include in their portfolio at every point in time that will minimise the conflicts in the three economic requirements. This is regarded as the portfolio structure problem. And it constitutes the critical problem facing financial institutions and monetary authorities.

In resolving the conflict, the developmental aspirations of the country may not often be explicitly accounted for. Wilson (1966) has observed that financial institutions have to play some additional non-orthodox roles in developing countries by way of contributing to the economic development of these countries. Thus for instance, these institutions will not be expected to adhere strictly to the real bills doctrine but rather transform short term liabilities to longer term investments to enhance development in that country. Such requirements on financial institutions often conflict with their cardinal objectives discussed above. This worsens the institutions' dilemma in determining a suitable portfolio structure. Also, in less developed countries the desire by monetary authorities to promote monetary stability and encourage the development of a sound financial system have also brought about various regulatory restrain on financial institution portfolio behaviour. This has

created further problems and inhibited the ability of financial institutions to determine the optimal portfolio mix to achieve their identified objectives. Interestingly, on the contrary, as identified by Gurley and Shaw (1960, 1967) and some earlier work on the subject, financial institutions behaviour, if not effectively regulated and monitored, may have adverse implications for the effectiveness of economic policies, interest rate determination and the attainment of internal and external balance in developing economies.

This dual problem on the possibility of a divergence in the objective function of financial institutions and the developmental aspirations of LDCs and the hypothesised recursive effect of financial institution portfolio structure and behaviour, on financial policy and economy growth is the prime focus of investigation in this study.

1.2 Motivation and Purpose of the Study

This study on portfolio behaviour of financial intermediaries, by which we mean how these institutions arrange their assets and liabilities taking cognisance of the liquidity, solvency and profitability requirements, analytically examines and compares the portfolio behaviour of firms in the insurance and merchant banking industries in Nigeria. While insurance companies offer the specialized service of underwriting life and non-life insurance policies, merchant banks, apart from its role as a wholesale banker, serves as a discounting house and offer equipment on lease among other banking functions provided (see p. 32 for details).

This research into the portfolio behaviour of these institutions is specifically motivated by:

(a) observed paucity of studies on portfolio behaviour of financial intermediaries in less developed countries, especially in Nigeria where there are very few empirical studies on the subject-matter. Moreover, existing studies are based mainly on commercial bank behaviour except for that by Omoruyi (1984) on insurance companies investment behaviour. This study will therefore enrich existing knowledge on financial behaviour of bank and non-bank financial institutions. It would also contribute by providing pioneering insight into the overall portfolio behaviour of insurance and merchant banking firms in Nigeria;

(b) empirical evidence notably by scholars like Silber (1969), Campbell (1978) etc. (discussed extensively in Chapter 3) suggests that portfolio composition and behaviour of financial institutions have important implications for economic growth and development;

(c) the proposition that the current neglect of the structure of liquidity as well as the portfolio composition of the broad category of financial intermediaries, and the pre-occupation with the narrow definition of money, in the formulation and implementation of monetary policy in Nigeria may have adverse implications for the effectiveness of monetary policy. The Radcliffe Committee (1959) report and the Gurley and Shaw (1960) thesis (both of which are elaborately discussed in Chapter 3) are the main proponents of the view;

(d)   the recognition that inadequate coverage of the port-
folio of insurance companies as well as the long end of
the asset structure of merchant banks by policy
guidelines issued by the monetary authorities in Nigeria
also have implications on the impact of economic policy
in Nigeria. Thus, this study, apart from giving an
insight into the effects of regulation and deregulation
on the portfolio behaviour of financial intermediaries,
also allows for an analysis of how and to what extent
deregulation inhibit the process of monetary policy; and

(e)   it is noted that one of the goals of financial intermedia-
tion is the attainment of a developed and efficient
money and capital market to cater for both the short
period and long term financing of economic development
in the country. This study provides an avenue for
monitoring and analysing the role and contributions of
the insurance and merchant banking firms to the
development of financial markets in Nigeria.

In view of the above, the specific objectives of this study are:

1.   to identify, model, analyse and compare the composition,
characteristics, patterns and structure of the balance sheet
of insurance firms and merchant banks in Nigeria, so as to
provide an understanding of the behaviour of these financial
institutions in Nigeria;

2.   to investigate the impact of the portfolio behaviour of these
institutions on the effectiveness of monetary policy in Nigeria
and also to verify the effects of their portfolio composition
on the level of economic activity in Nigeria as well as on the

development of a viable and efficient financial market in the country;

3. to test and examine the extent to which liquidity and asset diversification are behavioural considerations in the determination of the portfolio structure of insurance companies and merchant banks. It also investigates the substitutability and complementarity of insurance and merchant banks asset holdings and the implications for institutional behaviour and policy formulation in Nigeria;

4. to look at interest rate sensitivity in financial behaviour in Nigeria and consider the implications for policy formulation as well as identifying other factors that explain portfolio behaviour in these institutions;

5. to conduct an intertemporal comparison of financial behaviour between insurance and merchant banking firms. It also analyses and compares the structure of portfolio adjustment and the portfolio adjustment process in these institutions;

6. to examine the implications of the inadequate coverage of insurance companies as compared to merchant banking firms, by monetary policy directives and guidelines, for their portfolio allocation; and

7. to investigate the nature of term transformation as well as the general portfolio maturity structure prevailing in the insurance and merchant banking firms operating in the country.

1.3 Scope of the Study

Though the study seeks to explain and model asset and liability holdings of financial intermediaries, the empirical investigation is limited to data obtained from insurance and merchant banking firms in Nigeria. The study makes use of aggregated annual time-series data for the merchant banks and insurance companies. This is because this is the only form of data set readily available. The accuracy of the data set is guaranteed to the extent that the firms are by law required to send returns of their financial transactions to the Central Bank of Nigeria (CBN) and the Federal Ministry of Finance and Economic Development from where these information were obtained in aggregated forms.

However, all attempts at obtaining disaggregated cross-section data proved futile. The quality and quantity of the disaggregated balance sheet data available was substandard and could not be used to derive any reliable and meaningful results. Also, quarterly time series data, postulated to be more illuminating and instructive on the impact of portfolio behaviour of financial institutions on monetary and financial policy as well as overall economic activity, was not available for the insurance companies. In order to facilitate comparison and ensure uniformity, therefore, the study was restricted to only annual data series. This was done bearing in mind the nature of the Nigerian financial environment and policy process. For instance, interest rates were mainly reviewed annually during the period covered by the study. Thus the use of annual data series will sufficiently illuminate financial behaviour in the insurance and merchant banking firms. In this

regard, no significant loss would be incurred.

This study is essentially based on time series data covering the period 1965-1985 for the merchant banks and the period 1969-1985 for the insurance companies. Annual data covering the period 1980-1985 were adopted for the complementary inter-temporal comparative analysis of insurance and merchant bank behaviour in Nigeria.

The time period covered is limited by the availability of reliable data in both institutions, particularly, the insurance companies where reliable data collection started only after the promulgation of the Insurance Companies Regulation Act of 1969.

The empirical analysis will be based largely on the model of portfolio choice under conditions of uncertainty (both static and dynamic versions) and the model to evaluate the impact of portfolio composition on level of economic activity. Other supportive analysis to determine the impact of behaviour of these firms on monetary policy, economic activity, capital market development, are also carried out.

1.4   Outline of the Research Methodology

1.4.1   Method of Data Collection

Our study as we noted earlier is based on aggregated secondary balance sheet data for all the insurance companies (categorized into life, non-life and joint insurance funds) and the merchant banking firms. The data requirements in the case of the

insurance firms were collected from the Office of the Director of

Insurance, Insurance Division, Federal Ministry of Finance, Ikoyi,

Lagos. The data requirements for the merchant banking firms were

extracted from various issues of the Economic and Financial Review,

which is a quarterly publication of the Central Bank of Nigeria.(CBN).

The other data requirements particularly the interest rate

structure were extracted from various issues of the Central Bank

of Nigeria's Annual Report, and various issues of the CBN's

Economic and Financial Indicators. Information on the Gross Domestic

Product (GDP) of Nigeria were obtained from the Federal Office of

Statistics. The money supply data (broad and narrow definitions)

were extracted from the International Financial Statistics (IFS)

published by the International Monetary Fund (IMF). Other data

requirements were extracted from divers sources which will be

appropriately specified in the main text of the thesis.

1.4.2 Analytical Techniques

The time series data collected were summarised and analysed

using various statistical techniques. Specified hypothesis regarding

financial behaviour were tested using a number of non-parametric

statistical procedures like the Analysis of Variance (ANOVA)

adopting the Snedecor's variance ratio test. Various ratios were

also computed to give an indication of the behaviour of these

institutions. A percentage ratio analysis of the portfolio maturity

structure was carried out while a statistical approach using the

technique for comparison of means was developed to analyse term

transformation behaviour in these institutions.

Econometric models of portfolio choice under conditions of uncertainty (static and dynamic versions) were developed and estimated. In addition, a model explaining the effect of portfolio composition on the level of economic activity was specified and estimated. Appropriate econometric techniques based on the econometric problems on hand (discussed extensively in chapter five) were invoked in estimating the models. Elaborate diagnostic checks were carried out on the estimated models so as to confirm the validity and reliability of our results.

The computer package called Time Series Processor (TSP) available at the University of Lagos Computer System was used to carry out all the required estimations with the exception of the stability test of the estimated disequilibrium model of portfolio choice. The statcalc package on the Amstard Microcomputer of the Department of Economics, University of Ilorin, was adopted in this case.

All the techniques outlined above will be extensively discussed in appropriate sections of the thesis.

1.5 Organization of the Thesis

The next chapter presents an overview of the Nigerian financial system. It traces the historical development of institutions operating in the system as well as the structure and growth of these institutions. The chapter considers also the characteristics of the Nigerian financial environment, particularly how these concern the insurance and merchant banking firms. Chapter three

surveys theoretical developments and the various modelling approaches adopted in studying portfolio behaviour of financial intermediaries. The results of previous empirical studies are also discussed in the chapter. The chapter examines various theoretical propositions on the possible effects of insurance and merchant bank behaviour on monetary policy, economic growth and development, financial market development, interest rate determination and the growth of the institutions as well as the entire financial system in general. In doing this, the postulates of various theoretical doctrines on these issues particularly the Gurley and Shaw (1960) thesis and the Radcliffe Committee Report of 1959 are discussed, among others.

The fourth chapter on balance sheet structure and flow of funds analysis in the Nigerian insurance and merchant banking firms, provides knowledge on the expected and actual layout, categorization and characteristics of the balance sheet of these firms. The chapter presents results of the test of various hypotheses set up to pin-point and bring out the essential and important characteristics of portfolio holdings in these institutions, particularly, with regards to the structure of liquidity, term transformation, asset diversification and asset holding patterns within these institutions. Thus, the chapter provides an insight into the actual portfolio behavioural pattern. In chapter five, three main econometric models are developed for our empirical investigation on the portfolio behaviour of insurance and merchant banking firms in Nigeria. The chapter discusses the various econometric problems involved in estimating these models and proffer solutions

to them. A discussion of the econometric technique used to estimate the model is also provided.

Chapters six and seven contain the results of our empirical investigation and also provide an evaluation of the estimated model as well as discussion on their implications for the objectives of our study.

The last chapter provides a summary of the whole study, draws conclusions and makes recommendations on the basis of the empirical results.

CHAPTER TWO

OVERVIEW OF THE NIGERIAN FINANCIAL ENVIRONMENT

2.1 Introduction

The financial environment is a complex network embracing payments mechanisms, borrowing as well as lending of funds. The entire environment represents a system (financial system) for mobilizing the surplus in an economy and channelling it to the most productive activities; providing liquidity at desirable time and levels as well as instituting controls. Broadly, the financial system encompasses the financial markets and financial instruments traded in the market as well as the institutions and organs that operate within the system. As highlighted in Chapter 1, the key role of the financial system is the intermediation function of channelling funds from those with income in excess of their needs (surplus units) to those wishing to borrow (deficit units).

The development of a financial system is closely related to the economy within which it evolves. However, generally, the financial system deals in instruments or claims. These are all more or less sophisticated forms of IOUs. They are an asset of one party and a liability of another. In most instances the former party is entitled to repayment at a specified time and also receives a promise of some interest, share of profits or other service as compensation for his loan. Operations in financial institutions also involve term transformation of maturities, that is, they provide liquid liabilities which me e need of savers whilst employing their funds in the longer term financial assets which is more

convenient for borrowers. Though a financial system often starts with a rudimentary or underdeveloped and very simple framework, the system becomes more and more developed and sophisticated, in nature, in the course of the country's economic, social and political development. The Nigerian financial system is no exception to this gradual growth. The Nigerian financial system initially, had been the monopoly of commercial banks prior to the establishment of a central bank and other sophisticated types of financial institutions, which laid the groundwork for further progress.

This chapter takes a hard look at the history, growth and developments in the various components of the financial system thereby providing an understanding of the environment in which insurance and merchant banking firms conduct their business. Section 2.2 provides an analysis of the size of the Nigerian financial system while Section 2.3 traces the history and examines the structure of the financial system with emphasis on development of insurance and merchant banking in Nigeria. In Section 2.4 a general overview of the regulatory environment for the operation of insurance and merchant banking firms is provided. The last section of the chapter examines the constraints to effective developmental performance of the Nigerian financial system.

2.2 Size of the Nigerian Financial System

In terms of its size, the Nigerian financial system, using the conventional approach (see Falegan (1987) p. 54), has grown rapidly in nominal terms. The money stock grew by 375.8% between 1975 and 1983 from ₦4,167 million to ₦19,825 million. In terms of

the average annual growth rate, the money stock grew at 21.1%. For commercia bank credit to the private sector which increased from ₦1,540 million in 1975 to ₦11,291 million in 1983 (representing a 633.2% increase) the average annual growth rate is 26.6%, while claims on the government rose from ₦788 million to ₦5,533 million, a 602.2% increase in the same period. Increases observed averaged 38.1% in terms of the annual growth rates. In fact, the entire system has grown tremendously as reflected by the growth in the asset of major financial Institutions (see Tables 2.1 (A & B) and 2.2 which give indication of the growth in assets and savings in Nigerian financial intermediaries).

However, the phenomenal increase in nominal money stock may be a reflected of the high rate of inflation. In real terms, the rate of growth was much lower. Using the GDP deflator, money stock was equal to only ₦7,262 in 1983. The average annual growth rate in real terms was only 6.6% compared to the nominal growth rate of 21.1%. Finally, as Falegan (1987) inferred, based on the Deposit bank assets/GNP and money Stock/GNP ratios, the Nigerian financial system is smaller than that of many countries as will as seen in Table 2.3.

The phenomenal growth (as we shall see later) is also evident in the number of branches of institutions set-up, increase in the types of financial institutions and the number of financial instruments introduced into the financial environment. Despite the growth and increasing diversification in the financial system, a large proportion of activities, especially in terms of total deposits pooled and total assets, is still dominated by the commercial banking firms. (see Tables 2.1B and 2.2).

TABLE 2.1A

NIGERIA'S FINANCIAL ASSETS, 1970-1985

Year	Assets* (₦)	Financial Ratio**	Growth Rate of Financial Ratio
1970	950.0	18.0	-14.3
1971	1,005.4	15.1	-16.1
1972	1,161.4	16.2	7.3
1973	1,414.1	12.7	-21.6
1974	2,156.3	11.6	-8.7
1975	3,622.5	17.0	46.6
1976	5,278.9	19.6	15.3
1977	7,057.5	22.1	12.8
.1978	7,691.3	24.7	11.8
1979	9,848.7	24.4	-1.2
1980	14,397.4	32.0	31.2
1981	15,548.1	33.2	3.8
1982	16,893.9	32.5	-2.1
1983	19,365.2	35.7	9.9
1984	21,595.4	36.4	2.0
1985	23,818.7	36.4	0

*Financial assets consist of claims against non-financial spending units (primary securities) and financial institutions (indirect securities). The measurement here consists of the latter claims.

**Ratio of financial assets to Gross National Product (GNP).

Source: Computed from various issues of Annual Reports and Statements of Account and Monthly Reports by Central Bank of Nigeria (CBN)

TABLE 2.1B

ASSETS OF THE MAIN FINANCIAL INSTITUTIONS BY TYPE OF INSTITUTIONS, 1970-1985
(a)   AMOUNTS (N Million)

Institutions	1969/70	1970/71	1972/73	1973/74	1974/75	1980	1984	1985
I. Central Bank of Nigeria	392.0	438.0	559.5	1032.9	4078.2	9,357	14,341	15,728
II. Commercial Banks 1	758.3	1134.6	1367.6	1613.3	2767.5	16,341	30,100	31,998
III. Merchant Banks	10.3	13.3	18.6	46.4	114.3	1,008	4,496	5,001
IV. Development Banks 2 and Investment Companies	40.3	54.1	59.8	89.3	124.3	656.5	1,095.1	973
V Mortgage Institutions 3	11.1	12.1	22.7	33.7	41.1	334.8	550.1	550
VI. Insurance Companies	41.0	68.5	47.3	49.9	n.a	290.0	614.0	600
VII. National Provident Fund	73.2	86.5	120.8	144.8	170.8	324.0	489.7	525
'III. Hire Purchase Companies	2.2	4.0	6.5	..5	8.5	n.a	n.a	n.a
TOTAL	1328.8	1811.1	2203.1	3017.8	7304.7	28,310	51,686	55,375

TABLE 2.1B   (Contd.)

(b)   PERCENTAGE DISTRIBUTION'' (%)

Institutions	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1980	1984	1985
I. Central Bank of Nigeria	29.5	24.2	27.7	25.4	34.2	55.8	33.1	27.8	28.0
II. Commercial Banks 1	57.1	62.6	59.2	6.1	53.4	37.8	57.7	58.2	58.0
III. Merchant Banks	0.8	0.7	0.8	0.8	1.5	1.6	3.6	8.7	9.0
IV. Development Banks 2 and Investment Companies	3.0	3.0	3.3	2.7	3.0	1.7	2.3	2.1	2.0
V Mortgage Institutions 3	0.8	0.7	0.8	1.0	1.1	0.6	1.2	1.1	1.0
VI. Insurance Companies	3.1	3.8	2.3	2.1	1.6	n.a	1.0	1.2	1.0
VII. National Provident Fund	5.5	4.8	5.6	5.5	5.0	2.3	1.1	1.0	1.0
VIII. Hire Purchase Companies	0.2	0.2	0.3	0.3	0.2	0.2	n.a	n.a	n.a
TOTAL	100.0	100.0	100.0	100.0	100.0	100/0	100.0	100.0	100.

Notes:
1. Total assessment customers liabilities (per control) including cooperative banks, except for 1980 and 1984 data which were for total assets gross.
2. Data for the NBCI and NACB only for 1980, 1984 and 1985.
3. Data for the Federal Mortgage Bank only for 1980, 1984 and 1985.

Sources: i.   Report of the Committee on the Nigerian Financial System, December 1978.
          ii. Ade T. Ojo (1976). The Nigerian Financial System (for insurance companies for 1969 and 1971)

          iii. CBN, Annual Reports

TABLE 2.2

INSTITUTIONAL SAVINGS IN THE FINANCIAL SYSTEM, CUMULATIVE, 1977–1985
AMOUNTS (₦ Million)

		1977	1978	1979	1980	1982	1983	1984	1985
1.	Savings Time Deposits with Commercial Banks	2255.1	2601.7	3702.1	51632.2	6614.5	7391.3	8956.8	ͺ95.0
2.	Time Deposits with Merchant Banks	82.4	110.7	117.3	219.7	522.6	631.1	872.9	1145.0
3.	National Provident Fund	320.4	269.9	306.7	338.9	425.7	459.4	489.7	525.0
4.	Federal Mortgage Bank	16.8	19.2	27.9	40.7	66.0	84.7	116.5	114.0
5.	Federal Savings Banks	8.0	8.1	7.7	7.3	5.5	5.0	7.3	8.1
6.	Premium Bonds, Savings Certs. & Saving Stamps	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	TOTAL	2591.8	3009.7	4161.8	5734.0	7634.3	8571.6	10443.0	11787.0

PERCENTAGE (%)

		1977	1983	1984	1985
1.	Savings Time Deposits with Commercial Banks	86.9	86.2	85.8	85.0
2.	Time Deposits with Merchant Banks	3.2	7.4	8.4	10.0
3.	National Provident Fund	3.2		7.4	8.4
4.	Federal Mortgage Bank	9.0	5.4	4.7	4.0
5.	Federal Savings Banks	0.6	0.9	1.1	1.0
6.	Premium Bonds, Savings Certs. & Saving Stamps	0.3	0.1	0.1	0.1
		0.0	0.0	0.0	0.0
	TOTAL	100.0	100.0	100.0	100.0

Source   CBN: (i) Economic and Financial Review, June, 1983
(ii) Annual Reports, 1983, 1984 and 1985.

TABLE 2.3

COMPARATIVE FINANCIAL STATISTICS - 1980

Country	Per Capita Income US$	Deposit Bank Assets/GNP	M_2/GNP
Nigeria	870	36	32
Argentina	2,390	52	32
Brazil	2,050	39	23
Chile	2,150	65	30
Jordan	1,400	156	140
Korea	1,520	92	35
Morocco	2,090	28	25
Philipines	650	51	30
Portugal	2,350	120	110

Source: International Finance Corporation, Emerging Stock Markets Factbook, 1990

2.3 Evolution, Structure and Development of the Financial System

The Nigerian financial system consists of all financial institutions, including commercial banks, merchant banks, cooperative credit societies, insurance companies (life and non-life), development banks, pension funds and other financial houses, operating within the money and capital markets in the country. At the apex of these institutions is the Central Bank of Nigeria.

As mentioned in Chapter one, financial intermediaries are categorized into Bank and Non-Bank institutions. In Nigeria the banking institutions comprise of only the Central Bank, the commercial banks and the merchant banking firms. The non-bank financial intermediaries include the life and non-life insurance companies, and the National Pension Fund. The Federal Savings Bank (formally post office savings bank), the National Provident Fund, the Nigerian Industrial and Development Bank (NIDB), the Nigerian Bank for Commerce and Industry (NBCI), and the Nigerian Agriculture and Cooperative Bank (NACB). These non-bank institutions are not confined to the organized sector of the economy alone. They operate actively in the unorganized sector of the financial system where they serve the basic function of stimulating savings and ensuring that such savings are effectively and efficiently allocated to productive uses. In this unorganized sector, the activities of money lenders and traditional thrift societies including 'Esusu' and (Ajo' funds common in most parts of the Federation, predominates[1]. We also have establishments like the hire purchase houses and the various forms of cooperative societies operating in the country. However, the commercial banks in particular, and the merchant banks represent the dominant institutions, serving as the administrator of the payment system and the primary channel of credit to the economy.

The distinguishing factor, however, between the bank and

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1. 'Esusu' or 'Ajo' – Local methods or models of creating credit through the formation of indigenous thrift groups or societies.

non-bank financial intermediaries, apart from operational differences in terms of the performance of specialized functions, lies in the seeming inability of non-bank institutions to make funds available to finance expenditure in excess of the funds arising out of their current income flow. Nevertheless, these institutions now constitute an important element in the provision of both short-term and long-term capital for the development of the Nigerian economy; particularly as these non-bank institutions collect a sizeable proportion of current voluntary savings (see Table 2.2). Below is a presentation of the evolution and development of the main institutions and organs of the financial system.

2.3.1 Central Banking in Nigeria

As we have highlighted in the preceding sub-section, the Central Bank of Nigeria (CBN) is at the apex of the Nigerian financial system. It was established in 1958 as a monopoly bank to take up functions hitherto performed by the defunct West Africa Currency Board (WACB), which was set up by the British Colonial Government. The WACB served as the central monetary agency with its functions restricted to the issuance of the West African Pound before the creation of the Central Bank of Nigeria and other English-speaking West African countries.

Since the establishment of CBN, it has taken bold steps directly and indirectly to expand and improve the country's financial system. The bank's activities relating to improving the financial environment and the domestic economy in general are as follows:

(1) Issuance of legal tender currenc, and maintenance of its purchasing power.

(2) Banker to Government; in this respect, the CBN has responsibility for management of public debt. It floats the various Federal Government debt instruments including: Treasury Bills, Treasury Certificates and Development Stocks. The Central Bank also grants temporary advances in form of "ways and means" to Government to meet shortfall in recurrent budget revenue. As Government banker, the CBN gives financial advice in respect of how to maintain monetary stability, operation of the financial market, link between government and the financial community and coordination of monetary and fiscal policies,and national economic policies generally.

(3) Services to commercial and merchant banks; supervision of the banks through examination of their books and appraisal of their operational and financial positions based on the returns and annual balance sheets, thus ensuring high standard of conduct and management throughout the banking system. In cooperation with other banks, CBN promotes and maintains adequate and reasonable banking services to the public, especially inter-bank clearing. It also imposes liquidity ratio on banks to control monetary expansion. It provides outlets for investment of banks' temporary surplus funds through 'call money fund' and accommodates banks' short term demand for funds by grant of direct advances or rediscounting bills.

(4) Monetary management through regulation of banking system credit and general supervision. Monetary management aims

at broad objectives of price stability, high rate of employment, sustainable rate of economic growth and balance of payment equilibrium. The various instruments are selected bearing in mind the trade-offs among conflicting objectives in such a way as to maximize the overall benefit to the economy. The CBN uses the following instruments viz:

-   Variable discount rate

-   Direct regulation of interest rates

-   Reserve management to control liquidity and influence credit operation (cash, liquid asset reserve and supplementary reserve)

-   Direct control of banking system credit involving imposition of quantitative ceilings on overall distribution of banking system credit.

-   Persuasion to influence lending operation of commercial banks.

(5)   Promotion of economic development by creating environment and institutional framework conducive to the mobilization and channelling of funds into more productive investments through nurturing the growth of money and capital market institutions.

Further, the CBN, in its bid to identify with the development of the economy, has developed policies and programmes for the broad spectrum of the institutions constituting the financial system. They have expanded and improved upon their operations by evolving a functional but complex organizational structure to cope with the increasing complexity and dimensions of its functions. The Bank has established many branches and currency centres all over the Federation. In the process, the Central Bank has acted as a catalyst

to economic development as well as a data bank for financial and economic research and management.

2.3.2   Commercial Banking in Nigeria

The commercial banking system operating in the country dates back to the colonial period.

Tables 2.4 - 2.6 highlight the growth of commercial banking in Nigeria during the period of study. The first commercial bank to operate in Nigeria is the First Bank of Nigeria, then Bank of British West Africa. The bank was established in Lagos in 1894, followed by the Barclays Bank (D.C. & O), now Union Bank of Nigeria Ltd., with a branch in Lagos in 1917. The British and French Bank, now UBA Ltd., came to Lagos in 1949.

Between them, these expatriate banks monopolised commercial banking in Nigeria until 1933 when the National Bank of Nigeria Ltd. was launched. The African Continental Bank (ACB) was founded in 1947. The period before 1952 witnessed a free-for-all banking system in Nigeria. Many ill-conceived attempts were made to set up banks which failed due to mismanagement and under-capitalization[2].

The 1952 Ordinance was replaced by the Banking Act of 1958 and the Banking Amendment Act of 1962. The aim of the Act was to facilitate the growth of financial framework which will meet the new and greater need of Nigeria; it prescribed procedure and standard of banking, defined permissible capital and reserves, regulated examination by banking examiners and instituted supervision of

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[2]See Ajayi and Ojo (1981): p.16.

the Central Bank.

The 1969 Banking Act made it mandatory on all banks operating in Nigeria to register as Nigerian companies and increase the minimum capital requirement for indigenous bank to ₦600,000 and foreign banks to ₦1,500,000.

By 1959 just before independence, there were 8 commercial banks in Nigeria with 160 branches. Twenty years later (1978), there were 19 banks with 618 branches. As at the end of 1984, there were 27 commercial banks with 1,213 branches.

The number of branches of the commercial banks increased rapidly particularly from 1977 due to the Rural Banking Expansion Scheme. The first phase of the scheme (1977-80) involved establishment of 200 branches. By December 1980 at the end of the scheme, 194 branches had been established.

The second phase of the scheme (1980-83) involved establishment of 266 additional branches. Today, there are banks in all states and local government areas of the Federation.

Commercial banks perform very important functions in the banking system. They accept deposits, act as agents of payments, lend to customers by means of loans and overdrafts, discount bills and render important agency services on behalf of their customers and other banks. In executing these functions, they act as intermediaries between a large number of depositors or lenders on one hand and borrowers on the other hand, thus mobilising capital and channelling it to effective use throughout the country at the times when they are most needed and in places where they can most effectively be used. The existence of banks as a source of loanable

TABLE 2.4

COMMERCIAL BANKS BRANCHES AS AT DECEMBER 1985

	Commercial Banks	Branches as at December 1985
1.	African Continental Bank Ltd.	95
2.	Allied Bank (Nig.) Ltd.	33
3.	Bank of Credit & Commerce Inter. (Nig.) Ltd.	26
4.	Bank of the North Ltd.	70
5.	Cooperative Bank Ltd.	36
6.	Cooperative & Commerce Bank Nig. Ltd.	38
7.	Commercial Bank (Credit Lyonnais) Nig. Ltd.	1
8.	First Bank (Nig.) Ltd.	229
9.	Habib Nig. Bank Ltd.	7
10.	I.B.W.A. Ltd.	61
11.	Kaduna Cooperative Bank Ltd.	14
12.	Kano Cooperative Bank Ltd.	12
13.	Lobi Bank of Nig. Ltd.	6
14.	Mercantile Bank of Nig. Ltd.	31
15.	National Bank of Nig. Ltd.	98
16.	New Nigeria Bank Ltd.	37
17.	Nigeria Arab Bank Ltd.	23
18.	Nigeria International Bank Ltd.	1
19.	Owena Bank Ltd.	15
20.	Pan African Bank of Nig. Ltd.	27
21.	Progress Bank of Nig. Ltd.	18
22.	Savannah Bank of Nig. Ltd.	32
23.	Societe Generale Bank Nig. Ltd.	14
24.	Sokoto Cooperative Bank Ltd.	1
25.	Union Bank Nig. Ltd.	197
26.	UBA Ltd.	135
27	Universal Trust Bank Ltd.	3
28.	Wema Bank Ltd.	37

Source: CBN, Annual Reports, 1985

TABLE 2.5

GROWTH OF COMMERCIAL BANKING IN NIGERIA

Year	No. of Banks	Total No. of Branches
1971	16	318
1972	16	358
1973	n.a	n.a
1974	17	403
1975	n.a	n.a
1976	18	464
1977	19	508
1978	19	618
1979	20	n.a
1980	20	n.a
1981	20	869
1982	22	991
1983	25	1,108
1984	27	1,213
1985	28	1,297

Source: CBN, Annual Reports (Various Issues) .

TABLE 2.6

DISTRIBUTION OF BANK BRANCHES AS AT 30TH SEPTEMBER 1984

	States	Branches of Commercial Banks
1.	Abuja	8
2.	Anambra	86
3.	Bauchi	36
4.	Bendel	75
5.	Benue	33
6.	Borno	41
7.	Cross River	50
8.	Gongola	37
9.	Imo	80
10.	Kaduna	62
11.	Kano	65
12.	Kwara	45
13.	Lagos	199
14.	Niger	31
15.	Ogun	51
16.	Ondo	77
17.	Oyo	106
18.	Plateau	40
19.	Rivers	56
20	Sokoto	41
	TOTAL	1,219

Source: Central Bank of Nigeria.

critical reasons, namely

(1)   there has been, both in the developed and developing econo-
       mies, a concentration of research on commercial banking loan
       and overall portfolio behaviour with very little effort aimed
       at studying the economic impact and implications of those for
       other categories of financial institutions. Moreso, there has
       been a pioneering effort to investigate the portfolio behaviour
       of commercial banks in Nigeria (see, for example, Fakiyesi
       (1984)); and

(2)   it has been found that Central Bank monetary policy based on
       utilizing the narrow definition of money supply to regulate
       economic activity represents a declining portion of broad money
       stock and hence monetary control coverage in Nigeria. (See
       Table 2.7). Hence, there is need to evaluate the suspected
       continued and rapidly increasing impact of the portfolio activi-
       ties of other types of financial institutions, especially the
       Non-Bank Financial Institutions (NBFIs), on monetary policy in
       Nigeria since current policy framework covers less than 60%
       of the money stock leaving more than 40% uncatered for.

2.3.3   Merchant Banking in Nigeria

The first merchant bank to be established in Nigeria, the
Nigerian Acceptance Ltd. (NAL Merchant Bank Ltd.) commenced
operations in 1960.

The Nigerian Merchant Bank Ltd. (formerly UDT) started
operating in 1973. Three other merchant banks started operating in
1975 and by 1985, there were twelve (12) merchant banks in Nigeria
operating in 26 branches (see Tables 2.8 and 2.9). All the

merchant banks have their head offices in Lagos, while five of the leading banks among them have 13 branches in the other major commercial centres - Port Harcourt, Kano, Kaduna, Ibadan and Owerri.

The merchant banks perform specialised functions which include:

- Loan and project finance

- Issue of bonds and stocks

- Equipment leasing

- Foreign exchange remittance

- Export promotion

- Banking services involving short, medium and long term deposits, lending and general credits particularly accep-tance of credits, term loans, bridging finance, bill discounting, documentary credits and commercial paper.

- Financial advisory services on capital restructuring, stock exchange quotation, dividend policy, tax and government regulations, overseas investment and fund/ portfolio management.

Thus, strictly speaking, merchant banks are investment whole-sale banks serving the needs of corporate and institutional clientele. They are generally governed by the same statutory and central bank regulations as commercial banks. They constitute a watershed between commercial banks and development finance institutions.

To perform their functions effectively, merchant banks have formed subsidiary stock brokerage companies that undertake some of the functions including fund management, trusteeship, underwriting

TABLE 2.7

PROPORTION OF MONETARY CONTROL IN NIGERIA

Year	M1	Quasi Money	M2	M1/M2 x 100
1980	9.22	5.18	14.40	63.3
1981	9.74	5.80	15.55	62.6
1982	10.05	6.85	16.89	59.5
1983	11.28	8.09	19.37	58.2
1984	12.20	9.40	21.60	56.4
1985	13.27	10.55	23.82	55.7

Source: Computed from figures extracted from Economic and Financial Review, CBN 1986 December

TABLE 2.8

GROWTH OF MERCHANT BANKS IN NIGERIA

Year of Establishment	No. of Banks	Total No. of Branches
1960	1	1
1975	5	7
1979	6	8
1980	6	12
1981	6	14
1982	8	19
1983	10	24
1984	11	25
1985	12	26

Source: CBN, Annual Reports (Various Issues)

TABLE 2.9

MERCHANT BANKS IN NIGERIA

	Branches Dec. 1985
1. ABC Merchant Bank Ltd. (1985)	1
2. Continental Merchant Bank Nig. Ltd. (1975)	4
3. First City Merchant Bank Ltd. (1983)	1
4. Gindlays Merchant Bank of Nig. Ltd. (1984)	1
5. Indo-Nigeria Merchant Bank Ltd. (1982)	1
6. ICON Ltd. (Merchant Bankers) (1975)	3
7. International Merchant Bank Nig. Ltd. (1975)	3
8. Merchant Bank of Africa (Nig.) Ltd. (1983)	1
9. Merchant Banking Corproation Nig. Ltd .(1982)	1
10. NAL Merchant Bank Ltd. (1960)	4
11. Nigeria American Merchant Bank Ltd. (1979)	3
12. Nigeria Merchant Bank Ltd. (1973)	3

Source: CBN, Annual Reports, 1985

services, corporate finance, stock brokerage and stock exchange dealings. As a hybrid between commercial and development banks, they compete with commercial banks for bank deposits, commercial bills and other investment banking services, on the other hand, however, unlike development finance institutions which rely largely on equity funds and shareholders' loans, and unlike commercial banks which enjoy largely a cost-free deposit base, merchant banks in_ Nigeria buy virtually all their funds through payment of interest on fixed term deposits arising from inter-bank deposit placement or issue of certificate of deposits. Although their competition with

commercial banks is healthy for the financial system, Falegan (1987) noted that there is evidence of high levels of fragmentation and wide disparities in rates of return in the system.

2.3.4 Insurance Companies in Nigeria

Insurance business started in Nigeria in 1919, barely 30 years after the establishment of the first banking institution in the country.

British companies with agents in Nigeria dominated the insurance industry before 1960. The Insurance Companies Act of 1961 requires all insurers to be registered. By 1963, 22 companies had been registered. By 1972 the number of registered companies was 65 and 73 companies by 1979, 85 in 1983 and 87 by April 1985.

Prior to 1970, over 60% of the insurance companies were owned entirely by foreigners. NICON was established in 1969 to challenge this foreign domination. The indigenisation exercises of 1972 and 1977 further influenced the structure of ownership. The Nigerian Re-Insurance Corporation was set up in 1977. By 1978, 70% of the companies were owned by Nigerians and 30% owned jointly with foreigners (See Table 2.10). The insurance companies have branches in all parts of the country and the industry includes over 8,600 intermediaries made up of brokers, adjusters and agents spread across the nation.

Insurance is a service industry and a non-banking financial institution which provides security and protection against various risks in return for premiums which are accumulated and invested in the economy. In Nigeria there are life and non-life insurance companies as well as those with mixed operations. Non-life insurance

TABLE 2.10

DISTRIBUTION OF INSURANCE COMPANIES BY TYPE OF BUSINESS

Type of Business	1969		1970		1971		1972		1973		1974		1975		1976		1977	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Wholly life	6	22.2	7	16.3	6	11.3	8	12.3	9	12.8	9	12.8	9	13.1	6	10.2	6	10.2
Wholly non-life	13	48.2	26	60.5	38	71.7	43	66.2	44	62.8	41	58.6	43	62.3	37	62.7	38	64.4
Life and non-life	8	29.6	10	23.2	9	17.0	14	21.5	17	24.4	20	28.6	17	24.6	16	27.1	15	25.4
TOTAL	27	100.0	43	100	53	100	65	100	70	100	69	100	59	100	59	100	59	100

Type of Business	1978		1979		1980		1981		1982		1983		1984		1985	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Wholly life	6	9.5	8	10.9	8	10.7	9	10.7	9	10.7	2	2.3	3	3.4	4	4.6
Wholly non-life	42	66.7	47	64.4	49	65.3	57	67.9	57	67.9	60	70.6	62	70.5	60	69.0
Life and non-life	15	23.8	18	24.7	18	24.0	18	21.4	18	21.4	23	27.1	23	26.1	23	26.4
TOTAL	63	100	73	100	75	100	84	100	84	100	85	100	88	100	87	100

Source: Federal Ministry of Finance, Insurance Division, lagos.

companies sell protection against loss of property, resulting from accident, fire, theft, negligence and other predictable hazards. These are short-term liabilities and premium paid in return for promise of indemnity in case of the occurrence of the contingency Marine and motor insurance are the most important in this group. Life insurance involves more long-term contracts where accumulated premium can be invested in long-term projects. Endowment policies are the most popular life insurance in Nigeria.

The Insurance Miscellaneous Provisions Act of 1964 and the Insurance Act of 1976 stipulate that insurance companies must invest not less than 40% of their policy reserves in securities while having minimum investment of 25% of total assets in securities of government and semi-government bodies. Non-life companies are expected to invest not more than 10% of total assets in real property and life not more than 25%.

2.3.5   Development Banking in Nigeria

Development banks provide medium and long term finance for productive investment and provide technical, managerial and administrative advice needed to formulate and carry out such investments. They do not generally take deposit, they rely entirely on treasury funds. The banks include:

(i)   Nigerian Industrial Development Bank (NIDB)

(ii)   Nigerian Bank for Commerce and Industry (NBCI)

(iii)   Nigerian Agricultural and Cooperative Bank (NACB)

(iv)   Federal Mortgage Bank of Nigeria (FMBN)

(v)   Savings institutions (which collect deposits).

(i)   Nigerian Industrial Development Bank (NIDB)

NIDB was established in January 1964 as a private company with paid-up capital of ₦4.5 million. Initial resource was ₦8.5 million. In 1976, the Federal Government acquired ₦1.6 million of the bank's ordinary shares thus holding 94.2% of equity capital.

By 1977 NIDB's total resource stood at ₦97.6 million made up of ₦12.5 million equity and ₦85.1 million of borrowed assets. Total assets in 1983 was ₦386.5 million and ₦343.8 million in 1984. NIDB provides medium and long-term finance and makes equity investment.

It was set up to carry out the function of assisting privately-owned enterprises engaged in industry, commerce, agriculture, and the exploitation of natural resources in Nigeria, by providing finance in the form of medium and long-term loans or by equity participation; sponsoring and under-writing any issues or conversion of shares and securities, furnishing managerial, technical and administrative advice or assisting in obtaining such advice and services for Nigerian business undertakings.

NIDB finances those enterprises which by reason of their size were deemed capable of making significant contributions to the economy's development.

Minimum investment is ₦50,000 and maximum of 75% of project total capital and free reserve, whichever is lower. NIDB does not take less than 11% or more than 49% of clients' paid-up capital investment. Investment is limited to manufacturing, non-petroleum, mining and tourism sector.

NIDB operates through five administrative zones to cover the

whole country, viz:

- North-Western Area for Kaduna, Katsina, Niger, Sokoto and Kano States based in Kaduna.

- South-Eastern Area for Imo, Anambra, Benue, Cross River, Akwa-Ibom and Rivers States based in Aba.

- North-Eastern Area covering Bauchi, Plateau, Borno and Gongola States with centre at Bauchi.

- South-Western Area, covering Ondo, Oyo, Bendel and Kwara States based at Akure.

- Lagos Area covering Lagos and Ogun States.

(ii)   Nigerian Bank for Commerce and Industry (NBCI)

NBCI is one of the specialized development banks in Nigeria established for the purpose of providing long and medium-term credit needs of both public and private enterprises. It was created by Decree No. 22 of May 5, 1973, with the main objective of "provision of equity capital and funds by way of loans to indigenous persons, institutions and organisations for medium and long-term investments in industry and commerce at such rates and upon such terms as may be determined by the Board in accordance with the policy directives of the Federal Executive Council".

The backdrop for the establishment of the bank was said to have been provided by the perceived fear of failure of the indigeni- zation scheme being proposed by government at that time. As the indigenization exercise was being feared to fail (especially from lack of funds and buyers, and the apparent lack of technical ability of the Nigerian public to invest in stocks and shares), the NBCI was established to provide or act as a catalyst for successful indigenisation

by engaging in all types of investment banking and underwriting operations. In other words, NBCI was meant to operate like an all-purpose bank. The bank is involved in commercial banking, merchant banking and consultancy. It also handles small scale industrial loans.

Established with an authorised capital of ₦50m (subscribed 40% by the Central Bank and 60% by the Federal Government) and endowed with wide powers to borrow by way of loans from any source to meet its obligations and discharging its functions as laid down by the Decree, the bank has financed quite a large number of investment projects in commerce and industry at both the public and private sector levels. Available statistics show that by 31st March 1977, (four years of the bank existence), a total of 126 projects have already been approved. It has branches in all states of the Federation.

(iii)   Nigerian Agricultural and Cooperative Bank Ltd. (NACB)

NACB was established in April 1973 by the Federal Government. It started with a subvention of ₦12.0 million, out of which equity was ₦11.0 million and loan capital of ₦11.0 million.

NACB has its headquarters in Kaduna with branches at Abuja, Enugu, Bauchi, Benin-City, Makurdi, Owerri, Funtua, Kano, Ilorin, Ikeja, Maiduguri, Calabar, Yola, Ibadan, Jos, Port Harcourt, Sokoto, Minna, Abeokuta and Akure.

The bank is expected to improve the level and quality of all aspects of agricultural production including horticulture, poultry farming, pig breeding, fisheries, forestry and timber productions; enhance the availability of storage facilities and promote marketing of

agricultural products through liberal credits to farmers. The bank also provides consultancy service in project identification up to implementation and evaluation.

(iv)   Federal Mortgage Bank of Nigeria (FMBN)

FMBN was reconstituted from the Nigerian Building Society in 1977. It is wholly owned by the Federal Government with a share capital of ₦20 million. Its initial resource base was ₦150 million.

The bank aims at expanding and coordinating mortgage lending on a nation-wide basis. In this respect, it has branches in each of the states and area offices at Bauchi, Enugu, Ibadan, Ikeja, Kaduna, Minna and Port Harcourt. It provides services in the following areas:

- Loans for private residential houses

- Loans to mortgage institutions

- Development and promotion of mortgage institutions

- Supervision and control of mortgage institutions

- Credit to commercial property developers and estate developers of offices

- Assistance to building material industry and construction industries in terms of research on improving housing patterns and standard.

- Mortgage protection system with insurance companies.

(v)   Savings Institutions

These are banks which accept small amounts of money from customers. They are satisfied with little profits which they invest in government bonds and other investments. They also pay interest to their customers for their deposits. Savings institutions include

the Federal Savings Bank and the Provident Fund.

(a)   Federal Savings Bank (FSB)

Established in 1974 to replace the Post Office Savings Bank, FSB mobilise small savings and deposits from persons and make repayments.   Savings scheme include Popular Savings, Target Savings, Terms Savings and Children Savings.

Branches outside the post office include those at Enugu, Benin-City, Owerri, Ilorin, Lagos, Ebute Metta, Surulere, Minna, Akure, Ondo, Ijebu-Ode, Ibadan, Jos, Port Harcourt and Sokoto.

(b)   National Provident Fund (NPF)

NPF was established in 1961 as a contributory pension scheme for non-pensionable public servants and employees of private sector establishments who employ more than 10 workers.

The Fund invests in Federal Government stocks or quoted equities and debentures.

2.3.6   The Financial Markets

The market within which the institutions discussed above operate is referred to as the financial market made up of both the money and capital markets.

(i)   The Nigerian Money Market

The Nigerian money market was established for the following reasons:

1.   To enable government indigenise credit base.

2.   To provide the necessary machinery needed for government short-term financing needs.

3.   It was seen as a necessary step for the prosperity and progress of an independent nation.

4. To perform the traditional function of a money market for the country.

The instruments commonly traded on in the Nigerian money market are: Treasury Bills, Call Monies, Treasury Certificates, Commercial Bills and Certificates of Deposits. Each of these instruments constitutes a market within the overall umbrella of the Nigerian money market. The treasury bill is the most important of the money market instruments. Out of the total money market assets outstanding in 1986 with a value of ₦24,183.7 million, treasury bills accounted for ₦16,976.0 or 70.2%. In that year government debt instruments accounted for 98.3% of the total outstanding. The commercial banking system is the greatest investor in treasury bill instruments. The other investors are the Central Bank, merchant banks, government, other financial intermediaries and miscellaneous investors. As at 1986, holders of treasury bills and treasury certificates outstanding were: Central Bank (41.9%), commercial banks (43.4%), merchant banks (4.8%), government (0.1%) and others (9.8%).

In conclusion, the money market has succeeded largely in indigenising the credit base as well as mobilizing short-term funds from savers-lenders to borrowers-investors, especially the government. But the market's role in enhancing the effectiveness of monetary management has been negligible. The market has remained narrow, shallow and not fully integrated. At present, there is gross imbalance between government and private sector securities in the market, the tilt being in favour of the former.

(ii)   The Nigerian Capital Market

The Nigerian Capital Market is the long term end of the Nigerian financial system just as the money markets is its short term end. In other words, the capital market performs for the economy, at the long-term end, the functions which the money market performs for the economy at the short-term end of the spectrum. This is a market where borrowing is for long-term and lenders lend for long term.

There are two aspects of the market - primary and secondary market. The primary market is concerned with the selling of new securities when they are first offered by the issuing company. On the other hand, the secondary market deals with the selling of old securities.

The merchant banks which are specialists in investment banking dominate the primary market. Any company proposing to raise new capital for its operations has to do this through an investment bank or merchant bank which will advise on the appropriate price of the new securities. The securities include: ordinary shares, preferred shares, cumulative preferred shares, etc. The bank usually takes the interest of both the issuing company and the public into consideration when determining their prices. Normally, the investment banks underwrite a new issue of shares by buying them from the issuing company and selling them to the public.

The secondary market is dominated principally by the stock exchange. The buying and selling of securities are done through the jobbers and brokers. A jobber buys and sells securities to a broker who in turn deals directly with the public. The broker is

the intermediary between the jobber and the public and often engages in finding out which securities are available and at what price.

A number of reasons are accountable for the establishment of the Nigerian Capital Market and they are:

1. Provision of local opportunities for borrowing and lending for long term purposes;

2. Provision of facilities necessary for the quotation and ready marketability for shares and stocks;

3. provision of a suitable base for foreign business to offer their shares for sale to the Nigerian public;

4. Provision of an opportunity for   the Nigerian public to invest and participate in the shares and ownership of foreign businesses;

5. Creation of opportunity for the authorities to mobilise long-term capital for the economic development of the country;

6. Regulation of the activities of the market operations and introduction of a code of conduct to check abuses; and

7. Finally, provision of a healthy and mutually acceptable environment for participation and cooperation of indige- nous and expatriate capital in the joint effort to develop the Nigerian economy to the mutual advantage of both parties, through participation and ownership.

The Nigerian Capital Market is composed of the following institutions:

(a)   The Nigerian Stock Exchange (NSE)

(b)   The Nigerian Industrial Development Bank (NIDB)

(c)   The Securities and Exchange Commission (SEC)

(d)   The Nigerian Bank for Commerce and Industry (NBCI)

(e)   The Nigerian Agricultural and Cooperative

       Bank (NACB)

(f)   Second-tier Securities Market (SSM)

The Central Bank of Nigeria (CBN) is also a part of the capital market. As the apex of the financial system, the CBN plays a number of roles in the Nigerian capital market. These include promotional, financial, operational and participatory. In this role as a promoter, the CBN singularly organised the establishment of these institutions. It also formulates rules governing the operations of the market and also participates in it. Of the institutions operating in the Nigerian capital market, the Stock Exchange is the most important. The Lagos Stock Exchange was incorporated in 1960 and became the Nigerian Stock Exchange in 1977 with branches in Kaduna and Port Harcourt. The Stock Exchange is managed by the Nigerian Securities and Exchange Commission (SEC) which was set up in 1978. The responsibilities of the Commission include:

1.   Determining the price at which shares or debentures
      of a company are to be sold to the public either
      through offer for sale or by direct issue.

2.   Determining the timing and amount of any subsequent
      public issue of shares or debentures by that company.

3.   Other matters incidental or supplementary to the fore-
      going as the Commission may at its discretion determine

the operations of the market   including number of firms listed, their distribution into different industrial groups, transactions in both gilt-edged securities and price of the securities.

There are only 7 firms listed on the Exchange in 1962 and by 1971 there were still only 17 firms but with the indigenisation exercise, starting from 1972 and 1977, the number of listed companies increased. By 1985, there were 94 companies quoted. (See Tables 2.11 - 2.14).

TABLE 2.11

NUMBER OF FIRMS ON THE STOCK EXCHANGE

Year	Number of Firms Listed
1962	7
1963	8
1964	9
1965	11
1966	12
1967	12
1968	12
1969	13
1970	15
1971	17
1972	25
1973	28
1974	38
1975	39
1976	38
1977	38
1985	94

Source: CBN

TABLE 2.12

NUMBER OF FIRMS LISTED ON THE NIGERIAN STOCK EXCHANGE BY INDUSTRY GROUP, 1986

	No. of Firms
Automobile and Tyre	6
Banking	5
Breweries	4
Building	4
Chemicals	5
Commercial	3
Computer & Office Equipment	3
Conglomerates	6
Construction	8
Cosmetics	2
Food/Beverages/Tobacco	12
Footwear	2
Industrial & Domestic Products	7
Investment Companies	2
Machinery (Mktg)	3
Packaging	5
Petroleum (Mktg)	5
Pharmaceutical & Animal Feed	7
Publishing	2
Textile	5
TOTAL	**96**

Source: CBN.

TABLE 2.13

GROWTH OF BROKERS ON THE NIGERIAN STOCK
EXCHANGE

Year	Number of Brokers
1978	6
1979	8
1980	10
1981	13
1982	15
1983	16
1984	18
1985	20

Source: CBN.

TABLE 2.14

BROKERS ON THE NIGERIAN STOCK EXCHANGE

1. Abacus Securities Ltd.

2. All-Bound Investment Ltd.

3. AMH Continuation Ltd.

4. Capital Trust Brokers Ltd.

5. Centre-Point Investments Ltd.

6. CSL Stock Brokers Ltd.

7. Financial Trust Co. (Nig.) Ltd.

8. ICON Stock Brokers Ltd.

9. IBM Securities Ltd.

10. Inter State Securities Ltd.

11. Kapital Investment & Trust Co. Ltd.

12. Merchant Securities Ltd.

13. ML Securities

14. New Devea Finance Services Co. Ltd.

15. Nigerian International Securities Ltd.

16. Nigerian Stock Brokers Ltd.

17. Prudent Finance Ltd.

18. Prudential Securities Ltd.

19. Russel (Brokers) Nig. Co. Ltd.

20. Wintrust Ltd.

Source: CBN

The number of wholly-owned Nigerian firms quoted on the exchange by 1985 was only 5. This low participation of Nigerian companies is due to three main reasons:

1. The stringent listing requirement on the Exchange

2. High cost of public quotation

3. Fear of losing control

This has led to the setting up of Nigeria's second-tier securities market with less stringent conditions. The requirements for membership include:

1. Submission of a 3-year financial track record

2. 500,000 minimum equity base

3. A minimum of ₦50,000 (10%) equity capital to the public

4. A minimum of 100 shareholders.

DDC Co. Ltd. was the first firm to be admitted, others include Delta Glass Factory and Juli Pharmacy Ltd as at the end of February 1986. The Nigerian Stock Exchange operates through agents and brokers who deal on behalf of lenders and borrowers of funds. There were only 6 approved brokers dealing in the Stock Exchange in 1978. As at the end of 1985, there were 20 brokers.

2.4 The Regulatory Environment for Insurance and Merchant Banking

Extensive regulation of financial markets, institutions or regulation of the provision of financial services is common in most countries including Nigeria. Four main reasons have been advanced to justify the need for regulating these financial institution. These are:

1. the imbalance of information between buyers and sellers present in almost all markets which is, particularly, great when financial services are sold to private individuals;

2. financial markets are for obvious reasons particularly vulnerable to the entry of dishonest suppliers and creditor consumers;

3. while some financial transactions are as straightforward as the purchase and sale of everyday commodities, many involve a continuing and complicated relationship over time in which the details of the contract are largely implicit and often would not be made explicit; and lastly

4. in promoting monetary stability and ensuring the effectiveness of monetary policy, the authorities need be able to regulate the stock of money as well as influence the interest rate structure. In essence, they need to control the financial intermediaries through which their operations influence these instruments of monetary control.

This sub-section discusses the various legislations and regulations on the behaviour of insurance and merchant banking firms in Nigeria, since it is postulated that regulation and control of these institutions may influence and affect portfolio behaviour in these institutions.

2.4.1 Merchant Banking Regulation in Nigeria

The regulatory factors that have an impact on merchant bank behaviour in Nigeria can be classified into two:

(a) Relevant laws, and

(b)   Directives issued by the Central Bank of Nigeria. The CBN

has responsibility for monetary management in Nigeria apart

from being the supervisory and regulatory institution for

merchant banks in Nigeria.

To date, there has been six legislations concerning the opera-
tions and behaviour of merchant banking firms in Nigeria.   These
are:

1.   Income Tax Management Act of 1969

2.   The Exchange Control Act of 1962

3.   Nigerian Enterprises Promotion Decree of 1977

4.   Central Bank of Nigeria Act of 1958

5.   The Banking Decree of 1969

6.   The Banking (Amendment) Decree of 1979.

The feature of the various legislations that are concerned with

controlling the structure of merchant banks portfolio as well as

regulating the general portfolio behaviour in the merchant banking

industry is considered below.

The Central Bank of Nigeria Act of 1958 grants the institution

the power for regulation, supervision and control of banks in

Nigeria; while the 1968 amendment grants the Central Bank powers to

prescribe sectoral allocation of credit as well as powers to define cash

and liquidity ratios for licenced banks.   By 1976, the Central Bank

issued the annual monetary policy circular or credit guidelines which

also specified the interest rate structure operative for the merchant

banking industry.   Prior to 1976, the merchant banks arranged their

portfolio based primarily on the dictates of their profitability objective

and also on convenience of asset holdings.

The Banking Decree of 1969, as amended in 1979, imposed further restrictions on the flexibility of portfolio configuration of merchant banking firms in the country. The Decree mandates the banks to maintain reserve funds, minimum holding of cash, it also specified the maturity structure of assets particularly in terms of their liquidity. The Decree also specified the various assets the banks are allowed to invest in. These include stabilization securities and special deposits.

The laws initially applied to both commercial and merchant banks. The merchant banks can only offer checking facilities for their corporate clients. The minimum specified deposit (interest bearing) was fixed at fifty thousand naira (₦50,000). Also the banks, except with prior approval of the Central Bank, cannot hold for more than six months any equity interest acquired while managing an equity issue. As we mentioned earlier, these legislative provisions are more intimately guided by the provisions of the annual monetary policy circular (or credit guidelines) issued by the Central Bank of Nigeria.

The Central Bank, from the 1976/77 fiscal year, as far as it considers desirable, prescribes different guidelines to regulate the merchant banks as opposed to the commercial banks. Also, from that date, it has prescribed different asset holding requirements for the merchant banks thus removing the legislative bottleneck which may tend to make merchant banks have a similar portfolio behaviour like commercial banks.

Thus, in addition to the profitability, solvency and liquidity considerations in determining merchant bank behaviour, Central Bank

regulation and supervision of the asset behaviour of merchant banks may play an important role in determining and explaining their portfolio behaviour and composition.

2.4.2 Insurance Companies Regulation in Nigeria

Government regulation of insurance companies started with the promulgation of the Insurance Companies Act of 1961. The provision of this Act were further elaborated upon in the Insurance Miscellaneous Provisions of 1964, as well as the Income Tax Management Act of 1961. These legislations basically put pressure on the insurance companies to find more investment outlets (see Ojo, 1974).

· The Insurance Companies Regulation of 1968 specified the type of investment opportunities available to insurance companies as well as stipulating minimum asset composition for some asset categories in the portfolio of the insurance companies. Under the legislation the insurance companies are allowed to invest in Federal and State Government securities, securities of semi-government institutions, industrial debentures and unsecured loans, preference and ordinary shares, mortgage loans on real estate, loans to policy holders, treasury bills and certificates, cash in deposit account and cash in hand or in current account. The law requires that at least 40% of insurance companies asset portfolio should be in the form of liquid assets so as to enable them meet any contingency. The investment pattern of insurance companies is expected to be constrained by this requirement.

The Act which established the National Insurance Corporation of Nigeria (NICON) also may affect to some extent the investment

policy and patterns of the insurance companies, as every insurance company in Nigeria was compelled to cede ten per cent (10%) of every risk insured to NICON, while on every large risk, the insurer had to supply NICON with information relating to its rates, the risk and the insured. The same Re-Insurance Provision now obtains in respect of the Nigerian Re-Insurance Corporation. These provisions are to ensure that an increasing proportion of the gross national insurance fund is retained in the country.

Prior to the recommendation of the committee on the Nigerian financial system, the monetary authorities (that is, the Central Bank of Nigeria) do not play any significant role in controlling or regulating the portfolio behaviour of insurance companies. Even up till the present time, the Central Bank still does not possess the supervisory power over insurance companies, this power is being exercised solely by the Insurance Division of the Federal Ministry of Finance.

The Committee recommended that monetary authorities should play a more significant role in determining the rate structure and formulating investment guidelines for insurance companies. As a result of government acceptance of this recommendation, the Central Bank of Nigeria's Monetary Policy Circular No. 10 in respect of Credit Guidelines for the 1978/79 fiscal year brought the operations of the insurance companies in terms of the applicable interest rate structure under the control of the Central Bank. The insurance companies were asked to submit returns of their monthly financial transactions to the Central Bank of Nigeria. However, the firms do not comply often with this provision. In the 1986 guidelines, the CBN reported that the failure on the part of many insurance

companies to report on their operations despite all the appeals made to them in the past, had denied the monetary authorities a major source of information on their behaviour and its impact on the economy.

The Insurance Act of 1976 fundamentally intends to make the insurance companies operate on a sound and healthy financial basis. The Act, apart from stipulating the capital (both statutory and paid-up) required to set up an insurance company, also prescribes the pattern and form of investing insurance funds. It also stipulates that every insurer shall, at all times, in respect of the insurance business transacted by it in Nigeria, invest and hold in Nigeria assets equivalent to not less than the amount of the funds in such insurance companies as shown in the balance sheet and the revenue account of the insurer.

The Act stipulates that insurance companies can only invest in securities specified under government and other securities (local trustees' power) Act and the Trustee Investments Act of 1962. T... Act further stipulates that twenty-five per cent (25%) of total assets should be held in this form.

The Act also gives insurance companies power to grant loans to building societies approved by the Minister of Finance, loans on real estate, property, machinery and plants in Nigeria, loans on life policies within their surrender values, shares in other securities of a society registered under any law relating to cooperative societies. The companies are allowed also to diversify into such other invest-ments as may be prescribed from time to time. The 1976 Act further stipulates that not more than 10% of total assets should be in real

property in the case of non-life business and not more than 25% in real property in the case of life insurance business.

One major disadvantages of the legal control of insurance companies in Nigeria is the rigidity of controls unlike those of the merchant banks. The insurance regulation in Nigeria may not be sufficiently adaptable to changing economic circumstances. Also the regulatory provisions for insurance companies do not pose much problems, since the provisions do not prevent the insurance companies from keeping fully invested by channelling the majority of their funds into profitable investments.

2.5 Constraints on Effective Performance in the Nigerian Financial System

In the previous section, we have presented an overview of the structure, and main institutions that constitute the Nigerian financial system. To further enhance our understanding of the financial environment we present here some of the constraints faced, and hindering proper and effective functioning of the Nigerian financial system.

The interest rate policy, prior to the recent structural reforms, and during the period covered by our empirical study, has been that of direct regulation by the central banking authorities. In essence, the rates have been very low and rigid. (See Tables 2.15-2.17). The emphasis has been on the role of interest rates as a means of regulating the cost of credit (the loan rate) ostensibly to encourage investment. The assumption of such policy is that low interest rates is a prerequisite for the financing of long term development programmes. Thus, interest rates policy in the Nigerian

TABLE 2.15
INTEREST RATE STRUCTURE IN NIGERIA FOR SELECTED YEARS

Rediscount Rates	1978	1979	1980	1981	1982	1983
1. Minimum rediscount rate	5	5	6	6	8	8
2. Treasury bill issue rate	4	4	5	5	7	7
3. Treasury certificate (1 yr.)	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$
4. Treasury certificate (2 yrs.)	$4\frac{5}{8}$	$4\frac{5}{8}$	6	6	8	8
5. Federal Government Development Stock	6-7	6-7	7-8	7-8	$9-9\frac{3}{4}$	$9-9\frac{3}{4}$
4-8 years maturity	6	6	7	7	9	9
9-14 years maturity	$6\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$9\frac{1}{4}$	$9\frac{1}{4}$
15-20 years maturity	$6\frac{3}{4}$	$6\frac{3}{4}$	$7\frac{3}{4}$	$7\frac{3}{4}$	$9\frac{1}{2}$	$9\frac{1}{2}$
20-25 years maturity	7	7	8	8	$9\frac{3}{4}$	$9\frac{3}{4}$
Deposit rates savings deposits	4	5	6	6	$7\frac{1}{2}$	$7\frac{1}{2}$
Time deposits with 7 days notice	$4\frac{1}{2}$	$4\frac{1}{2}$	5	6	$7\frac{1}{2}$	$7\frac{1}{2}$
Time deposit for one month	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	7	7
Time deposit for 1-3 months	$4\frac{3}{4}$	$4\frac{3}{4}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$7\frac{1}{4}$	$7\frac{1}{4}$
Time deposit for 3-6 months	5	5	6	6	$7\frac{1}{4}$	$7\frac{1}{4}$
Time deposit for 6-12 months	$5\frac{1}{4}$	$5\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$7\frac{3}{4}$	$7\frac{3}{4}$
Time deposit for over 12 months	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	8	8
Lending Rates:						
Minimum	7	7	$7\frac{1}{2}$	$7\frac{1}{2}$	$9\frac{1}{2}$	$9\frac{1}{2}$
Maximum	11	11	$11\frac{1}{2}$	$11\frac{1}{2}$	13	13

TABLE 2.15   (Contd.)

Rediscount Rates	1978	1979	1980	1981	1982	1983
1. Preferred sectors maximum	9	9	$9\frac{1}{2}$	$9\frac{1}{2}$	$11\frac{1}{2}$	$11\frac{1}{2}$
2. Less preferred sector maximum	8-12	8-11	$11\frac{1}{2}$	$11\frac{1}{2}$	13	13
3. Agric. credit guarantee scheme	4-6	4-6	5-6	5-6	6-7	6-7
4. Residential housing cost not more than ₦100,000	6	6	6	6	7	7
5. Agricultural production	-	6	6	6	7	7

Source: Central Bank of Nigeria.

TABLE 2.16
DIFFERENTIALS AMONG SELECTED RATES FOR SELECTED YEARS

	Lending Rate			Deposit Rates				Spread Between			
	Discount rate (i)	Lending rate			Savings (iv)	Term (1 Yr) (v)					
		(ii) min	(iii) max	(iixiii) diff			(ivxv) diff	(iixiv)	(iixv)	(iiixiv)	(iiixv)
1963	4	7	12	5	3	3½	½	4	3½	9	8½
1965	5	7	12	5	3½	4	½	3½	3	8½	8
1970	4½	7	12	5	3	4	1	4	3	9	8
1975	3½	6	9	3	4		(no limit)	2	–	5	–
1977	4	6	10	4	4		(no limit)	2	–	6	–
1979	5	7	11	4	5	5½	½	3	1½	6	5½
1980	6	7½	11½	4	6	6½	½	1½	1	5½	5
1982:											
April	9	11½	14	2½	7½	8½	1	4	3	6½	5½
Nov	8	10½	13	2½	6½	7½	1	4	3	6½	5½
1983	8	10½	13	2½	6½	7½	1	4	3	6½	5½

Source: Falegan, S.B. (1987): Redesigning Nigerian Financial System University Press Limited, Ibadan. p. 141

TABLE 2.17

REAL INTEREST RATES[a]

Year	Rates of Inflation	Rediscount Rate	Treasury Bills	Deposit[b] Rate	Lending[c] Rate
1971	16.1	-8.2	-8.2	-9.5	-6.6
1972	2.6	-10.0	-10.4	-11.3	-3.5
1973	5.7	1.9	1.4	0.4	9.2
1974	12.3	-1.3	-1.9	-2.7	5.8
1975	33.6	-7.8	-8.7	-7.4	-2.8
1976	24.3	22.5	-23.3	-22.2	-17.7
1977	19.3	-16.3	-17.1	-16.3	-11.5
1978	18.6	-12.0	-12.8	12.8	-7.0
1980	11.4	-4.6	-5.5	-4.6	0.2
1981	20.8	-4.8	-5.8	-4.8	-
1982	27.9	-10.6	-11.4	-11.0	-6.5
1983	33.4	-15.6	-16.3	-15.9	-11.6

[a] Calculated on the basis of 1 + i - 1 where pt - 1 is the previous inflation and   is the interest rate
$$1+Pt - 1$$

[b] On savings deposits.

[c] Maximum lending rates.

Source: Falegan, S.B. (1987): Redesigning Nigeria's Financial System, University Press Limited, Ibadan. P. 149

financial environment have paid little attention (or none) to the role of interest rates as instruments for efficient allocation of available funds and for effective mobilization of surplus financial resources. Further, both in terms of the spread (differentials) between the rates and considering the real rates of interest (considering the rate of inflation) the interest rate policy and structure have contributed to reducing the volume of available funds for financial investment. Thus, during the period covered by our study, realistic rates in both financial investment and savings do not seem to have been given serious consideration in formulation and management of monetary policy. Notwithstanding recent policy shifts, the various interest rate structure in Nigeria today are still largely unrepresentative of the true market rates especially considering the structure of the market, indirect monetary rules and teleguides being employed by the Central Bank especially with regards to using its rediscount rate to influence the other market rates as well as the restrictive policies employed successfully by financial institutions to inhibit the correct determination of market rates due to the selllers' market nature of the financial system as mentioned earlier. In essence, the interest rate policy in Nigeria over time has not aided an efficient and optimal utilization of financial resources in the market nor has it stimulated optimal financial behaviour within and among the various institutions and agents operating within the system.

With regards to the institutions, it is noted that most of their credit operations are short term in nature, thus inhibiting faster rate of economic development. Also there is inadequate and untimely supply of information on activities in the financial environment as well

as shortages of suitable and experienced manpower to ensure the development of an efficient system.

There is a glaring problem with respect to banking habits both in terms of awareness and apathy to the functions of these institutions especially the emerging specialized institutions. Further, on banking habits, the high incidence of fraud and preponderance of bad debt in the portfolio holding of financial institutions have to a great extent also inhibited the growth potential of the Nigerian financial system.

Also, the activites of the CBN with regard to its regulatory practices which sometimes are inconsistent and contradictory hinder the prospect for financial development in Nigeria. Some financial. institutions ignore these directives outright. This was the case with agricultural lending policy (sectoral allocation) in the late seventies and early eighties. Other problems include poor services offered by the institutions, discriminatory practices and the fact that most of these institutions are not customer-oriented as basically the Nigerian financial environment is a sellers' market. Until the recent policy shifts, banks, it was observed, did not perform efficiently their critical function of attracting funds from surplus units and effectively allocating such funds to the most productive uses. The recent policy changes as evident in the Structural Adjustment Programme (1986-88) and subsequent deregulation of interest rates as well as the tight monetary policy by the Central Bank brought about some minimal changes in bank behaviour in this respect. Some institutions, especially the commercial banks, embarked on desperate and historic search for

customers offering higher interest rates and an incentive package which in some cases included free check books, express services, and generous loan term.

Some institutions show flagrant disregard for monetary guidelines and regulations of the Central Bank of Nigeria; some insisting on facing the penalties rather than keep the rules. As we shall elaborate upon later, for example, the insurance companies behaviour during the period showed a disregard for Central Bank rules (see Monetary Guidelines 1984, 1985 and 1986 - section on insurance companies).

The financial market itself is narrow with a limited number and volume of securities or financial instruments available. There seems also to be a weak and insufficient demand for securities in the market considering, for instance, the amount of treasury bills or certificates unsubscribed or outstanding in the market over time which are then normally bought over by the Central Bank to provide the necessary funds for the government. In 1983, 1984 and 1985, over 50% of issues in each case was left unsubscribed for the Central Bank to take. (See Tables 2.18-2.21).

Previous studies (see Onoh, 1984) have also identified that there is apathy on the part of investors. The holding pattern of securities indicate the willingness to keep holding assets irrespective of its going yield. This behaviour has not facilitated the development of the financial market. Further, despite the fact that conditions stipulated for quotation on the Stock Exchange are stiff, indigenous investors have also not demonstrated enough willingness to be listed. This again is attributable to our sociological characteristics with

TABLE 2.18

TREASURY BILLS: ISSUES AND SUBSCRIPTIONS
(N Million)

Year	Issues	Subscriptions							
		Central Bank	Commercial Banks	Development[1] Banks	Individuals	Saving-Type[2] Institutions	Statutory Boards and Corporations	Merchant Banks	Others[3]
1980	8,639.0	1,803.3	6,104.4	–	5.7	74.9	378.8	206.2	65.8
1981	11,976.0	5,890.4	5,438.4	13.0	7.8	82.7	69.9	237.5	236.6
1982	26,476.0	18,283.1	7,522.1	–	7.5	97.3	0.9	475.4	89.7
1983	45,832.0	28,445.0	15,805.0	–	7.4	136.4	0.7	1,330.1	106.7
1984	55,904.0	28,107.9	28,820.9	–	12.9	128.2	22.9	2,586.9	224.3
1985	6,876.0	4,372.5	2,099.5	–	2.9	31.8	0.0	316.9	52.4

1. Development Banks include Nigerian Industrial Development Bank, Nigerian Bank for Commerce and Industry and Nigerian Agricultural and Cooperative Bank.

2. Saving -Type Institutions include Mutual savings and loan groups, Credit Organization, Cooperative Societies, Insurance Companies and Federal Savings Bank, etc.

3. Others include Federal, State and Local Governments and other companies.

Source: CBN, Economic and Financial Review, December, 1986.

TABLE 2.19

TREASURY BILLS: ISSUES AND SUBSCRIPTIONS
(%)

Year	Issues	Subscriptions							
		Central Bank	Commercial Banks	Development Banks	Individuals	Saving-Type Institutions	Statutory Boards and Corporations	Merchant Banks	Others
1980	100	20.9	70.7	–	0.07	0.9	4.4	2.4	0.8
1981	100	49.2	45.4	0.1	0.07	0.7	0.6	2.0	2.0
1982	100	69.1	28.4	–	0.03	0.4	0.003	1.8	0.3
1983	100	62.1	34.5	–	0.02	0.3	0.002	2.9	0.2
1984	100	50.28	44.4	–	0.02	0.2	0.4	4.6	0.4
1985	100	63.6	30.5	–	0.04	0.5	0.0	4.6	0.8

Source: Computed from figures obtained from Economic and Financial Review, Central Bank of Nigeria, December, 1986.

TABLE 2.20

TREASURY CERTIFICATES: ISSUES AND SUBSCRIPTIONS
(N Million)

Year	Issues	Subscriptions							
		Central Bank	Commercial Banks	Development Banks [1]	Individuals	Saving-Type [2] Institutions	Statutory Boards and Corporations	Merchant Banks	Others [3]
1980	1,917.6	1,413.1	493.5	–	–				
1981	1,190.0	703.8	469.7	–	–	5.0	–	6.0	–
1982	1,188.6	685.2	500.0	–	–	0.2	–	16.3	–
1983	4,730.9	3,910.3	811.3	–	–	3.4	–	–	–
1984	4,433.1	3,068.7	1,328.4	–	–	–	–	9.0	0.3
1985	2,821.8	2,309.2	494.9	–	0.2	–	–	20.7	15.3
				–		–	–	17.5	–

1. Development Banks include Nigerian Industrial Development Bank, Nigerian Bank for Commerce and Industry and Nigerian Agricultural and Cooperative Bank.

2. Saving -Type Institutions include Mutual savings and loan Groups, Credit Organizations, Cooperative Societies, Insurance Companies and Federal Savings Bank, etc.

3. Others include Federal, State and Local Governments and other companies.

Source: CBN, Economic and Financial Review, December, 1986.

TABLE 2.21

TREASURY CERTIFICATES: ISSUES AND SUBSCRIPTIONS
(%)

Year	Issues	Subscriptions							
		Central Bank	Commercial Banks	Development Banks	Individuals	Saving-Type Institutions	Statutory Boards and Corporations	Merchant Banks	Others
1980	100	73.7	25.7	–	–	0.3	–	0.3	–
1981	100	59.0	39.5	–	–	0.02	–	1.4	–
1982	100	57.6	42.1	–	–	0.3	–	–	–
1983	100	82.7	17.1	–	–	–	–	0.2	0.006
1984	100	69.2	30.0	–	–	–	–	0.5	0.3
1985	100	81.8	17.5	–	0.007	–	–	0.6	–

Source: Computed from CBN, Economic and Financial Review, December, 1986.

respect to not wanting to part with valuables and private assets. This also has had a negative impact on financial market development in Nigeria.

Infrastructural and communication inadequacies, especially the telecommunication network, has also adversely affected financial development. Political instability as well as constant changes in government policy have also critically affected financial development in Nigeria. This keeps investors wary of trading in the financial system especially embarking on longer term investment which is germane to overall economic development. There is also a seemingly low cost for debt financing in contrast to equity financing, though this contention is controversial and should attract further research. The contention here is that this is evidently the case in Nigeria, and in effect it had negatively influenced financial market development in Nigeria.

The system may have to discard with the old rigid rules and regulations governing operations in the financial markets. Thus, a functional system should be put in place to ensure speedy development of the financial markets. Overall, the Nigerian financial environment should evolve a new traditionally based system to evolve a new array of institutions and instruments that will cater for and is relevant for the generality of Nigerians both in the urban and rural areas, as the present institutional framework concentrates mainly on the modern sector. Also, traditional thrift systems of 'Ajo' or 'Esusu' should be developed to form the bedrock of the new emerging financial system.

CHAPTER THREE

PORTFOLIO BEHAVIOUR OF FINANCIAL INTERMEDIARIES: A REVIEW

3.1   Introduction

Clearly, there has been an upsurge in the interest on financial institution behaviour and the economic significance of these institutions at both the theoretical and policy levels. In the last three decades an enormous body of literature has evolved around developing an acceptable theory on the portfolio behaviour of financial intermediaries. The major impetus for interest at the theoretical level has been the work of Gurley and Shaw (1959, 1960). They attempt to broaden the concept of money by suggesting that claims against all types of financial intermediaries possess the character of money in varying degrees. In effect, they question the orthodox theoretical practice of confining the concept of money to non-interest bearing claims against government and commercial banks. In the main, they argue that a compi .ensive financial theory is necessary to account for all the significant factors which may contribute to liquidity in an economy.

The Radcliffe Report (1959) provided the major stimulus for increased interest in financial intermediaries at the policy level. The report advanced the view that the existence of financial intermediaries is likely to have an impact on the effectiveness of monetary policy. Two main factors were postulated to support this contention. First, they called attention to the liquidity of the liabilities of a wide variety of non-oank financial intermediaries. This led them

to question the adequacy of relying on policy instruments which operate solely on the supply of money, and emphasize the importance of influencing the general liquidity of the economy, since they regarded the latter as affecting decision to spend. From the point of view of policy then, attempts to reduce the level of planned expenditures by reducing the supply of money may be largely frustrated because the total stock of liquid assets may be only slightly affected.

The second argument is linked to their view that there is no reason for supposing, or any experience in monetary history indicating, that there is any limit to the velocity of circulation. Financial intermediaries can, in principle, undermine monetary policy by raising the income velocity of circulation when the authorities are seeking to restrain the expansion of the level of money income by stabilizing the stock of bank deposits and currency. Financial intermediaries are in a position to mobilize idle balances and return them into active circulation by making their liabilities relatively more attractive to hold, through increasing the. prospective rates of return. The extent to which the activities of the intermediaries are destabilizing will depend on the elasticity of substitution between idle money and time deposits held as part of the permanent portfolios of spending units and their own debt, and the extent to which they are prepared to allow the prospective rate on their own debt to continue to rise.

Thus, in essence, the new view, according to Tobin (1969), tends to blur the sharp traditional distinction between money and other assets and between commercial banks and other financial

intermediaries. Instead, he focuses on demands for and supplies of the whole spectrum of assets rather than on the quantity and velocity of money. Also he regards the structure of interest rates, asset yields and credit availabilities rather than the quantity of money as the linkage between monetary and financial institutions and policy on the one hand and the real economy on the other.

This chapter presents a concise review of the literature on the portfolio behaviour of financial institutions. In this connection, economic thought on issues concerning substitution between different assets, extent of asset diversification, asset term transformation and interlinkages between portfolio selection on the one hand and financial market development, economic growth, monetary policy as well as regulation of financial institutions on the other hand are examined. The chapter also reviews existing portfolio theories based on broad model groupings identified from the literature on the subject-matter. Accordingly, for this purpose, the traditional portfolio theory models and models based on neoclassical micro-economic analysis ...e examined[1].

The chapter is organized into seven main sections. The next section presents existing thoughts and issues on the portfolio

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[1] Although we recognise the classification of portfolio behaviour models by Baltensperger (1980), into partial models and complete models, we have adopted our classification for two major reasons: (a) the entire literature or the partial models dealing with either questions of optimal asset choice or liability management, can be incorporated within the framework of the neoclassical microeconomic treatment of the banking firm; and (b) to emphasize the actual dichotomy within the literature (see for instance Klein (1971 p. 2105) and Sealey and Linddey (1977 p. 1252) which give credence to our classification and the dichotomy within the literature.

behaviour of financial institutions and its implications while Section 3.3 considers the models based on traditional portfolio theory. Section 3.4 reviews the various approaches which adopt the neo-classical microeconomic analysis or the theory of the firm into formulating an adequate theory of the banking firm and Section 3.5 examines other model types that have been developed to explain some other aspects of the portfolio behaviour of financial institutions. Section 3.6 provides a discussion of the results of some of the existing empirical studies on portfolio behaviour of financial inter-mediaries. The last section, Section 3.7 provides a summary of inferences from the entire review.

3.2 Issues of Portfolio Choice in Financial Institutions

3.2.1 Portfolio Choice and Monetary Policy

Monetary policy simply defined is a deliberate attempt by monetary authorities to regulate and influence the money supply and the structure of interest rates, so as to achieve certain desirable macroeconomic objectives such as full employment and price level stability. Ghatak (1983) posits that the objectives of monetary policy in less developed countries (LDCs), including Nigeria, are usually related to money and credit control, price stabilization and economic growth.

Doubts about the ability of monetary policy to exert effective control over economic activity are raised by some schools of thought, which emphasise the extent to which the financial system is able to evade the monetary authorities attempt to control the money supply and interest rates by the ability to restructure their portfolio. The

role of financial intermediaries in this respect has been emphasised in the Gurley and Shaw thesis (1960) and the Radcliffe Committee Report (1959) as discussed earlier.

Gurley and Shaw (1960) argue that the savings and other deposits of the different types of financial intermediaries are more or less the same as the demand deposits of the commercial banks because it is not difficult to convert the savings deposit of the financial intermediaries into cash demand deposit. In other words, the deposits of these other institutions are classified as near money (or money substitutes).

Smith (1959) also noted that although financial intermediaries other than commercial banks cannot create money (i.e. means of payments), a number of them do issue claims such as time deposits, savings and loan shares which are very close substitutes for money. Their credit creating activities expand the supply of loanable funds available to finance expenditure, even if this does not lead to the expansion of money supply.

Since in most developing countries the central bank focuses essentially on the control of M1 neglecting near monies, it follows therefore that the presence of these near monies will frustrate a successful operation of monetary policy. For instance, a reduction in the rediscount rate brought about by an expansionary monetary policy is likely to lower the rate of interest offered by intermediaries and allow asset holders to substitute demand deposits for the claims of the broad category of financial intermediaries. Thus, it is argued that the adjustment process involved in trying to eliminate excess money balances is snortened and made almost immediate, thus

weakening monetary policy.

Also in a regime of tight monetary policy, central bank will reduce the money supply (M1) but will not reduce liquidity since near monies or money substitutes could be converted into cash to replenish the deposited stock of liquidity. Thus reduction in money supply will not by itself be adequate to reduce the amount of liquidity in the economy.

The weakness of the operation of monetary policy because of the operation of financial intermediaries and the growth of money substitutes was also elaborated upon by the Radcliffe Committee on the working of the monetary system in the United Kingdom. The Radcliffe Committee held the view that the centrepiece of monetary mechanism was not the supply of money but the structure of liquidity. They also noted that the activity of the non-bank financial intermediaries in particular affect the total volume and structure of liquidity in the economy. Goldsmith (1968, 1974) further argued that the growth of financial intermediaries, particularly the non-bank intermediaries led to the relative decline of commercial banks among all intermediaries.

In the same vein Gurley and Shaw (1959, 1960) concluded that the relative decline of commercial banks weaknens the ability of the central bank to control economic activity and that hence a direct control of all financial intermediaries is called for, since there is no justification for the treatment of commercial banks as unique from the broad category of financial intermediaries and moreover the distinction between bank and non-bank intermediaries should be dropped.

Cagan and Schwartz (1975) hold the view, based on their empirical study using United States data, that the growth of money substitutes has in fact increased the effectiveness of monetary policy rather than weaken it. Dernburg and McDougall (1980), however, assert that it is undoubtedly true that the presence of large scale intermediation makes the quantitative impact of monetary policy difficult to predict.

In the Nigerian financial environment, very little empirical study has been carried out directly to assess the quantitative impact of large scale financial intermediation on the effectiveness of monetary policy. Tomori (1984) however, elaborately discussed how the growth of financial intermediaries particularly the behaviour of non-bank financial intermediaries has weakened the effectiveness of monetary policy. He argued that central bank monetary policy of controlling the money stock (M1) in Nigeria represents just a pro-portion of total money supply. In fact, according to him, only about 60% of total money stock is being accommodated with the CBN regulations (see Table 2.7).

In conclusion, just like the determination of most other relationships, the impact of the activities and the general portfolio behaviour of financial intermediaries on the effectiveness of mone-tary policy in Nigeria should be treated as an empirical question.

3.2.2 Portfolio Choice and Financial Market Development

Financial intermediation, as elaborated upon in chapter one, is a system whereby an economic unit creates and issues claims against itself, using the proceeds to acquire and hold financial claims against other economic units. As also mentioned in chapter

two, a financial market embraces both the money and capital markets. A malfunctioning financial market tend to inhibit growth in real output per capita and create a vicious circle of low income, savings, investment and government finance.

Improvements in the financial market require a rapid rate of growth in the quantity and variety of financial assets available. This, however, depends on the size of the interest rate premium earned by financial institutions over time.

Financial intermediaries solicit savings paying a deposit rate for them, and assume responsibility for savings allocation, charging a primary rate of interest to ultimate borrowers. The differential between the primary rate and the deposit rate compensate for factor costs and risks in financial intermediation.

Adewumi and Ojo (1982, p. 225) noted that an efficient financial market facilities investment and provides a degree of liquidity in respect of financial assets which as they are long term would not be liquid otherwise. Also they noted that an efficient market permits a better allocation of financial resources. They observed ti.at wherever broad and competitive financial markets exist, they tend to improve the allocation of savings, indicate investment opportunities virtually automatically and rank them to show the best alternatives. Therefore the importance of the markets are conceived in their ability to facilitate the continuous process of arranging asset portfolios for savers.

The operations in the markets, Adewumi and Ojo further indicated, tend to increase the volume of savings and investment in an economy; improve the allocation of resources among alternative

investments; as well as increase the economy's rate of growth.

Fama (1970, p. 383) had earlier discussed the efficiency of financial markets in terms of the ability of prices in such a market to provide adequate signals for resource allocation under the assumption that security prices at any time fully reflect all available information.

However, the Nigerian financial market, like those of many developing countries, which provides the financial institutions with a viable outlet for investible funds has performed unsatisfactorily. In particular prices have been largely regulated by the Securities and Exchange Commission. Also the market information system and overall infrastructural base are poorly developed. In addition, rigid regulation of entry into the market has led to a low volume of activities. Yields on financial instruments until very recently are low, inflexible and rigidly maintained, the prices in most cases are not market determined, they are regulated and managed by the monetary authorities. Therefore prices in the market do not represent the true supply and demand conditions. In fact the Nigerian financial market is generally described as underdeveloped and inefficient (see for instance Okafor (1980, pp. 136-157), Adewumi and Ojo (1982, pp. 271-273), Ajayi and Ojo (1981, pp. 68-71), Akinyemi (1981, p. 37)).

The behaviour of stock holders in the market is that they buy and hold on to stock indefinitely irrespective of the market valuation of the stock. That is, stock holding is insensitive to market valuation of the stocks. Thus the financial firms are left with virtually no appreciable amount of stocks to invest their

resources in. In fact, the only time these firms have a chance of buying stocks is when new issues are listed which even then are usually over-subscribed. Consequently, the secondary markets are underdeveloped jeopardizing the attainment of the market objective of optimal asset holdings.

Wal and Patrick (1973) argue that in less developed countries only credit worthy firms can sell securities via a capital market, that these firms also have prime access to bank loans and hence that such firms have greater freedom of choice between different sources of finance, therefore development of capital market provides no reallocation to such firms. Lognathan (1973) also held the view that saving institutions, financial intermediaries and financial markets of the types that are functioning today are geared towards mobilising financial resources to enable the privileged few to increase further their wealth and incomes. These postulations point to the fact that the structure of financial markets in most countries tend to favour a particularly privileged group in society. The discrimination is particularly in the strict and ofter. impossible conditions for quotation on the market. This tends to favour only the already financially adequate firms to the detriment of the small financially disabled firms who need the services of the markets most. The argument here is that the financial intermediaries including the merchant banks and insurance companies have a crucial role to play in the development of a "just" and efficient financial market in Nigeria.

Adewumi and Ojo (1981, pp. 273) noted that the emphasis in the Nigerian financial market has been on the development of the

bonds and securities market to the neglect of the equity market. Intermediation should endeavour to diversify and hold more equity shares particularly the equity of small financially handicapped firms. These financial intermediaries therefore, apart from increased direct financial investment in the money and capital market, can contribute to the development of the market by financing potentially small equity investors. They could help finance the firms such that they can be listed on at least the second tier securities market (SSM) (where conditionality for quotation are more liberal) and also they can provide other necessary encouragement for the small scale firms particularly the agro-allied firms; through their investment behaviour in the markets. Also, rather than holding on to stocks and shares indefinitely, institutions should evaluate the market worth and the potentials of their securities periodically with a view to achieving optimal portfolio holdings always and to ensure that financial resources are allocated to their best uses.

Furthermore, investment outlets should be created both at the stock exchange and the money market itself, so that the insurance and merchant banking firms will be able to make a more significant impact in the financial markets and in effect stimulate its growth of the Nigerian economy in general. Also for the intermediary to play a meaningful role in the development of an efficient financial market, we argue that recent deregulation of interest rates on financial instruments in the markets should be maintained and implemented across the board. Rates should be market determined and the rigidities inherent in the market should be removed. Government intervention in the operations of the market should also

be minimised.

In conclusion also, the question of to what extent intermediation in general or the behaviour of insurance and merchant banking firms have contributed to the development or to which the structure or nature of the financial market itself have influenced financial behaviour is strictly an empirical question, which this study will elaborate upon.

3.2.3   Economic Growth and Financial Intermediation

Discussions in the earlier sections pin-pointed ways in which financial intermediation could contribute to economic growth and possibly in effect, to economic development. In the literature, however, controversy surrounds the argument that the portfolio behaviour of financial firms influence economic growth. There is, however, a consensus of opinion on the fact that intermediation per se involving the mobilization of savings and channelling them into profitable investments contributes to economic growth and improves economic welfare (see Ghatak (1981) p. 58). These institutions being a source of revenue to the government and, may be, through their investment activities also contribute to economic growth and development. Tomori (1984) argues also, that the importance of these financial institutions, with regards to contributions to economic growth, is best seen in their ability to provide non-inflationary support to the economy.

On the other hand, as economic growth occurs the saving investment process becomes much more intricate. This leads to rapid evolution of institutions which specialize in the intermediation of fund flow. The result of such rapid institutional growth is that

accumulation of primary debt and financial assets occurs more than that of real wealth as the number of such specialized institutions approaches an optimum, financial assets and real wealth tend to grow equally. Similarly, factor inputs of the financial sector increase more rapidly at the early stages of institutional evolution than inputs of other sectors; balanced growth eventually sets in as optimal institutional growth is attained.

Finally, growth in financial institutions and increasing specialization in financial intermediation leads to growth in both the quantity and variety of financial assets. This stimulates the saving-investment process which leads to economic growth.

Members of the credit school as pointed out by Silber (1969) differentiate between increases in the money supply due to increases in bank loans (loan money) and those due to increases in bank investments (investments money) (see Tobin (1965) and Smith (1956)). They argue that in the case of a loan, the borrower can be expected to quickly spend the funds he received from the bank on real goods and services. While in the case of investments, the seller of the security may choose to keep the new funds in idle balances or purchase another financial security, rather than purchasing real goods and services. The summary of their argument is that the marginal propensity to spend loan money on real goods and services may be greater than for spending investment money and thus it follows that a shift in bank portfolio from investments to loans could increase the gross national product even though total bank credit, bank deposits and the money supply all remained constant.

The monetarist (see for example Friedman and Miselman (1963))

argue to the contrary. They focus solely on monetary aggregates, without regard to their origin. The monetarists believing that money is only a temporary abode of purchasing power and denying the existence of idle balances, posit that the relationship between a change in the money supply and spending is stable, regardless of whether changes in the money supply stem from loans to investment or vice-versa.

3.3 Portfolio Theory Models or Models of Subjective Risk Aversion

In the analysis of the behaviour of financial intermediaries, portfolio theory has been the widely used tool. The bank has been treated not primarily as a firm but as a rational investor in an environment characterised by risk or uncertainty.

Prior to Keynes's publication of the General Theory in 1936, financial behaviour was predicated on the quantity theory of money, within the simple MV = PT framework. Money was perceived merely as an instrument to facilitate the purchase of goods and services. It played a passive role in the economy. In the liquidity preference theory Keynes considered financial instruments (money) not merely as a medium of exchange but as an asset. The approach identifying transactions, precautionary and speculative motives for holding money, involved an integration of monetary theory and the theory of interest.

Subsequently, Tobin (1958) formulated the risk aversion theory of liquidity preference based on portfolio selection. This theory removes two major defects of the Keynesian theory of liquidity

preference. First, Keynes's liquidity preference function depends on the inelasticity of expectations of future interest rates; and second, individuals hold either money or bonds. Tobin has removed both defects. His theory does not depend on the elasticity of expectations of future interest rates but proceeds on the assumption that the expected value of capital gain or loss from holding interest-bearing assets is always zero. Moreover, it explains that an individual's portfolio contains both money and bonds rather than only one at a time.

Tobin starts his portfolio selection model of liquidity preference with the presumption that an individual asset holder has a portfolio of money and bonds. Money neither brings any return nor imposes any risk on him. But bonds yield interest and also bring income. However, income from bonds is uncertain because it involves a risk of capital losses or gains. The greater the investment in bonds, the greater is the risk of capital loss from them. An investor can bear this risk if he is compensated by an adequate return from bonds.

If g is the expected capital gain or loss, it is assumed that the investor bases his actions on his estimate of its probability distribution. It is further assumed that this probability distribution has an expected value of zero and is independent of the level of the current rate of interest, r, on bonds.

His portfolio consists of a proportion M of money and B of bonds where both M and B add up to 1. They do not have any negative values. The return on a portfolio R is therefore,

$$R = B(r+g) \qquad \text{where } 0 \leqslant B \leqslant 1.$$

Since g is a random variable with expected value zero, the expected return on the portfolio is

$$R_E = \mu R = Br.$$

The risk attached to a portfolio is measured by the standard deviation of R, that is, σR. Tobin describes three types of investors. The first category is of risk lovers who enjoy putting all their wealth into bonds to maximise risk. They accept risk of loss in exchange for the income they expect from bonds. The second category is of plungers. They will either put all their wealth into bonds or will keep it in cash. Thus plungers either go all the way, or not at all. But the majority of investors belong to the third category. They are risk averters or diversifiers. Risk averters prefer to avoid the risk of loss which is associated with holding bonds rather than money. They are prepared to bear some additional risk only if they expect to receive some additional return on bonds, provided every increase in risk borne brings with it greater increases in returns. They will, therefore, diversify their portfolios, and hold both money and bonds. Although money neither brings any return nor any risk, yet it is the most liquid form of assets which can be used for buying bonds any time.

In order to find out the risk averter's preference between risk and expected return, Tobin uses indifference curves having positive slopes indicating that the risk averter demands more expected returns in order to take more risk. This is illustrated in Figure 3.1 where the horizontal axis measures risk (σR) and the vertical axis the expected returns ($\sigma \mu R$). The line OR is the budget line of the risk averter. It shows the combinations of risk

and expected return on the basis of which he arranges his portfolio of wealth consisting of money and bonds. I_1 and I_2 are indifference curves. An indifference curve shows that he is indifferent between all pairs of expected return and risk that lie on I_1 curve. Points on I_2 curve are preferred to those on I_1 curve. But the risk averter will achieve an equilibrium position between expected return and risk where his budget line is tangential to the indifference curve. It is point T on the budget line and I_1 curve.

In the lower portion of the figure the length of the vertical axis shows the wealth held by the risk averter in his portfolio consisting of money and bonds. The line OC shows risk as proportional to the share of the total portfolio held in bonds. Thus point E on this line drawn as perpendicular from point T determines the portfolio mix of money and bonds. It is OP of bonds and PW of money.

Thus the risk averter diversifies his total wealth OW by investing partly in bonds and partly keeping cash. That is why he is called a diversifier. He is not prepared to accept more risk unless he can also expect greater return. However, the risk averter possesses an intrinsic preference for liquidity which can only be offset by higher interest rates. The higher the interest rate, the lower the demand for money, and the higher the incentive to hold more bonds. On the contrary, the lower the interest rate, the higher the demand for money, and the lower the willingness to hold bonds. This is illustrated in Figure 3.2.

The slope of the budget line increases with the increase in the interest rate. This is shown by the budget line r_1 rotating

EXPECTED
RETURNS

RISK

O

T

I₂   R

I₁

τ

B

P   E

M

W   C

RISK

FIG 3.1 : Relationship Between Expected
Returns and Portfolio Risk

EXPECTED
RETURNS

OPC

I₃ r₃

I₂

T₃

r₂

I₁

T₂

r₁

T₁

O

RISK

B₁   E₁

B₂   E₂

B₃   E₃

W   C
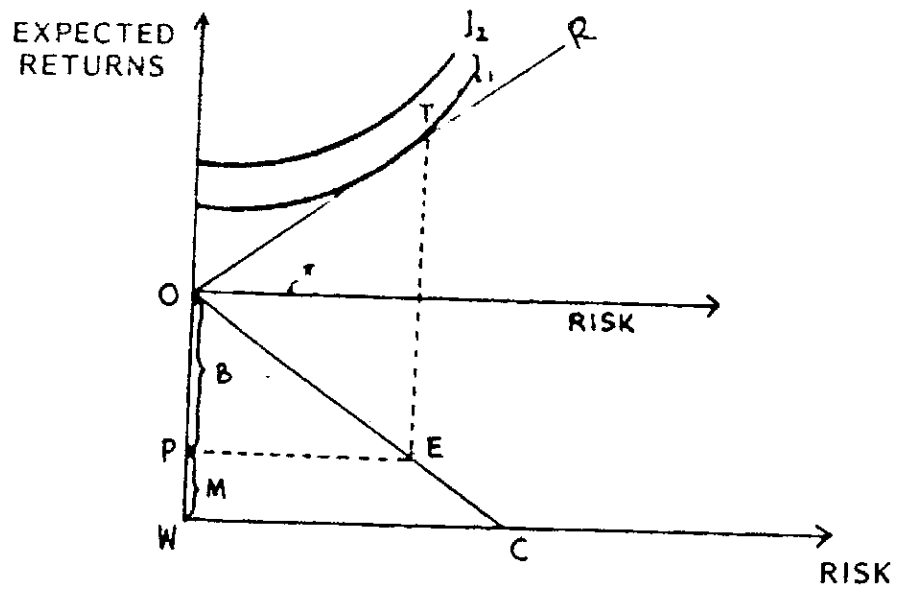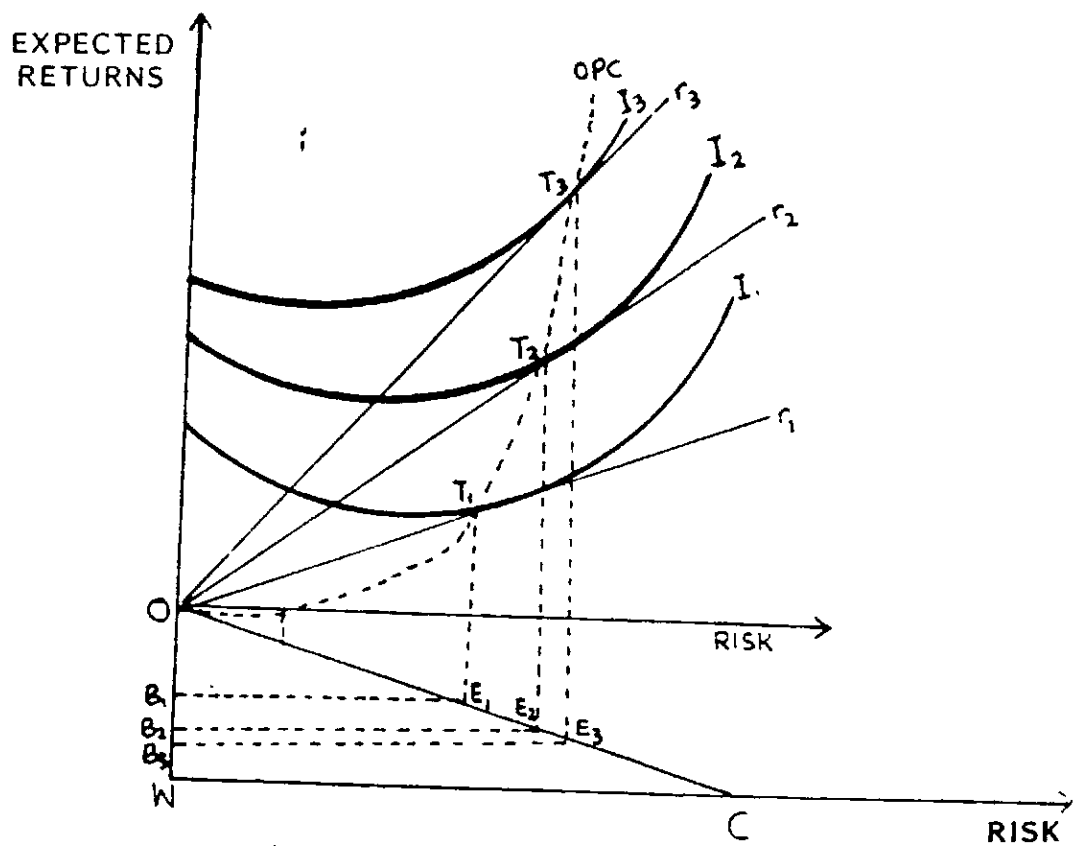
RISK

FIG 3.2 : Relationship Between Expected
Returns and Portfolio Risk with
Changes in Interest Rate.

upward to r_2 and r_3. Consequently, returns increase in relation to risk with increase in the interest rate, and the budget line touches higher indifference curves. In Figure 3.2, budget lines r_1, r_2 and r_3 are tangents to l_1, l_2 and l_3 curves at points T_1, T_2 and T_3 respectively. These points trace out the optimum portfolio curve, OPC in the figure shows that as the tangency points move upward from left to right, both the expected returns and risk increase.

These tangency points also determine the portfolio selection of risk averters, as shown in the lower portion of Figure 3.2. When the rate of interest is r_1, they hold OB_1 bonds and B_1W money. As the rate of interest increases from r_1 to r_2 and r_3, risk averters hold successively more bonds OB_2 and OB_3 and reduce money to B_2W and B_3W in their portfolios. The figures also shows that as the rate of interest increases by equal increments from r_1 to r_2 to r_3, risk averters hold bonds by decreasing increments, $B_2B_3 < B_2B_1 < OB_1$.

Apart from the work by Tobin, modern portfolio theory owes much credit to the seminal article of Markowitz (1952). He began with the very simple assumption that rational investors like a high rate of return and are risk-averse. He argued that any rule for constructing portfolios of assets which does not imply the superiority of diversification must be rejected both as a hypothesis and a maxim.

This implies that where two securities in a portfolio have the same returns and are independent, but have different risk levels, the risk-averse investor would choose the security with less risk.

Where the returns of two assets in a portfolio are positively correlated, the portfolio risk cannot be reduced by diversification and the overall portfolio risk is equal to a simple weighted average of the risk of the two individual assets. For any given combination of two assets, the lower the overall risk of the portfolio, the more negative the correlation between the assets. In all cases, except perfect positive correlation, the combination of two assets into a portfolio will produce some overall risk reduction, however small. In other words, the risk of the portfolio is less than the weighted average of the risk of the two individual assets. In choosing a portfolio of assets to hold then, an investor considers the overall risk-return profile of a portfolio rather than the risk-return profile of each asset in isolation.

Markowitz characterized the set of portfolios which satisfy the above conditions as the "efficient set". A portfolio is efficient if none other gives either (a) a higher expected return and the same variance of returns or (b) a lower variance of returns and the same expected return. He, therefore, suggested that the process of portfolio selection be approached by: (a) making probabilistic estimates of the future performances of securities; (b) analysing those estimates to determine an efficient set of portfolios and (c) selecting from that set, the portfolios best suited to the investor's preferences. In order to determine the efficient set of portfolios, Markowitz assumed that the individual security returns have a joint normal probability distribution. This assumption implies that the joint probability distribution of returns of risky assets is fully described by the means and variances of the individual asset

returns and the covariances of each asset return with every other asset return. Here, the mean measures the asset's expected returns while the variance is a measure of the risk factor involved in constructing a portfolio of assets.

A number of studies have been undertaken to test whether or not normality of returns is a justifiable assumption. Kendall (1953), Moore (1962), Farrar (1965) and Cohen and Pogue (1967) have tested and given empirical validity to the Markowitz's 'Expected returns - Variance of returns' model. However, the view has also been seriously questioned, notably by Mandelbrot (1963), Fama (1965) and Roll (1967). Mandelbrot and Fama both argue that returns on individual securities should conform to symmetric stable distributions, and specifically to stable Paretian distributions. Stable Paretian distributions are described by four parameters as opposed to the normal (Gaussian) distribution which requires only two moments of the probability distribution of returns namely, a mean and a variance. These four parameters are: (1) a location parameter; (2) a scale parameter; (3) a skewness index which, when the distribution is symmetric, is equal to zero; and (4) a characteristic exponent which measures the total probability contained in the extreme tails of the distribution; when the characteristic exponent equals 2, the distribution is identical to the normal distribution (Aber 1973). Fama's (1965) empirical work on stock market prices suggests distributions with a characteristic exponent of between 1.7 and 1.9. Being less than 2, probability distribution are more in the extreme tails than normal distributions. Roll's (1967) work with Treasury bill rates and Blume's (1970) work with

stock portfolios produce similar evidence. Bierman and Smith (1930) have also argued that the appropriateness of using only means and variances may well be questioned indicating that the fact that there are ready markets for puts, calls, warrants and convertible bonds suggests that skewness and higher moments are also relevant. In his own work, Aber (1973) argued that it was reasonable to consider returns normally distributed justifying this stand by reference to Fried's (1970) work whose forecasting model involving normally distributed variables appears to be consistent with observed stable Paretian distributions having infinite variance. Works by Lintner (1970) and Leland (1968) also assume that returns are normally distributed.

Other problems associated with the Markowitz model include his assumption that the variance is a good measure of risk. Variance measures both desirable and undesirable deviations above and below the level of expected return (Williamson 1970). He tried to circumvent this problem through the use of semi-variance which is defined as the expected value of the squared deviations to one side of the mean and this greatly complicates the computational problem (Williamson 1970). The model also presents a number of practical problems in collecting and dealing with data. Thus for an analysis of 100 securities, it has been shown that the security analyst must estimate 100 return expectations, 100 variances and 4950 covariances making a total of 5250 items of data. Hence even given the assumption of normality of returns, the number of assessments required remains high in any analysis involving several variables. This objection has led to attempts to simplify the

variance-covariance matrix. Markowitz (1959) himself suggested that it might be possible to relate each security's rate of return to the rate of return on some index of general market performance, as a substitute for the full covariance matrix.

Various authors have developed models which approach the theory of the financial firm from the above framework, i.e. applying the general theory of portfolio behaviour under assumptions of subjective risk aversion (see for example Parkin (1970), Parkin and Ghosh (1972), Pyle (1971), Hart and Jaffe (1974), White (1975), Royama and Hamada (1967)).

The authors apply or adapt general portfolio theory of the Tobin-Markowitz variety mostly and some have applied the dynamic version developed by Tobin and Brainard (1968).

3.3.1 Basic Features of the Tobin-Markowitz Model

As discussed above, Markowitz (1952) and Tobin (1958) pioneered recent developments in the study of institution portfolio behaviour, encompassing the whole economy. They have provided the theoretical foundations for developing model structures used in the analysis of portfolio selection behaviour. The basic highlights and characteristics of their hypothesis, as mentioned above, have also been adopted by various authors to develop models that explain the portfolio behaviour of financial intermediaries. White (1975) highlighted the basic characteristics of the usual Tobin-Markowitz (T-M) model. The static model, he notes, is a model based on the theory of portfolio selection involving the construction of an 'efficient' portfolio set.

This approach assumes that, subject to a balance sheet constraint, all investors wish to invest in individual assets so as to maximize expected utility at the end of a single decision period, where utility depends on the actual yield realised on the whole portfolio over the period. In situation of uncertainty of returns expected utility depends not only on portfolio returns but also on its anticipated variance. This mean-variance trade off is the central characteristic of the Tobin-Markowitz approach. The alternative and sufficient assumption necessary are either that the utility function of investors is quadratic or that the uncertain returns from investment are considered by investors to be normally distributed.

If investors choose assets at beginning of each period so as to maximize expected utility and if over time investors subjectively evaluated views about the variances and covariances of the returns on balance sheet items remain constant, then demand functions for the choice set items (endogenous items) can be derived. The demand function being related to its own expected return, and those for other assets as well as the level of exogenous assets in the balance sheet. Whether the functions are linear or non-linear, White (1975) argues depends on which of the alternative approaches noted above is used to establish the Mean-Variance framework. While in his empirical study he assumed linearity with the assumption of normally distributed portfolio returns combined with the assumption that 'Investors' Utility functions demonstrate constant absolute risk aversion.

Also, Gramlich and Kalchbrenner (1969) and Townsend (1972) have derived identically specified function of the Tobin-Markowitz variety (discussed above). However, their analysis deals

with the case where expected returns is determined with certainty.

3.3.2   Basic Features of the Tobin-Brainard (T-B) Model

Tobin and Brainard in a series of scholarly studies (see for example Tobin, J. and Brainard, W. (1968, 1), (1968, 2) have extensively developed models also directed at explaining the asset and liability behaviour of financial intermediaries and the implication for monetary policy.

The Tobin-Brainard model is identical to the Tobin-Markowitz model in all aspects, except, that the T-B model is dynamic with actual changes in holding of their endogenous variable representing an adjustment from actual to desired levels and also it allows for the possibility of short-run flow constraints.

Brainard and Tobin posit a stock adjustment model structure of the type:

$$\Delta X_{1,t} = L \ (X^D_{1},t-X_{1},t-1) + C\Delta X_{2,t}$$

where

$$X_1 \ a \ \lnot \ X^D_{1,t} = n - \text{component vectors of actual and desired}$$
$$\text{choice set items respectively}$$

$$X_2 = m - \text{component vector of exogenous items}$$

n and m   = number of choice set items and exogenous items in balance sheet respectively

t   = time period.

The adjustment of any one choice item in the model is influenced by all other desired portfolio adjustment. Since the model incorporates the presence in each demand equation of the desired minus actual holdings. Also White (1975) notes that the presence of elements

of ΔX_2 in each equation implies that short term flows of exogenous items have a separate influence on the demand for choice set items (other than the influence they exert through their contributions to disposable assets). This phenomenon, according to White, is referred to as 'short-run flow constraints'. This concept, as White notes, is suggested by other work in the field (see for instance Jeffers and Kwon (1969), Deleew (1965), Goldfeld (1966), Norton (1968) and Silber (1970)).

Tobin and Brainard draw attention to the fact that balance sheet constraints do always impose constraints on the estimates of the parameters in the different equations in the models. They then argue that the following conditions must apply to the structural parameters in their model:

$$i^T b = 1 \qquad i^T L = \lambda i^T$$

$$i^T A = 0 \qquad i^T C = (1-\lambda) i^T$$

where

i = summing row vector; A, b and c = vector of parameter estimates, L = a vector indicating speed of adjustment and = 0.

Tobin and Brainard originally holds that $\lambda = 0$, Ladenson (1971) empirically shows that setting $\lambda = 1$ also satisfy the balance sheet constraint. White (1975) however, argues that any value could in fact be ascribed to λ and the balance sheet constraint will still be met.

In his empirical investigation, White suggests that required portfolio constraints should be observed always, by imposing constraints on the reduced form.

3.3.3   Other Models Based on Portfolio Theory

Baltensperger (1980) notes that of all the models based on traditional portfolio theory, the most basic is the one by Pyle (1971). His paper is an attempt to provide an answer to the question of under what circumstances would financial intermediation take place? Pyle developed a general model of financial intermediation which has its roots in the Telser-Hoothakker model of commodity hedging.

Pyle's approach considers an intermediary which has to choose between three securities a riskless security plus two securities with an uncertain yield over the given decision period presumed to be loans and deposits. The question is under which conditions to sell risky deposits in order to buy risky loans. Letting X_0, X_1 and X_2 denote the amount of the three assets with $(X_0 + X_1 + X_2 = 0)$ (balance sheet constraint) and r_0, r_1, and r_2 the corresponding yields per decision period with r_0 certain and r_1 and r_2 random variables with given expectations and joint distributions. The firms profit for the decision period is given by

$$\pi = r_0 X_0 + r_1 X_1 + r_2 X_2 = X_1(r_1 {}_r 0) + X_2(r_2 - r_0)$$

The firm maximizes the expected utility of profit where the utility function $U(\pi)$ is characterised by risk aversion (i.e. concave).

The uncertainties about the decision period yields r_1 and r_2 (as well as the relationship between them) are seen as arising from differences in the lengths of their respective maturities and the decision period.

Pyle shows that in the case of stochastic independence between assets and liability yields intermediation $(X_1 > 0, X_2 < 0)$ will occur

only if there is positive risk premium on deposits $(r_o > E(r_2))$. In other words if there is a positive expected yield difference between assets and liabilities. If there is a positive dependence between the two rates r_1 and r_2 these conditions are still sufficient for intermediation to occur. Pyle also specified that the probability for intermediation to be profitable, ceteris paribus, increases with the expected yield difference $E(r_1) - E(r_2)$ and with the degree of positive correlation. Thus optimum assets and liability choice are interdependent except in the case when r_1 and r_2 are independent. The assumption of risk aversion is crucial to ensure a finite firm size as well as a place for the riskless asset in the portfolio.

Most scholars contend that Pyle's conceptualization and analysis are correct. The question raised is that how and why will the conditions for intermediation specified by Pyle come into existence, and then persist. Thus, the approach does not indicate clearly what factors bring an intermediary into existence and consequently why it performs the functions it performs. The only answer to this issue in the context of Pyle's model which disrega.ₛ (like all the other models of subjective risk aversion) the question of real resource costs, liquidity and solvency considerations is found in terms of risk aversion. With risk aversion, the expected rate differential is guaranteed and then intermediation is possible and profitable.

Baltensperger (1980) however, argues that the introduction of real resource costs into the Pyle model would provide alternative answers to the question. This is particularly the case when we consider that the number of individuals who engage in arbitrage may

be sufficiently high to completely eliminate the need for further arbitrage, that is, they efficiently eliminate the expected yield differential.

Pyle (1971 pp. 746) concludes that his model provides a framework for additional research in financial intermediation. In particular, the comparative statics of these models can provide hypotheses on the response of intermediaries to changes in yield parameters which are at least, in principle, testable. Baltensperger further contends that it is not sufficient to assume exogenous determination of yields, he suggests that they should be endoge-nized not necessarily in terms of price setting but in the sense that even in a perfectly competitive market equilibrium, prices are determined by cost and demand conditions. He suggests that one major task of the theory of the financial firm must be to explain how the firm combines resources of various kinds in order to generate the net yield and profit streams. This, he went further, requires going beyond a pure traditional portfolio approach. While in agreeme : with his contention, we argue that portfolio theory and risk aversion can still play a useful role as an element of a more complete model. Pyle himself agree that there remains many unanswered questions regarding the theory of financial intermedia-tion, with particular emphasis on building a more dynamic model of the portfolio problem facing financial intermediaries.

Another modelling variety based on portfolio theory is pro-vided by Andersen and Burger (1969). They developed a theory of asset management and commercial bank portfolio behaviour based on two alternative hypotheses of financial behaviour namely the

accommodation principle implied in the commercial loan theory of banking and the profit maximization principle implied in recent developments in bank portfolio theory and related research. They investigate empirically these alternative hypothesis based on evidence from commercial banks in the United States.

The accommodation principle implies that the demand for bank loans determines bank portfolio behaviour; this aspect or conceptualization of bank behaviour, Andersen and Burger (1969) notes, is critical and important for monetary management. On the other hand, the profit maximization principle implies that commercial bank responses to market forces determine their portfolio behaviour. Further, they argued that expectations of bank response to actions of the monetary authorities (e.g. central bank) differ according to which principle is accepted. They also observe that changes in bank portfolio behaviour also have important implications for monetary management. For instance, as they discussed, a shift in the function explaining the desired level of bank loans would be reflected in a change in the intercept. A change in the shape would be a change in the elasticity of the desired level of loans with regards to one or more of its arguments. Thus, they posit that monetary authorities when attempting to forecast the asset behaviour of banks in response to monetary policy must take into consideration empirical questions bearing on these questions.

Consequently, the Andersen and Burger (1969) model was based on two key principles:

(1)   Bank Behaviour under the Profit Maximizing Principle

Total deposits - member bank total deposits (D) are constrained by their total reserves (deposits at Reserve banks and vault cash) and the average reserve requirement ratio. This relation may be expressed by the following identity:

$$D = \frac{1}{r} R$$

In the above expression, R is member bank total reserves. It consists of non-borrowed reserves (NB) and borrowings from Reserve banks (B). The term $\bar{r}$ is the average reserve requirement ratio which takes into consideration the distribution of deposits between demand and time accounts and between city and country banks.

The identity may be expanded to:

$$D = \frac{1}{r} (NB + B)$$

With $\bar{r}$ constant, member banks as a group may expand their deposits by borrowing from reserve banks, or as a result of the Federal Reserve System increasing non-borrowed reserves. This allows them to have more earning assets.

Borrowing: Member banks borrowing from Reserve banks, although relatively small compared with NB, constitutes an important aspect of bank behaviour. It is a liability item which allows banks some flexibility in their asset management within the constraint imposed by non-borrowed reserves.

The desired level of borrowings from Reserve banks (B*) is postulated as follows:

$$B^* = f_1(i_s, i_d, i_f, C_b, D)$$

In this relationship, i_s is the short-term interest rate, i_d the Federal Reserve discount rate, i_f the federal funds rate, and C_b other costs of borrowing. B^* is postulated to be positively related to i_s, i_f, and D negatively related to i_d, and C_b.

Excess Reserves: Holdings of excess reserves, other things constant, results in holdings of fewer earning assets; therefore bank hold excess reserves for returns other than earnings. Holdings of excess reserves constitute a buffer stock which allows banks to meet sudden withdrawals of deposits without requiring a reduction in earning assets. The desired level of excess reserves (ER^*) is given by the following function:

$$ER^* = f_2(i_s, i_d, i_L, C_{er}, D)$$

ER^* is postulated to be negatively related to i_s and i_L and positively related to D, i_d, and C_{er} (costs of managing excess reserves).

Loans: Earning assets in the form of bank loans consist mainly of loans to business, households, and financial institutions. The desired level of loans (L^*) is given by the following relationship:

$$L^* = f_3(i_s, i_d, i_L, C_1, D)$$

L^* is postulated to be negatively related to i_L and i_d, and C_1 (transactions costs of lending) and positively related to i_s and D.

Investments: Earning assets classified as investments consist mainly of holdings of government securities. The desired level (I^*) is expressed as:

$$I^* = f_4(i_s, i_d, i_L, C_i, D)$$

Investments are considered a residual item in their analysis. However, I* is postulated to be negatively related to i_s and i_d, and C_i (transaction costs of investments) and positively related to i_L and and D.

(2) Bank Behaviour under Accommodation Principle

Under the accommodation principle, bank behaviour would mainly reflect the demand of customers for loans. For example, a rise in the demand for loans from banks (supply of this form of earning asset) would be met, subject to the deposit constraint, by reductions in investments and excess reserves and an increase in borrowings from Reserve banks. This implies that the factors influencing the demand for bank loans affect L*, I* ER*, and B*.

The following equation is postulated as determining the supply of loans (viewed as earning assets of banks):

$$L^* = g (i_s, i_L, GNP, W)$$

L* is postulated to be negatively related to i_s and positively related to i_L, and signs are the ones commonly developed on the basis of business maximization of profits and household maximization of satisfaction, subject to wealth and income constraints.

As stated above, the function g would be the relevant one for examining bank behaviour under the accommodation principle. Incorporation of this principle into the functions for B*, ER*, L*, and I* in place of the profit maximization principle, introduces GNP and W into each function and reverses the signs for i_s in the B*, ER*, L* equations, and the sign for i_L in the L* equation.

Like the Tobin-Brainard model, Andersen and Burger adopts a stock adjustment framework used as the basis of constructing the

model of bank portfolio behaviour. It is assumed that banks have a desired level of each of the balance sheet items under consideration (B^*, ER^*, L^*, and I^*) and that the stock of the items held is changed at a certain rate (speed of adjustment) to close the gap between the actual and the desired level. The desired stock depends on the economic factors spelled out earlier; while the speed of adjustment coefficient may range from zero to plus one. The closer it is to one, the faster the speed of adjustment.

The Andersen and Burger model has been in use and may be relevant to our environment. Apart from this, the model allows for variations in the arguments in individual demand/asset functions to suit the particular purpose. However, the Tobin-Markowitz and Tobin-Brainard Models earlier discussed have a wider theoretical acceptance based on their explicit linkages with the core theories of portfolio selection. The micro-theoretic foundation of the Anderson and Burger model are not clearly spelt out nor is the specific functional form specified. The model does not also capture situation of uncertainty which is germane to financial institution behaviour.

In the literature, it is observed that a number of modelling approaches, on portfolio selection behaviour exist. These models introduce new arguments and theoretical underpinnings to the variety of asset/liability (or both) equation. Specifications which are not necessarily based on any of the models discussed above. However, these approaches are not generalized. They are restricted to peculiar situations, in most cases (see for example Bates and Bradford (1980), Omoruyi (1984), etc). The empirical results on

some of such models are incorporated and discussed in section 3.5.

In conclusion, we recognise that following the classification cf Baltensperger (1980) these risk aversion models are complete models in the sense that in most cases they explain assets and liability interactions and the determination of the total size of the firm and do not concentrate on either asset or liability management which characterise the partial models of the banking firm. Sealey and Lindley (1977) and Baltensperger (1980) argue that this approach is inadequate as a tool of analysis in the study of the behaviour of financial institution. Sealey and Lindley (1977 p. 125) notes that "the inadequacy of this approach stems from the total omission of production and cost constraints under which financial firms operate and thus the role of these constraints in determining the equilibrium output mix and the scale size of the financial firms". Klein (1971 p. 205) in his own paper posit that in the face of conceptual difficulties in drawing the analogy between a bank and the typical firm of neoclassical analysis, most treatments of the bank at the mics level have concentrated on the specific problem relating to the allocation of a bank's fund among competing stock of assets. That is a bank has been treated not primarily as a firm but as a rational investor in an environment characterised by risk or uncertainty. On the basis of this, he argues that the neoclassical analysis of the banking firm (which shall be discussed in the next section) has yielded to portfolio theory.

3.4   Neoclassical Microeconomic Models of the Financial Firm

Some studies on the portfolio behaviour of financial intermediaries have proposed to describe the operations of the financial firm (mostly and actually mainly commercial banks) by utilizing the concepts of the neoclassical theory of the firm. The advantage of this approach over portfolio analysis of banking firm is that it takes cognisance of the entire behavioural consideration of the institution as a firm and the nature/structure of the financial market.

The discussion is categorized into three main groups. First, the partial models are considered then the monopolistic models and the real resource models both classified by Batensperger (1986) as part of the complete models.

3.4.1   The Partial Neoclassical Models of the Banking Firm

The partial models also following Battensperger (1980 p. 3) is classified into two groups (1) models of optimal asset choice or models of bank reserve and liquidity management; and (2) models of liability management. These models are comparable to the analysis of the minimum cost of production in the general neoclassical theory of the firm.

1.   Models of Optimal Asset Choice or Liquidity Management Models

The basic model on which the literature on this model type is based can be traced back to Edgeworth (1888). Baltensperger asserts that in recent times this approach had been taken up by a variety of writers including Orr and Melon (1961), Porter (1961), Morrison (1966), Poole (1968), Frost (1971), Baltensperger himself (1972a,b), Ritzman (1973), Pringle (1947), Hester and Pierce (1975), Keskela

(1976) and Niehans (1978), etc.

Baltensperger provides a summary of the characteristics, developments and main features of this model type in his 1980 survey article. The total deposits (D) for an individual bank is assumed given. The bank is also assumed to face a two asset-choice problem, either reserves which in some work includes secondary reserves (securities) or earning assets (E), r denotes the net yield on loans. The bank is assumed subject to withdrawal risk (X) which denotes the outflow of deposits and thus reserves during the period with estimated probability density function f(x). The occurrence of reserve deficiency makes necessary certain costly adjustments for the bank. If we further assume for simplicity that adjustment costs are proportional to the size of the reserve deficiency with P denoting the fact of proportionality.

The problem we have to solve is to choose the optimal (beginning of period) allocation of the given funds (D) among reserves and loans.

If r is believed to be independent of the volume of loans given, the two cost items to be balanced against each other can thus be expressed as rD = opportunity cost of holding reserves and

$$L = \int_r^x p(X-R)f(X)dx \qquad (3.6)$$

for the expected adjustment cost due to reserve deficiencies.

Optimal asset choice necessitates the minimisation of the sum of these two cost elements which will imply the equalization of marginal cost and marginal returns of holding additional reserves.

$$r = p \int_R^X f(X)dx \qquad (3.7)$$

The basic proposition is that banks must choose the positive level of reserves such that the probability of a reserve deficiency is just equal to the ratio r/p. This condition defines the bank's desired reserves as a function of the data of the model r, p and f(x). Furthermore, the interpretation of the formulation here implies that the optimal reserves depend on the structure (ratio) of interest rates only and not on the absolute levels. It should however, be kept in mind here that (a) cannot be identified with the loan rate net of all costs (including information and administration costs) of extending credits and (b) p cannot be identified simply as the discount rate. The rate P must reflect all the cost of portfolio management including transaction costs in bank attempts to borrow from the Central Bank as a result of reserve deficiency.

It is noted that the fulfilment of the condition for a positive level of optimal reserves does not seem unlikely anymore. Baltensperger however, posits that r and p are finally related to the loan rate and discount rate. It therefore becomes clear that optimal reserves depend not only on the structure but also on the level of interest rates.

It is also identified that various modifications can be and have been introduced to models of this type in the literature. These modifications include

(A)   Declining demand functions for loans whereby the marginal opportunity cost of reserve holdings is not given by r anymore, but rather by the marginal revenue lost due to reducing E by a unit. r is perceived by the bank to be negatively related to the amount of credit offered by the bank. Thus the firms

optimality condition then becomes:

$$\delta E(\pi)\delta e = -\delta E(\pi)\delta E = -[r(E)+Er'(E)] - L_r = 0 \qquad (3.8)$$

Poole (1968) has also made the deficiency cost function p(X-R) non-linear in a similar way, without affecting the logic of the model.

Introducing legal reserve requirements in the model has the effect of reducing the critical value of the reserve loss X beyond which a reserve deficiency and corresponding adjustment costs occur.

(C) Cost of adjusting to optimal portfolio - In· the presence of adjustment costs an adjustment is profitable only if the resulting gain more than offsets the cost of the adjustment itself. This feature could also be introduced into our basic model.

(D) Diversification of earning assets - If the earning assets are not homogeneous which depict reality, Baltensperger notes that the fundamental way to explain asset diversification is in terms of risk-return considerations along the lines of general portfolio theory (earlier discussed). Baltensperger however, enumerated some other ways in which the problems of asset diversification can be introduced into our model. One possibility he notes is to extend the model of reserve management (discussed above) such that earning assets which are characterised by relatively high return at the same time are characterised by relatively high conversion cost into cash.

(E) Information costs regarding the risk of default have been neglected in various models of bank asset selection. Ainger and Sprenkle (1968) however, hypothesise that banks which

spend reserves on the collection of information about their customers can reduce the expected rate of default thus earn-ing a return on information collection activities; however, the specific incorporation of this phenomenon into the basic model has been controversial. Baltensperger (1980) writes that Aigner and Sprenkle (1968) specifications are faulty in that

(a)   they assume that banks always overestimate the true probability of default, so that more information neces-sarily means a lower default probability, and

(b)   they regard extra information as valuable only if it results in a downward adjustment in the estimated default probability.

Some scholars have argued that the cost of information errors arises because they lead to decisions which are suboptimal, this Baltensperger (1980) notes is possible regardless of whether we initially have an underestimation or overestimation of the true probability. Baltensperger (1972b, 1974) and Milde (1976) have provided an approach which links the cost of incomplete information and the return to more information with the variability of certain random variables (such as default losses and deposit fluctuations).

(F)   Determinants of the distribution of deposit changes - optimal reserves in the basic model discussed above is postulated to be a function of the parameter s, r and p and the deposit fluctuation distribution f(x). If f(x) is approximated by a normal distribution as we assume for simplification, optimal reserves can be expressed as a multiple (b) of the standard

deviation of X with b being determined by the ratio r/p

$$R = b\delta_x \qquad (3.9)$$

The distribution of deposit fluctuations f(x) should be expected to depend on the volume as well as the structure of bank deposits.

II. Models of Liability Management

Baltensperger (1980) mentioned the paucity of studies on the liability section of the balance sheet of financial institutions. This is also the case in earlier studies of portfolio behaviour of financial institutions in Nigeria. The total volume as well as the structure of liabilities are usually assumed exogenous and not subject to optimizing behaviour. The view prevalent in the literature is that banks are presumed to have no choice, but to accept all deposits it is offered at the ruling deposit rates hence most analyses assume bank liabilities are exogenously determined.

Arguments to the contrary in the literature are based on two main reasons, namely:

(1) that a bank has a variety of possibilities to influence the attractiveness of various types of liabilities and thus the public demand for them, for example, the non-price terms such as advertisement campaign for deposits; and

(2) that even if deposits are assumed exogenous, it would still be sensible to ask for the structure and volume of liabilities which are optimal and thus desired by the bank given the potential structure and yield of its asset portfolio. These reasons question the plausibility of the assumption of exogeneity of

liability portfolio of financial institutions and thus models of portfolio liability management may be indispensable for a full understanding of bank portfolio behaviour.

Baltensperger (1980) again provides a simple basic model that typifies and incorporates the various developments on models of liability management. He assumed that there are only two liability items in the balance sheet of the financial firm homogeneous deposits (D) and equity capital (W). He noted the almost complete disregard of the banks capital account in most analytical model of bank behaviour. The capital account item is regarded as exogenous and not of any meaningful role in the model. Following his various publications in the area (Baltensperger (1973), Baltensperger (1972a, b)), the scholarly works of Niehans (1978, chp.9) and Eaggart and Greenham (1978)),he adopted the inventory theoretic approach to the determination of the banks liability structure. Capital account performs a fundamental economic function, similar to that of liquidity reserves namely protection against certain types of uncertainty and the possibility of emergency adjustments and cost.

They assume a bank with given beginning of period level and structure of assets A.

The banks income from the assets are known a priori in probabilistic form only with estimated density function g(Y) partly due to the default risk, uncertainty about (end of period) interest rates and asset prices. g(Y) depends on volume and structure of the banks asset portfolio. If the bank issues an amount of deposit D and promises to pay an interest rate i on these deposits, the end of period indebtedness will be D(1-i). If the end period assets

A+Y are less than the end period debt or deposits, the bank finds itself with an end of period negative net worth that is the bank is insolvent. The conditions for this to occur is summarised thus

$$A + Y - D(1+i) = (Y - iD) + (A - D) < 0$$

OR

$$Y - D(1+i) - A = \hat{r} \tag{3.10}$$

The probability of this event is positively related to the size of D or negatively related to W(=A-D). It is very costly for a financial firm to become insolvent, the cost borne includes cost of organizing creditor-debtor meetings; legal services, loss of confidence by the public and possible suspension by the supervising authorities. Baltensperger posits insolvency costs are positively related to the size of the capital deficiency ($\hat{Y}$ - Y) assuming proportional relationship with cost per dollar of deficiency denoted as a. The expected cost of insolvency S then can be expressed as

$$S = \int_{\infty}^{\hat{Y}} a (\hat{Y} - Y) g(Y) dY \tag{3.11}$$

Baltensperger notes that the cost of avoiding insolvency is as important as the cost of insolvency. So also the existence of legal capital requirement which may impose similar costs on the banks before insolvency actually occurs, whenever the capital account drops below or near to the required level. If we assume all these costs are incorporated in S, the banks optimal decision regarding the structure of liabilities involves balancing these costs against the cost of using equity capital rather than deposits funds.

Letting p represent the opportunity cost of equity funds and

assume p · i. The marginal opportunity cost of increasing equity capital W by some unit of currency then is p - i. The corresponding marginal return is given by the associated reduction in S,

$$Sw = \int_{\infty}^{\hat{Y}} a\, \hat{Y}w\, g\, (I)\, dY = -\int_{-\infty}^{\hat{Y}} a(1+i)g(Y)\, dY \qquad (3.12)$$

optimality requires

$$p - i = -Sw \qquad (3.13)$$

Thus the optimal demand for equity capital and supply of deposits is determined by the rates P, i, a and the distribution g(Y), according to the approach.

It is noted that two important features of bank portfolio behaviour have been neglected in the formation of the basic model discussed above. These are:

(a)   The cost of issuing and maintaining deposit contract: a variety of services is offered by banks to their customers and these form a major element of the contract agreement between banks and depositors. Pesek (1970) and Saving (1977) incorporated this aspect of banking into their formulation of a theory of the banking firm. A cost function C(D) is introduced into the model as an explicit representation of the feature. The critical value of Y becomes:

$$Y = D(1+i) + C(D) - A \qquad (3.14)$$

and the optimality condition is

$$P - (i + cp) = -Sw \qquad (3.15)$$

with

$$Sw = -\int_{-\infty}^{\hat{Y}} a\, (1+i+C_D)g\, (Y)\, dY \qquad (3.16)$$

(b)   Secondly i has been treated as a market determined magnitude independent of the deposit-equity ratio chosen by the bank. The possibility of insolvency costs implies that the nominal deposit rate i has to be distinguished from the expected rate of return received by depositors (t). Baltensperger (1980) then posits that given a positive probability of default (we note that Baltensperger had earlier in the same article criticized the plausibility of this assumption as regards the Aigner and Sprenkle (1969) model of liquidity management incorporating information costs earlier discussed) the latter rate (t) is necessarily less than the former (i). Given the nominal rate i, t is a function of D. However, if the banking system is characterised by a reasonable amount of competition the bank will be forced to grant the depositors a compensating adjustment in the nominal deposit rate i, whenever the effective rate t is lowered due to an increase in the deposit-equity ratio this is particularly true in a competitive environment.

Hence, Baltensperger posits that the deposit rate I is functionally related to the firms financial structure particularly the quality of deposits whereby

$$i = i(D) \tag{3.17}$$

the price function i(D) is then implicitly determined by the expression for t (expected rate of return paid to depositors)

$$t = i - [(I+a)_a].S/D \lessdot i \tag{3.18}$$

considering that the use of equity capital implies opportunity costs equal to pw ÷ p(A-D) the firms expected profit then is expressed as

$$E(\pi) = E(Y) - tD - C(D) - S \cdot P(A-D)$$

Optimal liability structure then occurs when

$$dE(\pi)dD = -t - C_D \quad S_D + P = 0$$

or

$$P - t = C_D + S_D \tag{3.19}$$

This implies that banks will expand deposits production up to the point where the marginal cost of producing deposits (= $C_D + S_D$) equals the corresponding marginal revenue (=p-t).

An interior optimum, Baltensperger notes, also requires that the two functions intersect each other from the right side. That is $C_{DD} + S_{DD} > 0$; otherwise corner solutions will prevail.

The introduction of deposit insurance could also affect the optimal liability structure. Baltensperger notes that. an efficiently organized deposit insurance scheme whereby banks graduate premiums paid by the bank to the insurer according to insolvency risk and thus liability structure (given bank assets and g(Y) whereby the banks will simply pay a risk premium to the insurance company instead of depositors, will leave the optimization problem unchanged.

Also, the situation is somewhat different if insurance premium are determined independently of insolvency risk; the optimality condition will also differ if the premium paid to all firms are identical, this favours the relatively risky firms. If the bank assets are endogenous this will lead to a change in asset structure towards the relatively risky types of assets.

Baltensperger (1980) identified that this adverse portfolio selection phenomenon is prevalent and well known in the United States

Deposit Insurance Scheme.

There have been other attempts to modify and improve the basic liability model discussed by Baltensperger (1980). The attempts have been concentrated on the incorporation of information collection, asset diversification as additional endogenous elements. The introduction of these elements will affect the optimal capital decision to the extent that their activities lead to a reduction in risk (σ_r) (See Baltensperger and Milde (1976)).

Another area of modification is the explicit introduction of regulation and legal restrictions. Mingo and Markowitz (1977), Santomero and Watson (1977) discuss the banks deposits capital decision in terms of a framework relying exclusively on regulation.

Pringle (1976) discussed the banks capital decision in a model which disregards insolvency cost S as well as service production cost C. His model treats the problem essentially as one of liquidity management under the assumption of exogenous but stochastic deposits and a less than perfectly elastic loan demand function facing the bank. In summary, Pringle posits that given fixed deposits the bank will raise additional funds from the least cost source and make additional investments as long as the marginal returns from the latter exceed the cost of financing. The least cost source of financing is assumed to be equity financing. In this way the model yields a determinate solution for the firms capital position without taking into account its risk bearing functions. However, if the least cost source is assumed to be something different, the firm in the model will not use any equity capital. Also if the firms demand function for loans is such that even with a zero equity capital the marginal revenue from loans

is already B (cost of equity capital use) or below B, the firm will also not use any equity capital. Furthermore, if the marginal returns from loans is constant the optimal capital position is indeterminate. Thus, Pringle's approach to the determination of the banks capital position is less basic than the original model developed earlier in the sense that the bank uses only equity capital as a supplementary source of capital as other sources of funds are assumed to be either exogenously fixed or more expensive.

Baltensperger (1980) also discussed the problem of having different types of deposits in his survey of partial liability models of the banking firm. He argued that one main difference between different types of deposits is the different contractual obligations inherent in each deposit type and of the underlying production technologies.

Baltensperger proposed a two-type deposit structure model such that the banks expected profit function is given by

$$E(\pi) = E(Y) - i_1 D_1 - i_2 D_2 - C(D_1 D_2) - L(D_1 D_2) \qquad (3.20)$$

with earning assets $A = D_1 + D_2 - R$. The earning assets are fixed exogenously. Total cost depends on the levels of both deposits and i_1 and i_2 are market rates of interest paid on each deposit types respectively.

The optimal structure of deposits then is determined by the condition

$$(i_1 - C_1 + L_1)(1-R_1) = (i_1 - C_2 + L_2)(1 - R_2) \qquad (3.21)$$

where subscripts 1 and 2 denote partial derivates with respect to D_1 and D_2 respectively. Baltensperger reiterated that the second order

conditions for cost minimization must hold for the avoidance of corner solutions.

The models discussed in section 3.4-1 of this survey (partial Neoclassical (portfolio structure) models) deal with the question of either asset choice or liability management of banks. These models, as mentioned earlier, are comparable to the analysis to the minimum cost production of a given level of output in the general theory of the firm. These models do not explain the interrelationships beween asset and liability choices and also the determination of the total size of the firm. The partial models are therefore of very limited use in reality as they assume one side of the balance sheet exogenous and do not provide clues as to the speed, nature and causes of the adjustment mechanism recognised in their discussion of asset or liability choices.

3.4.2 Complete Neoclassical Models of the Banking Firm

The complete models which adopt the neoclassical framework can be categorized into two broad types, namely:

(I) The Monopolistic Models

(II) The Real Resource Models

Most of the work in this area have also concentrated on developing a generally acceptable theory of the commercial banking firm.

(I) Monopolistic Models

Some scholars notably Klein (1971) and Monti (1971, 1972) characterise the banking markets as a monopoly market. They neglect entirely, and in some cases inadequately introduce, the real resource cost aspects of banking and in essence determine demand

functions by the public for bank products.

Baltensperger (1980) argues that although this procedure does allow a solution to the problem of firm scale and portfolio structure, it does not appear to be a very satisfactory solution as resource cost aspects are neglected, since it cannot tell anything about the production and supply characteristics of banks services. This is manifested by the fact that models of this sort completely break down if the firm is forced to behave as a price taker rather than a price setter.

The Klein (1971) model assumes that banks can choose among three assets - cash reserves, government securities and loans. On the liability side, three items are again distinguished, two types of deposits called demand deposits and time deposits and equity capital. Equity capital is assumed exogenously fixed and actually could be dropped from the model without any consequence for the logic of the model and its solutions.

The bank is assumed to maximize profits. Monti's model (1971, 1972), though similar to that of Klein, considered the implications of different objective functions for example maximization of deposit size instead of profit. The model determines the optimal structure of assets and liabilities as well as the total size of the bank under the assumption that it acts as a price taker in the market for government securities but as a Monopolist price setter in the markets for bank loans as well as the markets for both types of deposit.

The average return on bank loan is considered to be negatively related to the amount of credit extended $rE = rE(E)$ with $r E < 0$ and the average rates of interest which the bank has to pay on the two deposits types are viewed as being positively

dependent on the levels of the respective deposit types

$$i_1 = i_1(D_1) \quad \text{with } i_1^1 > 0$$

and

$$i_2 = i_2(D_2) \quad \text{with } i_2 > 0$$

The bank thus is seen as a monopolist. optimizing along the loan demand and deposit supply curves of the public.

The banks demand for reserves is determined by the use of an inventory management model with stochastic deposit withdrawals typified by the liquidity management models discussed earlier. Klein treats the reserve flow distribution $f(x)$ as a fixed distribution independent of the composition of deposits and it is regarded as homogeneous of degree one in total assets.

It follows from the above that banks will extend loans until the resulting marginal revenue is equal to the exogenous rate (rg = exogenous rate on government securities)

$$rE + Er'E = rg \tag{3.22}$$

This determines the banks supply of loans. Furthermore, the bank will sell deposits of either types until the corresponding marginal expenditure is equal to (rg) (the exogenous rate (rg) adjusted for the marginal cost of liquidity management) hence

$$i_1 + D_1 L_1 = i_2 + D_2 i_2 = rg \tag{3.23}$$

This determines the level D_1 and D_2 and implicitly i_1 and i_2. These levels together with the exogenous capital account determine total portfolio size. Since we have explained that reserves are determined as a given proportion of total portfolio (the size of the proportion depends on the parameters of the reserve flow distribution rE and P

and independent of the volume and structure of deposits).

Baltensperger (1980) discussed various identified weakness as of the Klein (1971) models. The complete dependence on the assumption of a monopoly banking market is a major weakness of the work. It is known that the bank model breaks down if we relax this assumption. It is also argued that this approach is not satisfactory, as an analysis of the cost of banking activities is missing from Klein's model. This view is supported by Lindley and Sealy (1977 p. 1252), who note that the inadequacy of Klein's approach amongst others is found in the incomplete application of the essential elements of the theory of the firm to financial institutions.

Also with respect to deposits, the cost of liquidity management should be included in a more meaningful way by at least making it dependent on the structure of deposit liabilities and possibly not making it homogeneous of degree one in scale.

In Klein's work there exists no difference between the two deposits types from the point of view of production and supply. The only difference between them being differences in demand. However, for a meaningful discussion of the determinants of relative deposits supplies and rates, Baltensperger (1980) notes that Klein should have taken the cost of producing and maintaining deposit contracts and the associated services.

Also in respect of bank assets the cost of producing and maintaining different types of credit contracts as well as differences in default risk and consequently differences in insolvency costs should also have been considered in the model.

Differences in cost of adjustments when facing liquidity

problems should also be included to allow for meaningful differentiation between different bank assets.

These features are neglected in Klein's model where from point of view of production and supplies there exist no differences in bank assets.

The proper differentiation of assets and liabilities as stressed above, will offer vital clues on two vital issues stressed by Klein (1971) and subsequently taken up in the literature (see for example Pringle (1976)). These issues are:

(a)   the question of the interdependence of asset and liability management; and

(b)   the question of the determination of relative deposit rates.

Klein in his model showed that optimal asset choice is independent of optimal liability choice and thus deposit market characteristics and deposit rates paid. He subsequently used this to prove the non-justification of deposit rate ceilings and prohibition. Baltensperger notes that Klein's model conclusions hold only on the basis of many special assumptions (which were enumerated earlier). However, the introduction of the resource cost consideration, Baltensperger argues, will bring joint determination of bank assets and liabilities.

Monopolistic models are useful, in that financial institutions have a role to play in imperfect markets, especially if the imperfection surrounds incomplete information, uncertainty, adjustment costs, etc. This does not imply that the monopoly models are superior to the models which categorize the banking firm as a price taker.

(II)   Real Resource Models

Most of the literature on the theory of the banking firm neglects the production aspects of banking business. However, the banking business is quite resource-intensive. Sealey and Lindley (1971   p.1251) identified the two major areas of neglect in previous studies;

(a)   the previous studies fail to appropriately classify outputs and inputs of the financial firm by failing to consider the criteria on which the financial firm makes economic decisions; and

(b)   the previous studies also have neglected the analysis of the technical aspects of production and cost for the financial firm.

Some authors have pioneered research into this area. These include the works of Pesek (1970), Saving (1977), Towey (1974) and Sealey and Lindley (1977). These models explain the size and structure of bank liabilities and assets purely in terms of the flow of real resource costs of generating and maintaining these stock.

The studie: however, disregard the cost of liquidity management as well as solvency protection which form part of the real resource costs. Rather, their models emphasise in particular, the cost of deposit production. The bank is simply said to have a production relating different combinations of inputs.

Baltensperger (1980) also provided a summary of the basic features of this model type. In it, production and maintenance of all the different liability and asset types are viewed as independent processes. We can derive a separate production function for each of the ith assets (including liabilities) which are treated as negative assets.

$$E_i = E_i (V_i, h) \quad D_i = D_i(V, h) \tag{3.24}$$

V_i, h denote the quantity of the various inputs type employed in the production of that i^{th} asset. A more general function is specified in its implicit form by allowing technical interaction between various activities.

$$H(E_i, D_j, V_h) = 0 \tag{3.25}$$

The bank is then viewed as maximizing its profits

$$\Pi = \sum_i r_i E_i - \sum_j i_j D_j - \sum_h W_h V_h \tag{3.26}$$

where

$$W_h = \text{the decision period rental price on input} \quad h$$

subject to the following technical constraints.

$$H (E_i \ D_j \ V_h) = 0 \tag{3.27}$$

or $\qquad E_i = E_i(V_i, h) \quad \text{and} \quad D_j = D_j(V_j, h)$

a balance sheet constraint is imposed such that

$$\sum_i E_i = \sum_j D_j (i - K_j) \tag{3.28}$$

where K_j = exogenous cash reserves requirements for liability type j and market determined prices r_i, i, and W_i (or corresponding demand and supply functions of the public for E_i, D_j and V_h; if the bank is able to act as a price setter in any of these markets). This yields the optimal levels and combinations of all the E_i, D_j and V_h according to the theory of the firm principles, with second order conditions requiring decreasing returns to each activity and scale as in any other production process. In this approach therefore decisions regarding assets and liability structure and scale, generally, are

jointly determined. Baltensperger notes that this kind of study incorporating the real resource costs need to be more fully integrated with some of the other elements traditionally stressed in banking models, particularly, considerations with liquidity and solvency management aspects. Such an approach has been developed by Niehans (1978, chp.9, p. 175) and a similar model influenced by an earlier version of the Niehans (1978) model, built by Baltensperger and Milde (1977).

Their analysis is based on the assumption of expected profit maximization and price taking by the firm in all markets. The model can easily be modified to take account of price setting along the lines of monopoly models which most authors prefer and adopt. The elements of the models allow a simultaneous analysis of firm size, asset structure and liability structure taking into account real resource costs, liquidity costs and insolvency cost all at the same time.

The bank balance sheet constraint is given as
$R + E = D + W = A$ (all terms as defined earlier). Assuming one type of asset and deposits, the financial firm maximizes the expected profit given by

$$E(\pi) = rE - ID - C (D_1 E) - L - S - PW \qquad (3.29)$$

The firm has three choice variables now. For example, we can view it as choosing total portfolio size A and two variables characterising the structure of asset and liability side and liability side respectively. Expected profit is then expressed as

$$E(\pi) = r \times A - t A - C(A,X,\delta) - L(A,X,\delta)$$

$$- S(A,X,\delta) - P(1-\delta)A \tag{3.30}$$

$$= [Xr - dt - (1-\delta)P] A - C(A,X,\delta)$$

$$- L(A,X,\delta) - S(A,X,\delta) \tag{3.31}$$

The expression $[Xr - \delta t - (1-\delta)P]$ measures the difference between the expected rate of return on assets r, weighted with the asset structure parameters x and the weighted sum of the two expected cost rates t and p. The lost expressions C, L and S (as earlier defined) are expressed in terms of portfolio allocation parameters x and r, so that the partial derivatives of these functions with respect to A, measure the respective marginal costs under conditions of constant portfolio structure optimization with respect to A, X and δ determine the optimal structure of the banks asset and liability portfolio as well as its optimal scale in terms of the parameters of the underlying cost and return functions. It is clear in this kind of model that all these decisions regarding determination of asset structure, liability structure and the total scale of the firm will be made in an interdependent way.

3.5 Other Models

The model types to be discussed here differ from the earlier ones which tend to concentrate on the general analysis of portfolio behaviour in financial intermediaries. Some scholars have developed models which provide an insight into how to model and investigate the impact of bank portfolio composition on certain macro economic variables particularly the Gross National Product (GNP).

Studies using single equation estimations by Anderson (1969),

Campbell (1978), Silber (1969,1) and Sutherland (1977) investigate the relationship between portfolio composition and economic activity proxied by the Gross National Product. These studies suggest that an increase in bank loans will have a larger impact on GNP than an equivalent increase in bank investment. However, the study by Batavia and Lash (1982) which is reviewed here provide results contrary to these earlier studies.

Batavia and Lash (1982) assumed that bank loans are exogenous (contrary to the earlier studies) and show that the portfolio composition of banks do not have any impact on GNP. It is also argued that the previous studies (mentioned earlier) using equation estimation usually of the form:

$$GNP = a_0 + a_1M + a_2H + a_3L \qquad (3.32)$$

where

    M = Money supply

    H = Ratio of government expenditure to government revenue

    L = Ratio of bank loans to bank earning assets

suffer from simultaneous equation bias since a change in GNP itself could lead banks to adjust their portfolio by shifting between loans and investment.

The authors then proceed to test empirically and show the existence of a two-way causalty between GNP and bank portfolio composition.

They developed a simultaneous equation model of three equations and an identity.

$$
\begin{aligned}
GNP &= a_0 + a_1M + a_2H + a_3L \\
LD &= b_0 + b_1GNP + b_2(LR/CPR) \qquad (3.33) \\
LS &= C_0 + C_1NBR + C_2(LR/IR)
\end{aligned}
$$

$$LD = Ls = L$$

where

GNP, M, H and L are as previously defined, and

LD = Demand for bank loans as a ratio of bank earning assets

LS = Supply of bank loans as a ratio of bank earning assets

NBR = Supply of non-borrowed reserves

CPR = Rate on commercial paper

IR = Interest rate on bank investment in securities

LR = Short term lending rate

They then estimate the model first by adopting ordinary least squares (OLS) and then as a simultaneous system using two stage least squares (2SLS) and three stage least squares (3SLS) estimation techniques.

Batavia and Lash (1982) report that estimating the equations using OLS indicates a result similar to previous studies, that is bank portfolio composition has an impact on economic activity. However, using the simultaneous equation system (i.e. using 2SLS which generate estimates that are consistent but in general not asymptotically efficient and the 3SLS which estimate all the equations in the model simultaneously and thus resolves the problem encountered in 2SLS indicate that there is no significant influence on GNP of bank portfolio composition. This result negates the proposition by the earlier studies that an increase in bank loans have a larger impact on GNP than an equivalent increase in bank investment in securities. The conclusion to be drawn from the Batavia and Lash

study is that policy makers do not have to bother themselves with the composition of bank portfolio as far as maintaining economic growth (i.e. increase in GNP) is concerned. We note, however, that this position is controversial and is a subject for empirical debate.

3.6 Empirical Evidence and Applications of Portfolio Behaviour Models

In the previous sections, the various approaches found in the literature for modelling bank behaviour were discussed. Also in Section 3.5 the controversy on the relationship between bank portfolio composition and the Gross National Product was discussed. In that section, the empirical results on the various approaches adopted to investigate the existence or otherwise of a relationship between bank portfolio composition and GNP were highlighted. In this section, a summary of the results and conclusions of some of the various empirical investigations into the portfolio behaviour of financial intermediaries using either the approaches discussed in Sections 3.3 and 3.4 or adopting a new theoretical standpoint is presented. In doing this the paucity of studies in this area in less developed countries (LDCs) including Nigeria; concentration on empirical applications of these models for commercial banking firms exclusively; and the lack of adequate empirical tests of the neoclassical models of the financial firm, are recognised.

Bain (1971) commenting on financial econometric models with regards to the adjustment mechanism and the role of constraint variables notes that the partial adjustment mechanism is specified in most empirical models. He argues that the proportionate adjustment

factor has not been the subject of detailed economic analysis, and has generally simply been treated as a constant parameter of the system which is estimated through statistical analysis. Thus, the rate of adjustment does not depend on the size of the gap, relative interest rates or the availability of liquid funds. Similarly, when other adjustment mechanisms such as almon lag distributions have been employed, no theory of the process of adjustment has been specified.

The empirical evidence on rates of adjustment has been mixed with earlier studies for example De Leeuw (1965), Goldfeld (1966) finding generally very low rates of adjustment - sometimes less than 10% per quarter and some more recent studies for example Hendershort (1971), Helliwell and others (1971) report quite rapid adjustments.

Many investigations have included flow constraints in their models. In some instances the statistical significance of the reported estimates suggest that these variables are important. Bain (1971), for instance, notes that sometimes they seem much more significant than the interest rates which enter into the theoretical model as determining the equilibrium stock of assets. This has been: the case in the study by Goldfeld (1966) and Hendershort (1971).

Silber (1970) studied the portfolio behaviour of financial institutions in the United States economy adopting a model framework similar to the Tobin-Brainard specifications. In terms of the general portfolio behaviour of the six types of financial intermediaries con-sidered, he found that the demand for different categories of securities are sensitive to interest rate differentials. He also found

that all intermediaries with the exception of commercial banks and savings and loans association adjust their investment portfolios in response to changes in relative rates of interest.

For commercial banks, he reports that relative deposit flows seem to be the important determinant of portfolio composition. He also found that the use of the stock adjustment principle in the specification of the security demand equations of the financial sectors seems to have been a reasonable assumption. He also, like Hendershott (1977) and Helliwell et al (1971), report a fairly quick speed of adjustment. His study also identified that the behaviour of financial institutions differ significantly. Silber (1970) also identified from his analysis that the underlying risk relationships between different categories of securities are the basic factors that determine whether two securities will be substitutes for or complementary with each other. In terms of the implication of his study for monetary policy, after estimating the structural set of equations representing behaviour in the financial and non-financial sectors of the U.S. economy, he calculated ..1e reduced form of the model. The impact multipliers corresponding to reserve requirements changes, discount rate changes and open market operations indicate the importance of substitute and complement relationships between government bonds and private debt instruments for the efficacy of monetary policy.

He also had conclusions for the efficiency of the capital market and the thinness of the bond markets. He argues argues from his results that the capital markets can induce funds to flow into different investment categories with rather moderate changes in the

structure of capital market rates.

Parkin (1970), as well as Parkin, Gray and Barret (1970), have carried out studies to explain discount house and commercial bank portfolio as well as debt selection behaviour respectively. They developed a simple model of rational choice in conditions of uncertainty of the T-M variety. The results were similar in most respect especially with regard to the adequacy of the modelling approach for explaining financial institution behaviour.

The main empirical findings of the Parkin (1970) study was that the model was able to explain a good proportion of the portfolio and debt changes of discount houses. Almost all the coefficients relating asset and liability levels to interest rates are well determined despite high intercorrelations between the independent variables, and have signs which confirm a priori expectations. Majority of the a priori specifying restrictions were tolerably well satisfied even when the equations were freely estimated. The study also rejected the view that the behaviour of financial institutions, at least for those in the U.K. Monetary System cannot be explained in terms of simple models and that their portfolio and debt selection behaviour is so unstable that it is virtually impossible to make predictions. The result, however, indicates that there is plenty of scope for improvements in the model, some of which were highlighted in his article. They include:

(i)   proposing alternative assumptions on the utility function;

(ii)   assuming a marginal portfolio adjustment cost;

(iii)   assuming a monopolistic bond market; and

(iv)   testing a variety of alternative classification of balance sheet items into the choice set and exogenous items.

Parkin and Ghosh (1972) also developed a model of the Tobin-Markowitz variety for the United Kingdom (UK) building societies. They report that the result of their study indicate the failure of their model to capture expectations generating mechanism as reflected in the perverse diagnonal matrix elements, in the matrix of interest rate coefficients on government securities and local authorities securities.

Also in the report, the hypothesis that the a priori restrictions imposed are true was rejected. It was observed that this is not different from earlier findings on commercial banks and discount houses (see Parkin J.M. (1970), Parkin, J.M.; Gray M.R. and Barret R.J. (1979)).

The White (1975) study involved estimating three main model types: (a) the static Tobin-Markowitz Model; (b) the Tobin-Brainard Model; and (c) a variety of the Tobin-Brainard model. White distinguished between the balance sheet structure used for empirical investigation. He identified two alternative structures, due to his recognition of the need to aggregate the numerous balance sheet items, so as to simplify the task of model building. White notes that the T-B model and its variant are identical, such that it is difficult to discriminate between them empirically. However, he reports that the variant model was superior on the balance though from a priori verification of sizes and signs of the parameters and the goodness of fit, there was little to choose from between them.

His results revealed that deposits banks in the U.K. are sensitive to interest rate incentives when allocating their financial resources and they do not operate solely on the basis of traditional asset ratios and other institutional conventions; though these may be taken into consideration. He observed also that the expected signs on expected interest rates were not met. He also found that the liquidity ratio requirement had a significant effect on the portfolio behaviour of deposit banks. He finally acknowledged the failure of his study to give clues on which of either static or dynamic models to choose from.

The empirical result of the Andersen and Burger (1969) model indicates that the significant adjustments have taken place in bank portfolio composition or behaviour. Also, their study revealed that bank behaviour is better explained by the profit maximization principle in contrast to the accommodation principle.

Research by Stephen Goldfeld and Edward Kane (1966) has brought into question the assumption that all banks react in the same mann... to changes in factors such as short-term market interest rates, the discount rate, availability of reserves and new loan demand. Goldfeld investigated commercial bank portfolio behaviour using a stock adjustment model. He fitted the structural model with quarterly, seasonally adjusted time series data from the third quarter of 1950 to the second quarter of 1962. Goldfeld concluded that for both country and city member banks the major determinants of excess reserve holdings appeared to be interest rate considerations (the differential between the bill rate and the discount rate) and changes in the availability of reserves (as measured by a potential-deposit

variable). However, the portfolio responses of the two classes of banks to changes in interest rates, deposit flows and new loan demand were markedly different. In the management of excess reserves the city bank sector was found to be more responsive to interest rate considerations than country banks. With respect to changes in borowings to meet new loan demand, Goldfeld found that city banks increased their borrowings by $12 for each $100 of new loan demand while country banks borrowings rose only about $6 per $100.

Kane and Goldfeld presented and estimated a model of member bank borrowing from Reserve Banks. Banks were assumed to maximize utility which was postulated to be a function of the cost of acquiring reserves and borrowing. Utility declines as this cost of borrowing rises. Kane and Goldfeld suggest that following an exogenous disturbance, banks may effect desired changes in their investment portfolios through a series of partial adjustments. In the short-run a bank may prefer to borrow from the central bank rather than immediate liquidation of its investment portfolio. Hence, banks may borrow more than a static model would imply. They estimated a dynamic model using weekly data on reserves and borrowings from 1953-63. The results using both seasonally adjusted and unadjusted data supported the importance of a distributed lag response. Also they found that the speed of portfolio adjustment for country banks was lower than the speed for city banks. Carson and Scott (1963) provided a comprehensive study that examined the influence of a limited set of commercial bank attributes on the willingness of these banks to bear risk. Although

they identified size of bank, rate of bank growth, ratio of time to total deposits, ratio of capital to total deposits, volatility of deposits, bank location, management psychological propensities to accept or avoid risk, and the extent of competition with other financial intermediaries, as factors which affect portfolio decisions of individual banks, specific attention was paid to the effect of the first four factors only.

The risk proxies used by Carson and Scott were liquidity variables which measure the proportion of cash and government securities to total assets, the ratio of government securities in the bank's portfolio maturing within one year plus cash to total assets, proportion of total assets held as demand balances with other banks, ratio of net loans and discounts to total assets and the various loan categories to total assets. The results of the regression results based on a sample of 3,930 commercial banks showed that the independent variables largely conformed to a priori expectations with respect to sign and size for all the risk proxies but for some of the components of the loan portfolio.

Generally, the adjusted coefficient of determination (R^2) reported by Carson and Scott was low; values ranged between 0.075 and 0.565. This shows that the market conduct variables selected for the study do not sufficiently explain the element of risk aversion on the part of commercial banks.

Although the study by Carson and Scott provides a good test of the Arrow (1965) and Pratt (1964) risk aversion hypothesis in the banking industry, no attention was paid to the banking market structure. This perhaps, may explain the rather poor goodness of

fit reported by the regression results.

Ratti (1980) recently provided a more formal test of bank attitude toward risk and the behaviour of the index of risk aversion for commercial banks. His analysis of quasi risk-aversion was based on uncertainty in demand deposits flows and default risk on loans. The empirical tests indicated that commercial banks are strongly risk-averse and that their index of relative risk aversion is increasing profits.

The results reported by Ratti suggest that favourable (unfavourable) environmental changes will generate income effects that will lead to proportionately less (more) risk taking by bank. However, like Carson and Scott, he ignored effects of market structure.

Saunders (1969), Russell (1969) and Bies (1971) also focussed on determinants of portfolio behaviour and growth of commercial banks looking mainly at endogeneous factors. Whereas Desai (1972) and Stone (1972) were more concerned about factors which influence banks credit to the weake sectors of an economy, and cost of borrowing from commercial banks respectively, Haslem (1968, 1969), Haslem and Longbrake (1971) and Gacy and Bedford (1972) examined determinants of profitability using financial ratios.

The study by Haslem and Longbrake, for example, was a discriminant analysis of commercial bank profitability. Their main aim was to isolate a few key financial ratios which significantly explain the variation in commercial bank profitability, using two groups of banks; the highest and lowest relatively profitable banks. Using discriminant analysis, they found a subset of variables which

explained differences in profitability for the two sub samples of banks. Multiple regression analysis was then used to test the relevance of the selected variables for all banks sampled. The results demonstrated the overwhelming importance of operating expenses and non-operating items in the determination of bank profitability.

Based on their findings, Haslem and Longbrake concluded that operating expenses such as interest on time and savings deposits are particularly important in determining profitability and banks could improve on their profits by investing a greater proportion of their assets on tax-exempt securities and by charging loan interest rates commensurate with actual credit risks.

Bond (1971) provided statistical estimates of the marginal rates of return which commercial banks realize on deposit and capital stock. Ignoring interest expenses, he found that estimated marginal rates of return on time deposits were approximately three times greater than marginal rates of return on demand deposits. The higher marginal rate of return on time deposit he attributed to the lower servicing costs of these deposits and the tendency of banks to place greater proportion of their funds in high earning but less liquid assets. However, when Bond included the interest expenses of time deposits, the profit rate on time deposit fell below the profit rate on demand deposits. He concluded that regulation of the commercial banking industry affects the returns which commercial banks realize on their deposits and capital. The higher profit rate on demand deposits he attributed to the result of the prohibition against payment of interest on these deposits. On the other hand, the relatively lower marginal rate of return on bank

capital, he claimed, is an indication that regulation induces bank to issue capital beyond the strict profit maximizing level.

In recent years, attention has been paid to the performance of Black-owned banks operating in the United States. (See Brimmer, 1971, 1972; Emeka, 1973; Boorman and Kwast, 1974; Bates, 1976; Bates and Bradford, 1980). The study by Bates and Bradford which is the most recent in this connection, presented an interesting analysis of the portfolio behaviour of black-owned commercial banks. Using regression analysis, the results they reported showed a significant relationship between bank liquidity and government deposit holdings and other determinants specified in the model.

Saunders and Ward (1976) focussed on the effect of this risk element on the performance of clearing banks in the United States between 1965 and 1975. The framework of analysis was Jensen's formulation of the Capital Asset Pricing Model (CAPM). The risk examined was not that inherent in the banking market structure but that perceived by investors. The analysis, however, was not rigorous.

James (1976) examined the influence of local banking market structure and local loan risk on short-term interest rates using CAPM framework. His aim was to determine whether the existing institutions for the interregional transfer of short-term capital were adequate for the operation of a well-functioning national money market. To this end, he employed five independent variables which included a monopoly power index (bank density index) and an index for business cycle. The regression results reported showed that the local banking market structure, and hence local monopoly

power, was the most significant factor accounting for differences in interest rates.

The issue of risk in banking has also been approached from the information perspective. It has been argued as mentioned earlier by Aigner and Sprenkle (1968), Baltensperger and Milde (1976) and recently Stanhouse (1986), that uncertainty, i.e. incomplete information about various aspects of banking activities plays a central role in bank portfolio selection and hence the returns to earning assets.

Aigner and Sprenkle, for example, hypothesized that the bank, by spending resources on the collection of information about its customers, can reduce the expected rate of default thus earning a return on its information collection activity.

Stanhouse, on the other hand, demonstrated how Bayesian information can be analysed as a variable input in determining an optimal bank portfolio. He investigated the impact of information in a way that is statistically plausible. Deposit growth and time deposit variability, they found, were not significant determinants of the liquidity of black-owned banks' assets portfolio. In fact, he found that demand deposit variability was the single most important determinant of bank liquid asset holdings.

On the basis of their findings, Bates and Bradford concluded that the portfolio behaviour of black-owned banks is determined mainly by their sources of funds rather than their aversion to investing in loans.

Although the study by Bates and Bradford is in the area of portfolio behaviour and risk aversion, it explicitly ignored the

effect of the competitiveness of the banking market structure. This is not to suggest, however, that elements of market structure have not been examined in studies relating to banks portfolio behaviour. Relative to those that analysed portfolio behaviour strictly on internal structural characteristics or asset holding behaviour, these are very few.

We have earlier identified the paucity of studies covering entire portfolio behaviour in LDCs, particularly Nigeria. However, Fakiyesi (1984), Lambo (1986), Ajayi (1976), Marsth (1978), Omoruyi (1984), etc. have worked on the issues under discussion. Further, extensive empirical works on aspects of the portfolio behaviour of commercial banks in Nigeria has been carried out by Ajayi (1972, 1973a, 1973b, 1974, 1977, 1978a, 1978b), Tomori (1972), Teriba (1974), Odama (1974), Ojo (1974a, 1974b), Akinnifesi and Phillips (1978), and Ajayi and Ojo (1981), etc. These studies however, were only concerned about the portfolio structure and behaviour implicitly. Studies that actually investigated the portfolio behaviour of these institutions, as we mentioned earlier, are very few. The findings of some of these studies are elaborated on below.

Masih (1978) specified and estimated commercial bank portfolio demand equations for Pakistan (a developing country). He reports that among the policy instruments the commercial loan rate and the bank rate did not come out significant in the equation for bank credit. He also mentioned that his analysis is inconclusive regarding the efficacy or otherwise of the selective credit controls and moral suasion, the role of which remains ambiguous in an aggregate macroeconomic framework he adopts. He also found that the weighted

average interest rate exercises significant influence on government securities, the liquidity ratio, government loans from banks and government deficit financing. He also found that a rise in the policy variables included in his model viz - government deficit finance, government loans from banks and the weighted average rate of interest on government securities - would enable banks to expand both holding of government securities and bank credit to the private sector by ensuring an increase in their loanable funds.

Ajayi (1976) attempts an empirical study of portfolio behaviour of commercial banks in Nigeria. He formulated his model based on a stock adjustment framework to allow for the possibility that the actual holding of an asset does not necessarily equal the desired level or value at any point in time. The portfolio holding was hypothetically implied to be dependent on income while the own price of the item and other relevant variables were dependent on the portfolio item under consideration. For instance, the loan equation was made dependent on the differential between exports a... imports. Ajayi expects that the level of exports and imports will be negatively and positively related to the loan portfolio respectively. Also, he introduced a dummy variable to capture the effect of the civil war in all the equations and another dummy to capture the effects of restrictions in bank lending.

The general conclusions of his study are that

(a)   the interest elasticity of the demand for treasury bills is very weak and this has a very negative implication for the control of money supply through open market operations. He also reported that portfolio adjustments are insensitive

to the prevailing interest rate structure. However, the results indicate that banks are sensitive to discount rate changes which imply that banks economize on their use of cash reserves when the discount rate rises. The result for the loan equation shows that the excess liquidity ratio is an important constraint on the extension of loans. Thus he argues that if the supply of bank credit influences demand, reserve requirements changes emerge as a highly effective policy instrument for controlling domestic demand and the rate of growth of the money supply, while at the same time minimising induced capital flows. Ajayi (1976) in conclusion however identified the preliminary nature of his results.

Also, a broader study on money supply determination in Nigeria, using a portfolio approach, and carried out by Ajayi (1978) indicates insensitivity of bank portfolio composition to the interest rate structure. His analysis also negates the argument that general reliance on open market operations as the means of conducting general monetary policy as postulated by Smith (1965). He noted that discount rate policy and reserve requirement changes may be more effective. Other highlights of Ajayi (1978) study were that:

(1)   the civil war had effect on savings behaviour due probably to the fact that small savers withdrew their money from banks as they moved from one region to another in anticipation of any eventuality;

(2)   the speed of adjustment of the various assets of the banks depicts a high degree of variability. According to Ajayi, the policy implication of this finding is that, given a fixed

interest rate target, the path of adjustment of money supply will involve a fairly complicated interaction among the individual asset demand.

Fakiyesi (1984) using variants of the Tobin-Markowitz and Tobin-Brainard model establishes a conceptual framework and analyses empirically the implication of bank portfolio composition for financial policy formulation in less developed countries. His results indicate the preponderance and relative insignificance of interest rates in influencing financial behaviour in Nigeria commercial banks. Also the analysis suggests that term transformation was less positive than expected and that availability of funds played a critical role in determining bank portfolio behaviour in Nigeria. He argued that there is need for a more comprehensive study of overall portfolio behaviour in the Nigerian financial system to provide a basis for a more detailed articulation and responsive framework for policy formulation and coordination within the system.

Lambo (1986) tested two hypotheses with respect to commercial bank portfolio management as done by Andersen and Burger (1969), that is, the profit maximization principle and the accommodation principle to see which is more relevant to the Nigerian commercial banking industries. The results of regression analysis reported by Lambo appeared to lend support more to the relevance of the profit maximization principle as also found out in the Andersen and Burger (1969) study.

Oyejide and Soyode (1986a) analysed the structure of commercial bank deposits for the period 1960 to 1975. Their main aim is to examine the effect of interest rate on deposits, income (wealth)

and seasonality of demand for idle cash balance on deposit shifts. The results reported showed that to a large extent income has a positive effect and its impact is generally larger on demand deposits than is for savings and time deposits. The relative price effect was negative in a majority of cases while the impact of seasonability was felt more on demand deposit as well as savings deposit than it was on time deposit. They argued that the plausibility of the result for time deposit is very high on the ground that these deposits cannot be easily converted into cash under the pressure of seasonal demand. In a separate study, Oyejide (1986) focussed attention on the effect of the composition of banks' deposit liabilities on its net revenue position and derived marginal rate of return on different types of deposits. Teriba (1974) analysed data on demand deposits for the period 1950-1967 and concluded that the commercial banking industry is a highly concentrated oligopoly. He observed that there exists inter-bank competition for deposits but that this is premised on non-price rather than on price strategies.

Apart from these few studies on commercial bank behaviour, other research efforts in Nigeria have concentrated on the historical analysis of the growth of financial institutions in regards of developments in their portfolio structure and behaviour with very limited exemptions of studies on behaviour of other types of financial institutions (see as will be discussed later, Omoruyi (1984) for instance). Studies on the historical developments in institution portfolio include: Brown (1966), Nwankwo (1980), Ozoaga (1981), Okigbo (1981), Adekanye (1983), and Adewumi (1985) among others.

Omoruyi (1984) provided an econometric analysis of the determinants of the investment behaviour of insurance companies in Nigeria between the period 1969-1981. He specified equations to explain net acquisitions of four major assets - government securities; stocks, shares and bonds; mortgages and loans; and cash and bills receivable. Omoruyi's model specified each category of asset as a function of available funds, simple average of interest rate on government securities, commercial bank deposits and loans and deposits with the Federal Savings Bank. It is the contention here that this average rate of interest is not very meaningful, since it pools the cost of fund and yield on investments of insurance companies all at the same time, thereby losing its meaning. Also a dummy variable was introduced to capture the effect of government regulation on investment behaviour in these institutions. The variables were deflated by the value of the gross domestic product and the linear and log linear forms were tried incorporating the stock adjustment mechanism. Estimation was by the ordinary least squares technique. The results indicate that a major factor positively influencing investment, in various assets, by insurance companies has been availability of investment funds. Also the asset holding in both non-life and combined life and non-life companies are influenced by the previous level of holding of assets, especially with regard to holding of stock, shares and bonds. The coefficients of interest rate, in most cases, were found to be negative suggesting that prevailing low rates of interest have some disincentive effects on insurance company investments. Omoruyi (1984) also found that government regulation have had a significantly constraining influence on

investments by insurance companies.

Omoruyi's study like those of Ajayi (1976), Masih (1978) and like most other available studies in LDCs all lacked a clear micro-theoretic underpining or foundation which would justify the use of the equation systems which they have adopted. This is more the case for the study by Omoruyi (1984) who recognised the need to adopt the portfolio approach in understanding financial behaviour but, yet introduced just a simple pooled average rate of return on some of the broad spectrum of assets. This tends to give a distorted picture of investment behaviour in these financial institutions.

3.7   Summary

In this chapter, the various concepts and issues on the postulated theoretical interrelationships and impact of the portfolio behaviour of financial institutions on monetary policy, financial market development and overall economic growth were elaborately discussed. The main thrust of the exposition suggests that the nature and extent of the interlinkages need to be evaluated empirically so as to improve financial policy formulation and implementation in developing countries.

We have also surveyed the various approaches to the theory of the banking firm and provided a discussion on the results of some of the empirical investigation in the area from the survey of relevant literature. Some inferences and comments can be made on the advances so far made in developing a satisfactory theory and model of portfolio behaviour:

1. The portfolio theory models or models of risk aversion most commonly found in the literature have a role to play in the development of a more complete model of the financial firm.

2. That empirical work in the Neoclassical Microeconomic analysis of the banking firm have been largely non-existent. This is attributed to the various controversies particularly that of appropriate classification of outputs and inputs and the extent of theoretical sophistication and complexity of these models.

3. That there is a need for a 'more complete model' of the banking firm which will (unlike the partial models) consider the joint determination of the liability and asset structure of the financial firm, as well as the total size of the firm, without compromising the traditional elements stressed in banking models i.e. solvency, liquidity and profitability considerations.

4. That even the complete neoclassical models of the banking firm neglect the considerations of liquidity and solvency management aspects. Although, as we noted in the review, Niehans (1978 chp. 9) and Baltensperger and Milde (1977) have developed an approach to incorporate this feature, empirical work with these models to our knowledge is still largely non-existent.

5. That all the models with the exception of the Tobin-Brainard (1968) model of bank portfolio behaviour do not consider the dynamic aspects of financial behaviour of the banking firms and consequently the nature, causes and speed of the portfolio adjustments have been neglected in these studies.

6. That most studies concerning the portfolio behaviour of financial institutions in less developed countries (for example Ajayi (1976), Maish (1978) and Omoruyi (1984) have concentrated on developing hypothetical models explaining demand for financial assets which are not based explicitly on any particular utility function, its objective variables and the eventual estimable equations clearly spelt out. Thus the estimated equations lack a theoretical basis or underpinning. The desirability of experimenting with a system of equations derived from a utility functional form which has a theoretical basis and justification, thus, cannot be overemphasised.

7. That the sparseness and low informational content of data on the portfolio of financial firms in less developed countries have resulted in the paucity of studies in the area and of course the applicability, for empirical investigation, of most of the portfolio behaviour models especially the neoclassical microeconomic models which although very useful cannot be easily applied to our financial environment.

In all, these studies are significant steps forward in the analysis of the behaviour of firms in the financial industry. However, they have raised an avalanche of questions yet to be cleared in the Nigerian context, particularly, and in theory generally. While they provide good technical scaffoldings, they are silent on the questions: to what extent does the financial firm adjust, relatively, to the determinants of functional and non-functional returns. What is the attitude toward risk in Nigerian financial intermediaries. Also, will deregulation of the industry, particularly

under a Structural Adjustment Programme, affect institution behaviour and ensure effectiveness of monetary and economic policies, facilitate economic growth and enhance financial market development? How significant is the deviation of fund flow from the norm, a determinant of returns to the banking firm's asset portfolio?

It is in the attempt to provide meaningful answers to these questions that this study intends to make a modest contribution to studies in the financial sector.

CHAPTER FOUR

BALANCE SHEET STRUCTURE AND FLOW OF FUNDS IN NIGERIAN INSURANCE AND MERCHANT BANKING FIRMS

4.1 Introduction

This chapter discusses and examines some of the observed characteristics of the balance sheet of insurance and merchant banking firms in Nigeria. The purpose is to give an idea of developments in the balance sheet structure over the period 1980-85 and also to provide a basis for understanding and explaining the general portfolio behaviour in these institutions.

To properly situate the analysis, the next section (Section 4.2) presents a conceptualization of portfolio selection in the insurance and merchant banking firms based on both economic theory and past empirical findings. This provides a foreknowledge of expected behaviour in these institutions and their theoretical impacts. Thus, it facilitates an app iation, understanding and comparison of portfolio behaviour to be investigated in later sections of the chapter as well as in subsequent chapters.

In Section 4.3, we identify the various items that comprise the balance sheet of insurance and merchant banking firms in Nigeria. We also elaborate on the features of the individual items in the balance sheet of these institutions.

An examination of the portfolio structure in terms of the percentage composition of each item held is performed, thereby providing an understanding of portfolio holding patterns and extent of diversification in Nigerian insurance and merchant banking

institutions. The results are presented in Section 4.4. which analyses the sources and development in the liability stock of the insurance companies and merchant banks, while Section 4.5 presents the structure of the asset portfolio of these institutions. In Section 4.6 a statistical test is performed and reported to verify and assess the significance of variations in asset holding patterns in these institutions.

In Section 4.7 the portfolio maturity or term structure is considered as well as the nature of the term transformation in the insurance and merchant banking firms. The last section provides a summary of deductions from the various analysis carried out in the chapter to illuminate on the balance sheet structure of these financial institutions.

4.2 Conceptualization of Portfolio Choice in Financial Institutions

In Chapter two, an overview of developments in the Nigerian financial system was presented. In this section, we discuss briefly the theoretical conceptualization on financial behaviour, as developed in economic theory, as well as expectation on the pattern of asset holding in the insurance and merchant banking firms in Nigeria given the financial environment elaborated upon earlier in the thesis.

4.2.1 Theoretical Underpinings

Essentially, as we have pin-pointed earlier, the financial sector of an economy fulfils an extremely important function, namely the allocation of capital among alternative uses. In doing this, economic theory indicates that, in general, capital flows into

activities that have the highest rates of return.

Thus, essentially, the yield on any particular portfolio item and the volume of that asset demanded should, ceteris paribus, have a positive relationship (that is in case of a demand function for the asset item with the own rate as explanatory variable, the relationship should be significantly positive).

Further, it should be expected that an investor's portfolio, aiming at maximizing profit given a minimum liquidity and solvency level, will consist significantly of large number of securities whose interrelationship would be critical to the attainments of the institutions cardinal objectives.

These interrelationships among assets in the portfolio of an investor can be considered based on their risk attributes.[1] Securities which share the same risk attributes are likely to be substitutes. It should be noted here that only securities whose risk components are independent may be used to diversify the portfiolio so as to reduce overall risk (see Samuelsonian(1946) proof). If the risk component of different securities compensate for each other to a great extent, the diversification of the portfolio might actually result in a complementary relationship between these securities. It should also be noted here that the substitute - complement relationship in asset portfolio vary between financial intermediaries and not only is the volatility of portfolio quite variable between financial institutions but in addition there are limitations placed in the investment opportunities of the intermediaries.

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[1] See Appendix 4.1 for the various sources of risk and uncertainties as well as their attributes.

Thus two securities i and j are substitutes if

$$\frac{dQ_i}{dP_j} \quad ` \quad 0$$

in the security market, where Q_i is the quantity of security i and P_j the price of security j which   inversely related to interest rates. Hence two securities will be substitutes if

$$\frac{dQ_i}{dr_j} \quad < \quad 0;$$

r_j is the interest rate on security j. They are complements when

$$\frac{dQ_i}{dr_j} \quad > \quad 0$$

Here we refer strictly to gross substitutes or complements since we know that financial intermediaries are subject to a wealth constraint. It should be observed here also that factors such as the maturity of the asset, the issuer, and/or nature as well as priorities of claims and the yield also complement with the risk premium in determining the interrelationship between the asset composition of financial intermediary portfolio.

It is the general conceptual view that different categories of assets, both between and within the loan and investment port- folio are substitutes for one another given that their risk components do not in fact compensate for each other to facilitate diversification of the asset portfolio. This is clear when we consider the situation in the Nigerian financial environment where rates are very low and rigid during the period of study and the financial market is in fact very narrow in terms of types of securities available. This thus implies that diversification of asset portfolio may not be a critical

objective during the period. Similarly, a complementary relationship between the liability portfolio and the asset portfolio is often hypothesised.

In essence, as would be elaborated upon later in the remaining chapters of this thesis, financial intermediary behaviour can be explained by a set of demand equations for each category of security held.

In each equation, the own rate of interest, rate on all alternative assets along with other relevant arguments will appear in the function as explanatory variables.

The next two sub-sections articulate, within a conceptual framework, envisaged asset holding behaviour of insurance and merchant banking firms. This is to effectively situate our analysis in line with theoretical expectations, the regulatory environment and importantly, provide the needed conceptual basis for our study.

4.2.2   Asset Choice in the Merchant Banks

Apart from satisfying the statutory stipulations and taking cognisance of liquidity, solvency and profitability requirements, merchant banks are expected to hold most of their asset composition in medium and long term form. This is because the liabilities of these institutions are fixed and predictable to a high degree. Therefore, merchant banks are looked up to for the provision of medium and long term finance. They should not concentrate on the provision of short term finance, which are presumed to be reserved for commercial banks.

Adewumi and Ojo (1982, p. 8?) argue however that though they share the view that merchant banks are expected to fill a

financial gap in the economy (i.e. provision of longer term finance), they do not think that certain financial operations should be considered as falling only within the scope of merchant banks, while others fall only within the scope of commercial banking operations. According to them, both merchant banks and commercial banks could offer financial facilities in both short-term and longer term basis in the process of their financial intermediation role.

Apart from the transformation of short term funds into longer term loans and investments both types of banks could offer necessary financial services to mobilize funds on a longer term basis.

The Committee on the Nigerian financial system has also deliberated on the functioning of the merchant banks. Its recommendations emphasised that the central bank guidelines should be used to enhance wholesale character of merchant banks. Adewumi and Ojo (1982) remarked that it would be unrealistic to expect merchant banks to operate strictly on their traditional narrow lines of business, where they now face increasing competition from commercial banks. In an attempt to make up for the small volume of their traditional bill business, their operations in the Nigerian situation are expected to overlap those of the commercial banks to some extent. Adewumi and Ojo (1982) went further to suggest that apart from equipment leasing which the Committee on the Nigerian Financial System and the monetary authorities emphasize, the merchant banks can diversify their asset structure to incorporate other services such as insurance broking, commodity dealing, hire purchase and leasing. In conclusion, they note that they are not suggesting that merchant banks should not concentrate on the financial intermediary side of banking,

untrammelled by the real bills doctrine and other rigid rules of commercial banking. They further argue that what is expected of the merchant banks is for the banks to be more dynamic in the performance of the transformation function which should make it possible for them to employ more of their short term deposits in financing longer term productive activities. Also some merchant banks are involved with government finance and also as a result of Federal Government permission of state governments and other parastatals to approach the capital markets directly, merchant banks have become involved in the floating of state government loan stocks. Merchant banks are expected therefore through their portfolio behaviour to play a crucial role in enlarging and strengthening the capital market in Nigeria and also contributing to national economic development funds through the provision of medium and long term finance.

4.2.3   Asset Choice in the Insurance Industry

Like the merchant banks, the portfolio behaviour of insurance companies is expected to be influenced by the requirements of law (discussed in Section 2.4.2). The insurance companies are also expected to arrange their portfolio based on liquidity, solvency and profitability considerations.

However, based on the nature of the liabilities of these institutions, we expect that the insurance companies classified into life and non-life firms should have an asset behaviour such that the life insurance companies invest or concentrate more on long term finance, while the non-life companies on the other hand should invest more in shorter term assets and securities because of the short term

nature of their liabilities and since claims on non-life business are relatively erratic and unpredictable. Life insurance companies cater essentially for long term contractual savings, which results in a steady cash inflow and few pressing and unpredictable cash outflows. Payments to policy holders can easily be predicted on the basis of statistical analysis and actuarial tables which thus enable the companies to invest safely in long term securities. Another effect of the contractual nature of life insurance is the lack of the need for liquidity. The need for cash is relatively predictable and can generally be met from the regular flow of premium and investment income. Consequently, life insurance companies only need to hold a minimum amount of cash and benefit by keeping as full invested as possible.

In conclusion, the insurance companies could be expected to serve as one of the important financial institutions for the mobilization of individual savings, with the type of contractual savings which they mobilize they could invest in many long term projects and offer more financial services in the economy which the licensed banks often consider not to fall within their conservatively defined sphere of operation.

In conclusion, overall economic growth and development is enhanced by the efficiency of the financial sector and in particular, there is an interrelationship between economic growth and the portfolio behaviour of financial institutions. In the same way, various interlinkages exist between financial behaviour and the effectiveness of monetary policy, the impact of stabilization policies, allocation and utilization of capital in the financial market as well as overall development of the financial system itself.

4.3 Description of Balance Sheet Items

There is a need to understand the nature of the various components of the balance sheet of the insurance and merchant banking firms, especially when we take into cognisance the fact that financial intermediaries, including the insurance companies and merchant banks, create differentiated assets and liabilities. Thus, a brief description of each of these assets and liabilities might be helpful in appreciating, understanding and explaining the balance sheet structure and behaviour of these institutions.

4.3.1 Merchant Banks

The asset holdings of Nigerian merchant banks include the following:

(a) cash balances held with the Central Bank of Nigeria;

(b) other cash balances held with banks in Nigeria, offices and branches of the banks abroad and with other banks abroad. The cash balances contained in (a) and (b) above are assumed not to yield any interest.

(c) Loans and advances; these are part of the banks' earning assets and they include those made to banks in Nigeria, subsidiaries of banks in Nigeria and other customers. The category also includes money at call outside the Central Bank. This refers to bank funds on call with other merchant banks, commercial banks and other finance houses. The call money, like any other advances, earn interest for the lenders.

Other forms of advances granted include discounting bills payable in Nigeria. This includes discounting of commercial bills such as bills of exchange and promisory notes as well as factored debts which is

a type of business finance in which financial specialists (called factors) take responsibility for collecting the credit of their clients. The factor (in our case, the bank) then retains a certain percentage of the debt to cover various charges including factoring commission and the interest on money advanced.

(d)   Merchant banks' investment in Nigeria include

(i)   treasury bills and certificates

(ii)   balances with call money fund

(iii)   stabilization securities

(iv)   bankers' unit fund and certificates of deposits

(v)   equipment on lease

(vi)   other categories of investment

All of the above yield interest for the merchant banking firms.

(i)   Treasury bills and Treasury certificates: these are issued by the government through the Central Bank of Nigeria. The treasury bills are issued in practise for three months at a fixed rate of discount. On the other hand, the treasury certificates came into existence during the Nigerian civil war (1967-70) as an additional debt instrument for financing the war. The certificates are payable at par at a date not more than twenty-four (24) months from the date of issue.

(ii)   Balance with call money fund: The call money scheme was a device introduced into the Nigerian money market in 1962, whereby banking institutions placed their idle cash on call with the Central Bank of Nigeria for which some interest was paid. The interest, although not normally declared by the Central Bank, is usually in practise one per cent below that on the treasury bill rate.

(iii) Stabilization securities: These came into force as one of the monetary policy prescriptions of the 1976/77 Federal budget. They were introduced in an effort to reduce inflationary pressures in the economy and to mop up some of the excess liquidity in the banking system.

The Central Bank of Nigeria was the _bona_ _fide_ issuing authority of these securities. The amount to be considered in the allocation of stabilization securities shall be the increase in savings deposit over the level on the 31st of March 1976, arising from deposits in individual savings account not exceeding twenty thousand naira (₦20,000) each which are negotiable, not transferable and do not count as part of bank liquid assets.

The securities were meant to earn an initial interest of four per cent and subject to subsequent reviews at the discretion of the Central Bank of Nigeria.

(iv) Bankers unit fund and certificates of deposits: The instruments were introduced in 1975 with a view to providing more viable sources for investing idle cash in bank portfolio.

(v) Equipment lease: Leasing is a method of financing that enables a company to rent industrial equipment instead of buying it outright. This arrangement has some advantages in that it enables the lessee to have the use of expensive equipment immediately without the necessity of finding capital for it. Secondly, in the event of the obsolescence of the equipment, it can be replaced quickly without placing too great a strain on the lessee's capital resources. The bank charges a commission on business finance provided through equipment leasing.

(vi) Other investments: These represent other avenues in which merchant banks use their funds. They include investment in ordinary and preference share holdings; investment in Federal and State governments stocks, as well as investment in securities of semi-government bodies.

(f) Other assets: This is a category of unclassified items which are contained in the balance sheet statements of these banks. They contain residual asset items of undefined maturity, use and debtor.

The debt items of the merchant banks include funds held as:

(a) Capital accounts (issued and authorised). This represents the shareholders' (bank owners') interest or investment in the business.

(b) Cash balances held for banks in Nigeria, banks outside Nigeria, offices and branches abroad. The merchant banks do not pay interest on this liability item.

(c) Money at call from banks in Nigeria: These are loans from other financial institutions. They are subject to recall at very short notice (some on demand). The banks pay interest on these loans.

(d) Certificates of deposits issued: These are issued for deposits of a minimum of fifty thousand naira (₦50,000) at a fixed rate of interest for periods ranging from three months to five years. Although they are issued for fixed periods, such certificates can be readily negotiated in the secondary markets for securities.

(e)   Loans and advances obtained from other banks in Nigeria, banks outside Nigeria and other sources: These loans are of different maturity structure and merchant banks have to pay interest on the advances obtained.

(f)   Deposits – mainly time and demand deposits.   The time deposits are fixed for a particular period and interest is paid on such deposits, while the demand deposits do not bear interest.

(g)   Other liabilities – this category refers to an amalgam of spread out liabilities of various maturities and whose components are unspecified in the balance sheet returns of the banks.

4.3.2   Insurance Companies

The sources of funds held by the insurance companies (both life and non-life) are the paid up capital, paid in surplus, premiums paid in advance of services performed and income from the prudent management of these funds.   Essentially therefore the liabilities of insurance companies consist of:

(a)   the paid-up capital held with the Central Bank of Nigeria as stipulated by the Insurance Act of 1976.

(b)   Reserves – both contingency and other reserves.   These broadly consist of that proportion of the equity of the companies in excess of the nominal value of the issued equity.

(c)   Another liability item in the balance sheet of the insurance companies are the premium funds; in the case of life insurance companies we have the life fund which represents premiums paid in lieu of protection against the loss of income from actuarially premature death or retirement.

On the other hand, the non-life companies keep general funds in trust by selling protection against losses sustained by the policy holder. General funds items include selling protection against accident, fire, motor vehicle, marine, transport and aviation, workmen's compensation insurance, fund and a host of other insurance services grouped under Miscellaneous Insurance Fund.

(d)   The insurance companies also have cash items in their balance sheet, representing amount due to insurer, insurance agents, policy holder, outstanding claims admitted or intimated etc.

(e)   The last liability item in the balance sheet of insurance companies are classified as 'other liabilities'. A cursory look at the annual reports of some of the insurance companies give an indication of the items included under this category. These include bank overdraft, and loans obtained, dividends unpaid, proposed and those payable awaiting exchange control approval etc.

On the other side of the balance sheet of insurance companies, the assets or investment outlets for the funds generated by these companies are as follows:

(a)   Cash items held in the tills of the insurance companies or cash items in deposit accounts. The companies have cash deposits in registered banks either in the form of demand, savings, or time deposits. Cash deposits held in savings and time deposits yield interest. The companies also have certain non-interesting yielding cash balances held with or due from insurer, insurance agents and brokers.

(b)   Government securities: The companies hold both the Federal

and State Governments' stocks as well as securities issued by semi-government bodies. Securities falling into these categories include the ninety-day treasury bill or the one or two year treasury certificates. The insurance firms also invest in the Federal and State Governments development stocks which have a maturity of five, ten and twenty years and are redeemable at par at a specified rate of interest.

(c) Equity: The insurance companies also procure private securities from the Stock Exchange or singly or in partnership float new equity issues on the Exchange. Private securities holding by these companies include both ordinary and preference shares in listed or quoted companies at the Stock Exchange.

(d) Mortgages: These are loans given by these companies. In the case of mortgage loans, the legal transfer of ownership but not possession of the debtors property is passed on to the creditor. The mortgage debt represents the amount of interest and principal to be paid.

(e) Real Estate: This is direct investment by the insurance companies in developing real estate property, which may be leasehold or freehold. This is a long term component of the asset holdings of insurance companies.

(f) Other loans - the institutions grant loans generally to members of the public at specified rates of interest. So also they grant policy loans to holders of their policies particularly the life policy holders based on the surrender value of such policies.

4.4   Sources and Development of Liabilities

The ability of financial intermediaries and in particular insurance and merchant banking firms to acquire new assets, particularly earning assets, which boost their profitability will depend on their incurring new liabilities. Various debt instruments are available for these financial institutions within the Nigerian financial environment subject to the relevant legal restraints imposed on each institutional type.

Tables 4.1, 4.2 and 4.3 present the developments in the debt selection behaviour of the merchant banks, life insurance and non-life insurance firms in Nigeria respectively. This is discussed below.

The merchant banks major debt item was found in the amalgam of spread out liabilities of various maturities and classified under 'other liabilities' the items comprising this category are not disclosed by the banking authorities in the returns of the firms to the central banks. This liability item represents over 50% of all debt items in all the five years considered. Of all the listed and classified individual items, time deposits represent the most important single source of funds accounting for 21.78%, 17.27%, 18.44%, 21.59% and 26.35% of total funds from 1980-85 respectively. Non-interest bearing demand deposits accounts for an increasing proportion of the liabilities of these banks having a steady increase from 6.60% in 1980 to 11.37% of total debt in 1984 and declined to 10.61% in 1985.[2] Certificates of deposits issued by the merchant banks which stood

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[2]See Appendix 4.2 for a list of items under each broad liability category.

TABLE 4.1

STRUCTURE OF LIABILITY HOLDINGS OF MERCHANT BANKS IN NIGERIA

A.   MERCHANT BANKS (₦ Millions)

	1980	1981	1982	1983	1984	1985
Capital account	26.0	37.2	63.1	85.4	131.5	163.7
Cash balances held with the bank	8.3	59.6	35.1	67.1	76.5	36.1
Money at call	71.3	164.3	300.2	289.2	349.2	398.3
Certificate of deposit issued	78.6	102.8	185.5	184.8	116.5	72.5
Loans and advances taken	0	0	0.6	2.8	0	0
Demand deposits	66.5	122.4	272.3	484.7	511.0	530.5
Time deposits	219.6	327.9	691.2	293.8	970.1	1317.8
Other liabilities	537.9	1084.4	1754.8	2397.2	2340.6	2481.8
Total liabilities	1008.2	1898.7	3302.2	4304.9	4495.9	5001.1

B.   MERCHANT BANKS (%)

	1980	1981	1982	1983	1984	1985
Capital account	2.58	1.96	1.91	1.98	2.92	3.27
Cash balances held with the bank	0.82	3.14	1.06	1.56	1.70	0.72
Money at call	7.07	8.65	9.09	6.72	7.77	7.96
Certificate of deposit issued	7.80	5.41	5.62	4.29	2.59	1.45
Loans and advances taken	0	0	0.02	0.07	0	0
Demand deposits	6.60	6.45	8.25	11.26	11.37	10.61
Time deposits	21.78	17.27	20.93	18.44	21.59	26.35
Other liabilities	53.35	57.11	53.14	55.69	52.06	49.63
Total liabilities	100	100	100	100	100	100

Source: · Table 4.1A.

at 7.80% of total liabilities in 1980 declined to 4.45% by 1985 even though there was a marginal increase of 0.21% from 1981 to 1982. Also, call money from banks within and outside the country was observed to be another important source of funds for the banks. It represented 7.07%, 8.65%, 9.09%, 6.72%, 7.77% of total liabilities from 1980-85 respectively. Other features of the liability structure of merchant banks in Nigeria is thus the non-existence of savings deposit throughout the five year period. Also noteworthy is that capital accounts accounted for less than four per cent of the total liabilities of the bank in all the years considered.

The life insurance companies on their part have over eighty per cent (80%) of total debt accounted for by the life insurance premium paid by policy holders with the exception of 1982 when only 69.38% of total liabilities were from this category. The likely reason for this decline being that, as we observed, liabilities increased almost two-fold possibly due to advances due to insurers, agents, etc. (i.e. total amount due) which increased from 7.69% in 1981 to 18.68% in 1982. Hence, distorting the liability structure.

The liability items grouped under the broad category of total amount due accounts for 7.93%, 7.67%, 18.68%, 9.61%, 10.47% and 9.88% from 1980 to 1985.

The other liability items which include paid-up capital, contingency and other reserves, with other unclassified liabilities made up less than ter per cent (10%) of total liabilities in all the years with again the exception of 1982, when those items add up to 11.67% of total liabilities.

The obvious conclusion on the liability structure of the life

insurance companies is that the life fund represents a dependable and the main source of fund especially when we consider the nominal growth rate over the period of the fund which is 114.44%.

The non-life insurance companies hold most of their debt as total amount due to insurer, insurance agents, policy holders, etc. The non-life fund or general fund which consists of the accident, fire, workmen's compensation, motor marine and a host of other miscellaneous insurance funds accounted for only 25.49%, 20.02%, 18.58%, 11.84%, 9.82% and 8.88% of total source of funds from 1980 to 1985 respectively. Other undefined liability items accounted for 13.58%, 9.70%, 9.30%, 16.11%, 7.18% and 9.77% of total liabilities over the period 1980-85 respectively. Paid-up capital and reserves accounted for up to fifteen per cent (15%) of total liabilities in all the years covered.

In terms of the components of the non-life general insurance funds, we observe that motor vehicle insurance provides the highest source of income with 8.25%, 8.44%, 7.44%, 5.86%, 8.41% and 8.63% of total debt from 1980 to 1985. Marine insurance contributed a minimum of 1.69% in 1983 and a maximum of 5.32% of total debt in 1981.

All of accidents, fire, workmen's compensation and other misce-llaneous insurance premium funds contributed less than three per cent (3%) of insurance funds.

One striking feature of the liability structure of non-life insurance companies is that despite the growth in total liabilities (100.80%) over the period, the non-life insurance premium is a very small proportion of total liability stock in these firms. Its growth

TABLE 4.2
STRUCTURE OF LIABILITY HOLDINGS OF LIFE INSURANCE COMPANIES IN NIGERIA
A. LIFE INSURANCE COMPANIES (N Million)

	1980	1981	1982	1983	1984	1985
Paid up capital	10.11	11.21	13.47	12.28	10.90	15.13
Reserves	4.15	7.16	10.33	7.37	7.68	7.46
Total amount due to 'others'	22.93	29.27	103.41	51.59	65.56	70.18
Life fund	242.29	324.15	384.02	454.19	522.79	590.78
Other liabilities	9.68	10.03	42.27	11.40	19.42	26.02
Total liabilities	289.16	381.82	553.5	536.83	626.29	710.07

B. LIFE INSURANCE COMPANIES (% Df total liabilities)

	1980	1981	1982	1983	1984	1985
Paid up capital	3.50	2.94	2.43	2.29	1.74	2.13
Reserves	1.44	1.88	1.87	1.37	1.23	1.05
Total amount due to 'others'	7.93	7.67	18.68	9.61	10.47	9.88
Life fund	83.79	84.90	69.38	84.61	83.47	83.20
Other liabilities	3.35	2.62	7.64	2.21	3.10	3.66
Total liabilities	100	100	100	100	100	100

Source Table 4.2(A): Insurance Division, Federal Ministry of Finance, Ikoyi, Lagos.

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TABLE 4.3

STRUCTURE OF LIABILITY HOLDINGS OF NON-LIFE INSURANCE COMPANIES IN NIGERIA

A. NON-LIFE INSURANCE COMPANIES (₦ Million)

	1980	1981	1982	1983	1984	1985
Paid up capital	33.75	41.67	43.39	55.48	55.15	64.38
Reserves	67.43	73.63	90.42	88.93	144.33	159.92
Total amount due to 'others'	244.26	323.10	409.79	505.38	720.64	774.86
Non-life fund	75.42	124.87	140.01	106.79	108.88	109.03
Other liabilities	66.14	60.56	70.06	145.27	79.65	119.95
Total liabilities	487.0	623.83	753.53	901.85	1108.64	1228.14

B. NON-LIFE INSURANCE COMPANIES (% OF TOTAL LIABILITIES)

	1980	1981	1982	1983	1984	1985
Paid up capital	6.93	6.68	5.76	6.15	4.97	5.24
Reserves	13.85	11.80	12.0	9.86	13.02	13.02
Total amount due to 'others'	50.16	51.79	54.38	56.04	65.00	63.09
Non-life fund	15.49	20.02	18.58	11.84	9.82	8.88
Other liabilities	13.58	9.70	9.30	16.11	7.18	9.77
Total liabilities	100.0	100.0	100.0	100.0	100.0	100.0

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C. STRUCTURE OF NON-LIFE FUND HOLDINGS (N MILLION)

	1980	1981	1982	1983	1984	1985
Total non-life fund (general fund)	75.42	124.87	140.01	106.79	108.9	109.1
Accident insurance fund	4.66	10.53	12.42	12.35	11.9	13.8
Fire insurance fund	5.50	10.50	13.76	11.90	114.6	17.7
Workmen's compensation insurance fund	4.33	4.47	5.85	3.27	3.5	3.6
Motor vehicle insurance fund	40.34	52.68	56.10	52.82	49.9	45.7
Marine insurance fund	14.35	33.20	39.57	15.22	14.7	17.7
Miscellaneous insurance fund	6.24	13.49	12.31	11.23	14.3	10.6
Total liabilities	484.0	623.83	753.53	901.85	1108.6	1228.1

D.   STRUCTURE OF NON-LIFE FUND HOLDINGS (% OF TOTAL LIABILITIES)

	1980	1981	1982	1983	1984	1985
Total Non Life Fund	15.49	20.02	18.58	11.84	9.82	8.88
Accident Insurance Fund	0.96	1.69	1.65	1.37	1.07	1.12
Fire Insurance Fund	1.13	1.68	1.83	1.32	1.32	1.44
Workmen's Compensation Insurance Fund	0.89	0.72	0.78	0.36	0.32	0.29
Motor Vehicle Insurance Fund	8.28	8.44	7.44	5.86	4.50	3.72
Marine Insurance Fund	2.95	5.32	5.25	1.69	1.33	1.44
Miscellaneous Insurance Fund	1.28	2.16	1.63	1.25	1.29	0.86
Total liabilities	100.0	100.0	100.0	100.0	100.0	100.0

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E. STRUCTURE OF NON-LIFE FUND HOLDINGS (% OF TOTAL NON-LIFE FUND)

	1980	1981	1982	1983	1984	1985
Total non-life fund (general fund)	100	100	100	100	100	100
Accident insurance fund	6.18	8.43	8.87	11.56	10.93	12.65
Fire insurance fund	7.29	8.41	9.83	11.14	13.41	16.22
Workmen's compensation insurance fund	5.74	3.58	4.18	3.06	3.21	3.30
Motor vehicle insurance fund	53.49	42.19	40.07	49.46	45.82	41.89
Marine insurance fund	19.03	26.59	28.26	14.25	13.13	16.22
Miscellaneous insurance fund	8.27	10.80	8.79	10.52	13.13	9.72
Total liabilities	100.0	100.0	100.0	100.0	100.0	100.0

Source: Tables 4.3(A & C): Insurance Division, Federal Ministry of Finance, Ikoyi, Lagos.

Tables 4.3(B & D): Computed from Tables 4.3(A & C).

pattern or trend is also haphazard. The implication of this is that the non-life premiums are unreliable as a source of investment income. This finding on the non-predominancy of non-life premium supply is in contrast with the position held by some scholars for example see Onoh (1980 p. 268). He argues that premium income is the major and most important liability item in the balance sheet of insurance companies.

A cursory review of the balance sheet structure discussed above will indicate on a comparative basis that the merchant banks and non-life insurance companies have deposits or premium liabilities representing less than thirty-six per cent (36%) of total debt as against those of the life insurance companies which have over 60% life fund deposits.

Also the proportion of capital accounts held by the institutions indicate that the non-life companies have up to twenty-five per cent (25%) of total liabilties in this category while for the merchant banks and life funds, a smaller proportion of total debt (less than eleven per cent (11%) in all the years) are held as shareholders' fund.

The insurance companies also have a smaller proportion of their liabilities classified as "others" ranging from two per cent to seventeen per cent (2%-17%) while this category represents the major source of funds for the merchant banks.

The inference to be drawn from the liability structure considered is that more debt avenues should be developed by these institutions apart from further exploiting existing sources. This is particularly the case for the non-life insurance companies who have a dwindling proportion of their liabilities from the premium income.

4.5   Structure of Asset Holdings

In discussing the structure of asset holdings in the insurance and merchant banking firms, we have consolidated the balance sheet by aggregating the items into five broad categories[3], namely:

(a)   Cash, bills receivable plus other cash items;

(b)   Mortgages and loans;

(c)   Investment in securities (both public and private);

(d)   Property, investment in real estate and equipment lease; and

(e)   Other unclassified assets for all the merchant banks, life and non-life insurance companies.

The balance sheet consolidation was done to ensure conformity and to facilitate comparison of the asset structure in these institutions.

The structure and patterns of asset holdings in these institutions are depicted in Tables 4.4 and 4.5. We identify, based on a casual observation of the percentage composition of each asset category in Table 5.5 that asset holding patterns vary between and within these three types of financial institutions over the period 1980-84.

The merchant banks predominantly hold their assets specifically in loans and advances provided for their customers, representing 39.7%, 37.5%, 36.0%, 34.1%, 37.2% and 36.1% from 1980-85 respectively. In contrast to the life insurance companies which put majority of their asset holdings into investment in government, semi-government and private companies securities representing 38.7%,

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[3]See Appendix 4.2 for definition of items included in each category.

TABLE 4.4

PATTERN OF ASSET HOLDINGS OF MERCHANT BANKS,
LIFE INSURANCE AND NON-LIFE INSURANCE FIRMS
IN NIGERIA

(N Million)

Year	Asset Category	Merchant Banks	Life Fund	Non-Life Fund
1980	Cash, Bills, receivable plus other cash items	115.0	80.2	317.8
	Mortgages and loans	400.2	59.1	14.7
	Investment in securities (private and public)	75.3	111.9	90.9
	Property, investment in real estate, equipment lease	18.0	23.3	39.6
	Other unclassified assets	399.7	14.6	24.0
	Total Assets	1008.2	289.1	487.0
1981	Cash, bills receivable plus other cash items	204.3	104.8	380.0
	Mortgages and loans	711.9	71.4	22.3
	Investment in securities (private and public)	81.0	156.0	114.3
	Property, investment in real estate, equipment lease	14.6	24.0	65.8
	Other unclassified assets	886.9	25.6	41.4
	Total Assets	1,898.7	381.8	623.8

TABLE 4.4   (Contd.)

Year	Asset Category	Merchant Banks	Life Fund	Non-Life Fund
1982	Cash, bills receivable plus other cash items	405.7	170.3	445.9
	Mortgages and loans	1190.2	86.4	35.3
	Investment in securities (private and public)	316.5	189.5	141.1
	Property, investment in real estate, equipment lease	26.8	79.0	79.3
	Other unclassified assets	1,363.7	28.3	51.9
	Total Assets	3,302.9	553.5	753.5
1983	Cash, bills receivable plus other cash items	417.1	130.2	561.4
	Mortgages and loans	1,465.9	96.4	40.6
	Investment in securities (private and public)	550.9	229.4	157.8
	Property, investment in real estate, equipment lease	48.9	42.0	99.4
	Other unclassified assets	1,822.1	38.8	42.6
	Total Assets	4,304.9	536.8	901.8

TABLE 4.4   (Contd.)

Year	Asset Category	Merchant Banks	Life Fund	Non-Life Fund
1984	Cash, bills receivable plus other cash items	259.9	180.6	537.7
	Mortgages and loans	1671.9	97.3	22.4
	Investment in securities (private and public)	1009.9	260.9	380.1
	Property, investment in real estate, equipment lease	56.0	41.0	116.0
	Other unclassified assets	1501.2	46.6	66.4
	Total Assets	4495.9	626.3	1108.6
1985	Cash, bills receivable plus other cash items	267.6	197.7	567.6
	Mortgages and loans	1802.9	116.7	33.8
	Investment in securities (private and public)	1258.2	303.4	431.1
	Property, investment in real estate, equipment lease	86.2	51.8	123.4
	Other unclassified assets	1585.8	40.5	72.4
	Total Assets	5001.1	1710.1	1228.1

Sources: (1)   Central Bank of Nigeria, Economic and Financial Review (various issues)

(2)   Insurance Division, Federal Ministry of Finance, Ikoyi, Lagos

TABLE 4.5

PATTERN OF ASSET HOLDINGS OF MERCHANT BANKS,
LIFE INSURANCE AND NON-LIFE INSURANCE
COMPANIES IN NIGERIA

(% OF TOTAL ASSETS)

Year	Asset Category	Merchant Banks	Life Fund	Non-Life Fund
1980	Cash, bills receivable plus other cash items	11.4	27.7	65.3
	Mortgages and loans	39.7	20.4	3.0
	Investment in securities (private and public)	7.5	38.7	18.7
	Property, investment in real estate, equipment lease	1.8	8.1	8.1
	Other unclassified assets	39.6	5.1	4.9
	Total Assets	100.0	100.0	100.0
1981	Cash, bills receivable plus other cash items	10.8	27.4	60.9
	Mortgages and loans	37.5	18.7	3.6
	Investment in securities (private and public)	4.3	40.9	18.3
	Property, investment in real estate, equipment lease	0.8	6.3	10.6
	Other unclassified assets	46.7	6.7	6.6
	Total Assets	100.0	100.0	100.0

TABLE 4.5   (Contd.)

Year	Asset Category	Merchant Banks	Life Fund	Non-Life Fund
1982	Cash, bills receivable plus other cash items	12.3	30.8	59.2
	Mortgages and loans	36.0	15.6	4.7
	Investment in securities (private and public)	9.6	34.2	18.7
	Property, investment in real estate, equipment lease.	0.8	14.3	10.5
	Other unclassified assets	41.3	5.1	6.9
	Total Assets	100.0	100.0	100.0
1983	Cash, bills receivable plus other cash items	9.7	24.3	62.3
	Mortgages and loans	34.1	18.0	4.5
	Investment in securities (private and public)	12.8	42.7	17.5
	Property, investment in real estate, equipment lease	1.1	7.8	11.0
	Other unclassified assets	42.3	7.2	4.7
	Total Assets	100.0	100.0	100.0

TABLE 4.5   (Contd.)

Year	Asset Category	Merchant Banks	Life Fund	Non-Life Fund
1984	Cash, bills receivable plus other cash items	5.7	28.8	47.2
	Mortgages and loans	37.2	15.5	2.0
	Investment in securities (private and public)	22.5	41.7	34.3
	Property, investment in real estate, equipment lease	1.3	6.5	10.5
	Other unclassified assets	33.4	7.4	6.0
	Total Assets	100.0	100.0	100.0
1985	Cash, bills receivable plus other cash items	5.4	27.8	46.2
	Mortgages and loans	36.1	16.4	2.8
	Investment in securities (private and public)	25.2	42.7	35.1
	Property, investment in real estate, equipment lease	1.7	7.3	10.0
	Other unclassified assets	31.7	5.7	5.9
	Total Assets	100.0	100.0	100.0

Source: Computed from Table 4.4.

40.9%, 34.2%, 42.7%, 41.7% and 42.7% of total assets held. On the extreme end the non-life insurance companie asset holding patterns indicate that over the period the bulk of asset holdings were in the form of cash holdings either on hand, in deposit or current account or as balances with the insurer, insurance agents or policy holders. They kept a very large proportion of their asset holdings 65.3%, 60.9%, 59.2%, 62.3%, 47.2% and 46.2% of total assets from 1980-85 respectively in this form of cash and receivable.

We observe also that the non-life insurance companies prefer investment in real estate to offering loans and mortgages contrary to the behaviour of the merchant banks and the life insurance companies. Worthy of note is that in comparison with the other two institutions the merchant banks invest the least percentage of total assets over the period in securities (both public and private), this is contrary to expectations. We expect that due to the fixed nature of merchant banks deposits and other liabilities, they would invest more than these insurance companies (particularly the non-life insurance firms) in securities thereby contributing to improve ments in the underdeveloped nature of the capital market in Nigeria.

The preference for holding cash and other cash balances on call is visible and identified for the three types of institutions. None of the firms in any of the years covered kept less than ten per cent (10%) of asset holdings in this category. The disturbing aspect of this behaviour relates particularly to the non-life insurance companies whose asset holding patterns indicate that an average of over fifty per cent (50%) of total assets over the period is held in the form of cash in hand, deposits or balances with the

insurer or the insurance agents, etc. Even though we realise that non-life claims are erratic and unpredictable unlike life insurance companies and merchant banks, government regulations as contained in the Insurance Act of 1976 stipulates only a minimum asset holding at forty per cent for this category.

The conclusion to be derived from the excessive holding of assets in this category is that profitable investment opportunities are either not available or that most of the securities for which the insurance companies are allowed to invest their funds are not available in the market as a casual comparison of investible assets of insurance companies as contained in the Insurance Act of 1976 and the existing assets in the Nigerian financial environment will indicate.[4] Thus, most of the securities are not available in the market and the insurance companies are not able to find avenues to invest their excess funds. The point to note here is that the under-development of the financial system in general and the narrowness of the capital and money markets in Nigeria apart from the classical determinants or portfolio namely liquidity, profitability and solvency considerations as well as government regulations affect the asset holding patterns as well as the general portfolio behaviour of these financial institutions.

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[4]Insurance companies are allowed by law to invest in the following assets (see Insurance Companies Regulation 1968 as amended by the 1976 Act) - Federal and State governments securities, securities of semi-government agencies, industrial debentures and unsecured loans, preference and ordinary share holdings, mortgage loans and real estate loans, direct investment in real estate, treasury bills and certificates, cash in hand and in deposit account (fixed) cash in current account.

4.6   Statistical Test of Asset Holding Patterns

4.6.1   Specification of Objective and Statistical Method for Testing Hypothesis

In the previous section we have discussed the structure and patterns of asset holdings in the insurance and merchant banking institutions. We identified variations in the holding patterns among the three types of financial institutions under consideration. The objective in this section is to verify and assess the statistical significance of the finding in the last section that asset holding patterns vary between and within these institutions.

The analysis of variance using the Snedecor's variance ratio test was used to verify and assess the statistical significance of the hypothesis of whether or not asset holding patterns vary between the life insurance companies, non-life insurance companies and the merchant banks.

The analysis of variance is used when a comparison is required between more than two sets of data. For instance when an assessment of whether the differences between several sets of data is significant or not is required.

The technique requires the computation of seven basic parameters:

(a)   Correction factor

(b)   Total sample sum of squares (TSS)

(c)   Between sample sum of squares (BSS)

(d)   Within sample sum of squares (WSS)

(e)   Between sample variance estimate (BSV)

(f)   Within sample variance estimate (WSV)

(g)   Snedecor's variance ratio (Fc)

The general procedure of the non-parametric statistic is that we assume we have a number of subjects selected to the kth level yielding a rectangular array of numbers (Xijs).

The fundamental relationship is that

$$TSS = BSS + WSS$$

i.e. Total sum of squares = between sample sum of squares + within sample sum of squares.

$$\sum_{j=1}^{k} \sum_{i=1}^{n} (X_{ij} - \bar{X}_{ij})^2 = \sum_{j=1}^{k} \sum_{i=1}^{n} (X_{ij} - \bar{X}_{ij})^2 +$$

$$n \sum_{j=1}^{k} (X_{ij} - \bar{X}_{ij})^2$$

X = asset items.

The computation of the various estimates are as follows:

We compute the total sum of squares (TSS)

$$TSS = \sum_{j=1}^{k} \sum_{i=1}^{n} (X_{ij} - \bar{X}_{ij})^2 - CF$$

where CF = correction factor given by

$$CF = \frac{[\sum_{j=1}^{k} \sum_{i=1}^{n} (X_{ij} - \bar{X}_{ij})]^2}{N} \quad \text{and } N = nk$$

The between sample sum of squares (BSS) is also defined as

$$BSS = \sum_{j=1}^{k} \sum_{i=1}^{n} \frac{(X_{ij} - \bar{X}_{ij})^2}{n} - CF$$

While the within sample sum of squares(WSS) can be derived from the basic relationship

i.e.   TSS   =   BSS + WSS

         WSS   =   TSS - BSS

which implies

$$WSS = \sum_{j=1}^{k} \sum_{i=1}^{n} (X_{ij}-\bar{X}_{ij})^2 - \sum_{j=1}^{k} \sum_{i=1}^{n} \frac{(X_{ij}-\bar{X}_{ij})^2}{n}$$

we obtain degrees of freedom (Df) for the calculated parameters, These are given   as follows:

$Df(TSS) = N-1$ or $(nk-1)$

$Df(BSS) = K-1$

$Df(WSS) = (nk-1)-(k-1) = nk-k$

We can now compute the variance estimates required

1. Between sample variance estimate (BSV) $= \dfrac{BSS}{Df(BSS)}$

2. Within sample variance estimate (WSV) $= \dfrac{WSS}{Df(WSS)}$

We can then prepare a summary table of the estimated parameters

Source of Variance	Sum of Squares	Degree of Freedom	Variance Estimate
Between sample	BSS	Df (BSS)	BSS/Df (BSS)
Within sample	WSS	Df (WSS)	WSS/Df (WSS)
Total sample	TSS	Df (TSS)	–

We then compute the Snedecor's variance ratio test statistic (FC) where

$$FC = \frac{\text{Greater Variance Estimate}}{\text{Lesser Variance Estimate}}$$

FC = Calculated F-statistic

We subsequently obtain the critical value of F (Fα) at the specified level of confidence (in our case 95% or α = 0.05) from the F-distribution table using the degree of freedom of the greater variance estimate and lesser variance estimate as the numerator and denominator respectively.

Decision rule

If Fc < F$_\alpha$ - we accept the hypothesis that there is no significant difference and variations in asset holding occur by chance; but if Fc > F$_\alpha$ - we fail to accept the hypothesis that the variations occur by chance.

4.6.2 Results and Interpretation

The analysis of variance using the Snedecor's ratio used to verify and assess the statistical significance of the specified hypothesis of whether or not asset holding patterns vary between the life insurance, non-life insurance and merchant banking firms.[5]

The reported Snedecor's ratio (Fc) for the period 1980-85 are contained in Table 4.6. The critical value at 95% confidence limit from the table of F-distribution (F$_{0.05}$) at (2,12) degrees of freedom is 3.89.

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[5] See Appendix 4.3 for computed parameters of variance analysis of asset holding patterns.

TABLE 4.6

RESULT OF STATISTICAL TEST OF ASSET HOLDING PATTERNS IN INSURANCE AND MERCHANT BANKING FIRMS OF NIGERIA

Year	Fc	$F_{0.05}$ at $(2,12)$ Df	Decision
1980	1.6	3.89	Accept Ho
1981	2.2	3.89	Accept Ho
1982	3.8	3.89	Accept Ho
1983	4.2	3.89	Reject Ho
1984	4.6	3.89	Reject Ho
1985	4.9	3.89	Reject Ho

Thus, from the results of our statistical test we accept the hypothesis that for the years 1980-82 the observed asset holding patterns of these institutions do not vary significantly and any observed variations occur only by chance. While for the period 1983 to 1985, the asset holding patterns of these three institutions vary significantly, that is, there is a continuing divergence between the asset holding patterns in these institutions.

The implications of the result of our statistical test is two fold. Firstly, if the asset holding patterns of these institutions diverge significantly as observed from 1983 to 1985 then central bank monetary policy which focus primarily on the regulation of commercial and merchant banking firms and exercising very little control on the operations of insurance companies and other non-bank

financial intermediaries, should now consider the portfolio behaviour, the structure of liquidity as well as the asset composition of these other unregulated intermediaries which hitherto are neglected in the consideration, formulation and implementation of monetary policy in Nigeria, if we are concerned about the effectiveness of monetary policy as a tool for achieving desired economic targets or objectives.

Secondly, we have that for the period 1980-82 variations in the asset patterns are statistically insignificant unlike the holding patterns for 1983 to 1985. The implication here is that significant adjustments have taken place in the asset holding patterns within these institutions. Thus, there is a need to further investigate the portfolio behaviour of these institutions particularly with regards to the factors explaining portfolio choice and moreso the nature, speed and causes of portfolio adjustment in these institutions. Furthermore, the need for the development of models which will offer vital clues on these unresolved issues cannot be overemphasised. The models developed in the next chapter will attempt to examine these un-resolved issues among o[.]ur issues necessary for a complete under-standing of the portfolio behaviour of these institutions.

4.7   Portfolio Maturity Structure and Term Transformation

4.7.1   Portfolio Maturity Structure

Steiner and Shapiro (1953, p.67) in classifying the items of the asset portfolio recognised that there are three main ways of classify-ing the items (a) in terms of use which could either be commercial or industrial etc. (b) the type of debtor or creditor, whether public or private and (c) in terms of the maturity structure of the asset item.

They noted that in terms of classification according to maturity, assets are being categorised as to the time dimension for repurchase during the time assets are bought or sold.

They recognized three categorization of balance sheet items based on the maturity of the items. These are:

(a)   Long term assets - where the asset item has a maturity of five or more years.

(b)   Intermediate term assets - these have a maturity of over one year and not more than five years.

(c)   Short term assets - these are items having a maturity of less than one calendar year.

(d)   Demand credit - these are payable whenever the lender or seller 'calls' for the asset or the liability instrument.

In our examination of the maturity of the portfolio of insurance and merchant banking firms we adopt only three categories for classifying balance sheet items. These are

(i)   Longer term assets and liabilities having a maturity of above one calendar year, which then comprise of the long term and intermediate group according to the classification by Steiner and Shapiro (1953):

(ii)   Short term instruments which consist of the short term and demand credit. According to Steiner and Shapiro (1953) they have a maturity of less than one calendar year; and

(iii)   Unclassified items - these are items in the 'other assets' and 'other liabilities' categories. They represent an amalgam of instruments of diverse maturity and for which information was not available.

Our classification is justified based on

(a)   the amount of information content on portfolio components available on the insurance and merchant banking industry;

(b)   the fact that the approach facilitates comparison with regards to term transformation in these institutions; and

(c)   the nature of the financial system which is largely under-developed with a high degree of risk aversion. It is also predominantly a seller's market with marked preference for short term securities often 'on call'. In most cases, investment oulays with maturity period of above one year are considered as long term.

As far as the amount of data materials available is concerned, we were able to obtain information on the term structure of deposits taken by the merchant bank and also information was available on the maturity pattern of loans and advances granted by the banks (Tables 4.7 and 4.8). On the contrary, no such information was available on the premium and term of the various types of loans issued by the insuranc- ompanies. The researcher therefore assumed the term of these items based on a priori hypothetical information and presumptions on these items.

The term structure of assets and liability holding in the merchant banks (see Table 4.9) show that for both the asset and the liabilities a higher proportion of total assets/liabilities are held in the unclassified category being 53.35%, 57.17%, 53.14%, 55.69%, 52.06% for the liabilities and 39.6%, 46.7%, 41.3%, 42.3% in the case of the assets. This development does not give room for any substantive conclusion as regards the maturic; structure of portfolio holdings for the merchant banking firms. However, structure on the classified items

TABLE 4.7

ANALYSIS OF MERCHANT BANK DEPOSIT LIABILITIES BY MATURITY

(A)   (N million)

	1980	1981	1982	1983	1984	1985
(a) Repayable on demand	66.5	122.4	272.3	484.6	511.0	530.5
(b) Other deposits repayable						
(i) Within 3 months	85.7	183.8	481.5	453.6	636.3	881.6
(ii) Between 3 and 6 months	86.6	75.7	101.4	177.9	189.6	219.4
(iii) Between 6 and 12 months	38.8	63.6	97.4	151.6	130.4	171.9
(iv) Later than 12 months	8.6	5.0	17.2	10.6	14.4	45.3
Total (b)	219.7	328.0	691.3	793.7	970.6	1318.2
(c) Total deposits liabilities	286.1	450.4	963.5	1278.4	1481.6	1848.7

Sources   (i)   Central Bank of Nigeria, Annual Report and Statement of Accounts (various issues).

(ii)   Central Bank of Nigeria, Economic and Financial Review (various issues).

(B)   (%) OF TOTAL DEPOSIT LIABILITIES

		1980	1981	1982	1983	1984	1985
(a)	Repayable on demand	23.23	27.13	28.08	37.01	34.49	28.70
(b)	Other deposits repayable						
(i)	Within 3 months	29.96	40.79	49.65	35.48	42.95	
(ii)	Between 3 and 6 months	30.25	16.80	10.45	13.91	12.79	
(iii)	Between 6 and 12 months	13.55	14.12	10.04	11.86	8.80	
(iv)	Later than 12 months	3.01	1.11	1.78	0.83	0.97	
	Total (b)	76.77	72.82	71.92	62.09	65.51	
(c)	Total deposits liabilities	100.0	100.0	100.0	100.0	100.0	

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TABLE 4.8

ANALYSIS OF MERCHANT BANKS LOAN AND ADVANCES BY MATURITY

(N MILLION)

		1980	1981	1982	1983	1984	1985
Loans and Advances.							
(i)	On call	28.0	36.4	105.7	179.7	255.2	264.4
(ii)	Maturity between 3 and 6 months	28.8	43.3	58.40	72.7	48.9	68.8
(iii)	Maturity between 6 and 12 months	53.1	66.4	180.0	185.1	182.8	190.8
(iv)	Maturity between 1 and 3 years	152.3	258.1	231.3	186.8	255.8	276.4
(v)	Maturity between 3 and 5 years	78.6	108.0	163.8	223.9	259.2	272.3
(vi)	Maturity after 5 years	13.8	58.0	110.2	173.1	170.5	253.4
Total loans and advances		354.6	570.3	849.5	1021.4	1181.5	1326.1

Sources: (1) Central Bank of Nigeria, Annual Report and Statement of Accounts (various issues)
(2) Central Bank of Nigeria, Economic and Financial Review (various issues).

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(B)   (%) OF TOTAL LOANS AND ADVANCES

		1980	1981	1982	1983	1984	1985
Loans and Advances							
(i)	On call	7.90	6.39	12.44	17.60	21.76	19.94
(ii)	Maturity between 3 and 6 months	8.11	7.60	6.87	7.12	4.17	5.19
(iii)	Maturity between 6 and 12 months	14.96	11.65	21.20	18.12	15.59	14.39
(iv)	Maturity between 1 and 3 years	42.95	45.26	27.23	18.30	21.82	20.84
(v)	Maturity between 3 and 5 years	22.17	18.93	19.28	21.72	22.11	20.53
(vi)	Maturity after 5 years	3.91	10.17	12.98	16.95	14.55	19.11
Total loans and advances		100.0	100.0	100.0	100.0	100.0	100.0

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TABLE 4.9

MATURITY STRUCTURE OF PORTFOLIO HOLDINGS OF MERCHANT BANKS IN NIGERIA

A. (₦ Million)

| Item | Year | Maturity | | | |
		Shorter Term	Longer Term	Unclassi-fied	Total
Liabilities	1980	357.1	113.22	537.87	1008.2
	1981	669.32	144.87	1084.49	1898.7
	1982	1282.21	265.83	1754.80	3302.2
	1983	1626.94	280.68	2399.40	4304.9
	1984	1381.90	262.56	2851.30	4495.9
	1985	1441.80	336.07	3223.2	5001.1
Assets	1980	258.0	357.96	399.25	1008.2
	1981	476.76	535.24	886.69	1898.7
	1982	1082.13	856.26	1363.81	3302.2
	1983	1488.63	995.29	1820.97	4304.9
	1984	1847.81	1146.45	1501.63	4495.9
	1985	2163.5	1305.8	1531.8	5001.1

B. (% OF TOTAL ASSETS/LIABILITIES)

| Item | Year | Maturity | | | |
		Shorter Term	Longer Term	Unclassi-fied	Total
Liabilities	1980	35.43	11.23	53.35	100
	1981	35.25	7.63	57.17	100
	1982	38.83	8.05	53.14	100
	1983	37.79	6.52	55.69	100
	1984	30.74	5.84	63.42	100
	1985	28.83	6.72	64.45	100
Assets	1980	25.59	34.91	39.6	100
	1981	25.11	28.19	46.7	100
	1982	32.77	25.93	41.3	100
	1983	34.58	23.12	42.3	100
	1984	41.10	25.50	33.4	100
	1985	43.26	26.11	30.6	١٠٠

of liabilities are more of shorter term nature with the highest holding in the category being 38.83% in 1982 and the lowest being 28.83% in 1985. Longer term liabilities in all the years considered were lower than 12%.

The pattern discernible from the maturity structure of assets in the portfolio of the merchant banks is that in 1980 and 1981 there was a preference for longer term asset holdings relative to the demand for shorter term assets. In 1980 and 1981 shorter term assets were 25.59% and 25.11% respectively while for the same period longer term assets were 34.91% and 28.19%. From 1982 the pattern changed and the banks behaviour showed a preference for shorter term asset holdings being 32.77%, 34.58%, 41.10% and 43.26% in contrast to 25.93%, 23.12%, 25.50% and 26.11% for longer term assets from 1982 to 1985 respectively.

Another observable phenomenon is the decline for longer term asset holdings by the merchant banks. From a peak of 34.91% in 1980 longer term asset demand represented only 25.50% of total assets by 1984 incr.. .ing marginally to 26.11% in 1985. This observed chracteristics is not in consonance with one of the main objectives for the development of merchant banking in Nigeria which related to the provision of long term finance for the growth of industrial, agricultural, commercial enterprises, etc. in the country.

For the life insurance companies (see Table 4.10) liabilities are predominantly of longer term nature. This category being over 70% of total liabilities in all the years. The shorter term liability component represented only 7.93%, 7.07%, 18.68%, 9.61%, 10.47% and 9.88% of total liabilities from 1980 to 1985 respectively. The unclassified items represented

TABLE 4-10

MATURITY STRUCTURE OF PORTFOLIO HOLDINGS OF LIFE INSURANCE COMPANIES IN NIGERIA

A. (N Million)

| Item | Year | Maturity | | | |
		Shorter Term	Longer Term	Unclassi-fied	Total
Liabilities	1980	22.93	256.57	9.69	289.16
	1981	29.29	342.57	10.04	381.82
	1982	103.39	407.82	42.29	553.50
	1983	51.59	473.86	11.38	536.83
	1984	65.57	541.30	19.41	626.29
	1985	70.16	613.38	26.0	710.07
Assets	1980	139.09	135.33	14.74	289.16
	1981	176.02	180.22	25.58	381.82
	1982	256.82	268.45	28.23	553.50
	1983	227.08	271.08	38.65	536.83
	1984	278.07	301.87	46.35	626.29
	1985	313.86	419.67	40.48	710.07

B. (% OF TOTAL ASSETS/LIABILITIES)

| Item | Year | Maturity | | | |
		Shorter Term	Longer Term	Unclassi-fied	Total
Liabilities	1980	7.93	88.73	3.35	100
	1981	7.67	89.72	2.63	100
	1982	18.68	73.68	7.64	100
	1983	9.61	88.27	2.12	100
	1984	10.47	86.43	3.10	100
	1985	9.88	86.38	3.66	100
Assets	1980	48.1	46.8	5.1	100
	1981	46.1	47.2	6.7	100
	1982	46.4	48.5	5.1	100
	1983	42.3	5.5	7.2	100
	1984	44.4	48.2	7.4	100
	1985	44.2	59.1	5.7	100

less than 8% of total liabilities in all the years considered.

In terms of asset holdings the life fund companies are observed to have a marginal preference for longer term assets in all the years with the exception of 1980 when there was a marginal preference for shorter term assets. Short term asset was 48.1% and the long term component was 46.8% of total assets held.

Lastly, for the non-life insurance companies (see Table 4.11), liabilities are predominantly shorter term in nature, accounting for over 60% of total liabilities in all the years covered. Longer term liabilities accounted for less than 21% of total liabilities in all the years considered.

Assets were also held predominantly in shorter term financial instruments, accounting also for over 60% of total assets in all the years covered with the exception of 1984 and 1985 where there was a decline to 49.2% and 49.0% respectively. This is a new development in the term behaviour of these firms whereby there is an increasing preference for longer term assets.

Longer term asset holdings were respectively 26.8%, 28.9%, 29.2%, 28.5%, 44.8% .d 45.1% of total assets from 1980-85 respectively.

The salient points from our analysis are that while merchant banks have a higher proportion of their liabilities and assets in instruments whose maturity cannot be easily discernible from available information; but with regards to those instruments where information on their maturity are available, the banks incur shorter term liabilities relative to those of longer term nature. This identified characteristic is similar to the observed structure for the non-life insurance companies. On the other hand, the life insurance firms incur longer term liabilities.

TABLE 4.11

MATURITY STRUCTURE OF PORTFOLIO HOLDINGS
NON-LIFE INSURANCE COMPANIES IN NIGERIA

A. (N Million)

Item	Year	Maturity			
		Shorter Term	Longer Term	Unclassi-fied	Total
Liabilities	1980	319.72	101.20	66.13	487.0
	1981	447.97	115.28	60.51	623.83
	1982	549.75	133.83	69.93	753.53
	1983	612.14	144.39	145.29	901.85
	1984	829.48	199.44	79.71	1108.64
	1985	883.03	224.75	120.36	1228.14
Assets	1980	332.62	130.52	23.86	487.0
	1981	402.37	180.28	41.17	623.83
	1982	481.51	220.02	52.0	753.53
	1983	602.14	257.01	42.39	901.85
	1984	545.45	496.67	66.52	1108.64
	1985	601.79	553.89	72.46	1228.14

B. (% OF TOTAL ASSETS/LIABILITIES)

Item	Year	Maturity			
		Shorter Term	Longer Term	Unclassi-fied	Total
Liabilities	1980	65.65	20.78	13.58	100
	1981	71.81	18.48	9.70	100
	1982	72.96	17.76	9.28	100
	1983	67.88	16.01	16.11	100
	1984	74.82	17.99	7.19	100
	1985	71.90	18.30	9.80	100
Assets	1980	68.3	26.8	4.9	100
	1981	64.5	28.9	6.6	100
	1982	63.9	29.2	6.9	100
	1983	66.8	28.5	4.7	100
	1984	49.2	44.8	6.0	100
	1985	49.0	45.1	5.9	100

Generally only the non-life institutions show a clear cut pre-ference for shorter term assets holdings. This predominancy is on the decline however. Also, we observe a 'marginal preference' for longer term asset holdings in the life insurance companies over the period 1981-1985 while the reverse was the case in 1980. The merchant banks on their part had a time transformation of their asset term structure having a preference for longer term assets for 1980 and 1981 and the preference being in favour of shorter term assets from 1982 to 1985.

Also worthy of note is the circular decline in the percentage holdings of longer term assets in merchant banking firms up to 1983 with very slight increases in 1984 and 1985. The increases repre-sented not more than 2% in any of the two years.

Our quest for an examination of the maturity structure in these institutions is based on the hypothesis that the maturity structure of portfolio holdings as well as term transformation (which we consider next) in these institutions go a long way in determining the liquidity, solvency and often the profitability of the financial firm. The maturity structure is also said to influence whether or not the financial firm contributes to the development of financial markets in the country or play a significant role in the provision of long term finance for overall economic development of the country. Thus, in considering the implications of the maturity structure of portfolio holdings identified for each of these institutions, we consider below the nature of term transformation in these institutions. That is, we consider the extent to which these institutions use their short term liabilities to generate longer term assets. This analysis will further aid the derivation of meaningful conclusions from our analysis of the portfolio maturity

behaviour in Nigerian insurance and merchant banking firms.

4.7.2 Term Transformation

The role of special financial institutions (such as insurance and merchant banks) in increasing the supply of long term finance to industries and other sectors of the economy cannot be over-emphasised. These specialised institutions are the prime sources of capital for industrialization and indeed the financing of development. The institutions should consequently be in a position to pull short-term deposits which could be used to generate longer term funds. Thus, the expectations for merchant bank and insurance company behaviour are that they should be a major source of longer term finance which will aid industrialization and fulfill the developmental objectives of the economy. Thus, we expect (whatever the nature of liability holdings of these institutions), that to some extent as constrained by regulation and other requirements such as liquidity requirements, these institutions should hold more of longer term loans and investment assets in their portfolio. The principle of asset matching whereby institutions match short (long) term liabilities to short (long) term assets is inappropriate for the development objectives of the economies of less developed countries such as Nigeria.

The objective of this section is to compare the short-term liabilities of these insurance and merchant banking firms with the longer term asset component of their overall balance sheet. We consequently determine to what extent the institutions have been using term liabilities to generate longer term assets.

4.7.2(i)   Theory and Methodology of Analysis

We had earlier defined term transformation as the extent to which financial firms use their shorter term liabilities to acquire longer term assets. A search of the literature for an appropriate empirical procedure to follow in investigating term transformation in these institutions revealed a paucity of empirical investigation on the subject. Most discussion on the term structure and term transformation in financial institutions have been highly descriptive; inference being made from a casual comparison of the percentage composition of shorter term liabilities and longer term assets. Usually in most cases a casual comparison is made between the maturity structure of deposits and those for the loans and advances granted and generalization regarding the nature of term transformation in these institutions made accordingly. (See, for example, the case of studies based on Nigerian environment in Ajayi and Ojo (1981), Ojo and Adewumi (1982), Onoh (1980)).

These methods are inadequate, and are not usually sufficient for making such generalization particularly in the case where a large proportion of deposits are long term. Also conclusions derived from the approach involving comparison of deposits and loans is not valid for the entire balance sheet behaviour.

Consequently we have developed an empirical alternative using one of the existing non-parametric statistical procedure to verify term transformation in these institutions. Essentially the approach recognises three categorization of term transformation behaviour of financial institutions.

(a) A financial firm has positive term transformation when a larger volume of total short term liabilities is used to generate a larger volume of longer term assets.

(b) Negative term transformation refers to a situation when the volume of shorter term liabilities are used to generate a smaller volume of longer term assets and lastly

(c) Neutral term transformation occurs when the financial firms short term liabilities are equally matched or transformed to longer term assets.

The essential procedure of our method of investigation is to calculate the mean value or the expected value of the shorter term liability component and the expected or mean value of the longer term asset component. The values provide a summary of the term behavioural pattern evident in each of the distributions considered. The measure of central tendency yields a value around which all the other values in the distribution are distributed.

What we then do next is to compute the 'Term Transformation Summary (TTS) which is the first order condition (FOC), or the necessary condition to be fulfilled before a final decision on the nature of term transformation in the institutional type can be arrived at.

The FOC is thus given by

$$TTS = \bar{Y} - \bar{X}_1$$

where

$\bar{Y}$ = Expected value of longer term assets held

$\bar{X}_1$ = Expected value of shorter term liabilities held

TTS = Term transformation summary whereby if

TTS   ` 0 - indicates positive term transformation

TTS   `. 0 - indicates negative term transformation

TTS   = 0 - indicates neutral term transformation.

The first order conditions in the case of the negative term transformation (TTS < 0) and neutral term transformation (TTS = 0) are also sufficient conditions for verifying the nature of term transformation in these institutions. However, in the case of positive term transformation, the sufficient condition or the second order condition is given by

$$TTSS = \bar{Y} - \bar{X}_2$$

where

$\bar{Y}$ =   Expected value of longer term assets

$\bar{X}_2$ =   Expected value of longer term liabilities

TTSS =   Sufficient term transformation summary whereby

if TTSS > 0 - imply that the second order conditions confirms the result suggested from the first order condition. On the other hand, if TTSS < 0 - we reject the result from the fulfilment of the first order condition and then confirm the possibility of the existence of negative or neutral transformation in the financial institution.

The second order condition ensures that the longer term asset holding in the portfolio apart from exceeding the volume of short term liabilities (FOC) also exceed the longer term liabilities such that it is not actually the longer term liabilities that is being transformed into longer term assets in which case transformation will not be positive as indicated by the first order conclusion. Our approach has the added advantage that, unlike the previous descriptive analysis, generalizations can be made for a longer time period unlike

in the descriptive analysis where the approach becomes burdensome for analysis as the number of years considered increases.

To ensure that analysis and consequently the inferences are unbiased and that the mean or expected values used in the comparison of means generate representative results, we adopt the test for comparison of means. According to this approach, we test the statistical hypothesis that the differences observed between the two measures of central tendency are not statistically significant and that the differences occur by chance. Thus we set up the hypothesis as follows

Null hypothesis Ho: $\bar{Y} - \bar{X}_1 = 0$

difference occur by chance, and in the case of FOC indicating positive term transformation we have an additional item in our hypothesis that

Null hypothesis Ho: $\bar{Y} - \bar{X}_1 = 0$

and $\bar{Y} - \bar{X}_2 = 0.$

The alternative hypothesis H_1: $\bar{Y} - \bar{X} \neq 0.$

The test statistic for the comparison of means is given by

$$tc = \frac{\bar{Y} - \bar{X}}{\sigma\sqrt{\frac{1}{NY} + \frac{1}{NX}}}$$

where $\bar{Y}$ and $\bar{X}$ = the mean values being compared.

NY = number of observations for the sample for which $\bar{Y}$ was computed

NX = number of observations for the sample for which $\bar{X}$ was computed.

$$\sigma = \sqrt{\frac{(NY - 1)\ Sy + (Nx - 1)\ Sx}{NY + Nx - 2}}$$

SY   =   standard deviation of the distribution of Y

SX   =   standard deviation of the distribution of X

The decision rule is that we accept the null hypothesis if -

$t\frac{\alpha}{2} < tc < t\frac{\alpha}{2}$ and reject the null hypothesis if otherwise.

$t\frac{\alpha}{2}$ is defined as the table value of t obtained from the t - distribution table at $\frac{\alpha}{2}$ tolerable margin of error and NY+NX-2 degrees of freedom.

4.7.2(ii)   Results and Interpretation

We investigated term transformation behaviour in the insurance and merchant banking firms both for each of the years and using the procedure we have developed in the previous sub-section.

The results are tabulated in Table 4.12 and Appendix 4.4. In the case of the merchant banks in each of the years the banks had a negative term transformation throughout the period. Based on our approach the firms still had a negative term transformation. The statistical test to verify the hypothesis indicate that the calculated value of t (tc) is -21.73 whereas the tabulated value $(\frac{\pm t\alpha}{2})$ is given as ±2.23. From our decision rule, this implies that we should reject our null hypothesis and thereby accept the fact that transformation is negative and thus reject null hypothesis of insignificance which by our own interpretation would indicate that term transformation is neutral in the merchant banking firms over the period. This term transformation in the merchant banking firm is negative.

For the life insurance companies we had transformation being positive from the first order condition using the summary approach and for all the years using the year by year approach. The t-test for verification indicate that we re,e·· the hypothesis and affirm the observed characteristics of positive term transformation, i.e.

TABLE 4.12

COMPUTATION OF TERM TRANSFORMATION FOR
INDIVIDUAL YEARS

A. MERCHANT BANKS

Year	Longer Term Asset (Y)	Shorter Term Liabilities (X_1)	$Y-X_1$
1980	351.96	357.1	-6.1
1981	535.24	669.32	-134.08
1982	856.26	1282.21	-425.95
1983	995.29	1626.94	-631.65
1984	1146.45	1381.90	-235.45
1985	1305.80	1441.80	-136.00

B. LIFE INSURANCE FUND

Year	Longer Term Asset (Y)	Shorter Term Liabilities (X_1)	$Y-X_1$
1980	135.33	22.93	112.4
1981	180.22	29.29	150.93
1982	268.45	103.39	165.06
1983	271.08	51.59	219.49
1984	301.87	65.57	236.30
1985	419.67	70.16	349.51

Year	Longer Term Asset (Y)	Shorter Term Liabilities (X_2)	$Y-X_1$
1980	135.33	256.57	-121.24
1981	180.22	342.57	-162.35
1982	268.45	407.82	-139.37
1983	271.08	473.86	-202.78
1984	301.87	541.30	-239.43
1985	419.67	613.38	-193.71

TABLE 4.12   (Contd.)

C.   NON-LIFE INSURANCE FIRMS

Year	Longer Term Asset (Y)	Shorter Term Liabilities (X_2)	$Y-X_1$
1980	130.52	319.72	-189.2
1981	180.28	449.97	-267.69
1982	220.02	549.75	-329.73
1983	257.01	612.14	-255.13
1984	496.67	829.48	-332.81
1985	553.89	883.03	-329.14

tc = 44.22 and $\frac{t\alpha}{2}$ = +2.31 which implies tc > $\frac{t\alpha}{2}$ over the period. However, based on the sufficient condition the TTSS < 0, thus we have to conclude that transformation is not positive. This is very obvious if we consider that over 70% of liabilities are long term and long term assets were even less than 55% in all the years considered. The t-test to verify the TTSS also led to a rejection of the hypothesis as tc = 28.37 and $\frac{t\alpha}{2}$ = ±2.23. Thus, we infer that the life insurance companies term transformation were negative and not positive as indicated by the first order condition (FOC).

For the non-life insurance companies a yearly consideration indicated the existence of negative term transformation for each of the years considered. The summary approach also revealed that term transformation was negative over the period 1980-85 in these companies.

The t-test led to a rejection of the null hypothesis with tc = -36.97 and $\frac{t\alpha}{2}$ = ±2.23.

This observed behaviour of the non-life companies is very pathetic as these firms are only required by law to hold only 40% of assets in the short term assets category contrary to the observed 68.3%, 64.5%, 63.9%, 66.8%, 49.2% and 49.0% of total assets held in this form by these institutions from 1980-85.

From our discussion on the maturity structure of portfolio holdings and our statistical test to verify the nature of term transformation in these institutions, it is easily discernible that the life insurance companies which hold their portfolio in longer term assets contribute most to economic development as far as the provision of long term finance is concerned. Also their portfolio behaviour enhances

the development of the Nigerian financial market particularly the capital market (which is the long end of the financial market); which by all standards is relatively underdeveloped compared to the capital markets of the developed economies both in terms of the securities listed and the volume of transactions on the market. However, as revealed in our analysis, term transformation in these institutions is negative and also, over 70% of total liabilities are long term in nature and lower than 55% of total assets are held in longer term assets moreso if we take into cognisance that only 25% of total assets held are required to be kept as short term assets according to the insurance act of 1976, we posit that these institutions can further increase their long term asset component both to benefit in terms of possibly higher profits and also to further contribute to the development of the Nigerian capital market as well as enhance the growth of industries and general economic development of Nigeria.

Our analysis also reveals that the non-life insurance companies and the merchant banks particularly, are granting predominantly shorter term loans and advances (see Table 4.8). They are also investing in the shorter end of the Nigerian financial market. This is surprisingly the case for the merchant banks whose deposit liabilities are marginally shorter term in nature, and their overall liability holding also short term in nature, relative to the longer term component of their asset portfolio. These deposits and to some extent their overall liability holding are fixed in nature. They should be able to transform these funds into longer term assets which are critical to the development of the financial system and the overall Nigerian economy. Ajayi and Ojo (1981 p. 58) earlier noted this

feature. They argue that the merchant banks are yet to perform their expected role of enlarging and strengthening the capital market through the provision of medium and long term finance.

Despite our fear regarding the lack of suitable and 'profitable' (profitability not only in terms of returns but also in terms of the risk involved in investment) long term avenues for investment of funds as evident in the Nigerian financial market, we observe that these institutions, particularly the insurance companies, could float new equity or hold equity shares in other companies in the productive sector. This is because the merchant banks are only allowed by law to hold the equity of any company for not more than six (6) months or help in ensuring the listing of new issues on the stock exchange by providing the required capital for listing on the stock exchange.

Also the institutions could contribute to economic development by extending the term structure of the loans they offer as this will facilitate acquiring industrial equipment whose pay-back period is not short term but in the long period. The merchant banks should also endeavour to increase and improve on their equipment leasing activity which is one of the long term asset component of their balance sheet. This is advantageous and crucial to the industrial development of Nigeria as these banks can thus provide these facilities for small scale industrial establishments who do not have the capacity to purchase these equipments described as engine of growth for the Nigerian economy.

4.8 Summary of Deductions

In this chapter, we have identified and discussed the expected and observed structure of the portfolio holdings of insurance and merchant banking institutions in Nigeria from 1980-85. We have also statistically verified some of the crucial phenomena identified from the examination of the balance sheet structure and flow of funds in the institutions, apart from providing a description of each of the items found in their balance sheet.

We find that on the liability side, life insurance companies unlike merchant banks and non-life insurance companies have majority of the holdings as premium (deposits). This premium fund represents a steady source of fund against the observation for the deposits of the merchant banks and premium deposits of the non-life insurance companies.

We also identified the narrowness and lack of alternative debt instruments in these institutions. Also we identified the lack of diverse sources of suitable and profitable investment instruments.

On the asset portfolio structure, we identified a variation in holding patterns. For example, the non-life insurance companies were holding cash and other cash items predominantly, while the merchant banks hold predominantly loans and advances. Life insurance companies had a greater proportion of asset holdings in securities (both public and private).

We adopted the analysis of variance using the Snedecor's variance ratio test to verify the hypothesis of whether the observed variations in the asset portfolio are statistically significant or whether they occur by chance. Our results for 1980 to 1982 reveal that the

variations are chance occurrences, that is they were not statistically significant while for 1983, 1984 and 1985 the results were statistically significant, that is there is a continuing divergence between the asset holding patterns in these institutions.

We also provided an analysis of the maturity structure and term transformation in these institutions. .Our analysis indicates that life insurance companies predominantly incur longer term liabilities. The non-life companies had a clear preference for both short term asset and liabilities. Lastly, for the merchant banks, we had a data limitation as a larger proportion of the asset and liability holdings are unclassified with regards to their maturity structure. However, for the available items, liabilities were predominantly short term in nature while there was a continuing decline in the demand for the longer term assets in the balance sheet of the merchant banks.

In our analysis of the term transformation, an empirical approach to provide valid generalizations on the nature of term transformation in these institutions was developed. Our results revealed that all the institutional type had negative term transformation based on the first order and second order conditions developed. This was even the case for the life insurance companies which invest between 45% and 55% of their asset portfolio in the longer term components.

The implications of our analysis of the balance sheet structure and flow of funds in insurance and merchant banking firms are that:

(1)   The contributions of these institutions to overall economic development and particularly the development of the Nigerian financial market is limited, when we consider to what extent these institutions have been performing their special intermediation function of providing long term finance for development in Nigeria. Even the life insurance funds which provide between 45% - 55% of their asset portfolio as long term finance can still do better considering the structure of their liabilities and the regulatory environment which provides for only 25% of asset holdings in short term components.

(2)   The analysis also indicates that the narrowness of the financial market, apart from the classical determinants of the portfolio behaviour namely liquidity, solvency, profitability and government regulation considerations, affect the asset configuration and general portfolio behaviour in these institutions. Thus we recognise the need for the development of more suitable and viable debt and investment instruments in the money and capital markets in Nigeria.

(3)   The observed variations in the asset portfolio of both the Central Bank, regulated merchant banks and the relatively uncovered insurance companies by monetary policy circulars and directives imply that for the effectiveness of monetary policy in the country there is a need for the inclusion of these institutions in the policy guidelines of the Central Bank, as well as the development of stiffer and enforceable penalties for non-compliance in both institutional types.

(4)   Lastly, still based on the result from the statistical test of variations in asset holding patterns whereby the variations for 1980 to 1982 were not significant and those for 1983 to 1985 were significant, there is the implication that significant adjustments must have taken place in the asset holding patterns within these institutions.   Thus there is a need for the development of models, particularly dynamic models to further provide insight into our preliminary results and also explain the general portfolio behaviour in these institutions as well as provide clues on the nature, speed and causes of these identified portfolio adjustment in these institutions. The models developed in the next chapter are centered on providing clues on these issues.

CHAPTER FIVE

MODELLING PORTFOLIO BEHAVIOUR OF INSURANCE AND MERCHANT BANKING FIRMS IN NIGERIA

5.1   Introduction

The basic issue in this chapter, is to develop models that explain the portfolio structure and portfolio selection behaviour of insurance and merchant banking firms in Nigeria.

Our objective is to provide an understanding of how these institutions select their portfolio items and describe the responsiveness of the overall portfolio configuration to changes in the existing rates of interest on portfolio items and the level of the exogenous variables.

The models are built to examine the substitutability and complementarity of risky assets and liabilities in these institutions, as well as to investigate the impact of portfolio composition and behaviour in these institutions on

(a)   the effectiveness of monetary policy;

(b)   financial market development; and

(c)   the level of economic activity.

We also investigate the structure and process of portfolio adjustment thereby providing clues on the speed and causes of portfolio adjustment in the insurance and merchant banking institutions.

Three models are developed to achieve the above specified objectives.   The first two models concern the development of a speculative model based primarily on the theory of portfolio choice under conditions of uncertainty; the first of these models is a

static model while the second is the dynamic version of the model.

The third model is built essentially to investigate the impact of financial institutions portfolio composition on the level of economic activity.

In Sections 5.2 and 5.3 respectively, the layout of the static and dynamic model of portfolio choice under uncertainty are presented while Section 5.4 discusses the estimation procedure and problems in empirical test of these models. Section 5.5 contains the model proposed to analyse empirically the effect of portfolio composition on economic activity and Section 5.6 examines the estimation techniques and problems in empirical test of the model. The last section presents a summary of the hypothesis for empirical test using the three specified models.

5.2   The Static Model of Portfolio Choice Under Uncertainty

The choice theoretic model developed on the behaviour of insurance and merchant banking firms in Nigeria is based on earlier works by Parkin (1969, 1970)[1]. It assumes that each firm in the insurance and merchant banking industries possess a utility function of the form[2]

$$U = a - ce^{-b\pi} \qquad \cdots \qquad (1)$$

[1] As mentioned, the static model developed in this section is largely based on the work of Parkin. Parkin himself noted (see Parkin (1969)) that the models are grounded firmly on the theory of portfolio selection developed by Markowitz (1952) and Tobin (1958).

[2] The form of utility function adopted was first proposed by Freund (1956). In addition to possessing the usual slope properties (positive first derivative and negative second derivative), it also has an upper bound. The utility functional type has been used widely by Parkin (1969, 1970) to investigate the portfolio selection behaviour of a number of financial institutions in the United Kingdom economy.

where

U = utility per decision period

a, b and c are parameters c, b 0; a 0

π = profit per decision period.

The decision period is assumed fixed and is a period long enough to guarantee or ensure that uncertainty surrounds both borrowing and lending. The assumption surrounding the uncertainty of both asset yields and cost of borrowing, ensures that profit is a stochastic variable with the specific assumption that profit is normally distributed about mean μ and with variance δ_π^2 , that is

$$\pi \sim N (\mu \pi, \ \delta^2 \pi)$$

(2)

π = Profit Per Decision Period.

The principal objective of these financial institutions is assumed to be profit maximization.

Again, as a result of uncertainty we have to maximize the expected value of the utility function subject to the balance sheet constraint. We can therefore, find the expected value of the assumed utility function taking into account the normality distribution assumption of stochastic profits and incorporating the density function of the log-normal distribution as a result of the utility functional type specified.

Hence, since $\qquad V \sim \Lambda (\mu\pi, \ \delta^2\pi)$ (3)

and we have that the distribution function of U and π are related by $\Lambda(U) = N(\text{Log } U) \ U > 0$

where

$$d\Lambda(U) = \frac{1}{U\delta\pi\sqrt{2\Upsilon}} \ \exp \ [\frac{-1}{2\delta\pi^2} \log \ (U - \mu\pi)^2] du$$

with   = Constant = 22/7

describes the frequency curve of the distribution. The distribution possess moments of any order, and the jth moment about the origin is denoted by $\lambda^{'j}$ where

$$\lambda^{'j} = \int_{-\infty}^{\infty} u^j \, d\Lambda(U)$$

$$= \int_{-\infty}^{\infty} a - ce^{-b\pi} \, dN(\pi) \qquad (6)$$

which from the properties of the moment generating function of the normal distribution, gives the mean or expected value of the utility function as

$$E(U) = a - c \left[\exp \left(-\frac{b}{2} \mu_\pi + \left(\frac{b}{2} \right)^2 \sigma_\pi^2 \right) \right] \qquad (7)$$

Thus, the individual firm attempts to maximize the following function of the parameters of the probability density function of stochastic profits such that

$$\text{Maximize } E(U) = \text{Maximize } \left(\mu_\pi - \frac{b}{2} \sigma_\pi^2 \right) \quad \ldots \qquad (8)$$

where μ_π and σ_π^2 refer to the mean and variance of profit respectively as earlier indicated. Consequently, the objective function which the individual insurance and merchant banking firms seek to maximize is given by

$$W = \mu_\pi - \frac{b}{2} \sigma_\pi^2 \quad \ldots \qquad (9)$$

THE BALANCE SHEET

Items included in the balance sheet of these institutions are classified into:

(1) The choice set items – these are portfolio items among which the financial firm is assumed to choose when pooling or allocating financial resources. They represent a vector of

interest bearing liabilities and earning assets (x_1) of order nx 1. Our model seeks to explain financial behaviour with regards to movements in the choice set items.

(2) The level of net exogenous items - this represent the operating level of exogenous items in the balance sheet, that is the total exogenous assets less total exogenous liabilities (X_2)

where

$$X_2 = EA - EL \qquad \ldots \qquad (10)$$

EL = Total exogenous liabilities

EA = Total exogenous assets.

The exogenous components of the balance sheet are those items whose levels are assumed to be determined independently or prior to any choice procedure undertaken by the financial institutions. The volume or level of these exogenous items is recognised to influence or affect the allocation of financial resources to the choice set items.

Thus, the balance sheet constraint that total assets must equal total liabilities implies that

$$i'x_1 + X_2 = 0 \qquad \ldots \qquad (11)$$

where

i = a unit vector of Order 1 xn containing positive and negative units.

The portfolio selection problem, taking cognisance of the balance sheet constraints, becomes

$$\text{Max} \quad W = \mu_\pi - \frac{b}{2} \sigma_\pi^2$$

Subject to

$$i'x_1 + X_2 = 0 \qquad \ldots \qquad (12)$$

In providing solution to the problem, we define profit to be the returns on earning assets less the cost of borrowing. Thus

$$\pi = r'x_1 \qquad \ldots \qquad (13)$$

where

r = a 1xn vector of observed rates of interest corresponding to the choice set items.

The observed rates of interest are assumed to be measured with errors as they are postulated to contain forecasting errors as a result of uncertainty.

Therefore,

$$\hat{r} = r + \varepsilon \qquad \ldots \qquad (14)$$

where

$\hat{r}$ = 1 x n vector of expected yield and borrowing costs

ε = 1 x n vector of errors in forecasting.

Assuming further that $E(\varepsilon) = 0$

$$E(\varepsilon'\varepsilon) = C \qquad \ldots \qquad (15)$$

where C = a symmetric variance - covariance matrix of forecasting errors.

Introducing (14) to (13) we have that

$$\pi = (\hat{r} + \varepsilon)' x_1 \qquad \ldots \qquad (16)$$

resolving

$$\pi = \hat{r}' x_1 + \varepsilon' x_1 \qquad \ldots \qquad (17)$$

$$E(\pi) = \hat{r}' x_1 + E(\varepsilon') x_1$$

implies

$$E(\pi) = r' x_1 \qquad \text{since} \quad E(\varepsilon) = 0 \qquad \ldots \qquad (18)$$

Thus

$$\mu_\pi = r' x_1. \qquad \ldots \qquad (19)$$

Also, the variance of the profit distribution (σ_π^2) is given by

$$\sigma_\pi^2 = E[\pi - E(\pi)]' [\pi - E(\pi)] \qquad \ldots \qquad (20)$$

From (17) and (18) we have

$$\sigma_\pi^2 = E[(\mathcal{E}' x_1)' (\mathcal{E}' x_1)] \qquad \ldots \qquad (21)$$

$$= x_1' E(\mathcal{E}\mathcal{E}') x_1$$

which implies

$$^2 = x_1' C x_1 \qquad \ldots \qquad (22)$$

Where $C = E(\ ')$ and it describes the variance - covariance matrix of the error terms.

Replacing (19) and (22) in (12), the portfolio selection problem becomes

$$\text{Max } W = r' x_1 - \frac{b}{2} x_1' C x_1$$

Subject to $\qquad i' x_1 + X_2 = 0 \qquad \ldots \qquad (23)$

All variables are as defined earlier. The Langrangean optimization procedure is adopted to resolve the portfolio selection problem by optimizing with respect to x_1 and the Langrangean equation is given by

$$L = \hat{r}' x_1 - \frac{b}{2} x_1' C X_1 + (i' x_1 + X_2) \qquad \ldots \qquad (24)$$

The first order conditions for a maximum are:

(a) $\quad \dfrac{dL}{dx_1} = \hat{r} - bCx_1 + \lambda i = 0 \qquad \ldots \qquad (25)$

(b) $\quad \dfrac{dL}{d\lambda} = i' x_1 + X_2 = 0$

Hence, we have that

$$\hat{r} - bCx_1 + \lambda i = 0 \quad \text{and} \quad i'x_1 + X_2 = 0 \qquad \ldots \qquad (26)$$

The second order condition that the principal minors of the Bordered Hessian Determinant (BHD) formed from the second order derivatives, alternate in sign starting from positive is satisfied as can be easily verified from below

$$\frac{d^2L}{dX_1^2} = -bc \qquad \frac{d^2L}{dx_1 d\lambda} = i$$

$$\frac{d^2L}{d\lambda dX_1} = i' \qquad \frac{d^2L}{d\lambda^2} = 0 \qquad \ldots \qquad (27)$$

Forming the BHD, we have

$$BHD = \begin{vmatrix} -bc & i \\ i' & o \end{vmatrix} \qquad \ldots \qquad (28)$$

Here, we find that the principal minors alternate in sign starting from positive.

From the first order conditions in (26) we can generate a system of demand/supply equations for the choice set item of the individual financial firm. That is from the equations below:

$$\hat{r} - bCx_1 + \lambda i = 0$$

$$i'x_1 + X_2 = 0$$

If we rearrange by multiplying throughout by (-1), we have that

$$\begin{bmatrix} x_1 \\ \lambda \end{bmatrix} = \begin{bmatrix} b^c & -i \\ -i' & 0 \end{bmatrix}^{-1} \begin{bmatrix} \hat{r} \\ X_2 \end{bmatrix} \qquad \ldots \qquad (29)$$

Since $\begin{bmatrix} bc & -i \\ -i' & 0 \end{bmatrix}$ is a partitioned matrix. We perform

a partitioned inverse (block inversion) after which we resolve the system. Consequently, we have that

$$x_1 = \frac{1}{b}\left[C^{-1} - \frac{C^{-1}ii' C^{-1}}{i' C^{-1}i}\right]\hat{r} - \left[\frac{C^{-1}i}{i'C^{-1}i}\right]x_2 \qquad (30)$$

We can re-write the equation as

$$x_1 = \frac{1}{b} z_1 \hat{r} - rz_2 x_2 \qquad \cdots \qquad (31)$$

where

$$z_1 = C^{-1} - \frac{C^{-1}ii'C^{-1}}{i' C^{-1} i}$$

and

$$z_2 = \frac{C^{-1}i}{i' C^{-1} i} \qquad \cdots \qquad (32)$$

The properties of z_1 and z_2 have been well documented and examined in the literature. (See for example Parkin (1969), Barret, Gray and Parkin (1975)). The first property of z_1 is symmetry. In this regard Parkin (1970) argues that, it follows directly from the symmetry of the variance-covariance matrix C. Since C is symmetric so is C^{-1}. The additional part of z_1 is also symmetric, $i'C^{-1}i$ is a scalar and is the sum of all the elements of C^{-1}, so only the symmetry of $C^{-1}ii'C^{-1}$ need be established. $C i^{-1}$ is a column vector, the elements of which are the row sums of C^{-1}. $i'C^{-1}$ is a row vector, the elements of which are the column sums of C^{-1}. Since C^{-1} is symmetric, $C^{-1}i$ is the transpose of $i'C^{-1}$ hence $C^{-1}ii'C^{-1}$ is symmetric, the ijth element of which is the product of the ith row sum and the jth column sum of C^{-1}. The two components of z_1 are symmetric therefore, z_1 is symmetric. Parkin

(1970) notes that the economic interpretation of this is identical to that of the symmetry of substitution effect in consumer choice theory.

Secondly z_1 has zero row and column sums by post multiplying by the unit vector i we find that $z_1 i = C^{-1}i - \dfrac{C^{-1}ii' C^{-1}i}{i' C^{-1}i}$

which implies

$$z_1 i = C^{-1}i - C^{-1}i = 0 \qquad \dots \qquad (33)$$

Also from the symmetry of z_1, it follows that the column sums of z_1 are also zero. The economic interpretation is that asset and liability adjustments following a change in the expected rate of interest must be carried out such that the balance sheet is kept in balance that is an increase in any choice set item, as a result of interest rate changes, will lead to a decrease in at least one of the other choice set items. This feature corresponds to the Cournot aggregation in consumer theory.

Thirdly, we have the property of non-negative diagonal and dominant negative (unsignable) off diagonal elements. From the second order conditions for maximization (28) the diagonal elements are non-positive by multiplying by (-1) to give (29) yields non-negative diagonal elements. The economic interpretation of this is that an increase in the own rate of interest on an asset will never lead to a decrease in the volume of that asset held while for liabilities, an increase in the liability rate will never lead to an increase in that liability. From the second property highlighted above, column sums and row sums equals zero. It follows that the sum of the off diagonal elements of z_1 is less than zero. In economic terms,

it implies that substitution dominates complementarity. However, complementarity between particular pairs of assets and liabilities cannot be ruled out a priori.

The sole property attributable to z_2 is with regards to the sum of the elements of the column vector which gives a value of minus unity. This directly follows if we consider pre-multiplying z_2 by i'. This implies

$$i'z_2 = \frac{-i'\ C^{-1}i}{i'\ C^{-1}i} = -1 \qquad \ldots \qquad (34)$$

This corresponds to Engel aggregation in consumer theory. The economic meaning here is that exogenous increase in wealth will be distributed such that it does not exceed the wealth constraint. In other words, an exogenous increase in funds will be shared among the choice set items such that the distribution of the proportion allocated to each choice set item will exactly equal the net increase in wealth.

Equation (31) represents the behavioural function for an individual financial firm, aggregating for the entire industry based on further assumptions of consistent aggregation and that all firms in the industry face the same vector of expected interest rate (r) (a plausible assumption for the Nigerian financial environment during the period covered by the study). This assumption, however, implies technically that the institutions are operating in a perfectly competitive market. Consequently, the institutions are assumed to face the same variance-covariance matrix (C). However, they are assumed to differ in their attitude towards risk (b) and their 'size' as measured by the level of net exogenous items (X_2).

Thus we can rewrite our model as

$$\dot{X}_1 = BZ_1\hat{r} + Z_2 X_2 \qquad \qquad \cdots \qquad (35)$$

where

$$B = \frac{1}{N} \sum_{i=1}^{N} b_i$$

N = Number of firms in the industry

$$X_1 = \sum_{i=1}^{N} X_{1i}, \qquad X_2 = \sum_{i=1}^{N} X_{2i} \qquad \cdots \qquad (36)$$

Thus, the static model developed for investigating portfolio behaviour in the insurance and merchant banking firms is given by

$$X_{1,t} = \alpha\hat{r} + \Omega X_2 + u_i \qquad \qquad \cdots \qquad (37)$$

Such that

$$\alpha = BZ_1$$

$$\Omega = Z_2 \qquad \qquad \cdots \qquad (38)$$

and given the following constraints

(a) The symmetry of α

(b) $i' \alpha = 0$ $\cdots$ (39)

(c) $i' \Omega = i'$

All variables and parameters are as defined earlier and u_i = randomly distributed (stochastic) error term.

The hypothesis from our analysis is that portfolio choice in terms of the demand for asset or supply of liabilities in the insurance and merchant bank, which seek to maximize their profit,

is explained by the level of the own rates and other rates of portfolio choice items as well as the level of the exogenous items.

5.3 The Dynamic Model of Portfolio Choice Under Conditions of Uncertainty

The ideal model of portfolio behaviour should be capable of explaining portfolio adjustment process with regards to the nature, speed and causes of portfolio adjustment in financial institutions. This is particularly the case when we consider the results of our preliminary analysis of portfolio structure of insurance and merchant banking institutions in the previous chapter (Chapter 4) which indicates that significant adjustments have taken place in the asset portfolio of these institutions over the period 1980-1985.

Consequently, we incorporate the Tobin-Brainard (1968) stock adjustment framework into the earlier specified static portfolio selection model formulation. The dynamic formulation allows for the possibility that the actual holding of assets/liabilities do not necessarily equal the desired value at any particular point in time. The change from one period to the other is posited to be a fraction of the difference between the actual and desired values.

Thus, our dynamic model formulation is such that

$$X^D_{1,t} = \alpha \hat{r}_t + \Omega X_{2,t} + U_i \qquad \ldots \qquad (40)$$

where

$X^D_{1,t}$ = (nx1) component vector of desired choice set items. All other variables are as defined earlier.

The stock adjustment formulation is given by

$$\Delta X_{1t} = S(X^D_{i,t} - X_{1,t-1}) \qquad \dots \qquad (41)$$

$$\Delta X_{1,t} = X_{1t} - X_{1t-1}$$

where

$X_{1,t-1}$ = one period lag in the choice set items

S = a matrix of lag adjustment parameters (speed of adjustment)

Resolving the system yields the testable hypothesis or equation

$$X_{1,t} = S\alpha r_t + S\Omega X_{2,t} + (1-S)X_{1t-1} + \mu_i \qquad (42)$$

or

$$X_{1t} = \theta_1 r_t + \theta_2 X_{2,t} + \theta_3 X_{1t-1} + \mu_i \qquad \dots$$

where

$$\left.\begin{array}{rcl} \theta_1 & = & S \\ \theta_2 & = & S\Omega \\ \theta_3 & = & 1-S \end{array}\right\} \qquad \dots \qquad (43)$$

Tobin and Brainard (1968) highlighted the need to impose within and across equation constraints on the parameters, in the estimation of the dynamic model due to the balance sheet identity. In our analysis, the following conditions must apply to the structural parameters in the model

$$i'\alpha = 0; \quad i'\Omega = i'; \quad \text{and} \quad i'S = i' \qquad (44)$$

These constraints are imposed on the reduced form parameters. Also, we recognise their similarity to those imposed on the static demand and supply equations. However, as White (1975) noted, the constraints on the symmetry of α as derived from the static model

are not included in the dynamic model, since the dynamic form of the model will not permit this in any simple non-iterative way because α appears in equation (42) only as a combination with S and moreso, it would be wrong to impose symmetry on $\theta_1 = S\alpha$ for this ensures the symmetry of α only if S is symmetric. White concluded by arguing that there are no reasons to believe that the conditions holds. Furthermore, even though equations (37) and (40) are identical, equation (37) assumes that expected utility is maximized in a single period which is optimal only in the absence of transactions cost. Therefore, it would be wrong to incorporate the symmetry of α into a system that presumes transactions costs (adjustment lags).

In conclusion, the hypothesis of the dynamic formulation is that the level of demand or supply for a choice set item can be explained or is determined by the level of the expected own rate and other rates of interest, the level of the net exogenous items as well as the level of the choice set item in the previous period.

5.4 Estimation Procedures and Problems in Empirical Tests of the Static and Dynamic Models of Portfolio Selection Under Uncertainty

5.4.1 Estimation Techniques

In this section, we discuss the methodology and econometric problems involved in estimating the specified static and dynamic equations as well as explain the approaches adopted in circumventing or solving these problems

Essentially, the problem at hand is one of estimating a linear

multivariate (but non-simultaneous) system with linear restrictions applying within and across equations. This problem, as Barret et al (1975 p. 510) noted, has received extensive consideration particularly in consumer demand studies. In this regard, we have based our procedure on previous studies such as those by Barten (1964), Court (1967), Byron (1979) and Zellner (1962).

Our procedure is to stack the equations in the manner suggested by Zellner (1962) and followed up by Parkin (1969), Byron (1970), among others, thereby resolving the system to a single equation.

The static and dynamic systems are intended to be estimated subject to some specified restrictions on the parameters of the equations. We posit a priori, that the restrictions envisaged in (39) and (43) respectively, are automatically satisfied by the data on assets and liabilities which presume an accounting identity. Moreover in deriving the estimating equation, the balance sheet constraint had been built into the derivations. Though, however, imposing the linear constraints may still be desirable, the computer facilities at our disposal do not allow for the estimation based on the restrictions; however, no major loss is expected by the limitation as we have earlier suggested.

The ordinary least squares (OLS) technique, with the intercept term expected to yield insignificant estimates (since computer facilities at our disposal could not allow for restrictions to zero of these estimates), was invoked to estimate the models. The Time Series Processor (TSP) computer package available at the University

of Lagos, computer centre was used to estimate the static and dynamic models specified. The estimation of the stacked system of seemingly unrelated regression equations would have necessitated multivariate/generalized least squares estimation techniques due largely to the likelihood of disturbances from the equations being estimated. Thus, the estimate of the parameters are postulated to be asymptotically more efficient than those obtained by the application of the OLS technique. However, econometric theory also indicates that application of OLS technique to the specified system of seemingly unrelated regression equations group will still yield Best Linear Unbiased Estimators (BLUE) if either of two conditions hold, namely:

(i)   if the disturbance in the different equations have zero co-variances, the estimates will reduce to OLS estimates, and

(ii)   if the matrix of explanatory variables is the same for each and all equations (that is the identical regressor case), t.._ generalized/multivariate least squares estimate again reduces to ordinary least squares estimates.

These two conditions can easily be demonstrated (see Johnston, J. (1972), pp. 238-41).

Hence, in our specified static and dynamic models of portfolio choice under conditions of uncertainty, the vector of explanatory variables in each equation of the separate models is the same (i.e. identical regressor case). Thus, the appropriate econometric estimation technique to estimate tne system is the OLS technique

which we have adopted in our empirical investigation.

To determine the portfolio sensitivity to the interest rate expectation vector, mean elasticities (η_{ij}) based on the reported parameter estimates were calculated whereby

$$\eta_{ij} = \frac{dX_{1i}}{dr} \cdot \frac{\bar{r}}{\bar{X}_{1i}}$$

The mean elasticities are more informative than the linear slope coefficients (parameter estimates) reported since it is not easy to infer the sensitivity of asset and liability changes to interest rate by merely inspecting them.

With regards to evaluating stability of the estimated dynamic systems, literature has indicated a series of approaches for this purpose, these include calculating the eigenvalue or eigenvector of the estimated parameter matrix and making inference from this. Computer facilities at our disposal have also made it mandatory to adopt a very simplified approach which gives valid result and has also been put to use in other similar studies (see for example Ajayi (1974, 1976), and Obioma (1987) where also they discuss the strength of this method). The approach involves fitting a trend dummy from 1- 1965 in the case of merchant banks, and 1- 1969 in the case of insurance companies to (21) and (17) respectively. The statistical significance of this dummy variable is then evaluated. If it is statistically significant it implies that the estimated dynamic system is unstable and if it is statistically insignificant it implies the estimated system is stable and can be used for predictive purposes.

That is if $\frac{dX}{dT}$ = constant - system is unstable

but if $\frac{dX}{dT} = 0$ (i.e. statistically insignificant) which implies the system is stable and does not fluctuate with variation in the time frame.

5.4.2 The Balance Sheet of Insurance and Merchant Banking Firms

The balance sheet of these institutions are classified into choice set items and exogenous components. The choice set items are those among which banks are assumed to choose, when allocating or sourcing for financial resources. This thesis seeks to explain movements in choice set items. Exogenous items are those whose levels are determined independently of (or prior to) such a choice procedure. Most exogenous items, in the bank balance sheets, are so classified because it is assumed that these institutions simply accommodate movements in their components.

We also recognise the need to consolidate balance sheet items, since at any point in time, the true portfolio position of each institution and of financial institutions in general may be described by a balance sheet with all items at market values. Any such balance sheet might contain well over thirty items. Fortunately, for the task of model building such items can often be sensibly aggregated, thus, simplifying the task of model building and estimation. The distinction between choice set and exogenous items and the process of balance sheet consolidation, also, makes the task of explaining changes in aggregate balance sheet items easier. Secondly, it helps ensure that the degree of freedom requirements are met in empirical estimation, since we have only a limited number of portfolio observations in these institutions. The need to

distinguish between choice set items and the exogenous items also leads to further simplication of the analytical problem at hand.

Further constraints are evident in the non-availability of detailed information on the operations of the insurance and merchant banking institutions both in terms of the time spread and the level of disaggregation. This is, particularly, the case for the insurance companies where data materials are available only from 1969 up till 1985 only and moreover only on annual basis, even though for the merchant banks data materials are available at least from 1965 to 1985 on monthly, quarterly and annual basis. Our empirical investigation will therefore cover the period 1969-1985 for the insurance firms using annual data while for the merchant banks the study will cover the period 1965-1985 using annual data as well, so as to ensure conformity. This data limitation further necessitates the need for balance sheet consolidation.

The categorization and consolidation of balance sheet items into choice set items and exogenous items are contained in Tables 5.1 (A,B) and 5.2. A description of the balance sheet items that make up each category is included in Appendix 5.1. Our discussion below concerns only the classification of some items we consider noteworthy or controversial.

In the case of the merchant banks, demand deposits are assumed to be exogenous because of the argument that the banks cannot influence their level as they are assumed to take all demand deposits offered contrary to the believe for time deposits and the certificates of deposits issued, where we presume the bank can restrict the total amount of these deposits. Moreover, these banks

pay interest on these deposits and therefore acceptance of these deposits can only be undertaken subject to finding viable investment outlets for them, contrary to demand deposits for which during the period covered by the study the banks do not incur any borrowing cost and accept an administrative charge on the deposit. Hence, the bank can afford, at least to some extent, to keep these deposits in idle balances, thereby they accept all deposits offered contrary to the 'expected' behaviour for time deposits, bank borrowing and the certificates of deposits issued. Based on a similar argument, we classify insurance premium as a choice set items for the insurance companies.

Our position, thus, indicates that the problem facing financial intermediaries is not choosing assets level given a certain portfolio size but that in satisfying the profitability, liquidity and solvency constraints faced, the institutions must choose both the level of deposits/premiums to accept and the optimal allocation of funds over the various asset categories it holds simultaneously.

Also, some scholars have assumed loans and advances as exogenous (see for example Parkin et al (1969) and Norton (1968)). The argument being that banks will supply the demands of credit worthy customers subject to credit ceilings imposed by the monetary authorities. However, our position in this study is to assume endogenous determination of loans and advances based on the argument that banks might prefer to make advances but they can also direct their resources to other uses provided the inducement is large enough to offset their preferences. Hence, financial institutions may have an identifiable supply of loans and advances function.

TABLE 5.1   MERCHANT BANKS

5.1A

ITEMS	CATEGORIES
Choice Set	Total loans and advance Money market investment (treasury bills and treasury certificates). Other Investments. Time Deposits and Borrowed Funds. (less demand deposits.)
Exogenous Items	Net balances held Capital account Demand deposits Other liabilities Other assets.

TABLE 5.1 (B)

ITEMS	CATEGORIES
CHOICE SET	Total loans and advances Treasury bills Treasury certificates Equipment leasing Other investments Time deposits Borrowed funds
EXOGENOUS	Capital account Demand deposits Other liabilities Other assets Net balances held

TABLE 5.2   INSURANCE COMPANIES

ITEMS	CATEGORIES
Choice set	Government Securities. Other investment. Total loans and mortgages. Premium supply.
Exogenous Set	Net amount due from various sources Capital account Reserves Other liabilities Other assets Balancing items.

5.4.3   Interest Rates and Expectations Hypothesis

Estimation problems are encountered in that the decision period yield or cost of choice set items are specified in terms of expected interest rates which are unobservable directly.   The expected interest rates were captured by using alternative proxies. Essentially two proxy series were tried

(a)   Interest rate. lag by one period.

(b)   Current rate . of interest.

The basic procedure is to report the proxies which perform best in terms of the goodness of fit, the satisfaction of a priori specification restrictions on parameters in the model as well as the overall performance of the model.

In the empirical test of the model, only explicit monetary returns on choice set items will be considered in the vector of yields and borrowing costs.   Also, the corresponding rates of interest will be used for the individual choice set items, which for the items that have been consolidated a pooled simple average rate of interest will be adopted except otherwise stated in the relevant sections of the thesis.

The premium supply to insurance companies are assumed to attract the going rate on long term commercial bank deposit for life insurance fund supply and short term deposit rate for the non-life insurance fund premium supply.

The frequency of claims in life insurance and non-life insurance firms was also tried as a proxy to measure the cost of funds in the insurance industry as well as to capture the con-straint imposed on funds supply due to high withdrawal and vice

versa. The frequency of claims is computed simply as a ratio of claims in a particular period to total claims for the entire period covered.

Also, in the model estimation, the occurrence of multi-colinearity cannot be overruled. First most of the interest rates are observed, on a priori basis to move in response to fluctuations in the discount rate. Second, there is the potential data problem concerning the limited number of observations available for the empirical work, which will further aid the existence of this econo-metric problem. Multicolinearity may lead to large standard errors and hence, badly determined parameter estimates.

5.4.4   The Effect of Monetary Regulation and the Civil War

Two dummies, one for the insurance companies was intro-duced to capture the effect of the companies being relatively more deregulated than the merchant banks, the dummy carried a value of unity (1) when regulation was not in force and a value of zero (0) otherwise. The other dummy introduced for the civil war years was empirically tested only for the merchant banking firms whose period of study covered the civil war years. The dummy carried a value of Unity (1) during the civil war years 1967-70 and zero (0) otherwise.

5.5   Modelling the Effect of Portfolio Composition on Economic Activity

The objective of this model is to test the hypothesis regard-ing the relational issue of whether or not portfolio composition in terms of whether the asset portfolio holding is more in favour of

loans as compared to total investments of the insurance and merchant banking institutions affect the level of economic activity proxied by the Gross Domestic Product (GDP). It considers also, whether the insurance and merchant banking firms with diversified portfolio holdings have differentiated impact on the economy in Nigeria.

The basic model specified to examine the above issues is as specified below (all variables are in natural logarithms)[3]:

$$EA = a_0 + a_1 MS + a_2 FP + a_3 PC \qquad \ldots \qquad (45)$$

$$DPC = b_1 + b_1 EA + b_2 (STR/AFR) \qquad \ldots \qquad (46)$$

$$SPC = C_0 + C_1 SECA + C_2 (STR/INVR) \qquad \ldots \qquad (47)$$

$$DPC = SPC = PC \qquad \ldots \qquad (48)$$

where

EA = Economic activity proxied by the Gross Domestic Product

MS = Money supply (both the narrow (MSA) and broad (MSB) definitions are tried)

FP = Fiscal process proxied by the ratio of government expenditure to revenue

PC = Portfolio composition variable defined as the ratio of bank loans to earning assets (loans and Investment)

DPC = Demand for bank loans as a ratio of bank earning assets

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[3]The model developed to investigate the effect of portfolio composition on economic activity is similar to that adopted by Batavia and Lash (1982) to investigate the same problem in the United States economy.

SPC = Supply of bank loans as a ratio of bank earning assets.

STR = Short term lending rate

AFR = The rate on alternative means of financing

SECA = Surplus exogenous component of asset portfolio

INVR = The yield on investments.

The model has MS, FP, AFR, SECA and INVR as exogenous variables.

The first equation (equation (45)) relates the level of economic activity to the portfolio composition variable, the money supply and the fiscal variable. The argument here is an extension of the St. Louis single equation model which posit that monetary and fiscal variables are the major determinants of the level of economic activity, proxied by the Gross National Product in their case. The portfolio composition variable was added to measure its additional explanatory power for the level of economic activity or growth, beyond that provided by the two variables in the St. Louis model. All the three variables are expected to have a positive relationship with the level of economic activity.

The second equation postulates that the demand for institution portfolio composition, in terms of the demand for bank loans as a ratio of bank earning assets, is a function of GDP and the ratio of the bank loan rate to the rate on alternative means of financing which we represent by the discount rate due primarily to inavailability of data on such information and the fact that most rates are linked to the discount rate, as well as that the narrowness of the financial markets makes the central bank crucial in providing or

regulating alternative means of finance. The demand for bank loans is expected to increase with increase in GDP and decrease as the ratio of the bank loan rate to the rate on alternative means of financing increases.

Lastly, the third equation posits that the supply of bank loans expressed as a ratio of bank earning assets will be affected by the changes in the supply of exogenous asset components and changes in the ratio of the loan rate to rate on investment proxied by a simple pooled average of available rates on investment items (INVRA) and the treasury bill rate (INVRB). Since both bank loans and investments are postulated to be positive functions of the supply of exogenous asset components, the proper sign of coefficient C_1 is not obvious. Also, it is identified that the proper sign of C_2 on a priori grounds is uncertain. C_2 could be positive to reflect that an increase (decrease) in bank loan rates, relative to investment rates would induce banks to hold a larger percentage of their portfolio as loans (investments). If bank loans are perceived to be more risky however, banks may react both by raising bank loan rates, that is charging a higher risk premium and by adjusting their portfolios in favour of investments, in such a case C_2 would be negative. Thus, the difficulty in predicting the correct sign of C_2 on a priori grounds.

5.6 Estimation Procedures and Problems of Modelling the Effect of Portfolio Composition on Economic Activity

The model is specified in log linear form and in estimating the above specified simultaneous equation system which the order and rank conditions revealed were over identified, a comparison of

two main techniques of estimating such simultaneous systems was
invoked in terms of providing estiamtes that are BLUE as well as
asymptotically efficient.

The two-stage least squares procedure (2SLS) has the advan-
tage that the parameters of the equations are estimated indepen-
dently of the remaining parameters of the system. However, in
the presence of autocorrelation the 2SLS method leads to incon-
sistent estimates of the variance - covariance matrix, even though
the structural coefficients are consistent.

The 2SLS procedure, as noted, give estimates that are con-
sistent but in general, not asymptotically efficient. This is because
the 2SLS does not take into consideration the correlation of
disturbances across equations or the prior restrictions on other
equations in the system. The three stage least squares (3SLS)
which estimates all the equations in the system simultaneously takes
into account the above problems associated with the 2SLS procedure.
Hence, the 3SLS technique is desired in estimating a simultaneous
system such as that which has been specified. In essence both
the 2SLS and 3SLS procedures are adopted to estimate the simulta-
neous system. The results are used to evaluate the specified
hypothesis that loans have a larger impact on economic activity than
financial investments by these insurance and merchant banking
firms in Nigeria. This study reports also the OLS result for
equation (45) so as to provide comparability with earlier studies
using single equation models to evaluate the same hypothesis. It
is recognised that in estimation using the 3SLS procedure the
Durbin-Watson (D-W) statistic for verifying the presence or other-
wise of autocorrelation has no meaning. In the same vein the

goodness of fit statistic (R^2 or $\bar{R}^2$) has no clear formal meaning when using 3SLS. The properties of these simultaneous equation estimation methods are asymptotic and therefore, the Z distribution is more appropriate than the t-tests in verifying the statistical significance of the estimated parameters. Therefore, the ratio of the coefficients to their respective standard errors are reported.

5.7 Summary of Hypothesis for Empirical Tests

In the next two chapters, the three models specified based on the observed behaviour of insurance and merchant banking firms in Nigeria are empirically tested. Annual data covering the period 1969-1985 for the insurance companies and the period 1965-85 for the merchant banks are adopted in the empirical investigation. All data series refer to the end of period.

The models specified for empirical investigation can be summed up under three broad hypotheses:

(a)   That the demand for a choice set item (that is an endogenous portfolio item) is explained by the level of the expected own rate and other rates of interest for portfolio choice set items as well as the level of the net exogenous components of the balance sheet for the insurance and merchant banking firms which are assumed to be profit maximizers.

(b)   That level of the demand or supply for a choice set item can be explained or is determined by the level of the expected own rates and other rates of interest, the level of the residual or exogenous items as well as the

level of the choice set items in the previous period; granted that the profit maximizing insurance and merchant banking firms' actual holding of assets and liabilities do not necessarily equal the derived value at any particular point in time and that partial adjustment behaviour is assumed for these institutions; and

(c)   That the portfolio composition of these financial institutions affect the level of economic activity and that, particularly, loans have a larger impact on economic activity than financial investments by these insurance and merchant banking institutions in Nigeria.

The empirical investigation of these hypotheses will allow an understanding and explanation of the portfolio behaviour of these institutions with particular reference to interest rate effect on portfolio sensitivity, substitutability and complementarity among risky assets and the portfolio adjustment process in these institutions. The models further provide a basis for understanding the impact of financial intermediaries portfolio behaviour on the effectiveness of monetary policy, financial market development and the level of economic activity in Nigeria.

CHAPTER SIX

ESTIMATION, EVALUATION AND ANALYSIS OF PORTFOLIO BEHAVIOUR MODELS UNDER UNCERTAINTY

6.1 Introduction

The chapter reports the results of empirical test of models of portfolio behaviour of Nigerian insurance and merchant banking firms as discussed in the preceding chapter.

The test of the models of portfolio behaviour was conducted within a framework of rational choice in conditions of uncertainty. The results are also examined with a view to deriving the implications for economic policy, as well as for financial market development and also, general management.

In order to achieve the stated objectives, the static and dynamic models of portfolio choice under uncertainty discussed in Chapter 5 (Sections 5.2 and 5.3), particularly equations 37 and 42, were estimated for the different categories of insurance companies and the merchant banks. Empirical investigations were carried out as was discussed and specified in the chapter (see Section 5.4).

6.2 Results and Discussions of Results

6.2.1 Static Model: Merchant Banks

The results of the static model for the merchant banking firms are contained in Tables 6.1 - 6.12.

Generally, for all forms of equations, the results were significant as indicated by the F-statistic values for the different

balance sheet types as well as the interest rate proxies (i.e current levels - interest proxy 1 and lagged interest rate - interest proxy 2) tried.

In all cases, the model accounted for about 85% explanation of the dependent variable in terms of the coefficient of determination (R^2) value while the adjusted R^2 ($\bar{R}^2$) was above 75%.

In terms of autoregressive disturbances, the model performed satisfactorily, with the Durbin-Watson test indicating that auto-correlation was not present in all equations except for cases which fell in the critical region (i.e. for which the test is inconclusive). Specifically, the treasury certificate and other investment equations in Balance Sheet A interest proxy 1 case and the money market instruments equation as well as other investment equation in Balance Sheet B interest proxy 1 case, total loans and borrowed funds equation in Balance Sheet B interest proxy 2 case fell in this region.

Regarding the a priori assumptions, the expectation on the intercept term (C) to be statistically insignificant for both interest proxies was met in Balance Sheet A as well as for interest proxy 2 in Balance Sheet B. However, this expectation was not met in the total loans, money market instrument and borrowed funds equations in Balance Sheet B interest proxy 1.

In all cases, the assumption of symmetry was not met though the results in most cases indicated that assumptions regarding the column and row sums of the structural parameters were not met. This is contrary to similar estimation of the unconstrained model by Parkin (1970, p. 487); this inference holds also for the dynamic

MERCHANT BANK STATIC MODEL (BALANCE SHEET A)

	C	STR	TBR	TCR	ELR	OIR	TOR	BFR	NECM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	-879.36 (-1.32)	-7.74 (-0.06)	-38.59 (-0.28)	7.63 (0.38)	106.94 (0.63)	110.46 (1.43)	87.55 (0.95)	-67.91 (-0.81)	-0.54 (-3.39)	0.99	0.98	2.35	103.58	104926.0	-119.22	93.51
TBM	233.73 (0.62)	-29.43 (-0.41)	7.59 (0.09)	-2.66 (-0.23)	-21.35 (-0.22)	-20.38 (-0.47)	21.55 (0.41)	14.44 (0.30)	-0.84 (-3.82)	0.98	0.97	2.27	72.33	33820.7	-107.33	53.09
TCM	-9.95 (0.12)	1.19 (0.07)	-16.78 (-0.96)	-0.04 (-0.02)	-16.62 (-0.77)	-3.79 (-0.39)	1.16 (0.01)	37.05 (3.50)	(0.04) (3.91)	0.83	0.72	1.78	7.49	1688.46	-75.86	11.86
ELM	-27.90 (-2.05)	2.94 (1.41)	-2.62 (-0.92)	-0.65 (-1.58)	-6.37 (-1.82)	-6.02 (-3.81)	5.78 (3.05)	12.18 (7.11)	-0.04 (-5.19)	0.99	0.99	2.57	362.65	44.12	37.59	1.92
OIM	-179.06 (-0.98)	11.68 (0.34)	39.43 (1.04)	-7.21 (-1.31)	-32.69 (-0.70)	1.71 (0.08)	53.16 (2.10)	-18.94 (-0.83)	0.05 (0.45)	0.86	0.77	1.54	9.37	7094.57	-92.06	25.65
TDP	412.70 (2.09)	25.77 (0.69)	11.89 (0.29)	4.34 (0.73)	15.06 (0.30)	-32.07 (-1.40)	-116.18 (-4.24)	-31.26 (-1.26)	0.46 (3.96)	0.99	0.99	2.26	468.80	9245.43	-93.72	27.80
BDF	450.04 (1.44)	-4.40 (-0.07)	-0.91 (-0.01)	-1.42 (-0.15)	-44.97 (-0.56)	-49.91 (-1.37)	-53.02 (-1.39)	54.45 (-0.19)	-0.03	0.97	0.94	2.19	43.16	23159.9	-103.36	43.93

TABLE 4.1:   Interest Proxy 1

	C	STR	TBR	TCR	ELR	OIR	TDR	BFR	NECM	CWDM	R^2	$\bar{R}^2$	D.W	FC	SSR	LLF	SER
TLM	-887.46 (-1.17)	-7.37 (-0.05)	-38.36 (-0.26)	7.59 (0.34)	106.52 (0.57)	110.42 (1.37)	87.73 (0.88)	-67.91 (-0.78)	-0.54 (1.27)	0.50 (0.01)	0.99	0.96	2.25	59.17	3368.3	-119.22	
TBM	199.22 (0.47)	-23.35 (-0.29)	11.38 (0.14)	-3.46 (-0.28)	-28.03 (-0.26)	-21.04 (-0.46)	24.53 (0.43)	14.55 (0.29)	-0.83 (3.44)	8.26 (0.21)	0.98	0.96	2.25	59.17	33686.3	-107.29	
TCM	-3.13 (-0.03)	-0.01 (-0.0008)	-17.53 (-0.94)	0.12 (0.04)	-15.30 (-0.64)	-3.66 (-0.36)	0.57 (0.05)	37.03 (3.35)	0.05 (-0.89)	-1.63 (-0.91)	0.83	0.70	1.80	6.12	1683.21	-75.83	
ELM	-23.80 (-2.01)	1.98 (0.93)	-2.35 (-1.45)	-0.53 (-1.36)	-5.46 (-3.25)	-3.51 (-2.98)	4.93 (3.02)	11.86 (6.58)	-0.05 (-5.12)	1.36 (0.24)	0.99	0.99	2.53	354.21	46.18	-35.43	
OIM	-223.23 (-1.10)	19.44 (0.51)	44.26 (1.11)	-8.28 (-1.38)	-41.20 (-0.81)	0.86 (0.04)	56.96 (2.11)	-18.81 (-6.58)	0.07 (0.59)	10.52 (0.56)	0.87	0.76	1.57	7.89	7676.35	-91.76	
TDP	466.48 (2.12	16.36 (0.40)	6.02 (0.14)	5.58 (0.87)	25.39 (0.46)	-31.04 (-1.32)	-120.79 (-4.16)	-31.42 (-1.24)	0.44 (3.51)	-12.77 (-0.63)	0.99	0.99	2.20	395.86	8924.25	-93.34	
BDF	478.07 (1.35)	-9.35 (-0.14)	-3.99 (-0.06)	-0.77 (-0.07)	-39.54 (-0.45)	-49.37 (-1.30)	-55.44 (-1.19)	54.36 (1.33)	-0.05 (-0.23)	-6.71 (-0.21)	0.97	0.94	2.21	35.31	23071.3	-103.32	

TABLE 6.2: Interest Proxy 1 and Test of Civil War Effect

	C	STRG	TBRG	TCRG	ELRG	OIRG	TDRG	EFRG	NECM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	-29.51 (-0.20)	-104.31 (-1.79)	-287.89 (-1.77)	52.58 (1.83)	417.13 (2.92)	100.19 (0.83)	-116.11 (-10.76)	77.56 (10.50)	-1.10 (-6.10)	0.96	0.94	2.35	41.09	2588.79	-128.71	146.88
TBM	4.19 (0.28)	50.74 (8.58)	51.84 (3.12)	-4.50 (-1.54)	-54.49 (-3.74)	3.32 (0.27)	-41.97 (-2.69)	-29.04 (-1.85)	-0.76 (-41.57)	0.99	0.99	2.88	929.07	2683.21	-80.73	14.95
TCM	-1.89 (-0.22)	14.94 (4.36)	14.56 (1.52)	3.80 (2.25)	20.95 (2.48)	-0.15 (-0.02)	-22.41 (-2.48)	-42.73 (-4.70)	-0.04 (-3.52)	0.91	0.85	2.47	15.37	899.73	-69.25	8.66
ELM	-0.75 (-0.20)	3.38 (2.23)	1.22 (0.29)	1.20 (1.61)	13.26 (3.55)	-2.21 (-0.70)	-3.50 (-0.87)	-17.14 (-4.26)	-0.05 (-10.69)	0.98	0.97	3.07	89.59	176.37	-52.14	3.83
OIM	1.61 (0.06)	-21.07 (-2.00)	-24.93 (-0.85)	2.56 (0.49)	41.29 (1.59)	22.69 (1.04)	14.34 (0.52)	-27.46 (0.98)	-0.05 (-1.51)	0.85	0.75	2.79	8.60	8498.16	-92.83	26.61
TDP	15.46 (0.17)	7.74 (0.21)	89.85 (0.87)	-32.70 (-1.79)	-249.10 (-2.73)	-70.97 (-0.92)	115.84 (1.80)	176.67 (6.35)	0.73	0.96	0.94	2.64	39.88	104980	-119.22	93.53
BFD	10.88 (0.16)	48.58 (11.74)	155.35 (1.98)	-22.93 (-1.66)	-189.04 (-2.74)	-52.86 (-0.91)	53.80 (0.73)	17.26 (0.23)	0.27 (3.09)	0.91	0.86	2.40	15.75	59972.9	-113.35	70.69

TABLE 6.3: Interest Proxy 2

	C	STRG	TBRG	TCRG	ELRG	OIRG	TDRG	BFRG	NECM	CWDM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	-26.20 (-0.17)	-109.60 (-1.81)	-282.86 (-1.68)	48.71 (1.60)	414.17 (2.81)	109.08 (0.87)	-118.59 (-0.75)	-69.81 (-0.44)	-1.06 (-5.40)	-56.81 (-0.54)	0.97	0.94	2.41	34.40	252198	-128.43	15.
TBM	3.79 (0.25)	51.36 (8.36)	51.23 (3.01)	-4.03 (-1.31)	-53.13 (-3.62)	2.24 (0.18)	-41.67 (-2.60)	-29.98 (-1.86)	-0.76 (-38.41)	6.86 (0.64)	0.99	0.99	2.96	785.57	2585.85	-80.34	
TCM	-1.73 (-0.19)	14.68 (4.09)	14.81 (1.49)	3.61 (2.00)	20.81 (2.38)	0.29 (0.04)	-22.53 (-2.41)	-42.34 (-4.48)	-0.44 (-3.06)	-2.81 (-0.45)	0.91	0.84	2.54	12.77	883.35	-69.06	
ELM	-0.76 (-0.19)	3.38 (2.11)	1.22 (0.28)	1.21 (1.50)	13.26 (3.40)	-2.22 (-0.67)	-3.49 (-0.83)	-17.15 (-4.06)	-0.05 (-9.65)	0.68 (0.02)	0.98	0.97	3.07	73.00	176.36	-52.14	
OIM	1.62 (0.06)	-21.08 (-1.89)	-24.92 (-0.81)	2.55 (0.46)	41.28 (1.52)	22.71 (0.99)	14.34 (0.49)	-27.45 (-0.93)	-0.05 (-1.36)	-0.09 (-0.49)	0.85	0.73	2.79	7.01	8498.14	-92.83	
TDP	18.70 (0.14)	10.56 (0.27)	87.16 (0.81)	-30.64 (-1.58)	-247.52 (-2.62)	-75.72 (-0.94)	117.17 (1.16)	172.54 (1.69)	0.71 (5.63)	30.30 (0.45)	0.96	0.93	2.69	22.11	103078.0	-119.01	
BFD	9-57 (0.13)	50.68 (1.73)	153.36 (1.88)	-21.78 (-1.46)	-187.87 (-2.63)	-56.38 (-0.93)	54.78 (0.72)	14.19 (0.18)	0.25 (2.66)	22.48 (0.44)	0.91	0.84	2.44	13.08	58926.8	-113	73.

TABLE 6.4: Interest Proxy 2 and Test of Civil War Effect

MERCHANT BANK STATIC MODEL   (BALANCE SHEET B)

	C	STR	MMR	OIR	NBFR	NECM	R^2	$\bar{R}^2$	D.W	FC	SSE	SER	LLF
TLM	-1285.41 (-5.15)	67.68 (1.46)	-13.17 (-0.27)	122.14 (1.76)	82.38 (1.62)	-0.33 (-2.03)	0.98	0.98	0.04	193.50	112218.0	86.49	-11.93
MMI	383.289 (2.28)	-57.39 (-1.83)	4.62 (0.14)	-33.62 (-0.72)	38.93 (1.13)	-0.96 (-8.84)	0.97	0.96	1.81	107.60	50921.4	58.26	-11.68
MOI	-97.26 (-1.36)	-3.85 (-0.29)	2.08 (0.15)	-1.16 (-0.06)	31.00 (2.11)	-0.07 (-1.40)	0.92	0.89	1.51	32.67	9254.88	24.84	-93.73
NBFD	999.38 (6.52)	-6.44 (-0.23)	6.47 (0.22)	-87.35 (-2.04)	-152.81 (-4.85)	0.36 (3.58)	0.99	0.99	1.96	440.64	42379.4	53.15	-109.70

TABLE 6.5:   Interest Proxy 1

	C	STR	MMR	OIR	NBFR	NECM	CWDM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	-1300.37 (-4.74)	70.18 (1.39)	-14.56 (-0.29)	121.54 (1.69)	83.17 (1.57)	-0.33 (-1.95)	9.67 (0.16)	0.98	0.98	2.05	150.78	112010.0	-119.91	89.45
MMI	377.37 (2.04)	-56.40 (-1.66)	4.07 (0.12)	-33.86 (-0.70)	39.05 (1.09)	-0.96 (-8.51)	3.82 (0.09)	0.97	0.96	1.80	83.82	50888.9	-111.63	60.29
MOI	-102.43 (-0.30)	-2.98 (-0.21)	1.60 (0.11)	-1.37 (0.07)	31.10 (2.04)	-0.06 (-1.34)	3.34 (0.19)	0.92	0.88	1.51	25.49	9230.07	-93.70	25.68
BFD	1025.43 (6.12)	-10.80 (-0.35)	8.90 (0.29)	-86.32 (-1.96)	-153.33 (-4.73)	0.35 (3.45)	-16.83 (-0.46)	0.99	0.99	1.95	347.92	41749.9	-109.54	54.68

TABLE 6.6:   Interest Proxy 1 -   Effect of Civil War

	C	STRG	MMRG	OIRG	NBRG	NECM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	-134.60 (-0.81)	-81.05 (-1.27)	8.26 (0.09)	-31.11 (-0.23)	221.82 (2.45)	-1.10 (-5.69)	0.94	0.92	1.43	45.91	450866.0	-134.33	173.37
MMI	8.13 (0.28)	58.14 (5.13)	-23.42 (-1.39)	29.43 (1.27)	-117.57 (-7.30)	-0.83 (-24.01)	0.99	0.99	2.12	391.41	14292.3	-98.29	30.87
MOI	-14.79 (-0.52)	-13.32 (-1.22)	12.71 (-0.78)	8.78 (0.39)	33.07 (2.14)	-0.12 (-3.56)	0.88	0.84	2.52	22.0	13206.1	-97.46	29.67
BFD	141.26 (0.79)	36.23 (0.53)	27.87 (0.27)	-7.11 (-0.05)	-137.33 (-1.41)	1.05 (5.03)	0.92	0.98	1.69	38.01	522088	-136.07	186.56

TABLE 6.7: Interest Proxy 2

	C	STRG	MMRG	OIRG	NBRG	NECM	CWDM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	-130.36 (-0.77)	-83.65 (-1.28)	19.44 (0.20)	-22.86 (-0.17)	211.12 (2.23)	-1.06 (-5.03)	-63.49 (-0.54)	0.94	0.91	1.44	36.49	441768	-134.32	177.64
MMI	8.57 (0.28)	57.87 (4.94)	-22.26 (-1.25)	30.29 (1.26)	-118.69 (-6.99)	-0.82 (-21.73)	-6.63 (-0.31)	0.99	0.99	2.15	306.57	14193.0	-98.22	31.84
MOI	-14.71 (-0.50)	-13.37 (-1.18)	-12.49 (-0.73)	8.94 (0.38)	32.87 (2.01)	-0.12 (-3.21)	-1.22 (-0.06)	0.88	0.83	2.51	17.12	13203.3	-97.46	30.71
BFD	136.50 (0.75)	39.15 (0.56)	15.31 (0.14)	-16.37 (-0.11)	-125.30 (-1.23)	1.00 (4.41)	71.34 (0.56)	0.92	0.88	1.69	26.31	510600	-135.84	190.98

TABLE 6.8   Interest Proxy 2 — Effect of Civil War

MERCHANT BANK STATIC MODEL ANALYSIS OF PORTFOLIO SENSITIVITY

	STR	TBR	TCR	ELR	OIR	TDR	BFR
TLM	-	-	-	-	-	-	-
TBM	-	-	-	-	-	-	-
TCM	-	-	-	-	-	-	18.7
ELM	-	-	-	-	2.6	2.1	4.7
OIM	-	-	-	-	-	-	-
TDP	-	-	-	-	-	2.6	-
BFD	-	-	-	-	-	-	-

TABLE 6.9: Balance Sheet A: Interest Proxy 1

	STRG	TBRG	TCRG	ELRG	OIRG	TDRG	BFRG
TLM	-	-	-	7.1	-	-	-
TBM	3.4	1.9	-	-2.9	-	-1.7	-
TCM	12.0	-	1.6	12.6	-	-10.9	-21.5
ELM	2.1	-	-	6.1	-	-	-6.5
OIM	-5.5	-	-	-	-	-	-
TDP	-	-	-	7.1	-	-	-
BFD	-	-	-	9.9	-	-	-

TABLE 6.10 Balance Sheet A: Interest Proxy 2

	STR	MMR	OIR	NBFR
TLM	-	-	-	-
MMI	-	-	-	-
MOI	-	-	-	-
NBFD	-	-	-	2.3

TABLE 6.11 Balance Sheet B Interest Proxy 1

	STRG	MMRG	OIRG	NBRG
TLM	-	-	-	2.6
MMI	3.2	-	-	-3.8
MOI	-	-	-	3.1
NBFD	-	-	-	-

TABLE 6.12 Balance Sheet B Interest Proxy 2

model as well as for the insurance companies (static and dynamic models).

Plausible reason for the shortfall of the model in satisfying a priori restrictions are firstly, the possibility of multicolinearity in the model. As it would be expected in regressions of this nature involving more than four short-term rates of interest, multicolinearity is a problem in the sense that it leads to large standard errors and hence, badly determined parameter estimates. Fortunately, however, though the interest rate variables used are highly colinear (since in Nigeria these rates move along with the discount rate) they are not so colinear in the regressions to lead us to a definite conclusion on the presence of multicolinearity since an appreciable number of these rates (as would be seen later) are statistically significant with high coefficient of determination (R^2) values. Moreso, adequate care was taken to ensure that the multicolinearity problem was avoided by ensuring that at least we have three observations to each explanatory variable as required in theory. Thus, in the model, the fact that an appreciable number of explanatory variables are significant coupled with the good overall performance of the model as indicated by the F-statistic (FC) and R^2 values clearly makes the possibility of multicolinearity remote. The obvious conclusion here is that in estimating the model there is need to explicitly impose these linear constraints within and across equations. Lack of suitable computer facilities at our disposal did not allow us to pursue this further.

Apart from the above, lack of realization of a priori restrictions of column and row sum parameter vector as well as assumption of

symmetry in most cases, the model performance was fair with interest proxy 2 (lagged rates) proxy performing better in terms of the interest rate expectation hypothesis compared with model using interest proxy 1 (current levels). Also it can easily be inferred that model using Balance Sheet A offered us a better explanation of portfolio selection in this institution.

Altogether, considering the results for the merchant banks, the own rates were significantly positive, as postulated in theory, in Balance Sheet A interest proxy 2 for the treasury bills, treasury certificate and equipment leasing equations. It was also significantly negative in the time deposit equation in Balance Sheet A interest proxy 1 equation; borrowed funds rate was also significant and negative in Balance Sheet B interest proxy 1 case.

There were also cases of complementarity and substitutability in the portfolio holdings of the merchant banks. Balance Sheet A interest proxy 1 indicates that equipment leasing and borrowed funds are complements while equipment lease and the other investment categories are substitutes. In the proxy 2 case, total loan was found to be complements with treasury certificates and equipment leasing contrary to theoretical expectations which would indicate that these are substitutes. Possible reasons for this development in the Nigerian financial environment will include the disincentive effect of the interest rate structure as well as prevailing apathy and lack of innovativeness in the behaviour of these institutions. Also in the interest proxy 2 case the treasury certificates and equipment leasing variable itself was found to be complementary.

On the other hand, the balance sheet A interest proxy 2 results also showed that total loans and other investment categories are substitutes as postulated in theory. So also treasury bills with equipment leasing and time deposit are complementary. Treasury certificate was also found to be a substitute for time deposit and borrowed funds while equipment leasing was also a substitute to borrowed funds contrary to theoretical expectations. The implication of the empirical violations of a priori theoretical relationships for policy administration is enormous as economic policies based on these a priori relationships can be regarded as misdirected and may not achieve desired goals.

Specifically, we have three complementary relationships in balance sheet A proxy 1 all as postulated in theory, while the single substitute relationship between equipment leasing and other investment also gives an indication for caution among policy makers, in this case, with regards to policies aimed at regulating the investment portfolio of these institutions.

In interest rate expectations proxy 2, we also have three complementary relationships but in this instance, between total loans and equipment leasing as well as treasury certificates and equipment leasing. We also have six substitute relationships which also indicate the need for caution in monetary management of the economy.

For balance sheet B interest rate proxy 1, none of the regression equations have indication of substitutes or complements between portfolio items, but in the interest rate expectation proxy 2 loans and money market instrument are found to be complement so also are loans and borrowed funds as well as borrowed funds and

items classified under the other investment categories. The money market instrument were also found to be substitutes for borrowed funds.

The substitution relationships between some assets and liability categories as we have seen above, introduces a novelty to bank behaviour. The implication here is that these merchant banks re-arrange their portfolio so that in the situation where they are to increase their demand for borrowed funds, they will reduce their supply of asset items and vice versa. This feature also calls for caution in monetary policy formulation and administration. As parti-cularly, the few earlier studies of bank behaviour in Nigeria have treated the liability holding of financial institutions as exogenously determined.

The loan rate performance was poor in balance sheet A. It was insignificant in all cases except in balance sheet A interest rate expec-tation proxy 2; specifically, in the treasury bill, treasury certificate, equipment leasing and other investment categories equations but ne_ative, as expected, only in the other investment equation. The loan rate was also significant in the money market equation in balance sheet B proxy 2 case but it was positive.

Generally, for the merchant banks, we conclude that portfolio sensitivity to interest rate expectation is just fair considering the number of significant rates. However, the coefficients reported in Tables 6.1 - 6.8 are linear slope coefficients, Tables 6.9 - 6.12 which give the mean elasticities based on these coefficients indicated the portfolio sensitivity to interest rate expectations as discussed in Chapter Five. Our result from these tables indicate that, for the rates

which are signficant, majority of them are greater than one which indicates a high portfolio responsiveness to changes in these rates.

The levels of the net exogenous asset component also affect portfolio selection of these institutions. Its coefficients were significant in the time deposit, equipment leasing, treasury certificate and treasury bill equations in balance sheet A interest proxy 1 case but positive only in the treasury certificate, other investment and time deposit equations. While in the interest proxy 2 equation it was significant in the total loans, treasury bills, treasury certificate, equipment leasing, time deposit and borrowed funds equation but positive only in the time deposit and borrowed fund equations.

In the balance sheet B proxy 1 case, the level of the net exogenous asset component was signficant only in the money market instruments and borrowed funds equation, while it was signficant all through in the interest proxy 2 case with the borrowed fund equation being positive.

In all cases, the dummy variable used to capture the effect of the civil war on portfolio holding in this institution was found to be insignificant in all cases. This implies that the civil war had no conditioning effect on portfolio selection in these merchant banking firms.

6.2.2   Static Model: Insurance Companies

The three categories of insurance were tried in the empirical test. The results are reported in Table 6.13-6.30. For all the Insurance fund types tried, all the equations in the model were on the overall significant based on the F-statistic value except for the non-life insurance fund for interest proxy 2 and

INSURANCE COMPNIES STATIC MODEL

	C	STR	GSR	OIR	NPR	NECN	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLN	-14.68 (-1.46)	3.47 (1.06)	-1.60 (-0.54)	-0.007 (-0.29)	-0.002 (-1.29)	0.10 (3.02)	0.84	0.77	1.93	11.62	489.53	52.69	6.67
GSN	-463.27 (-8.71)	100.08 (5.76)	-39.66 (-2.52)	-0.002 (-0.15)	0.009 (1.19)	-0.83 (-4.67)	0.91	0.87	1.89	22.27	13722.3	-81.02	35.32
OIN	-46.24 (-3.20)	19.25 (3.54)	15.23 (2.87)	-0.13 (1.23)	-4.62 (-0.96)	-0.72 (-3.61)	0.93	0.91	2.02	34.36	13721.4	-63.21	18.21
PSN	564.90 (11.94)	-105.83 (-6.85)	28.84 (2.06)	0.004 (0.30)	-0.007 (-1.15)	-0.42 (-2.69)	0.98	0.98	2.08	133.02	10865.1	-79.03	31.43

TABLE 6.13 Non-life Interest Proxy 1

	C	STR	GSR	OIR	NPR	NECN	RDM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLN	-6.76 (-0.55)	1.16 (0.30)	0.18 (0.53)	-0.003 (-0.10)	-0.17 (-1.25)	0.71 (1.67)	9.82 (1.10)	0.86	0.77	2.23	10.06	437.00	-51.72	6.61
GSN	-458.56 (-6.66)	98.71 (4.55)	38.69 (-2.10)	0.002 (-0.12)	0.008 (1.14)	0.84 (-3.52)	5.82 (0.12)	0.91	0.86	1.88	16.89	13703.3	-81.01	37.02
OIN	-62.94 (-1.93)	-0.28 (-0.04)	7.01 (1.25)	4.38 (0.82)	2.69 (0.64)	0.17 (4.25)	-4.54 (-0.41)	0.98	0.97	2.04	93.99	12712.5	-78.21	6.26
PSN	552.45 (9.06)	-102.20 (-5.32)	26.29 (1.61)	0.003 (0.22)	-0.007 (-1.12)	-0.38 (-1.77)	-15.42 (-0.35)	0.98	0.97	0.04	102.01	10735.4	-78.93	32.77

TABLE 6.14   Non-life Interest Proxy 1 - Effect of Regulation

	C	STRG	GSRG	OIRG	NPRG	NECN	R^2	$R \bar{R}^2$	D.W	FC	SSE	LLF	SER
TLN	-3.61 (-0.53)	0.07 (0.02)	0.96 (0.26)	-0.004 (-0.16)	0.0004 (0.25)	0.11 (2.76)	0.77	0.67	1.30	7.57	692.74	-55.64	7.94
GSN	-133.59 (-1.80)	20.28 (0.51)	6.79 (0.17)	0.001 (0.41)	0.008 (-0.47)	-0.09 (-0.22)	0.46	0.21	1.19	1.87	82528.0	-96.27	80.62
OIN	-59.30 (-0.39)	-21.11 (-1.12)	32.31 (0.63)	3.24 (0.92)	1.23 (0.31)	-1.53 (-2.61)	0.83	0.74	2.81	18.43	538.73	-63.02	8.34
PSN	159.99 (1.77)	-7.96 (-0.17)	-28.01 (-0.56)	-0.002 (-0.41)	0.004 (0.18)	-1.29 (-2.41)	0.82	0.74	1.16	9.85	121902	-99.58	105.27

TABLE 6.15: Non-life Interest Proxy 2

	C	STRG	GSRG	OIRG	NPRG	NECN	RDM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLN	0.88 (0.14)	-2.33 (-0.60)	3.10 (0.93)	-0.005 (-0.22)	0.001 (0.73)	0.04 (0.82)	18.18 (2.25)	0.85	0.76	1.93	9.49	459.39	-52.14	6.78
GSN	-91.72 (-1.28)	-1.20 (-0.03)	26.57 (0.68)	0.001 (0.42)	-0.002 (-0.14)	-0.77 (1.14)	169.57 (1.81)	0.59	0.35	1.42	2.42	62228.6	-93.87	78.89
OIN	-22.65 (-0.42)	-6.08 (-0.54)	-2.09 (-0.17)	14.44 (1.36)	6.35 (0.85)	0.21 (2.88)	-0.60 (-0.04)	0.94	0.94	2.23	27.35	74235.0	-93.99	11.37
PSN	102.23 (1.23)	21.68 (0.49)	-55.29 (-1.23)	-0.005 (-0.45)	-0.004 (-0.23)	-0.36 (-0.56)	-233.96 (-2.15)	0.88	0.80	1.50	11.70	83256.0	-96.34	91.25

TABLE 6.16   Non-life Interest Proxy 2 - Effect of Regulation

	C	STR	GSR	OIR	LPR	NECL	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLL	50.68 (2.89)	12.42 (4.36)	-5.73 (-2.35)	0.004 (0.20)	0.34 (0.16)	-0.30 (-5.19)	0.99	0.98	1.51	150.09	328.17	-49.29	5.46
GSL	-12.42 (0.67)	10.56 (3.48)	-11.68 (-4.50)	0.001 (-0.47)	2.39 (1.08)	-0.40 (-6.40)	0.98	0.97	2.14	116.28	371.81	-50.35	5.81
OIL	-186.65 (-5.82)	17.03 (3.26)	13.34 (2.99)	-0.007 (-0.17)	-3.33 (-0.88)	-0.18 (1.72)	0.98	0.98	2.47	126.39	1099.65	-59.57	9.99
PSL	249.74 (4.95)	-40.01 (-4.87)	4.06 (0.58)	0.001 (0.22)	0.61 (0.10)	-0.12 (-0.73)	0.96	0.95	2.59	55.48	2721.75	-67.27	15.73

TABLE 6.17: Life Insurance Interest Proxy 1

	C	STR	GSR	OIR	LPR	NECL	RDM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLL	-43.81 (-2.64)	8.93 (2.79)	-2.36 (-0.82)	0.006 (0.31)	-0.15 (-0.08)	-0.28 (-0.08)	9.35 (1.85)	0.99	0.98	1.60	153.05	244.71	-46.79	4.55
GSL	-16.22 (-0.84)	12.49 (3.28)	-13.54 (-3.97)	-0.001 (-0.51)	2.66 (1.18)	-0.41 (-6.38)	-5.17 (-0.86)	0.98	0.97	2.29	94.71	346.30	-49.74	5.89
OIL	-158.45 (-4.73)	12.31 (1.64)	0.61 (0.07)	19.21 (1.94)	-2.79 (-0.82)	-0.03 (-0.19)	8.76 (0.70)	0.98	0.97	2.46	133.96	326.83	-53.48	8.90
PSL	247.08 (4.56)	-38.65 (-3.63)	2.75 (0.29)	0.001 (0.20)	0.80 (0.13)	-0.13 (-0.73)	-3.63 (-0.22)	0.96	0.94	2.58	52.24	2709.17	-67.23	16.46

TABLE 6.18: Life Insurance Interest Proxy 1 - Effect of Regulation

	C	STRG	GRSG	OIRG	LPRG	NECL	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLL	-0.72 (-0.09)	6.43 (2.60)	-8.044 (-2.60)	0.002 (0.61)	3.10 (1.10)	-0.43 (-7.04)	0.97	0.96	2.37	74.84	648.76	-55.08	7.68
GSL	-5.03 (-0.55)	4.69 (1.52)	-3.75 (-1.93)	0.002 (0.54)	1.03 (0.29)	-0.39 (5.19)	0.95	0.93	2.09	41.38	1010.70	-58.85	9.59
OIL	-8.90 (-0.43)	-1.13 (-0.16)	-2.83 (-0.31)	0.003 (0.03)	8.07 (1.02)	-0.70 (-4.09)	0.92	0.88	2.80	25.25	5172.25	-72.72	21.68
PSL	14.65 (0.50)	-9.99 (-0.99)	15.02 (1.15)	-0.004 (-0.34)	-12.20 (-1.07)	0.53 (2.13)	0.85	0.78	2.46	12.57	10631.7	-78.85	31.09

TABLE 6.19 : Life Insurance Interest Proxy 2

	C	STRG	GSRG	OIRG	LPRG	NECL	RDM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLL	1.22 (0.20)	0.25 (0.07)	-1.62 (-0.40)	0.002 (0.80)	3.58 (1.49)	-0.34 (-5.32)	17.20 (2.27)	0.98	0.97	2.39	86.64	428.75	-51.56	6.55
GSL	-3.10 (-0.36)	-1.41 (-0.30)	2.97 (0.53)	0.002 (0.63)	1.50 (0.46)	-0.31 (-3.53)	16.97 (1.64)	0.96	0.94	1.85	40.22	796.70	-56.82	8.93
OIL	-7.12 (-0.33)	-6.78 (-0.58)	3.40 (0.24)	0.004 (0.05)	8.50 (1.04)	-0.62 (-2.85)	15.73 (0.61)	0.92	0.88	2.88	19.89	4988.18	-72.4	22.33
PSL	8.99 (0.32)	7.94 (0.51)	-4.75 (-0.26)	-0.005 (-0.41)	-13.58 (-1.25)	0.28 (0.95)	-49.89 (-1.45)	0.88	0.80	2.55	11.88	8780.03	-77.22	29.63

TABLE 6.20 : Life Insurance Interest Proxy 2 — Effect of Regulation

	C	STR	GSR	OIR	LPR	NPR	NECJ	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLJ	-165.99 (-3.13)	23.79 (.21)	-4.10 (-0.74)	-0.002 (-0.004)	-4.23 (-0.58)	0.004 (1.47)	0.16 (2.27)	0.94	0.91	2.36	28.19	2201.02	-65.46	14.83
GSJ	-399.29 (-6.26)	115.07 (7.41)	-66.13 (-3.85)	-0.002 (-0.30)	-3.20 (-0.55)	-0.01 (-1.60)	-1.06 -15.78	0.96	0.94	2.17	44.17	40020.4	-90.11	63.26
OIJ	-358.31 (13.44)	30.96 (4.85)	-27.60 (-0.25)	-0.001 (3.42)	-5.91 (-1.21)	0.02 (2.96)	-0.1 (1.06)	0.95	0.92	3.21	31.82	6371.3	-74.50	25.24
PSL	223.51 (7.97)	-41.16 (-6.03)	9.15 (3.21)	0.01 (0.20)	1.84 (0.35)	-0.006 (-2.36)	0.1 (1.20)	0.97	0.95	2.57	63.39	1827.93	-63.88	13.52
PSN	693.58 (8.56)	-128.67 (-6.53)	26.88 (0.23)	0.003 (0.22)	9.80 (0.65)	-0.01 (-1.55)	-0.28 (-1.23)	0.98	0.96	2.58	71.46	1678.6	-87.31	14.53

TABLE 6.21: Joint Insurance Interest Proxy 1

	C	STR	GSR	OIR	LPR	NPR	NECJ	RDM	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLJ	-142.0 (-3.9)	19.6 2.5	3.9 (0.6)	-0.6 (-0.1)	2.9 (0.5)	0.1 (0.5)	0.1 (1.0)	28.39 (2.11)	0.96	0.96	3.1	35.8	1366.7	-61.4	12.3
GSJ	-327.8 (-3.6)	1-2.4 (5.3)	-62.0 (-3.6)	0.03 (0.3)	-3.5 (-0.3)	0.1 (1.7)	-1.2 (-5.0)	48.8? (-1.09)	0.97	0.96	2.2	38.8	8327.6	-76.8	30.4
OIJ	-254.6 (-4.10)	14.5 (1.2)	1.8 (0.2)	37.7 (3.7)	-4.9 (-0.8)	2.5 (0.2)	0.3 (3.1)	-7.08 (-0.34)	0.99	0.98	2.89	171.3	1276.8	-58.3	33.06
PSL	210.0 (5.0)	-38.8 (-4.3)	8.4 (1.0)	0.06 (1.0)	1.9 (0.3)	-0.07 (-2.3)	0.1 (1.1)	-43.47 (-1.49)	0.98	0.97	2.5	50.2	1788.3	-63.7	14.1
PSN	602.4 (5.2)	-112.5 (-4.6)	21.6 (1.0)	0.02 (0.2)	10.1 (0.7)	-0.1 (-1.6)	-0.4 (0.1)	-62.12 (-1.10)	0.99	0.98	2.5	62.7	1341.0	-80.8	38.6

TABLE 6.22 :   Joint Insurance Interest Proxy 1   —   Effect of Regulation

	C	STRG	GSRG	OIRG	NPRG	LPRG	NECN	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLJ	-0.7 ((-0.5))	15.8 (3.6)	5.2 (0.6)	0.2 (0.3)	0.03 (1.3)	1.5 (0.3)	0.01 (0.1)	0.96	0.95	2.2	25.6	1482.8	-62.1	13.6
G&J	-9.3 (-0.2)	31.0 (4.1)	-37.2 (3.2)	0.5 (0.3)	-0.7 (-1.0)	12.3 (3.0)	-1.1 (-2.8)	0.97	0.96	1.8	19.9	12412.5	-80.2	39.4
OIJ	10.8 (0.8)	10.4 (1.2)	-18.9 (-1.9)	-0.1 (-0.2)	0.8 (2.7)	17.1 (4.2)	0.2 (0.2)	0.99	0.98	2.5	104.4	1519.9	-62.3	13.8
PSL	-3.1 (-0.1)	3.7 (0.2)	0.2 (0.008)	-0.04 (-0.4)	0.009 (0.2)	10.3 (3.0)	0.2 (0.6)	0.98	0.97	2.5	10.9	6010.1	-74.0	27.4
PSN	-2.6 (-0.7)	-36.2 (-1.6)	42.0 (1.5)	0.6 (0.4)	0.02 (0.2)	18.3 (3.9)	0.3 (0.9)	0.94	0.94	1.6	51.8	12636.7	-80.3	39.7

TABLE 6.23   Joint Insurance Interest Proxy 2

	C	STRG	GSRG	OIRG	NPRG	LPRG	NECN	RDM	R^2	$\bar{R}^2$	DCW	FC	SSE	LLF	SER
TLJ	-27.1 (-1.1)	10.9 (0.8)	-13.4 (-0.8)	0.8 (0.7)	0.6 (1.1)	16.0 (2.1)	0.4 (0.2)	-0.77 (-0.59)	0.96	0.95	1.5	7.1	7498.6	-75.9	27.4
GSJ	-8.5 (-0.3)	58.9 (3.1)	-65.8 (-3.0)	-0.3 (-0.2)	2407.9 (3.5)	-134.6 (-0.5)	-1.3 (-5.0)	27.90 (0.31)	0.97	0.97	1.9	31.5	10185.0	-78.5	33.6
OIJ	-9.3 (-0.3)	-13.3 (-0.7)	6.3 (0.3)	0.8 (0.7)	0.1 (2.5)	25.7 (.27)	-0.5 (-2.2)	76.60 (2.24)	0.99	0.98	2.4	21.1	9213.5	-77.6	32.0
PSL	3.8 (0.1)	-1.3 (-0.9)	7.2 (0.4)	-0.6 (-0.6)	-0.1 (-0.2)	-16.5 (-0.2)	0.4 (1.8)	-83.86 (-3.67)	0.98	0.97	2.3	12.0	6903.4	-75.2	27.7
PSN	33.9 (0.5)	-37.0 (-1.0)	50.6 (1.1)	-0.1 (-0.5)	-0.1 (-0.9)	-41.0 (-2.0)	0.9 (1.8)	-246.05 (-3.67)	0.93	0.92	1.8	19.2	41839.4	-90.5	68.2

TABLE 6.24: Joint Insurance Interest Proxy 2 — Effect of Regulation

INSURANCE FUND
PROTFOLIO SENSITIVITY: JOINT INSURANCE FUND
(STATIC MODEL)

	STR	GSR	OIR	LPR	NPR
TLJ	3.5	-	-	-	-
GSJ	10.3	-4.6	-	-	-
OIJ	3.0	-	0.00005	0.9	-
PSL	5.4	-0.9	-	-	0.0004
PSN	4.8	-	-	-	-

TABLE 6.25: Interest Proxy 1

	STRG	GSRG	OIRG	LPRG	NPRG
TLJ	2.3	-	-	-	-
GSJ	7.3	-6.7	-	2.0	-
OIJ	-	-	-	2.1	-
PSL	-	-	-	1.5	-
PSN	-	-	-	1.4	-

TABLE 6.26: Interest Proxy 2

PORTFOLIO SENSITIVITY: LIFE FUND
(STATIC MODEL)

	STR	GST	OIR	NPR
TLL	2.6	-	-	-
GSL	2.3	-1.9	-	-
OIL	2.9	1.8	-	-
PSL	5.2	-	-	-

TABLE 6.27: Interest Proxy 1

	STRG	GSRG	OIRG	NPRG
TLL	1.2	-1.2	-	-
GSL	-	-	-	-
OIL	-	-	-	-
PSL	-	-	-	-

TABLE 6.28: Interest Proxy 2

PORTFOLIO SENSITIVITY: NON-LIFE FUND

	STR	GSR	OIR	NPR
TLN	-	-	-	-
GSN	-	-4.7	-	-
OIN	4.5	2.7	-	-
PSN	-	3.9	-	-

TABLE 6.29: Interest Proxy 1

	STRG	GSRG	OIRG	NPRG
TLN	-	-	-	-
GSN	-	-	-	-
OIN	-	-	-	-
PSN	-	-	-	-

TABLE 6.30: Interest Proxy 2

specifically, in the government securities equation.

Also, except for the government securities equation, where R^2 and adjusted R^2 values were 46% and 21% respectively, all other equations in the model had an overall explanatory power of between 98% and 84% (R^2) while the adjusted R^2 accounted for between 97% and 68% explanation of the dependent variables. The Durbin-Watson test for auto-correlation also indicated that the model was estimated free of autoregressive disturbances in all cases, except for the loans equations in the life insurance interest proxy 1 case and in the life fund interest proxy 2 cases as well as the government securities and premium supply equations in which case the tests were inconclusive.

The a priori expectations on the constant term was not met in some cases unlike the case for the Nigerian merchant banks. In the joint fund interest proxy 1 case, this assumption was not met, so also it was not met in the life fund interest proxy 1 equations (except the government securities equations) and also it was not met in the government securities, other investment and premium supply equations in the non-life fund interest proxy 2 case. The expectation on column sums and row sums of the parameter vectors as well as that of symmetry were not met in most cases and was expectedly similar to the situation for the merchant banks. Also, in all cases the frequency of claims used as a second proxy for the cost of fund was insignificant and hence was not reported in this study.

Generally, except for the loans equations, in the non-life insurance interest proxy 2 case and the other investment, premium supply (non-life) and premium supply (life) in the joint insurance fund interest proxy 2 case, the regulation dummy (RDM) was insignificant which

indicated that largely, government regulation of the insurance companies (and possibly of most other financial institutions) did not have any significant impact on their behaviour.

With regards to the own rates, the loan rates are significantly positive in all cases except for both interest rate proxies in the non-life insurance fund, where it was insignificant. The rate on government securities are significantly negative (contrary to theory) in all equations except for the non-life fund (both interest rate proxies) as well as the life insurance fund (interest proxy 2). This behaviour, though abnormal, is significant thus implying that there may be other unidentified critical factors influencing the direction of portfolio choice. Another plausible explanation may be the argument on investor dormancy in the markets whereby investors do not keep abreast of developments in the financial market. Further, another possibility is that they just invest in portfolio items that catches their fancy irrespective of interest rate behaviour.

The rate used to capture other investment categories equations was significant and negative in the joint fund interest proxy 1 case while it was positively signed in the joint fund life insurance and non-life insurance interest proxy 2 cases respectively. Yet, it was insignificant.

The loan rate was significant in all cases using interest rate proxy 1 for all categories of insurance fund and it was positively signed in most cases except for the premium equation in all categories of insurance as well as other investment and government securities equation in the non-life case. Overall, the performance of the loan rate was better than that for the merchant bank. That is, the port folio of these insurance companies was more sensitive to fluctuations

in the short-term lending rate.

In all cases examined, government securities was found to be complements with loans, while loans and investment in government securities were also found to be complements. Also, other investment and government securities were found to be complements, so was the non-life premium fund and other investment as well as the life and non-life fund premium supply and government securities in the model estimation for the joint insurance fund category, thus making five (5) complementary relationships observed in the insurance companies portfolio. Also three cases of substitutes were found to be significant, namely, significant substitution relationship between life insurance premium fund, non-life insurance premium fund and total loans as well as also a substitution relationship found between life premium fund and non-life premium fund. This result is similar to those obtained for the merchant bank liability holding.

From the above, we can easily generalize that for the insurance companies, the model that was best for explaining portfolio behaviour was the one using interest rate expectation proxy 2 (i.e. lagged values of interest rate) contrary to the behaviour for the merchant banks. The meaning of this is that in formulating the interest rate expectation hypothesis, studies in financial behaviour should identify the interest rate proxy best suited to the behaviour of the institution concerned and a trial of series of interest rate expectation proxies may be required in determining the rate best suited to capture the institutions outlook on interest rate expectations.

The effect of the level of net exogenous asset holding revealed that it exercised complete influence on all equations in the non-life

fund proxy 1 and 2 cases being only positive in the loan equation. However, for the joint and life insurance companies the exogenous component was consistently significant in the loans and government securities equation, while it was significant for the other investment equation proxy 2 case.

The inference on the sensitivity of portfolio holdings from Tables 6.25 - 6.30 which showed that when compared with the merchant banks, it was lower in most cases (except the loan rate case which was con-sistently above unity) for the insurance companies and in majority of cases it was less than one. This implies that insurance companies portfolio are less responsive (that is more interest inelastic) to changes in interest rate expectations.

It has been indicated in this section that financial institutions are capable of adjusting or re-arranging their portfolio. In order to high-light the nature of the adjustment process and evaluate the speed of adjustment in these institutions, we have postulated a dynamic model framework of portfolio composition under uncertainty, utilizing the partial (or stock) adjustment framework which indicates that portfolio responsiveness to changes in interest rate expectations are only partially successful during a period. Therefore, we identify that a complete adjustment of portfolio holding (X_1) to the desired level of portfolio holding (X_1^*) (specified as in Chapter Five) may not be allowed immediately for instance as a result of policy rigidities in the Nigerian financial environment. The next section thus considers the empirical result of the dynamic model formulation elaborately specified earlier in Section 5.3 of Chapter Five.

6.2.3   Dynamic Model: Merchant Banks

The results of the dynamic model estimated for the merchant banks are contained in Tables 6.31 -6.50. The F-statistic computed for all the two balance sheet categories for the merchant banks as well as the two interest rate expectations proxies tried indicates an overall significance of all equations in the model. Also, the explanatory power of the model, as measured by the R^2 and adjusted R^2 (R^2) values, is very high accounting for over 86% and 75% explanation of the dependent variable respectively.

As for the static model, though the _a priori_ expectation on the constant term were met in most instances, the converse is the case with respect to expectations on the row and column sums.

The dummy variable used to evaluate the stability of the dynamic system was insignificant with the exception of the money market instruments equation, in balance sheet B interest proxy 1, and the money market instrument and other investment categories equations in balance sheet B interest proxy 2 case. This is in consonance with the assumption and finding of White (1975). It (our result) implies that the model has wide applicability for forecasting or policy prediction. However, the model using balance sheet B, especially the interest proxy 2 case, should be treated with caution in policy prediction.

There was no auto-regressive disturbance in all the equations estimated except the money market instrument case in balance sheet B interest rate proxy 1 case. In these instances, the Durbin-Watson (D-W) statistic showed that the test was inconclusive. Also, similarly, the dummy used to capture the effect of the civil war on portfolio selection was tested for statistical insignificance and the result

	C	STR	TBR	TCR	ELR	OIR	TDR	BFR	NECM	XG	R^2	R^2	D.W	FC	SSE	LLF	SEE
TLM	73.84 (0.30)	-49.44 (-1.15)	11.00 (0.23)	18.52 (2.68)	158.76 (2.71)	8.20 (0.29)	-2.90 (-0.09)	-146.81 (-4.96)	0.82 (4.22)	1.75 (9.62)	0.99	0.99	2.49	804.53	11149.5	-95.68	31.
TBM	104.53 (0.61)	-3.86 (0.12)	41.80 (1.16)	1.70 (0.33)	32.65 (0.73)	4.75 (0.24)	-8.89 (-0.37)	-89.57 (-3.41)	-0.47 (-4.08)	0.62 (6.88)	0.99	0.99	3.09	318.01	6373.04	-89.81	24.
TCM	37.25 (0.58)	-2.83 (-0.24)	-16.49 (-1.26)	-2.11 (-1.05)	-19.45 (-1.20)	-3.33 (-0.46)	-1.25 (-0.14	38.55 (4.86)	-0.06 (-1.71)	2.08 (3.24)	0.91	0.84	2.62	13.10	863.107	-68.82	8.
ELM	-26.68 (-1.93)	2.61 (1.02)	-1.08 (-0.35)	-0.96 (-1.99)	-7.79 (-2.13)	-5.17 (-3.02)	7.02 (3.28)	11.05 (5.70)	-0.32 (-2.82)	0.23 (1.18)	0.99	0.99	2.62	333.32	3? 3	-36.33	1.
OIM	-176.09 (-1.47)	-1.64 (-0.07)	29.05 (1.16)	-5.83 (-1.60)	-32.14 (-1.04)	20.53 (1.40)	54.15 (3.25)	-9.98 (-0.65)	0.19 (2.46)	1.05 (4.08)	0.95	0.90	2.08	21.06	3138.54	-82.37	16.
TDP	319.66 (1.49)	29.84 (0.80)	7.05 (0.17)	3.28 (0.55)	10.01 (0.20)	-22.08 (-0.90)	-107.35 (-3.78)	-23.56 (-0.92)	0.33 (1.94)	-0.17 (-1.08)	0.99	0.99	2.29	422.53	8352.09	-92.64	27.
BFO	204.38 (1.54)	15.20 (0.62)	7.89 (0.29)	-5.24 (-1.34)	-53.09 (-1.61)	-35.68 (-2.38)	-30.19 (-1.67)	48.44 (3.00)	-0.17 (-2.17)	-0.83 (7.75)	0.99	0.99	2.80	233.67	3587.77	-83.78	18.

TABLE 6.31: Interest Proxy 1

	C	STR	TBR	TCR	ELR	OIR	TDR	BFR	NECM	CWDM	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SEI.
TLM	162.39 (0.60)	-64.04 (-1.36)	2.51 (0.05)	20.48 (2.77)	174.83 (2.81)	8.93 (0.31)	-10.60 (-0.31)	-147.69 (-4.92)	0.80 (4.01)	-19.37 (-0.84)	1.76 (9.53)	0.99	0.99	2.64	704.62	10416.8	-94.97	32.28
TBM	94.95 (0.49)	-217 (-0.06)	42.84 (1.11)	1.47 (0.26)	30.71 (0.62)	4.54 (0.21)	-8.02 (-0.31)	-89.44 (-3.25)	-0.46 (-3.75)	2.32 (0.13)	0.62 (6.55)	0.99	0.99	3.10	260.63	6362.44	-89.79	25.2
TCM	22.33 (0.32)	0.04 (0.003)	-14.55 (-1.05)	-2.63 (-1.18)	-23.00 (-1.30)	-3.64 (-0.48)	0.13 (0.01)	38.63 (4.74)	-0.06 (-1.45)	4.20 (0.62)	2.14 (3.20)	0.92	0.84	2.67	11.17	830.94	-68.42	9.1
ELM	-34.62 (-2.51)	4.01 (1.55)	-0.10 (-0.03)	-1.17 (-2.45)	-9.44 (-2.60)	-5.27 (-3.25)	7.80 (3.73)	11.00 (5.99)	-0.03 (-2.5)	1.92 (1.51)	0.24 (1.33)	0.99	0.99	2.98	334.84	31.89	-34.18	1.7
OIM	-216.86 (-1.64)	5.59 (0.22)	33.56 (1.28)	-6.78 (-1.28)	-40.03 (-1.74)	19.69 (-1.21)	57.67 (1.32)	-9.88 (3.29)	0.21 (-0.64)	9.76 (2.55)	1.06 (0.80)	0.95 (4.00)	0.90	2.04	18.39	2951.08	-81.72	17.1
TDP	403.64 (1.76)	21.34 (0.51)	-0.51 (-0.12)	3.91 (0.59)	14.90 (0.27)	-28.02 (-1.17)	-118.15 (-3.76)	-16.14 (-0.54)	0.32 (1.88)	-11.46 (-0.56)	0.23 (0.99)	0.99	0.99	2.19	355.20	8129.55	-92.36	23.5
BFD	2-6.80 (1.37)	14.78 (0.54)	7.63 (0.27)	-5.18 (-1.20)	-52.63 (-1.50)	-35.64 (-2.26)	-30.40 (-1.55)	48.43 (2.86)	-0.16 (-2.00)	-0.56 -0.04	0.83 (7.37)	0.99	0.99	2.80	191.22	3587.15	-83.77	18.94

TABLE 6.32: Interest Proxy 1 - Effect of Civil War

	C	STRG	TBRG	TCRG	ELRG	OIRG	TDRG	BFRG	NECM	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	10.30 (-0.21)	38.86 (1.58)	-41.01 (-0.68)	-18.58 (-1.53)	-224.29 (-2.74)	-38.12 (-0.88)	-0.22 (-0.004)	285.66 (4.44)	1.78 (5.89)	2.76 (9.72)	0.99	0.99	2.45	331.28	27018.6	-104.98	49.56
TBM	5.07 (0.36)	40.00 (4.27)	34.19 (1.70)	-5.60 (7.93)	-61.52 (-4.16)	1.55 (0.13)	-29.96 (7.75)	3.46 (0.13)	-0.70 (15.90)	0.14 (1.44)	0.99	0.99	2.83	900.08	2257.32	-78.91	14.33
TCM	-1.17 (-0.14)	13.24 (3.48)	19.05 (1.81)	2.85 (1.48)	17.12 (1.86)	-0.93 (-0.13)	-17.23 (-1.67)	-43.11 (-4.75)	-0.03 (-2.68)	0.50 (1.03)	0.92	0.85	2.61	12.84	820.99	-68.29	8.63
ELM	-0.40 (-0.11)	1.94 (1.03)	1.51 (0.36)	1.02 (1.36)	11.93 (3.13)	0.35 (0.09)	-2.56 (-0.64)	-16.81 (-4.25)	-0.03 (-2.11)	0.40 (1.22)	0.99	0.97	3.22	83.10	155.25	-50.80	3.76
OIM	2.16 (0.08)	-26.66 (-2.12)	-19.92 (-0.65)	-0.14 (-0.02)	30.21 (1.03)	16.21 (0.69)	36.66 (0.95)	-21.80 (-0.75)	-0.10 (-1.48)	-0.46 (-0.48)	0.86	0.75	2.69	7.54	7986.12	-92.18	26.94
TDP	-0.58 (-0.01)	-102.48 (-2.14)	79.70 (0.98)	10.85 (0.52)	232.78 (1.29)	12.44 (0.19)	151.24 (1.95)	-325.46 (-1.71)	-1.44 (-1.91)	3.89 (2.90)	0.97	0.96	2.54	58.29	59466.6	-113.26	73.53
BFD	4.64 (0.09)	-72.14 (-1.91)	22.03 (0.34)	-6.47 (-0.61)	35.93 (0.47)	-6.99 (-0.17)	123.19 (2.26)	-44.79 (-0.83)	-0.42 (-2.17)	2.43 (3.72)	0.96	0.93	2.27	30.55	26520	-104.78	49.10

TABLE 6.33: Interest Proxy 2

	C	STRG	TBRG	TCRG	ELRG	OIRG	TDRG	BFRG	NECM	CWDM	XG	R	R	D.W	FC	SSE	LLF	SER
TLM	-9.53 (-0.19)	36.65 (1.41)	-41.07 (-0.65)	-19.20 (-1.51)	-221.45 (-2.60)	-34.98 (-0.77)	-1.53 (-0.03)	285.67 (4.29)	1.77 (5.64)	-15.06 (-0.42)	2.74 (9.22)	0.99	0.99	2.45	275.78	2655.5	-104.78	51.03
TBM	4.67 (0.32)	40.60 (4.21)	33.48 (1.63)	-5.13 (-1.68)	-61.19 (-4.04)	0.45 (0.04)	-29.60 (-1.69)	2.67 (0.01)	-0.71 (-15.47)	7.01 (0.69)	0.41 (1.41)	0.99	0.99	2.93	771.17	2155.73	-78.43	14.68
TCM	-1.17 (-0.13)	13.24 (3.32)	18.92 (1.71)	2.83 (1.40)	17.25 (1.78)	-0.75 (-0.01)	-17.51 (-1.59)	-42.97 (4.49)	-0.03 (-2.50)	-0.90 (-0.14)	0.48 (0.88)	0.92	0.84	2.62	11.34	819.48	-68.27	9.05
ELM	-0.40 (-0.10)	1.56 (0.98)	1.50 (0.34)	1.03 (1.27)	11.94 (2.98)	0.33 (0.08)	-2.55 (-0.61)	-16.83 (-4.05)	-0.03 (-2.01)	0.17 (0.06)	0.40 (1.17)	0.99	0.97	3.23	68.01	155.19	-50.80	3.94
OIM	2.06 (0.07)	-26.57 (2.01)	-20.01 (-0.63)	-0.05 (-0.01)	30.14 (0.98)	15.81 (0.63)	37.08 (0.91)	-21.97 (-0.72)	-0.10 (-1.38)	1.88 (0.10)	-0.46 (0.80)	0.86	0.72	2.70	6.17	7978.89	-92.17	28.25
TDP	-0.86 (-0.11)	-101.01 (-1.96)	79.16 (0.92)	11.00 (0.50)	229.54 (1.20)	10.72 (0.15)	151.28 (1.86)	-22.66 (-1.61)	-1.43 (-1.80)	7.00 (0.13)	3.86 (2.71)	0.98	0.96	2.54	47.78	59367.7	-113.29	77.05
BFD	3.75 (0.07)	-69.87 (-1.77)	21.50 (0.32)	-5.50 (-0.49)	35.29 (0.44)	-9.78 (-0.22)	123.43 (2.18)	-46.55 (-0.83)	-0.43 (-2.11)	15.88 (0.45)	2.41 (3.56)	0.96	0.92	2.34	25.52	26000.1	-104.57	50.99

TABLE 6.34: Interest Proxy 2 - Effect of Civil War

MERCHANT BANK DYNAMIC MODEL (BALANCE SHEET TYPE B)

	C	STR	MMR	OIR	NBFR	NECM	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	-662.25 (-1.27)	59.29 (2.12)	5.10 (0.17)	48.74 (1.05)	1.86 (0.05)	0.86 (3.26)	1.43 (4.89)	0.99	0.99	2.23	411.14	41479.9	-109.48	54.43
MMI	38.20 (2.01)	0.44 (0.56)	-6.32 (-0.43)	9.61 (0.42)	-28.57 (-1.11)	-0.51 (5.14)	0.61 (6.31)	0.99	0.99	3.42	411.82	10586.2	--95.14	27.50
MOI	-65.18 (-1.13)	-22.76 (-1.88)	-2.63 (-0.24)	20.14 (1.17)	38.68 (3.26)	0.11 (1.63)	1.03 (3.17)	0.95	0.93	1.76	45.35	5385.6	-88.04	19.61
NBFD	815.76 (1.94)	-0.17 (0.008)	2.09 (0.10)	-76.36 (-2.52)	124.93 (-5.36)	-0.02 (-0.20)	0.50 (4.01)	0.99	0.99	2.05	739.41	19714.5	-101.67	37.53

TABLE 6.35: Interest Proxy 1

	C	STR	MMR	OIR	NBFR	NECM	CWDM	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	-663.34 (-3.02)	59.45 (1.86)	5.01 (0.16)	48.71 (1.01)	1.90 (0.05)	0.86 (3.14)	0.63 (0.17)	1.43 (4.70)	0.99	0.99	2.23	327.24	41479.0	-109.48	56.49
MMI	35.87 (0.36)	8.82 (0.47)	-6.54 (-0.40)	9.51 (0.40)	-29.51 (-1.51)	-0.50 (-6.00)	1.55 (0.08)	0.61 (7.04)	0.99	0.99	3.42	327.94	10580.8	-95.13	28.53
MOI	-69.46 (-1.10)	-22.04 (-1.69)	-3.02 (-0.26)	19.95 (1.12)	38.76 (3.15)	0.11 (1.58)	2.74 (0.20)	1.02 (3.06)	0.95	0.92	1.73	36.21	5368.44	-88.0	20.32
NBFD	839.15 (6.59)	-4.00 (-0.18)	4.23 (0.19)	-75.49 (-2.43)	-125.47 (-5.25)	-0.02 (-0.21)	-14.76 (-0.57)	0.50 (3.90)	0.99	0.99	2.00	603.37	19230.6	-101.41	38.47

TABLE 6.36: Interest Proxy 1 - Effect of Civil War

	C	STRG	MMRG	OIRG	NBRG	NECM	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	8.17 (0.11)	-0.80 (-0.03)	2.02 (0.05)	-15.56 (-0.28)	16.97 (0.37	1.13 (4.02)	2.05 (8.31)	0.99	0.99	2.52	223.46	75957.4	-115.83	73.66
MMI	18.61 (0.98)	33.17 (3.72)	-14.53 (-1.33)	16.49 (1.09)	-70.06 (-4.90)	-0.65 (-15.07)	0.33 (4.78)	0.99	0.99	1.78	804.32	5431.80	-88.13	19.70
MOI	-9.79 (-0.37)	-19.96 (-1.86)	-10.28 (-0.68)	-6.23 (-0.28)	57.53 (2.95)	-0.25 (-3.14)	-0.92 (-0.06)	0.90	0.86	2.49	21.85	10618.9	-95.17	27.54
NBFD	-4.83 (-0.04)	-98.99 (-1.91)	36.26 (0.56)	-27.35 (-0.31)	171.51 (1.93)	-0.91 (-2.13)	2.17 (4.82)	0.97	0.96	2.46	72.23	196111	-125.79	118.3

TABLE 6.37: Interest Proxy 1

	C	STRG	MMRG	OIRG	NBRG	NECM	CWDM	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	8.49 (0.11)	-1.67 (-0.06)	4.39 (0.10)	-13.89 (0.24)	15.56 (0.33)	1.12 (3.88)	-13.31 (-0.26)	2.04 (7.94)	0.99	0.99	2.54	178.79	75563.4	-115.77	76.24
MMI	18.47 (0.94)	33.09 (3.58)	-15.07 (-1.31)	15.92 (1.01)	-69.05 (-4.51)	-0.65 (14.56)	3.48 (0.25)	0.34 (4.60)	0.99	0.99	1.76	743.73	5405.1	-88.08	20.39
MOI	-10.01 (-0.37)	-19.98 (-1.80)	-11.33 (-0.71)	-7.72 (-0.33)	59.68 (2.82)	-0.26 (-3.02)	-6.57 (-0.34)	0.96 (-1.82)	0.90	0.85	2.55	17.56	10526.3	-95.08	28.46
NBFD	-6.30 (-0.05)	-96.13 (-1.80)	28.97 (0.43)	-32.49 (-0.35)	175.74 (1.91)	-0.92 (-2.09)	42.00 (050)	2.15 (4.64)	0.97	0.95	2.53	58.65	192342	-125.6	12.64

TABLE 6.38: Interest Proxy 2 - Effect of Civil War

	C	SVP	XG	NECM	BFR	TDR	OIR	ELR	TCR	TBR	STR	R^2	FC	D.W	SER
TLM	832.67 (0.96)	11.00 (0.46)	-0.55 (-2.01)	-2.45 (-5.24)	163.30 (1.27)	-91.30 (-0.63)	-38.23 (-0.31)	15.05 (0.37)	-16.73 -0.49	-143.04 (-0.95)	-66.04 (-0.43)	0.97	37.71	2.80	130.47
TBM	-118.67 (-0.81)	-6.67 (-1.60)	0.49 (4.84)	-0.49 (-5.83)	-47.58 (-1.65)	-22.10 (-1.24)	7.91 (0.40)	-0.91 (-0.14)	8.33 1.48	14.15 (-0.95)	47.22 (-0.43)	0.99	349.71	3.19	21.79
TCM	65.74 (1.24)	-2.32 (-1.72)	1.94 (3.29)	-0.10 (-5.56)	38.98 (5.84)	-10.29 (-1.69)	-1.50 (-0.21)	0.54 (0.23)	1.99 (1.13)	-38.02 (-5.33)	-5.18 (-0.59)	0.94	16.42	2.93	7.62
ELM	3.26 (0.21)	-0.30 (-0.75)	0.17 (0.58)	-0.05 (-4.63)	10.35 (3.56)	3.41 (1.37)	-4.67 (-2.18)	0.56 (0.72)	0.?3 (0.22)	-7.09 (-2.84)	-1.96 (-0.70)	0.99	193.95	.12	2.34
OIM	-142.32 (-1.15)	-2.17 (-0.65)	0.57 (1.52)	0.07 (1.08)	-24.94 (-1.40)	47.02 (2.89)	3.95 (0.21)	-1.93 (-0.36)	-0.54 (-0.11)	13.91 (0.64)	1.54 (0.71)	0.94	18.05	2.28	17.33
TDP	-126.83 (-0.54)	-6.42 (-1.38)	0.006 (0.03)	0.63 (5.59)	-30.30 (-1.27)	-59.63 (-2.24)	4.34 (0.18)	-2.26 (-0.28)	13.33 (2.14)	9.28 (1.97)	60.56 (0.35)	0.99	253.30	2.96	25.68
BFD	408.58 (2.58)	0.34 (0.07)	0.67 (2.89)	-0.25 (-3.46)	37.66 (1.61)	-29.59 (-1.14)	-46.97 (-2.21)	-2.70 (-0.37)	-3.09 (-0.46)	-21.42 (-0.77)	-23.05 (-0.76)	0.99	122.69	2.72	23.61

TABLE 6.39: Interest Proxy 1   Balance Sheet A

	C	SVP	XG	NECM	BFRG	TDRG	OIRG	ELRG	TCRG	TBRG	STRG	R^2	FC	D.W	SER
TLM	404.91 (-1.01)	11.07 (0.92)	0.07 (0.31)	-1.44 (-6.03)	-135.45 (-1.38)	-213.84 (-3.71)	73.62 (1.17)	40.95 (2.32)	4.52 (0.27)	80.06 (0.82)	47.67 (0.89)	0.99	131.01	2.91	70.65
TBM	-15.03 (-0.13)	-2.71 (-1.22)	0.21 (2.85)	-0.69 (-21.14)	41.87 (2.95)	17.78 (1.45)	-28.95 (-2.07)	-7.39 (-1.59)	-0.14 (-0.05)	-38.96 (-2.61)	6.65 (0.38)	0.99	771.82	3.03	14.68
TCM	-225.56 (-2.47)	0.48 (0.25)	0.53 (0.35)	0.02 (0.53)	9.90 (0.84)	3.73 (0.34)	-11.66 (-1.27)	-6.10 (-1.63)	1.34 (0.64)	-11.37 (-1.01)	35.17 (3.89)	0.89	8.34	2.02	10.41
ELM	-73.13 (-2.41)	1.04 (1.88)	0.25 (0.34)	-0.02 (-1.37)	0.02 (0.003)	1.52 (0.30)	-6.34 (-1.57)	-1.59 (-1.66)	-0.71 (-0.72)	2.85 (0.39)	11.02 (3.06)	0.98	79.13	2.13	3.66
OIM	53.37 (0.27)	6.36 (1.79)	-0.12 (-0.19)	-0.12 (-0.94)	-50.23 (-2.26)	28.65 (1.05)	-23.81 (-1.09)	-2.51 (-0.27)	-11.46 (-2.38)	63.60 (2.70)	-11.36 (-0.50)	0.90	9.30	1.94	23.57
TDP	55.05 (0.39)	-0.94 (-0.26)	0.25 (2.88)	0.43 (7.79)	61.85 (3.16)	6.48 (0.31)	2.86 (0.15)	-5.83 (-0.92)	-0.57 (-0.11)	-53.17 (-2.58)	-21.17 (-1.23)	0.99	359.01	3.21	21.58
BFD	341.29 (2.46)	-2.08 (-0.46)	1.52 (4.07)	-0.38 (-2.97)	-46.46 (-1.23)	-63.59 (-2.83)	9.63 (0.41)	16.55 (2.32)	7.59 (1.22)	39.55 (0.97)	-13.16 (-0.65)	0.98	93.97	2.84	26.95

TABLE 6.40: Interest Proxy 2   Balance Sheet A

	C	SVP	XG	NECM	NBFR	OIR	MMR	STR	R^2	FC	D.W	SER
TLM	430.02 (1.05)	0.24 (0.02)	-0.45 (-2.23)	-2.25 (-6.78)	10.87 (0.13)	-105.5 (-1.04)	-22.72 (-0.28)	11.03 (0.13)	0.97	55.58	2.38	128.01
MMI	107.76 (1.45)	-6.85 (-2.69)	-0.68 (-6.59)	-1.34 (-15.03)	25.51 (1.79)	9.96 (0.54)	-21.67 (-1.49)	-17.96 (-1.18)	0.99	436.71	2.28	23.29
MOI	-68.75 (-0.86)	-2.16 (-0.89)	9.11 (0.53)	-0.04 (-0.89)	36.11 (2.93)	-10.96 (-0.58)	1.82 (0.13)	-2.99 (-0.21)	0.89	15.03	1.55	22.00
NBFD	10.84 (0.07)	1.16 (0.35)	0.04 (0.20)	0.61 (9.48)	-67.04 (-3.54)	24.14 (0.94)	-1.95 (-0.11)	20.81 (1.07)	0.99	267.04	3.30	29.85

TABLE 6.41: Balance Sheet B Interest Proxy 1

	C	SVP	XG	NECM	NBRG	OIRG	MMRG	STRG	R^2	FC	D.W	SER
TLM	-333.86 (-1.18)	23.82 (2.72)	-0.16 (-1.15)	-1.46 (-6.80)	-190.77 (-3.73)	32.65 (0.51)	-8.79 (-0.18)	119.84 (2.48)	0.98	144.67	2.23	80.15
MMI	27.66 (0.37)	-6.38 (-2.83)	-0.39 (-3.80)	-1.12 (-13.59)	16.09 (1.25)	-21.20 (-1.22)	-16.51 (-1.28)	12.91 (0.99)	0.99	512.60	2.03	21.50
MOI	71.02 (0.89)	5.10 (2.37)	1.06 (3.58)	-0.08 (-2.12)	-41.89 (-2.83)	-10.42 (-0.62)	15.22 (1.16)	7.30 (0.54)	0.88	14.88	2.70	22.10
NBFD	283.81 (2.68)	-2.42 (-0.80)	0.27 (2.42)	0.36 (5.51)	30.35 (1.94)	-5.41 (-0.24)	0.07 (0.004)	-50.68 (-2.84)	0.99	268.77	2.77	29.75

TABLE 6.42: Balance Sheet B Interest Proxy 2

PORTFOLIO SENSITIVITY: MERCHANT BANKS
(DYNAMIC MODEL)

	STR	TBR	TCR	ELR	OIR	TDR	BFR
TLM	-	-	8.2	2.7	-	-	-2.1
TBM	-	-	-	-	-	-	-3.8
TCM	-	-	-	-	-	-	19.6
ELM	-	-	-	-	-2.0	2.6	4.3
OIM	-	-	-	-	-	8.5	-
TDP	-	-	-	-	-	2.4	-
BFD	-	-	-	-	1.5	-	-2.1

TABLE 6.43:   Balance Sheet A,   Interest Proxy 1

	STRG	IBRG	TCRG	ELRG	OIRG	TDRG	BFRG
TLM	-	-	-	-3.2	-	-	3.3
TBM	2.4	-	-	-2.7	-	-1.0	-
TCM	9.4	-	-	-	-	-	-17.7
ELM	-	-	-	4.6	-	-	-5.2
OIM	-	-	-	-	-	-	-
TDP	-	-	-	-	-	-	-
BFD	-	-	-	-	-	-4.2	-

TABLE 6.44:   Balance Sheet A   Interest Proxy 2

	STR	MMR	OIR	NBFR
TLM	1.3	-	-	-
MMI	-	-	-	-
MOI	-	-	-	4.4
NBFD	-	-	1.1	1.9

TABLE 6.45:   Balance Sheet B
Interest Proxy 1

	STRG	MMRG	OIRG	NBRG
TLM	-	-	-	-
MMI	2.1	-	-	-2.8
MOI	-	-	-	6.6
NBFD	-	-	-	-

TABLE 6.46:   Balance Sheet B
Interest Proxy 2

MERCHANT BANKS - PORTFOLIO SPEED OF ADJUSTMENT

TABLE 6.47:   BALANCE SHEET A INTEREST PROXY 1

Coefficient (Q)		Speed of Adjustment (S)
TLM	1.75	0.75
TBM	0.62	0.38
TCM	2.08	1.08**
ELM	0.23	0.77*
OIM	1.05	0.85
TDP	-0.17	1.17**
BFD	0.83	0.17

TABLE 6.48:   BALANCE SHEET A INTEREST PROXY 2

Coefficient (Q)		Speed of Adjustment (S)
TLM	2.76	-1.76**
TBM	0.14	0.86
TCM	0.50	0.50
ELM	0.40	0.60
OIM	-0.46	1.46**
TDP	3.89	-2.89**
BDF	2.43	1.43**

TABLE 6.49:   BALANCE SHEET B INTERES PROXY 1

Coefficient (Q)		Speed of Adjustment (S)
TLM	1.43	-1.43
MMI	0.61	0.39
MOI	1.03	-0.03
NBFD	0.50	0.50

TABLE 6.50:   BALANCE SHEET B INTEREST PROXY 2

Coefficient (Q)		Speed of Adjustment (S)
TLM	2.05	-1.05**
MMI	0.33	0.77
MOI	-0.92	1.92
NBFD	2.71	-1.17**

NOTE: *Means coefficient insignificant or wrongly signes

**Means coefficient did not meet a prior restriction
or its both insignificant and did not meet a prior
expectations.

indicates that the civil war had no influence on portfolio selection.

For Balance Sheet type A interest rate expectation proxy 1 case the estimates were essentially similar with the static model case with the exception that there were more substitutes and complements relationship identified as being statistically significant. The added relationships are for complements, loans and treasury certificates, equipment leasing and loans, time deposit and other investment. While for substitutes we have loans and borrowed funds, treasury bills and borrowed funds as well as borrowed funds and other investment category. The Balance Sheet A interest proxy 2 case with the following new additional complementary or substitution relationship were statistically significant. These are the loan and borrowed funds, borrowed funds and time deposit which are complementary, and treasury certificate and time deposit as substitutes. While for the Balance Sheet B interest proxy 1 and 2 cases, the result was similar to the static relationship case with some rates which hitherto were significant being now insignificant. These include for complements loans, other investment and borrowed funds interest expectation proxy 1 case; loans and borrowed fund in the proxy 2 case. For substitutes, loans and other investment in the proxy 2 case and all the two significant substitute relationship in the interest expectation proxy 1 case.

The loan rate performance was poor also in the stock adjustment model formulation. It was insignificant in all equations in the Balance Sheets A and B interest proxy 1 case and significantly positive in the treasury bill equation Balance Sheet A interest proxy 2 estimation and the money market instrument in the Balance Sheet B interest proxy 2 case indicating as mentioned earlier, that treasury bills (or money market

instrument in general) and the banks loan and advances portfolio are complementary contrary to theoretical postulations which indicate a substitution relationship between the loan and investment portfolio.

With regards to the parameter estimates for the level of exogenous items, it was found to be significantly positive throughout, in the loan equation for all balance sheet formats considered and interest proxies tried. For the treasury bill equation it was significantly negative in Balance Sheet A interest rate expectation proxies 1 and 2, so also is the treasury certificate equation in Balance Sheet A interest rate proxy 2, equipment leasing equation in Balance Sheet A interest proxy 1. While on the other hand the other investment equation was significantly positive. In Balance Sheet B, only the other investment category was not significant, while it was significant in the interest rate proxy 2. The coefficients were negative for the money market instruments, other investments and borrowed funds equations.

On the overall, sensitivity of the portfolio to interest rate expectations, Tables 6.43 - 6.46, show that, like the static case, there is high responsiveness to changes in these rates.

With regards to the adjustment process, all the coefficients of adjustment (Tables 6.47 - 6.50) from actual to desired values range from 0.03 to 0.86 neglecting the values of the equations asterisked, which are wrongly singed (*) or for those which are insignificant (**), and some of which contravenes our assumption regarding the coefficient of adjustment that is 0<S<1.

The adjustment coefficient as seen thus, were generally less than 0.5 indicating a very slow process or speed of adjustment to the desired level with exceptional cases in the equipment leasing

Balance Sheet A interest proxy 1, treasury bill equation Balance Sheet A interest proxy 2 and the money market instrument equation Balance Sheet A interest proxy 2 estimations.

On the whole, the partial adjustment model performed fairly well when compared to the static model especially in the Balance Sheet A interest proxy 1 and 2 cases. The model also provides information on the adjustment process evident in portfolio behaviour of these institutions. With regards to portfolio adjustment, it was revealed that adjustment was non-rapid indicating an inherent weak point for monetary policy which strives at utilizing the interest rate structure for achieving desired goals. Such policies would be met with slow adjustment to desired levels.

6.2.4 Dynamic Model: Insurance Companies

The results for the various categories of insurance companies are contained in Tables 6.51 - 6.80. From the results, the F-statistic value in all cases revealed an overall significance of the model in all equations, the explanatory power of the model as indica $\cdots$ d by the R^2 and $\bar{R}^2$ value is above 80% and 72% respectively. The a priori assumption on constant term was met in all cases for the interest proxy 2, but violated in the proxy 1 case for the government securities and other investment equations in the joint insurance fund; other investment and premium supply equations in the life insurance fund; government securities, other investment and premium supply equations in the non-life insurance fund. The assumption of symmetry was not met while those on column sums and row sums were also not met in most cases similar to the static model case and for both model types in i ` ᐧ merchant bank case.

INSURANCE COMPANIES - DYNAMIC MODEL

	C	STR	GSR	OIR	NPR	NECN	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLN	-11.40 (-0.86)	2.60 (0.64)	-1.13 (-0.34)	-0.006 (-0.26)	-0.002 (-1.07)	0.09 (2.74)	0.10 (0.40)	0.84	0.75	1.97	18.97	481.90	-52.55	6.94
GSN	-551.45 (-3.44)	117.74 (9.71)	-45.41 (-4.40)	-0.003 (-0.32)	0.008 (1.69)	-0.92 (-7.82)	0.32 (4.00)	0.97	0.95	2.90	46.53	5276.88	-72.89	22.97
OIN	-26.19 (-2.24)	-4.86 (-2.41)	10.45 (7.10)	-0.002 (-0.16)	0.0002 (0-37)	0.15 (9.04)	0.53 (5.71)	0.99	0.99	2.28	261.06	103.34	-39.46	3.22
PSN	379.85 (2.36)	-77.23 (-2.73)	25.75 (1.85)	0.009 (0.08)	-0.007 (-1.16)	-0.18 (-0.73)	0.40 (1.20)	0.99	0.98	1.98	115.51	9498.09	-77.89	30.83

TABLE 6.51: Non-Life Interest Proxy 1

	C	STR	GSR	OIR	NPR	NECN	RDM	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLN	-7.35 (-0.52)	1.30 (0.30)	-0.30 (-0.01)	-0.003 (-0.09)	0.002 (-1.16)	0.07 (1.55)	10.38 (0.97)	-0.03 (-0.11)	0.86	0.75	2.25	7.77	436.41	-51.71	6.96
GSN	-535.32 (-11.16)	112.35 (7.91)	-41.82 (-3.55)	-0.002 (-0.18)	0.008 (1.68)	0.99 (-6.29)	22.60 (0.70)	-0.32 (-3.96)	0.97	0.94	2.74	37.93	5003.39	-72.44	23.58
OIN	-25.56 (-1.97)	-5.04 (-2.10)	10.56 (6.15)	-0.002 (-0.11)	-0.0003 (0.36)	0.14 (6.54)	0.70 (0.15)	0.53 (5.43)	0.99	0.99	2.31	279.25	103.08	-39.44	3.38
PSN	329.58 (1.85)	-72.20 (2.04)	56.69 (1.35)	-35.42 (-0.99)	-6.07 (-0.15)	-0.41 (-0.95)	-0.61 (-0.01)	0.20 (0.31)	0.98	0.97	2.30	75.07	1134.11	-75.26	2.39

TABLE 6.52: Non-Life Interest Proxy 1 - Effect of Regulation

	C	STRG	GSRG	OIRG	NPRG	NECN	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLN	-0.33 (-0.05)	-1.18 (-0.34)	1.59 (0.46)	-0.009 (-0.34)	0.006 (0.42)	0.09 (2.81)	0.36 (1.68)	0.82	0.72	1.54	17.82	540.25	-53.52	7.35
GSN	-0.31 (-0.55)	-1.23 (-0.83)	1.89 (0.72)	-.34 (-0.36)	1.59 (0.89)	-0.47 (3.43)	0.38 (1.63)	0.86	0.75	1.38	19.21	532.31	-47.20	9.32
OIN	2.90 (0.71)	-1.76 (-0.85)	1.52 (0.63)	-0.004 (-0.03)	0.004 (4.68)	0.09 (3.52)	0.85 (13.68)	0.99	0.99	1.79	209.38	177.61	-44.07	4.21
PSN	1.01 (0.03)	-18.49 (-1.03)	19.32 (1.00)	0.005 (0.32)	0.002 (0.19)	0.16 (0.60)	1.15 (8.36)	0.98	0.96	1.40	71.26	15259.5	-81.92	39.06

TABLE 6.53: Non-life Interest Proxy 2

	C	STRG	GSRG	OIRG	NPRG	NECN	RDM	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLN	1.20 (0.19)	-2.24 (-0.66)	2.93 (0.84)	-0.007 (-0.26)	0.001 (0.68)	0.04 (0.88)	14.92 (1.35)	0.12 (0.45)	0.85	0.74	1.88	7.52	448.95	-51.95	7.06
GSN	2.90 (0.68)	-2.07 (-0.76)	1.92 (0.58)	-0.006 (0.0004)	0.004 (4.34)	0.09 (2.79)	1.35 (0.19)	0.84 (9.61)	0.99	0.99	1.83	162.18	176.90	-44.03	4.43
OIN	28.42 (0.89)	-2.86 (-0.44)	-6.46 (0.93)	5.37 (0.85)	1.55 (0.35)	0.18 (4.41)	-18.35 (-1.80)	0.96 (4.66)	0.98	0.98	2.49	76.17	198.3	-53.01	6.49
PSN	-0.92 (-0.02)	-27.09 (-1.33)	31.15 (1.34)	0.007 (0.44)	0.003 (0.41)	0.07 (0.28)	59.21 (0.92)	1.27 (6.69)	0.98	0.96	1.70	60.31	13939.7	-81.15	39.36

TABLE 6.54: Non-life Interest Proxy 2 - Effect of Regulation

	C	STR	GSR	OIR	NPR	NECL	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLL	4.16 (0.20)	2.21 (0.60)	-2.96 (-1.52)	0.001 (0.78)	0.17 (0.12)	0.20 (-3.94)	0.69 (3.35)	0.99	0.99	1.75	243.11	154.68	-42.89	3.93
GSL	5.65 (0.14)	7.39 (1.04)	-11.10 (-3.79)	0.009 (-0.43)	2.39 (1.04)	-0.41 (-5.79)	0.51 (0.50)	0.98	0.97	1.99	90.31	362.83	-50.13	6.02
OIL	-163.16 (-4.05)	15.14 (2.71)	11.38 (2.32)	-0.002 (0.006)	-2.47 (-0.63)	-0.07 (-0.43)	0.24 (0.92)	0.98	0.98	2.06	105.26	1005.75	-58.81	10.03
PSL	251.15 (4.01)	40.27 (-3.81)	4.15 (0.54)	0.001 (0.21)	0.59 (0.09)	-0.11 (-0.44)	-0.02 (-0.04)	0.96	0.94	2.60	42.04	2721.23	-67.27	16.50

TABLE 6.55: Life Insurance Interest Proxy 1

	C	STR	GSR	OIR	NPR	NECL	RDM	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLL	0.35 (0.17)	1.70 (0.47)	-1.49 (-0.66)	0.001 (0.80)	-0.07 (-0.05)	-0.21 (-4.10)	5.14 (1.22)	0.60 (2.75)	0.99	0.99	1.69	218.68	132.78	-41.59	3.84
GSL	10.67 (0.26)	8.07 (1.13)	-13.09 (-3.70)	-0.001 (0.47)	2.72 (1.17)	-0.43 (-5.84)	-6.39 (-1.00)	0.23 (0.74)	0.98	0.97	2.07	77.57	326.50	-49.24	6.02
OIL	-154.27 (-3.26)	12.88 (1.60)	12.72 (2.09)	0.002 (0.05)	-2.53 (-0.62)	-0.03 (-0.18)	4.93 (0.41)	0.30 (1.01)	0.99	0.97	1.98	82.75	987.27	-58.75	10.47
PSL	246.75 (3.55)	-38.59 (-2.77)	2.72 (0.25)	0.001 (0.18)	0.80 (0.12)	-0.13 (-0.46)	-3.67 (-0.20)	0.004 (0.009)	0.96	0.93	2.58	32.53	2709.13	-67.23	17.35

TABLE 6.56: Life Insurance Interest Proxy 1 - Effect of Regulation

	C	STRG	GSRG	OIRG	NPRG	NECL	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLL	4.29 (1.87)	2.94 (3.53)	-5.37 (-5.17)	0.009 (1.01)	2.55 (2.95)	-0.17 (-5.56)	0.67 (10.33)	0.99	0.99	1.91	678.86	55.65	-34.20	2.36
GSL	-2.69 (-0.30)	2.36 (0.70)	-0.85 (-0.20)	0.002 (0.49)	-0.40 (-0.11)	0.33 (-3.90)	0.29 (1.45)	0.96	0.93	2.50	38.32	834.66	-57.22	9.14
OIL	9.43 (0.67)	8.38 (1.64)	-17.53 (-2.53)	-0.008 (-0.15)	9.71 (1.89)	0.27 (1.03)	1.34 (4.04)	0.97	0.95	2.52	53.08	1964.45	-64.50	14.02
PSL	0.14 (0.005)	-1.44 (-0.15)	5.69 (0.45)	-0.005 (-0.44)	-10.53 (-1.04)	-0.26 (-0.58)	1.03 (1.97)	0.89	0.83	2.14	13.84	7668.77	-76.07	27.69

TABLE 6.57: Life Insurance Interest Proxy 2

	C	STRG	GSRG	OIRG	NPRG	NECL	RDM	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLL	4.30 (1.79)	2.56 (1.92)	-4.93 (-3.09)	0.009 (0.99)	2.60 (2.84)	-0.17 (-5.31)	1.31 (7.84)	0.65	0.99	0.99	1.78	531.84	54.79	-34.07	2.47
GSL	-1.99 (-0.23)	-1.53 (-0.32)	3.33 (0.59)	0.002 (0.56)	0.43 (0.12)	-0.29 (-3.12)	12.94 (1.14)	0.19 (0.91)	0.96	0.94	2.19	34.03	729.00	-56.07	9.00
OIL	9.36 (0.63)	9.15 (1.03)	-18.41 (-1.69)	-0.008 (-0.14)	9.66 (1.78)	0.27 (0.97)	-1.94 (-0.11)	1.35 (3.73)	0.97	0.95	2.48	41.00	1961.86	-64.49	14.76
PSL	-7.64 (-0.32)	19.81 (1.45)	-17.72 (-1.11)	-0.005 (-0.58)	-11.96 (-1.34)	-0.62 (-2.42)	-56.91 (-2.02)	1.12 (2.44)	0.93	0.87	2.44	16.08	5284.36	-72.91	24.23

TABLE 6.58: Life Insurance Interest Proxy 2 — Effect of Regulation

	C	STR	CSR	CIR	LPR	NPR	NECJ	XG	R^2	$\bar{R}^2$	D.W	FC	SSE	LLF	SER
TLM	-103.16	8.88	18.0	0.009	-16.75	0.005	0.10	1.13	0.98	0.96	2.95	43.48	887.35	-57.74	10.53
	(-1.6)	(0.98)	(1.96)	(0.02)	(-2.24)	(2.10)	(1.98)	(2.29)							
GSJ	-285.63	86.24	-51.02	-0.002	-3.99	0.01	-0.83	0.45	0.98	0.97	3.05	79.73	978.32	-69.21	25.21
	(-5.12)	(6.25)	(-3.99)	(-0.26)	(-0.48)	(1.49)	(-5.71)	(3.39)							
CIJ	-893.2	9.24	24.50	-0.001	-3.31	0.005	0.18	0.51	0.99	0.99	2.14	1321.9	155.67	-42.90	4.16
	(- 9.93)	(2.91)	(11.44)	(-0.08)	(0.08)	(-2.02)	(5.11)	(6.67	(9.12)						
PSL	286.95	-51.80	10.12	0.006	2.53	-0.01	0.21	0.41	0.98	0.97	2.58	58.94	1136.21	-51.35	13.38
	(5.42)	(-5.13)	(1.44)	(0.14)	(0.53)	(-3.22)	(0.92)	(-2.00)							
PSN	287.51	-66.05	15.05	0.003	32.72	-0.01	0.13	0.80	0.99	0.98	2.10	2.10	1185.83	-72.46	24.67
	(2.02)	(-2.81)	(0.95)	(0.03)	(1.99)	(-1.80)	(0.80)	(3.29)							

TABLE 6.59: Joint Fund Interest Proxy 1

	C	STR	CSR	CIR	LPR	NPR	NICJ	RDM	XC	R^2	$\bar{R}$	D.W	FC	SSE	LLF	SER
TLJ	-93.9	11.8	6.1	0.2	-5.0	0.1	0.9	5.87	0.5	0.99	0.9?	3.0	32.0	1194.6	-60.3	12.2
	(-1.6)	(1.1)	(0.8)	(0.5)	(-1.0)	(0.6)	(0.9)	(0.40)	(1.1)							
GSJ	-248.1	80.0	-49.3	-0.06	-4.1	0.7	-1.0	-68.49	0.4	0.96	0.9?	3.1	68.3	3744.8	-70.0	21.6
	(-9.6)	(5.2)	(-3.8)	(0.7)	(-0.51)	(1.6)	(-4.8)	-0.58	(3.1)							
CIJ	-96.4	9.9	24.2	-0.03	-3.3	0.05	0.2	-3.28	0.5	0.97	0.9	2.3	1061.4	150.8	-42.7	7.?
	(-9.2)	(2.8)	(9.6)	(-0.2)	(-2.0)	(4.?)	.6	(0.51)	(8.7)							
PSL	287.0	-51.8	10.1	0.07	2.5	-0.09	0.2	-15.43	-0.4	0.99	0.9	2.6	58.9	1190.5	-60.2	12.?
	(5.4)	(-5.1)	(1.4)	(0.1)	(0.5)	-3.2	(1.9)	(-0.85)	(-2.0)							
PSN	310.6	-68.9	13.5	0.2	22.6	-1.0	0.11	18.05	0.8	0.95	0.9?	1.9	120.7	7037.	-75.3	28.?
	(2.6)	(-3.0)	(0.9)	(2.0)	(2.0)	(1.7)	(0.58)	(0.43)	(2.9)							

TABLE 6.60: Joint Fund Interest Proxy 1

Effect of Regulation.

	C	STRG	GSRG	CIRG	LPKG	LPRG	NECJ	XG	R^2	R^{-2}	D.W	FC	SSE	LLF	SER
	-1.00	2.95	-2.29	0.001	0.43	0.004	0.0003	0.94	0.96	0.92	2.46	27.35	1770.9	-63.6	14.0?
TLJ	(-0.07)	(0.56)	(-0.33)	(0.19)	(0.09)	(1.34)	(0.006)	(4.39)							
	-1.66	5.43	4.05	-0.002	-15.25	-0.02	-0.28	0.84	0.91	0.85	2.42	23.48	13463.0	-8.55	88.6?
GSJ	(-0.04)	(0.40)	(0.24)	(-0.17)	(-1.02)	(0.95)	(-1.59)	(2.79)							
	10.75	9.31	-17.68	0.001	7.38	0.008	0.004	1.02	0.99	0.98	2.94	133.34	1529.42	-62.87	13.?
CIJ	(0.83)	(1.39	(-2.18)	(0.21)	(1.59)	(3.09)	(0.04)	(11.46)							
	-0.12	1.42	1.91	-0.033	8.33	0.002	-0.08	0.83	0.89	0.80	2.45	10.59	1354.76	-57.35	11.6?
PSL	(-0.4)	(0.82)	(0.90)	(-0.90)	(-0.78)	(0.42)	(-0.36)	(2.74)							
	-2.32	-34.34	40.27	0.004	-3.33	0.007	0.34	1.06	0.98	0.96	1.46	65.57	8321.59	-72.14	27.5?
PSN	(-0.06)	(-1.64)	(1.58)	(0.31)	(-0.25)	(0.95)	(1.38)	(8.00)							

TABLE 6.61 : Joint Fund Interest Proxy 2.

	C	STRG	CSRG	CIRG	NPRG	LPRG	LPRG	NECI	XG	R^2	R^{-2}	D.W	PC	SEE	LLF	SER
TLJ	-0.7	-3.6	5.2	0.2	0.03	1.5	0.01	25.42	0.7	0.96	0.95	2.2	25.6	1482.8	-62.1	13.6
	(-0.5)	(-0.5)	(0.6)	(0.3)	(1.3)	(0.3)	(0.1)	(1.24)	(2.3)							
GSJ	-9.3	31.0	-37.2	0.5	-0.7	12.3	-1.1	173.43	0.5	0.98	0.97	1.8	19.9	12412.5	-80.2	39.4
	(-0.2)	(1.1)	(1.1)	(0.3)	(1.0)	(1.0)	(-2.8)	(2.37)	(1.9)							
CIJ	10.8	10.4	-18.9	-0.1	0.8	7.1	0.2	-5.34	1.0	0.99	0.98	2.5	104.4	1519.9.9	-62.3	13.8
	(0.8)	(1.2)	(-1.9)	(-0.2)	(2.7)	(1.4)	(0.2)	(-0.22)	(6.4)							
PSL	-3.1	3.7	0.2	-0.04	0.009	-10.3	0.2	-56.05	0.4	0.98	0.97	2.5	10.9	6010.1	-74.0	27.4
	(-0.1)	(0.2)	(0.008)	(-0.4)	(0.02)	(-1.0)	(0.6)	(-1.51)	(1.1)							
PSN	-2.6	-36.2	42.0	0.6	0.02	-1.3	0.3	29.39	1.2	0.93	0.93	1.6	11.8	12636.7	-80.3	39.7
	(-0.7)	(-1.6)	(1.5)	(0.4)	(0.2)	(-0.9)	(0.9)	(0.39)	(4.3)							

TABLE 6.62: Joint Fund Interest Proxy 2 - Effect of Regulation.

	C	SVP	XG	NECJ	NPR	LPR	OIR	GSR	STR	R^2	FC	D.W	SER
TLJ	-44.67 (-0.67)	3.14 (0.87)	0.30 (0.70)	0.13 (1.19)	7.17 (0.58)	-7.05 (-1.10)	8.55 (0.72)	0.78 (0.06)	0.82 (0.06)	0.97	38.99	2.85	11.10
GSJ	-177.64 (-1.30)	2.12 (0.27)	0.47 (2.87)	-0.76 (-3.32)	21.92 (0.92)	-11.39 (-0.82)	0.97 (0.04)	-47.74 (-1.66)	61.65 (2.10)	0.98	54.32	2.74	24.21
OIJ	-174.60 (-4.09)	-0.14 (-0.06)	0.48 (3.68)	0.28 (4.05)	-3.09 (-0.42)	-0.49 (-0.11)	14.17 (1.54)	15.97 (1.92)	4.92 (0.56)	0.99	374.52	2.70	7.30
PSL	177.29 (1.99)	-2.48 (-0.49)	-0.48 (-1.59)	0.005 (0.04)	-11.98 (-0.78)	5.13 (0.57)	-27.16 (-1.49)	26.31 (1.44)	-28.72 (-1.52)	0.97	36.04	2.68	15.52
PSN	208.07 (1.08)	-4.91 (-0.44)	0.62 (1.47)	-0.09 (-0.24)	-12.83 (-0.33)	22.38 (1.18)	-24.28 (-0.60)	28.05 (0.68)	-44.63 (-1.12)	0.98	76.48	1.84	32.82

TABLE 6.63: Joint Insurance Interest Proxy 1

	C	SVP	XG	NECJ	NPRG	LPRG	OIRG	GSRG	STRG	R^2	FC	D.W	SER
TLJ	-82.09 (-1.69)	2.24 (0.87)	0.26 (1.09)	0.21 (2.43)	7.07 (0.73)	-8.64 (-1.50)	12.53 (1.30)	1.45 (0.15)	4.28 (0.42)	0.98	57.82	2.59	9.16
GSJ	-294.31 (-1.92)	5.61 (0.90)	0.08 (0.34)	-1.11 (-4.18)	-15.94 (-0.63)	-0.05 (-0.003)	38.94 (1.41)	-95.07 (-2.87)	105.15 (2.84)	0.97	48.25	2.77	25.66
OIJ	305.68 (5.77)	-2.76 (-1.29)	1.78 (9.46)	0.08 (1.08)	3.47 (0.43)	13.41 (2.76)	15.64 (1.58)	-51.26 (-5.95)	-17.53 (-2.01)	0.99	326.14	1.97	7.80
PSL	113.56 (1.11)	-7.72 (-2.02)	-0.77 (-1.87)	0.11 (0.73)	-14.70 (-0.91)	3.78 (0.40)	-60.45 (-3.02)	60.15 (2.79)	-24.35 (-1.12)	0.97	33.49	2.48	16.00
PSN	256.68 (2.06)	-1.95 (-0.35)	0.60 (2.44)	0.02 (0.10)	27.32 (1.08)	-8.00 (-0.55)	-66.29 (-3.03)	90.89 (4.17)	-81.84 (-3.55)	0.99	207.89	2.77	19.99

TABLE 6.64: Joint Insurance Interest Proxy 2

	C	SVP	XG	NECL	LPR	OIR	GSR	STR	R^2	FC	D.W	SER
TLL	0.86 (0.05)	2.20 (2.88)	0.53 (3.13)	-0.15 (-2.99)	-0.81 (-0.67)	2.15 (0.71)	-0.58 (-0.19)	-1.15 (-0.37)	0.99	342.65	1.23	3.07
GSL	3.76 (0.09)	-0.56 (-0.35)	6.24 (0.17)	-0.35 (-2.87)	2.85 (1.32)	9.24 (1.46)	-20.51 (-3.70)	10.33 (1.56)	0.98	98.71	2.14	5.34
OIL	-133.84 (-3.49)	3.67 (1.88)	0.23 (0.84)	0.14 (0.77)	-4.08 (-1.22)	15.12 (1.62)	7.51 (0.84)	4.57 (0.55)	0.99	129.55	1.84	8.39
PSL	193.25 (3.53)	-5.40 (-1.64)	-0.04 (-0.01)	-0.50 (-1.87)	2.72 (0.52)	-31.49 (-2.43)	17.49 (1.22)	-23.67 (-1.72)	0.97	60.08	2.33	12.89

TABLE 6.65: Life Insurance Interest Proxy 1

	C	SVP	XG	NECL	LPRG	OIRG	GSRG	STRG	R^2	FC	D.W	SER
TLL	14.73 (1.60)	0.95 (1.90)	0.59 (6.15)	-0.18 (-6.32)	2.47 (3.08)	2.16 (1.05)	-5.80 (-2.65)	0.05 (0.02)	0.99	809.18	1.96	2.00
GSL	-110.77 (-5.45)	3.39 (3.26)	-0.28 (-1.42)	-0.03 (-0.42)	-2.39 (-1.42)	-0.39 (-0.07)	4.18 (0.69)	13.49 (3.40)	0.99	154.93	2.76	4.28
OIL	197.41 (3.34)	0.92 (0.65)	1.96 (4.39)	0.39 (2.30)	15.63 (4.24)	18.01 (1.82)	-42.18 (-5.17)	-11.74 (-1.70)	0.99	161.68	1.65	7.52
PSL	146.09 (1.80)	-7.39 (-2.54)	-0.09 (-0.19)	-0.48 (-1.74)	-3.88 (-0.69)	-52.17 (-3.02)	39.38 (1.85)	-18.68 (-0.98)	0.97	47.55	1.54	14.45

TABLE 6.66: Life Insurance Interest Proxy 2

	C	SVP	XG	NECN	NPR	OIR	GSR	STR	R^2	FC	D.W	SER
TLN	-30.68 (-0.)	-1.31 (-0.6)	-4.07 (-0.1)	0.10 (2.1)	4.05 (0.71)	-7.58 (-1.33)	1.76 (0.26)	6.51 (0.91)	0.87	8.92	2.07	6.55
GSN	-295.35 (-2.43)	3.21 (0.42)	0.53 (3.46)	-0.72 (-4.17)	1.29 (0.08)	4.00 (0.17)	-34.14 (-1.23)	69.29 (2.53)	0.96	35.48	2.67	24.3
OIN	-22.91 (-1.51)	-0.23 (-0.26)	0.61 (6.23)	0.15 (7.43)	1.34 (0.71)	-3.64 (-1.31)	12.64 (4.23)	-5.53 (-1.76)	0.99	385.6	2.61	2.88
PSN	349.66 (1.95)	2.42 (0.25)	0.20 (0.31)	-0.46 (-0.99)	-5.92 (-0.16)	-37.14 (-1.09)	60.74 (1.35)	-78.53 (-2.12)	0.98	92.10	1.92	31.96

TABLE 6.67: Non-life Insurance Interest Proxy 1

	C	SVP	XG	NECN	NPRG	OIRG	GSRG	STRG	R^2	FC	D.W	SER
TLN	-62.5 (-2.11)	-1.08 (-0.67)	0.42 (1.55)	0.10 (2.36)	-9.53 (-2.36)	-1.88 (-0.26)	5.34 (0.80)	9.83 (1.60)	89.20	10.62	2.61	6.07
GSN	-270.4 (-3.34)	7.08 (1.88)	0.24 (2.09)	-0.92 (-9.40)	-7.14 (-0.75)	65.01 (4.49)	-98.82 (-5.78)	64.65 (4.69)	98.71	98.65	3.06	14.77
OIN	32.52 (0.88)	-1.19 (-0.61)	0.90 (3.56)	0.16 (3.28)	3.29 (0.67)	6.21 (0.84)	-3.57 (-0.44)	-6.47 (-0.84)	97.80	57.28	2.35	7.41
PSN	282.19 (2.57)	-2.46 (-0.54)	0.45 (2.29)	-0.12 (-0.83)	14.62 (1.18)	-71.24 (-3.97)	92.25 (4.57)	-82.34 (-3.90)	99.53	275.81	2.92	18.55

TABLE 6.68: Non-life Insurance Interest Proxy 2

PROTFOLIO SENSITIVITY: JOINT INSURANCE
FUND (DYNAMIC MODEL)

	STR	GSR	OIR	LPR	NPR
TLJ	-	-	-	-1.6	-
GSJ	7.7	-3.5	-	-	-
OIJ	0.9	1.9	-	-	0.0003
PSL	6.8	-	-	-	0.0007
PSN	2.5	-	-	-	-

TABLE 6.69: Interest Proxy 1

	STRG	GSRG	OIRG	LPRG	NPRG
TLJ	-	-	-	-	-
GSJ	-	-	-	-	-
OIJ	-	-	-	-	0.0003
PSL	-	-	-	-	-
PSN	-	-	-	-	-

TABLE 6.70: Interest Proxy 2

	STR	GSR	OIR	PSR
TLL	-	-	-	-
GSL	-	-1.8	-	-
OIL	2.6	1.5	-	-
PSL	5.3	-	-	-

TABLE 6.71: Interest Proxy 1

	STRG	GSRG	OIRG	LPRG
TLN	C.5	-0.7	-	0.3
GSN	-	-	-	-
OIN	-	-2.0	-	-
PSN	-	-	-	-

TABLE 6.72: Interest Proxy 2

PORTFOLIO SENSITIVITY: NON-LIFE
FUND (DYNAMIC MODEL)

	STR	GSR	OIR	NPR
TLN	-	-	-	-
GSN	18.1	-5.4	-	-
OIN	-1.1	1.9	-	-
PSN	2.9	-	-	-

TABLE 6.73: Interest Proxy 1

	STRG	GSRG	OIRG	NPRG
TLN	-	-	-	-
GSN	-	-	-	-
OIN	-	-	-	0.004
PSN	-	-	-	-

TABLE 6.74: Interest Proxy 2

SPEED OF ADJUSTMENT: JOINT INSURANCE FUND

	Coefficient (Q)	Speed of Adjustment (S)
TLJ	1.13	-0.13*
GSJ	0.45	0.55
OIJ	0.51	0.49
PSL	0.41	0.59*
PSN	0.80	0.20

TABLE 6.75: Interest Proxy 1

	Coefficient (Q)	Speed of Adjustment (S)
TLJ	0.94	0.06
GSJ	0.84	0.16
OIJ	1.02	-0.02*
PSL	0.83	0.17
PSN	1.06	-0.06*

TABLE 6.76: Interest Proxy 2

SPEED OF ADJUSTMENT: LIFE INSURANCE FUND

	Coefficient (Q)	Speed of Adjustment (S)
TLL	0.99	0.31
GSL	0.59	0.49*
OIL	0.24	0.76*
PSL	-0.02	1.02

TABLE 6.77: Interest Proxy 2

	Coefficient (Q)	Speed of Adjustment (S)
TLL	0.67	0.33
GSL	0.29	0.71*
ODL	1.34	-0.34*
PSL	1.03	-0.03*

TABLE 6.78: Interest Proxy 2

SPEED OF ADJUSTMENT: NON-LIFE INSURANCE FUND

	Coefficient (Q)	Speed of Adjustment (S)
TLN	0.10	0.90
GSN	-0.32	0.68*
OIN	0.53	0.47
PSN	0.40	0.60*

TABLE 6.79: Interest Proxy 1

	Coefficient (Q)	Speed of Adjustment (S)
TLN	0.36	0.64*
GSN	0.38	0.62
OIN	0.85	0.15
PSN	1.15	-0.15*

TABLE 6.80: Interest Proxy 2

The Durbin-Watson statistics used to test for autocorrelation indicated that autocorrelation was not present in all equations in the model. However, for some cases such as the premium supply (joint fund interest proxy 2), total loans and government securities (life fund interest proxy 1), and loans alone in interest proxy 2, as well as all asset equations in the interest proxy 2 non-life insurance fund the test was inconclusive.

The result in the regulation dummy was insignificant in all cases except the government securities equation in the joint fund interest proxy 2 case which also indicated that government regulation played no critical role in influencing portfolio selection in these institutions.

The stability of the estimated equations was tested and the proxy variables were found to be stable as most of the coefficients were insignificant with the exception of the loan equation (interest proxy 1), government securities and premium supply (interest proxy 2) equations in the life fund case. Thus, like the merchant banks, the result indicates the usefulness of the model for policy prediction. The frequency of claims for each insurance category which was used to proxy the return on premium supply (cost of funds) was tried as specified and was found to be insignificant in all cases. Thus, it was excluded from the report. Like it was for the merchant banks, the results for the dynamic model for the insurance companies were largely similar to the static case. In some cases, specifically in the joint fund case, there were more number of complementary and substitution relationships as well as number of own rates that were statistically significant.

In the case of the life insurance fund, interest, proxy 2, one pair of substitutes and complementary relationships abound above what we had in the static version. These are the complementary relationship between loans and life insurance premium fund supply and the substitutability relationship between government securities and other investment categories.

In the non-life insurance fund case, the own rate on government securities is statistically significant but negative. Also here, all substitutes and complementary relationships identified are as in the static case except that the relationship between loans and other investment categories are now substitutes which is the expected classical relationship. In the interest proxy 2 case, a new complementary relationship between premium supply and other investment category was evident.

In the joint insurance fund, the performance of the loan rate was poorer than for the static model. It was not significant in the loans equations in interest proxy 1 and insignificant in all equations in the interest proxy 2 case. The observation on the loan rate in the joint insurance fund is also applicable to the life insurance fund where in this case only the other investment and premium supply equations are significant in interest proxy 1 and is only significant in the loans equation in interest proxy 2. The converse was, however, the case in the non-life insurance fund where the loan rate was significant in all equations using interest rate proxy 1 except in the loan equation itself. It was also negatively signed everywhere except the government securities equation and the insignificant loan equation. In interest proxy 2, however, it was insignificant in all respect and

all coefficients were negatively signed.

On the influence of the level of the next exogenous component, this was insignificant in all cases for the joint insurance fund interest proxy 1 and 2 cases. For the life insurance company both interest expectation proxies was significant in the loan and government securities equation with a negative coefficient while for the non-life insurance fund, the level of the net exogenous component was significant everywhere in both interest proxy 1 and 2 cases except the premium supply equation in interest proxy 2. They were positively signed in the loan and other investment equations in interest proxy 1. While also all equations were positively signed in interest proxy 2.

.The sensitivity of portfolio holding of these insurance companies was also generally lower in most cases than for the merchant banks in the dynamic case as was the case in the static version, see Tables 6.61 - 6.65.

On the portfolio adjustment process it is obvious from the analysis above that the dynamic model was of more explanatory value in the case of the merchant banks and in fact they have limited applicability with these insurance companies relative to the static model. This observation is contrary to the behaviour of the merchant banks. From the foregoing, a consideration of the speed of adjustment indicates that portfolio adjustment was comparatively slower ranging between 0.06 to 0.69 (see Tables 6.75 - 6.80 with those wrongly signed or asterisked shown as in the case for the merchant banks). On the average, the speed of adjustment is about 0.3 which is even a less rapid adjustment process compared with the merchant banks. As mentioned, economic policies utilizing the interest rate structure to

influence portfolio behaviour will have to critically access the adjustment process in these institutions, if they are to succeed.

6.3 Deductions from the Model

The model postulated explains a good proportion of the portfolio changes in Nigerian insurance and merchant banks. An appreciable number of the coefficients relating asset and liability levels to interest rates expectations are well determined and in some cases have signs which confirm a priori expectations. Both interest rate expectations proxies performed well, but on the whole the current levels (interest proxy 1) performed better; while for the different portfolio items the relevant significant interest rates depends on each case.

Apart from the a priori theoretical restriction on the constant term, other restrictions in terms of the symmetry, column and row sums of the parameter vectors were largely not satisfied. Tough argument in the literature abound that satisfaction of column and row sums restriction is not an evidence in favour (or otherwise) of the model, but realization of the symmetry assumption of the matrix of interest rate coefficients is a test of the validity of the model; its non-satisfaction does not however mean complete unusability of results for prediction and policy inferences (see Parkin, 1970).
From our empirical analysis, however, we can infer that understanding financial behaviour with the specified model of rational choice requires model estimation to explicitly incorporate linear restrictions applying within and across the equations. This calls categorically for restricted least squares estimation conir.··· to Parkin's (1970) standpoint. Though, as we mentioned earlier, some previous

studies have utilized this approach, computer facilities at our disposal were not adequate to embark on a study in such direction. Moreso, the estimated model still provides a first simple approximation of framework, or basis, for understanding and explaining portfolio behaviour of financial institutions in conditions of uncertainty.

From the results of the estimated model, we had earlier highlighted that there was an appreciable number of statistically significant parameter estimates. As discussed, the demand for different categories of securities are sensitive to specific interest rate expectation vector. Both the insurance and merchant banks adjust their investment portfolio in response to changes in these rates. Our finding indicates that the issues of the net exogenous portfolio item in most cases had a significant impact on asset demand and liability supply. Though the direction of influence also depends on each individual item.

The civil war dummy was insignificant in all cases. This indicates that the civil war had no significant impact on portfolio behaviour in the Nigerian merchant banks. The regulation dummy used to capture the effect of the insurance companies being relatively more deregulated than the merchant banks did not yield a conclusive result. Though in a large number of cases, the dummy was insignificant which implied that regulation or deregulation in the insurance industry did not play a critical role in the behaviour of the institutions. This finding puts a question mark on the wisdom of monetary authorities introducing various clauses in the enabling Acts setting up financial institutions, as well as using various monetary guidelines to regulate financial behaviour in these institutions. In most cases, the Nigerian example

has indicated that these institutions have always found a way of circumventing such rules and thereby the rules have little or no effect and in most cases desired goals are not realized. The optimum may be development of an indigenous policy mechanism as well as institutional framework which will stimulate and orientate bank behaviour towards achieving the development goals of the nation, without necessarily involving direct rules on the type and volume of asset - liability holding as well as the return-cost of funds. Such a framework as will be discussed later is that which will disentangle the money market from the apron-string of the Central Bank of Nigeria as well as introduce competitive financial instruments in both markets. Thus, the various agencies recently being set up to achieve the nation's long term developmental objectives, such as full employment, increased and rapid economic growth especially in agriculture, diversification of the economy, reduced inflation and balance of payments equilibrium (for example the Directorate of Foods, Roads and Rural Infrastructure (DFRRI), Directorate of Employment (NDE), etc. as well as other special projects can have their operations or activities financed through new instruments to be introduced into the financial markets. This will ensure speedy economic development without necessarily imposing direct regulation of financial institutions to moderate their behaviour.

The use of the stock adjustment principle in the dynamic model framework seems to have been a reasonable assumption, though it performed better in the case of the merchant banking firms. The speed of adjustment implied by the equations is found to be non-rapid (slow) implying that monetary policy based primarily on

influencing economic activity via the interest rate structure should be cautious of this identified adjustment behaviour, if such policy were to succeed.

In the study, the performance of the loan rate (short term lending rate) was fair, in some cases it met theoretical expectations, (in terms of sign) while in others it did not. It was also statistically significant in some cases. The own rates did not also produce a perfect result in terms of the sign of the coefficient, theoretically expected to be significantly positive, and which was violated in a number of cases.

Further, in terms of substitutability and complementarity between risky assets, we identified quite a number of them, though some of them were not in line also with theoretical expectations. For instance, in some cases, the institution loan portfolio were complementary with some categories of the investment portfolio, while some items in the investment portfolio, theoretically expected to be substitutes, were found to be complements (more examples and details of these contraventions of a priori conceptual expectations are contained in the earlier sections on evaluation of the models - section 6.2).

The implication of the foregoing is that monetary policy formulation and administration, which seek to moderate financial behaviour of these institutions, should be based specifically on a suitable and complete model of financial behaviour encompassing the entire financial sector. This will ensure a total understanding of portfolio inter-relationships moreso since behaviour has been found to be institution-specific in this study, and as some firms may react negatively to frustrate policies. In this case, policies should be well thought out

within a behavioural framework encompassing the entire sector.
Further, implementing policies on a priori theoretical expectations, ·
as is very common in Nigeria, may fail to achieve set goals. Policy
formulation in Nigeria should therefore be indigenized to suit our
particular behavioural conduct.

The financial market, during the period of study, was highly
regulated. Though since the advent of the Structural Adjustment
Programme new policy shifts have been introduced particularly with
the deregulation of interest rates, however, the monetary authorities
still control the financial markets especially the money market with
the Central Bank controlling the market rates, the volume and number
of money market instruments as well as the timing of asset availability
in the market. Moreover, more liberal operations in the capital market
was, in the main, under the guidance of various restrictive financial
and economic regulations. Also, the asset composition of most of
these institution portfolio are still directly being regulated; even some
of the control are endorsed in the enabling Acts (and amendments
thereof) of these institutions. (An example is the Insurance Act as
discussed in Chapter Two of this thesis).

In short, as mentioned earlier, the financial market in Nigeria
is underdeveloped with investors incuring high risk. We had earlier
also mentioned that an appreciable number of substitute and comple-
mentary relationships can be identified in the asset-liability portfolio
of these institutions. While significant relationships exist in a number
of cases between various interest rate expectation vector combinations
and different portfolio items, with the nature of the financial market
described above, it becomes necessary for our study to call for major

reforms in these markets, such that current and on-going policy and institutional reforms (to achieve desired structural reforms) also focuses attention on the financial markets and thereby ensure optimal utilization and allocation of financial resources rather than the cosmetic reform of deregulating only interest rates.

Though we agree that the operation of market forces should still be guided to avoid abuse, comprehensive and far-reaching reforms are still needed in the following areas:

(a) pruning down of the institutions in the markets so that only efficient establishments remain;

(b) defining clearly an effective financial system structure best .suited to our needs; and

(c) introduction of new competitive, especially medium to long term, financial instruments, in both markets, so that investors could have increased choice and can easily diversify their portfolio to reduce risk and hence increase firm profitability. This situation will in the main beef-up activities in both markets, which hitherto is largely passive. Especially introduction of these financial instruments, accompanied by greater deregulation of the markets with the instruments being off-shore. This is in the sense that they should not be related to the discount rate and should entirely be based on a demand-supply framework in the monetary system. The role of the monetary authorities should just be to prevent abuses.

The development also calls for a review of the laws guiding the operation of these institutions. To be specific the Ins   e Act should be reviewed to allow for freedom in portfolio selection in the

industry, while the Banking Acts which stipulates that merchant banks cannot invest in other lines of business or hold shares of another company for more than six months be repealed. The current drive for _laissez-faire_ should be entrenched as the guiding philosophy for these institutions in order to achieve faster economic . .
Reforms in the financial market should also include developjing a better information culture and consciousness, as well as campaigns against apathy.

It is also easily noticed from our analysis, that portfolio behaviour in these institutions are not well articulated as evident from the varying signs and sizes of the structural parameter estimates. The behaviour does not seem to be coherent or reflect any discernible pattern. One obvious inference here is that there is lack of experts, coupled with disregard by these institutions, for effective and efficient portfolio management. Lack of constant monitoring and eva-luation of their portfolio holding as reflected in our results is clearly an evidence of lack of concern on the part of these institutions. It seems to us that the institutions adopt an ad-hoc approach in portfolio management especially since the Nigerian financial market is more of a seller's market, and is highly profitable, they do not explicitly bother about maximizing profit, ensuring adequate liquidity and solvency nor achieving an optimal mix of the three critical objectives in their behaviour.

Financial institutions need to be more aware of their portfolio holdings to increase profitability as well as ensure their continued solvency and liquidity especially with the changing economic conditions. It should be noted that this inference is particularly the case for the

insurance companies which appear to have a more docile portfolio behaviour as the portfolio sensitivity analysis to interest rate expectations show, and as indicated by their speed of adjustment.

The main thrust of the analysis in this chapter is that port-folio selection in financial intermediaries, especially the insurance and merchant banking firms, has a negative implication for monetary management which strives to achieve internal and external balance in the Nigerian economy. Portfolio behaviour as well have also been influenced by (and also influences as a feedback) financial market development which in turn affects the level and speed of attaining economic development. The synopsis of the argument therefore, is that portfolio selection may affect the general level of economic activity. This assertion indicates that the main essence of our study is hinged on the effect of portfolio behaviour of these institutions on economic growth and development as well as general economic activity. The next chapter empirically addresses this issue.

CHAPTER SEVEN

IMPACT OF INSURANCE AND MERCHANT BANK PORTFOLIO COMPOSITION ON ECONOMIC ACTIVITY IN NIGERIA

7.1   Introduction

In the review of studies on the portfolio behaviour of financial intermediaries (Chapter Three), it was observed that the theory and empirical literature on the relational issue regarding the effect of bank portfolio composition on the level of economic activity have been shrouded in controversy. Hence, our study of the portfolio behaviour of insurance and merchant banking firms in Nigeria, apart from clearly identifying a standpoint, based on the Nigerian financial environment, on the ensuing controversy contributes to the debate by extending the analysis to other types of financial institutions (apart from commercial banks). In our case, the insurance and merchant banking firms, with differentiated portfolio holding patterns (as identified in Chapter Four), are considered in investigating the impact of financial institutions portfolio composition on economic activity in Nigeria.

The model developed to investigate the twin issues of whether or not portfolio holdings in insurance and merchant banking firms have any effect on economic activity and whether or not loans have a large impact on economic activity than financial investments were specified and discussed in Chapter Five (see Section 5.5 and Section 5.6) of the thesis. This chapter evaluates the estimated models, presents the results of our empirical investigation as well as discusses the policy implications of the results.

7.2 Model Estimation, Evaluation and Implications

Before testing the simultaneous model, we first tested the economic activity equation (equation 45) employing ordinary least squares and two-stage least squares to provide a basis for comparison with the three-stage least squares result for the simultaneous system and with previous empirical studies.

7.2.1 Model Estimation Using Odinary Least Squares Technique (OLS)

The results of equation (45) estimated by the OLS technique for the various institutional categories are presented in Tables 7.1 and 7.2 which depict the behaviour with the narrow and broad definitions of money supply respectively.

The overall performance of all the equations in terms of the F-statistics and the goodness of fit measure (R^2 and $\bar{R}^2$) is adequate. Serial correlation was absent in all equations based on the Durbin-Watson (D-W) statistic reported. However, for the narrow money supply equation in the case of the life insurance fund, the D-W statistic reported fell in the critical or uncertain regions. This was also the case for the non-life insurance equations in the broad money supply case.

The fiscal variable reported for all equations was found to be statistically insignificant except for the non-life insurance equation with broad money supply definition; where the variable is wrongly signed in all equations. This result may indicate the impotency of fiscal action in influencing economic activity in Nigeria during the period.

Also the portfolio variable which is of crucial interest in this

TABLE 7.1: MODEL OF PORTFOLIO COMPOSITION AND ECONOMIC ACTIVITY –
OLS ESTIMATES USING NARROW MONEY SUPPLY VARIABLE

Institution	C	MSA	FP	PC	R^2	$\bar{R}^2$	DW	fc	SSE
Merchant Banks	3.98	0.73	0.15	0.16					
	(17.80)	(23.10)	(0.95)	(1.90)	0.98	0.98	0.79	348.60	0.2
Joint Insurance Fund	4.02	0.73	-0.13	-0.12					
	(13.16)	(22.34)	(-0.78)	(-1.06)	0.98	0.97	0.84	179.85	0.2
Life Insurance Fund	4.23	0.72	-0.07	0.04					
	(13.19)	(21.51)	(-0.41)	(0.27)	0.97	0.97	0.91	166.25	0.3
Non Life Insurance Fund	4.50	0.74	-0.34	0.19					
	(17.66)	(26.30)	(-1.98)	(2.54)	0.98	0.98	1.67	249.80	0.2

Note: t – Statistic are in parenthesis.

TABLE 7.2:   MODEL OF PORTFOLIO COMPOSITION AND ECONOMIC ACTIVITY –
OLS · ESTIMATES USING BROAD MONEY SUPPLY VARIABLE

Institution	C	MSB	FP	PC	R^2	$\bar{R}^2$	DW	FC	SSE
Merchant Banks	3.86	0.70	0.19	0.18					
	(17.32)	(23.66)	(1.25)	(2.21)	0.98	0.98	0.76	365.53	0.36
Joint Insurance Fund	3.86	0.71	-0.05	-0.08	0.97	0.97	0.64	152.84	0.33
	(11.02)	(20.59)	(-0.29)	(-0.67)					
Life Insurance Fund	4.01	0.70	-0.01	0.03	0.97	0.97	0.70	148.23	0.34
	(11.51)	(20.31)	(-0.06)	(0.22)					
Non Life Insurance Fund	4.36	0.73	+0.36	0.26	0.99	0.98	1.67	307.29	0.17
	(18.72)	(29.22)	(-2.35)	(3.70)					

Note:-   t – Statistics are reported in parenthesis.

study was found to be insignificant in the case of the joint insurance and those of the life insurance fund. However, it exercised significant influence on economic activity in the case of the non-life insurance fund. For the merchant banks, the portfolio variable was found to be insignificant in the equation with the narrow definition of money supply but was found to be statistically significant in that of the broad money supply definition. The monetary variable (MSA) was statistically significant in all equations.

The conclusion derivable from the OLS result is that the institutions portfolio composition have diversified impact on economic activity proxied by GDP. This is easily linked to the fact that the structure of their portfolio composition differs as discussed in Chapter 4. Hence, the differentiated impact on economic activity of financial intermediary portfolio composition is recognized. This has been neglected in earlier studies, which also asserts that single equation studies of the institutions have indicated significant influence on economic activity.

Using more robust econometric techniques, we shall consider later whether differentiated asset portfolio structure will lead to different effects on economic activity. We also investigate whether or not the fact that the merchant banks which, apart from the commercial banks, are the main targets of monetary policy and the non-life insurance fund asset composition have significant influence on economic activity, indicate that monetary authorities should regulate the structure of their asset portfolio since there is the possibility of these institutions offsetting the effects of the traditional tools of monetary policy solely by their portfolio behaviour.

7.2.2 Model Estimation Using the Two-Stage and Three-Stage Least Squares Techniques

The result of equation (45) obtained through the 2 SLS estimation techniques are reported in Tables 7.3 and 7.4. The results are largely similar to the OLS results in respect of the effect of the monetary and fiscal variables. The estimates of the portfolio variable is also similar to that obtained through the OLS method except that the variable is now insignificant in both equations for the merchant banking firms.

The non-life equation in which the portfolio variable was found to be significant contained some elements of serial correlation, based on the D-W statistic reported. This further casts a doubt on the efficiency and unbiasedness of the result and consequently the potency of the portfolio variable in influencing economic activity in Nigeria.

The 3SLS procedure which takes account of the problems associated with the 2SLS estimates of the model earlier highlighted was then adopted.[1]

The 3SLS estimates, taking cognisance of these problems, are computed by estimating four systems of equations as specified to take account of variable characterised by more than one proxy (namely the narrow and broad definitions of money supply, MSA and MSB). While two proxies were also tried for the interest rate on investment namely the pooled rate of investment categories

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[1] That is, the problems brought about by the properties of the 2SLS which are consistent but in general asymptotically efficient and also their inability to take into consideration the correlation of disturbances across equations or the prior restrictions on other equations in the model.

TABLE 7.3: MODEL OF PORTFOLIO COMPOSITION AND ECONOMIC ACTIVITY: 2SLS ESTIMATES USING NARROW MONEY SUPPLY VARIABLE

Institution	C	MSA	FP	PC	D.W	SSE
Merchant Banks	4.60	0.65	0.46	0.58	1.30	0.91
		(8.13)	(1.35)	(1.61)		
Joint Insurance Fund	4.53	0.70	0.39	0.25		
		(14.00)	(1.26)	(0.53)	1.57	0.52
Life Insurance Fund	4.26	0.72	-0.07	0.06	0.88	0.31
		(24.00)	(-0.41)	(0.40)		
Non Life Insurance Fund	4.59	0.75	-0.42	0.25		
		(25.00)	(-2.21)	(2.78)	1.79	0.21

Note: – Ratio of estimates to standard error of estimates are reported in parenthesis.

TABLE 7.4: MODEL OF PORTFOLIO COMPOSITION AND ECONOMIC ACTIVITY – 2SLS ESTIMATES USING BROAD MONEY SUPPLY VARIABLE

Institution	C	MSA	FP	PC	D.W	SSE
Merchant Banks	4.50	0.63 (7.88)	0.50 (1.47)	0.60 (1.67)	1.36	0.90
Joint Insurance Fund	4.64	0.67 (9.57)	0.20 (0.51)	0.48 (0.80)	1.87	0.87
Life Insurance Fund	4.03	0.70 (23.33)	-0.01 (-0.06)	0.04 (0.27)	0.69	0.34
Non Life Insurance Fund	4.45	0.74 (24.67)	-0.43 (-2.53)	0.31 (3.44)	1.80	0.18

Note:- Ratio of estimates to standard error of estimates are reported in parenthesis.

(INVRA-available rates only) and the treasury bill rate (INVRB). The results are as reported below:

The performance of the model is good based on a cursory look at the sum of squared residuals reported. Also, the ratio of the estimates to the standard error of the estimates were higher than those for the 2SLS techniques, thus corroborating our a priori position regarding the superiority in terms of asymptotic efficiency of the 3SLS technique over the 2SLS method.

The measure of the goodness of fit ($\bar{R}^2$) has no clear meaning when using 3SLS, so also the Durbin-Watson statistics are not reported since they also have no relevance when using 3SLS.

However, for all the institutional types tried, the portfolio variable and the fiscal variable were statistically insignificant indicating that once the effect of GDP upon bank portfolio composition is allowed for, the portfolio variable ceases to exercise any significant influence on economic activity irrespective of the diverse portfolio structure exhibited by individual institutions.

In equation (2) the GDP variable was significant only for the merchant banks equations, indicating that GDP has no feedback effect on portfolio composition. However, despite this feature, the portfolio variable still remained insignificant for this institutional category in equation (1). Also the GDP variable was incorrectly signed in the non-life insurance firms' equations. The STR/AFR variable was statistically significant at any conventionally acceptable level for all institutional types tried except non-life insurance. They were also wrongly signed in all the equations with

MODEL OF PORTFOLIO COMPOSITION AND ECONOMIC ACTIVITY 3SLS ESTIMATES

MERCHANT BANKS

$$GDP = 4.50 + 0.63 \ MSB + 0.50 \ FP + 4.03 \ PC$$
$$ (9.00) (1.56) (1.88) \qquad SSE = 0.90$$

$$DPC = -2.15 + 0.16 \ GDP + 0.24 \ (STR/AFR)$$
$$ (3.20) (0.63) \qquad SSE = 3.52$$

$$SPC = -0.63 + 0.05 \ SECA + 0.09 \ (STR/INVRB)$$
$$ (5.00) (0.38) \qquad SSE = 3.54$$

LIFE INSURANCE

$$GDP = 4.03 + 0.70 \ MSB - 0.01 \ FP + 0.04 PC$$
$$ (14.00) (-0.04) (0.17) \qquad SSE = 0.34$$

$$DPC = -1.44 + 0.06 \ GDP - 0.29 \ (STR/AFR) \qquad SSE = 1.24$$
$$ (0.86) (-0.67)$$

$$SPC = -0.54 - 0.17 \ SECA + 0.19 \ (STR/INVRB) \qquad SSE = 0.53$$
$$ (-3.40) (0.70)$$

NON LIFE INSURANCE

$$GDP = 4.45 + 0.74 \ MSB - 0.43 \ FP + 0.31 \ PC \qquad SSE = 0.18$$
$$ (14.80) (-1.19) (1.94)$$

$$DPC = -2.09 - 0.03 \ GDP + 1.78 \ (STR/AFR) \qquad SSE = 3.81$$
$$ (-0.43) (4.14)$$

$$SPC = -2.40 - 0.03 \ SECA + 1.48 \ STR/INVRB)$$
$$ (-0.75) (5.48) \qquad SSE = 3.17$$

JOINT INSURANCE

$$GDP = 4.64 + 0.67 \ MSB + 0.20 \ FP + 0.48 \ PC$$
$$ (11.16) (0.56) (0.86) \qquad SSE = 0.87$$

$$DPC = -2.34 + 0.09 \ GDP + 0.67 \ (STR/AFR) \qquad SSE = 1.66$$
$$ (1.29) (1.56)$$

$$SPC = -1.58 + 0.05 \ SECA + 0.32 \ (STR/INVRB)$$
$$ (1.00) (1.19) \qquad SSE = 1.88$$

Note:- ratio of estimates to standard error of the estimates are reported in parenthesis.

LIFE INSURANCE

GDP = 4.03 + 0.70 MSB - 0.07FP + 0.04 PC
           (14.00)   (-0.04) (0.17)   SSE = 0.63

DPC = -1.44 + 0.06 GDP - 0.29 (STR/AFR) SSE = 1.25
        (0.86)   (-0.67)

SPC = -0.43 - 0.16 SECA - 0.01 (STR/INVRA)
      (-3.20)   (-0.02)   SSE = 0.55

NON-LIFE INSURANCE

GDP = 4.45 + 0.74 MSB - 0.43 FP + 0.31 PC
        (14.80)   (-1.19)   (1.72) SSE = 0.18

DPC = -2.09 - 0.03 GDP + 1.78 (STR/AFR)
      (-0.43)   (4.14)   SSE = 3.81

SPC = -3.00 + 0.02 SECA + 2.66 (STR/INVRA)
      (0.5)   (6.19)   SSE = 2.40

JOINT INSURANCE COY

GDP = 4.64 + 0.67 MSB + 0.20 FP + 0.48 PC
        (11.17)   (0.56)   (0.86) SSE = 0.87

DPC = -2.34 + 0.09 GDP + 0.67 (STR/AFR)
      (1.29)   (1.56)   SSE = 1.66

SPC = -1.62 + 0.06 SECA + 0.42 (STR/INVRA)
      (1.20)   (0.95)   SSE = 1.80

MERCHANT BANKS

GDP = 4.50 + 0.63 MSB + 0.50 FP + 0.60 PC
        (9.00)   (1.56)   (1.76) SSE = 0.90

DPC = -2.15 + 0.16 GDP + 0.24 (STR/AFR)
      (3.2)   (0.63)   SSE = 3.52

SPC = -0.72 + 0.05 SECA + 0.28 (STR/INVRA)
      (0.38)   (0.67)   SSE = 3.49

MERCHANT BANKS

$$GDP = \underset{(8.12)}{4.60} + \underset{(1.44)}{0.65\ MSA} + \underset{(1.71)}{0.46\ FP} + 0.58\ PC \qquad SSE = 0.91$$

$$DPC = \underset{(3.2)}{-2.15} + 0.16\ GDP + \underset{(0.65)}{0.24\ STR/AFR} \qquad SSE = 3.52$$

$$SPC = \underset{(5.0)}{-0.63} + 0.05\ SECA + \underset{(0.38)}{0.09\ (STR/INVRB)} \qquad SSE = 3.49$$

JOINT INSURANCE FUND

$$GDP = \underset{(10.00)}{4.53} + 0.70\ MSA + \underset{(0.11)}{0.04\ FP} + \underset{(0.44)}{0.25\ PC} \qquad SSE = 0.52$$

$$DPC = \underset{(1.29)}{-2.34} + 0.09\ GDP + \underset{(1.56)}{0.67\ (STR/AFR)} \qquad SSE = 1.66$$

$$SPC = \underset{(1.00)}{-1.58} + 0.05\ SECA + \underset{(1.19)}{0.32\ (STR/INVRB)} \qquad SSE = 1.88$$

LIFE INSURANCE FUND

$$GDP = \underset{(14.40)}{4.26} + 0.72\ MSA - \underset{(-0.27)}{0.07\ FP} + \underset{(0.36)}{0.06\ PC} \qquad SSE = 0.31$$

$$DPC = \underset{(0.86)}{-1.44} + 0.06\ GDP - \underset{(-0.67)}{0.29\ (STR/AFR)} \qquad SSE = 1.25$$

$$SPC = \underset{(-3.4)}{-0.54} - 0.17\ SECA + \underset{(0.70)}{0.19\ (STR/INVRB)} \qquad SSE = 0.53$$

NON-LIFE INSURANCE FUND

$$GDP = \underset{(12.50)}{4.59} + 0.75\ MSA - \underset{(-1.17)}{0.42\ FP} + \underset{(1.39)}{0.25\ PC} \qquad SSE = 0.31$$

$$DPC = \underset{(0.43)}{-2.09} - 0.03\ GDP + \underset{(4.14)}{1.78\ (STR/AFR)} \qquad SSE = 1.25$$

$$SPC = \underset{(-8.00)}{-2.40} - 0.32\ SECA + \underset{(5.48)}{1.48\ (STR/INVRB)} \qquad SSE = 0.53$$

MERCHANT BANKS

$$GDP = 4.60 + 0.65 \ MSA + 0.46 \ FP + 0.58 \ PC$$
$$\qquad\qquad (8.13) \qquad (1.44) \qquad (1.71) \qquad SSE = 0.91$$

$$DPC = -2.15 + 0.16 \ GDP + 0.24 \ (STR/AFR)$$
$$\qquad\qquad (3.20) \qquad\quad (0.63) \qquad\qquad SSE = 3.52$$

$$SPC = -0.72 + 0.05 \ SECA + 0.28 \ STR/INVRA)$$
$$\qquad\qquad (5.00) \qquad\quad (0.67) \qquad\qquad SSE = 3.49$$

JOINT INSURANCE

$$GDP = 4.53 + 0.70 \ MSA + 0.04 \ FP + 0.25 \ PC$$
$$\qquad\qquad (10.00) \qquad (0.11) \qquad (0.44) \qquad SSE = 0.51$$

$$DPC = -2.34 + 0.09 \ GDP + 0.67 \ (STR/AFR)$$
$$\qquad\qquad (1.29) \qquad\quad (1.56) \qquad\qquad SSE = 1.66$$

$$SPC = -1.62 + 0.06 \ SECA + 0.42 \ (STR/INVRA)$$
$$\qquad\qquad (1.20) \qquad\quad (0.95) \qquad\qquad SSE = 1.80$$

LIFE INSURANCE

$$GDP = 4.26 + 0.72 \ MSA - 0.07 \ FP + 0.06 \ PC$$
$$\qquad\qquad (14.40) \qquad (-0.26) \qquad (0.26) \qquad SSE = 0.31$$

$$DPC = -1.44 + 0.06 \ GDP - 0.29 \ (STR/AFR)$$
$$\qquad\qquad (0.86) \qquad\quad (-0.67) \qquad\qquad SSE = 1.25$$

$$SPC = -0.43 - 0.16 \ SECA - 0.01 \ (STR/INVRA)$$
$$\qquad\qquad (-3.20) \qquad\quad (-0.02) \qquad\qquad SSE = 0.55$$

NON-LIFE INSURANCE

$$GDP = 4.59 + 0.75 \ MSA - 0.42 \ FP + 0.25 \ PC$$
$$\qquad\qquad (12.50) \qquad (-1.17) \qquad (1.39) \qquad SSE = 0.22$$

$$DPC = -2.09 - 0.03 \ GDP + 1.78 \ (STR/AFR)$$
$$\qquad\qquad (-0.43) \qquad\quad (4.14) \qquad\qquad SSE = 3.81$$

$$SPC = 3.00 + 0.02 \ SECA + 2.66 \ (STR/INVRA)$$
$$\qquad\qquad (0.5) \qquad\quad (6.19) \qquad\qquad SSE = 2.40$$

the exception of those of the life insurance companies.

In the loan supply equation, equation (3), the surplus exogenous component variable (SECA) did not follow any discernaible pattern, while it was statistically significant in all equations of the merchant banking firms. Its performance also fluctuated in the case of the insurance companies without any particular pattern. The signing of the variable was also haphazard in behaviour. The ratio of the loan rate to the investment rates tried were statistically insignificant in all cases except the non-life equations. It was generally positively signed except in one case with the life insurance equation when it was negatively signed. The implication of this is that the rate may be serving adequately as a measure of the relative attractiveness of bank loans and does not give or serve as an indication of the risk premium on financial investment.

7.3   Deductions from the Model

Studies on the effect of bank portfolio composition on economic activity have been controversial. Some of these studies reported that bank loans have a greater impact on economic activity than bank investment and that the difference was temporary and limited to the contemporaneous period. The rationale for this was the proposition that money created in the form of bank loans would be more readily spent on goods and services than that resulting from a financial institution's purchase of security; noting that once the "new money" was spent the source of origin is unimportant. Batavia and Lash (1982), however, argued to the contrary suggesting that banks may in time of economic expansion (decline), liquidate (build up) their

investment portfolio to allow an expansion (contraction) of loans. Thus, adopting a simultaneous equation's system to investigate the issue, they found that once the feedback effect of GNP onto the loan ratio has been accounted for, the importance of the loan ratio declines. Thus, they failed to find any significant impact of bank portfolio composition of GNP in contrast to earlier studies.

Our analysis, apart from attempting to take a stand on the controversy, seeks to contribute to the debate by considering institutional types with diversified portfolio holdings and evaluating the impact of their divergent portfolio structure on GDP, so as to forestall any bias (if any) in the conclusions of earlier studies particularly the Batavia and Lash (1982) conclusion. Our results suggest and support the Batavia and Lash (1982) viewpoint with the added fact that this conclusion holds irrespective of the portfolio configuration of the institutions concerned. Our results for the different categories of insurance companies and merchant banking firms which have divergent portfolio structure indicate that the portfolio variable exert no significant influence on economic activity irrespective of the institution concerned.

Thus, we contend that policy makers should, as suggested by Batavia and Lash (1982), not concern themselves with the impact of the composition of financial institutions portfolio upon economic activity. Though we argue here that even though the variable is insignificant, the fact that loans have been shown not to have a greater impact on economic activity than investment still implies that all items in the asset portfolio, particularly the earning assets, have the same effect on GDP. Therefore, policy aimed at stimulating economic growth should not be concentrated on only a segment of

the portfolio as a shift to other asset components (in the other direction of policy goals) could affect the effectiveness of such policy. This holds especially in the case of Nigerian merchant banking firms, where the long end of their asset portfolio are relatively uncovered by Central Bank monetary and financial guidelines. Only to this extent do policy makers need to be wary of the effect of financial institutions' portfolio behaviour on economic activity irrespective of the structure of asset holdings in the institutions.

CHAPTER EIGHT

SUMMARY, CONCLUSIONS AND RECOMMENDATION

8.1   Summary of Findings

The study is an attempt to understand, analyse and evaluate the portfolio behaviour of financial institutions in Nigeria with specific reference to the insurance and merchant banking firms. It is also aimed at assessing the implications of the observed portfolio behaviour of these institutions for monetary policy, interest rate determination, financial market development and management as well as the level of economic activity. The study provides an understanding of the portfolio adjustment process in the institutions and examines also the implications of the insurance companies being relatively more deregulated than the merchant banks.

Developments in the theory of bank behaviour were surveyed, with emphasis on the various modelling approaches to understanding and explaining portfolio behaviour of financial institutions. The survey generally indicates that the orthodox portfolio theory models or models of risk aversion have a role to play in developing a simple and 'more complete' model for understanding portfolio selection in these institutions. Specifically, variants of the Tobin-Markowitz and Tobin-Brainard portfolio behaviour models adapted to the Nigerian financial environment were suggested for our empirical investigation. Ironically, it was observed that there was general paucity of studies with these models in developing countries and also, -- an evident '--'- of studies with respect to even the neoclassical microeconomic financial model specification in both the developed and

developing countries. The general conclusion, however, remains that models with an explicit utility function and thus, with a theoretical foundation and justification cannot be overemphasised in modelling financial behaviour.

Prior to model specification and estimation, an attempt was made to develop the conceptual basis for the study based on an elaborate overview of the Nigerian financial environment. Thus, conceptually, the interlinkages between portfolio selection on the one hand and monetary policy, regulation of financial institutions, financial market development, etc. on the other hand, were considered. Also a detailed description and analysis of the history, structure and growth of insurance companies and merchant banks were undertaken. Further, the structure of both the asset and liability portfolio of these institutions was also analysed. It was observed that there was a divergence in asset holding in these institutions. The analysis of variance (anova) using the Snedecor's variance ratio test was adopted to investigate whether or not identified variations were statistically significant. The test indicates that there was a continuing divergence in asset holding pattern over the period considered. An analysis of the maturity structure of the portfolio holding in these institutions also yielded a similar result.

In achieving a proper understanding of the term transformation behaviour in these institutions, the literature indicates that there was no clear-cut empirical approach for analysing term behaviour in financial institutions. We therefore developed a new empirical approach for understanding term transformation in these institutions. Using this empirical proposition we found that the

insurance and merchant banking institutions had a negative term behaviour in Nigeria.

The above result, on a preliminary basis, thus indicates that monetary policy as is currently being formulated and administered may be ineffective as there is a wide divergence in institution asset holding pattern. Secondly, the result of the empirical test of term behaviour also reveals that these institutions' contribution to economic growth and development is limited, particularly since longer term investments are germane to faster economic growth. These preliminary results also indicate that the narrowness of the financial market may have a critical impact on portfolio behaviour of financial institutions, in Nigeria, as revealed by the observed behaviour of the insurance and merchant banks. The preliminary analysis also emphasised the need for a more viable framework for monitoring and regulating financial institutions. However, as significant adjustments were identified to have taken place, the suggested variant of the Tobin-Markowitz and Tobin-Brainard model used to model financial behaviour in Nigeria insurance and merchant banking firms, was estimated to further illuminate on these issues, among others. Also, a model to investigate the impact of portfolio composition on economic activity in Nigeria was developed and estimated to further assess the impact of financial behaviour in these institutions.

The empirical test of the models revealed that the performance of the models was fair, as it provided a simple framework for understanding portfolio shifts in these institutions; though areas of improvements abound particularly with the achievement of a priori

theoretical expectations postulated by the model which in most cases were not realized. These include restrictions on the row and column sums of the interest rate vectors, the symmetry of the interest rate parameters and the statistical insignificance of the intercept term, etc.

Generally, the dynamic model performed best particularly in the case of the merchant banks. The stability of the estimated dynamic systems in most cases and hence, its utility for prediction were found to be very high. The model indicated a non-rapid adjustment process which, literarily, calls for caution in the use of interest rate structure as a policy tool for portfolio regulation. On regulation, the study identified generally that in most instances regulation in financial institutions did not critically affect portfolio configuration of these financial institutions.

Also, both the current level and lagged interest rate were suitable proxies for interest rate expectations. The results further indicate that the portfolio response to interest rate expectations vector is both institutional - and asset-specific, as the applicable rates to a particular portfolio item or for an institutional category vary. On the whole, however, a number of substitutes and complementary relationships emerged from the study. Some of these were in line with a priori theoretical expectations while some others were not. In fact, some portfolio item own-rates were negative and significant. Some earlier studies pointed out that this may in fact suggest that hitherto low rates of interest in the country may have some disincentive effect on investment by financial institutions.[1]

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[1] See for example Omoruyi (1984).

The implication of the foregoing is that behaviour in the Nigerian financial environment may not necessarily conform with orthodox economic postulations. Hence, the need for caution in monetary policy formulation and administration is further heightened. This indicates the need for economic policies to be specifically based on a large, appropriate econometric model of the entire financial sector so as to indicate the correct direction for policy akin to the Nigerian financial environment.

The model also confirmed the early fears expressed in the preliminary consideration of the balance sheet structure that the narrowness of the financial market play a critical role in influencing portfolio behaviour. Our study therefore calls for elaborate reforms of the financial system to further disentangle the system away from the apron string of the Central Bank of Nigeria within an optimal framework which ensures high economic performance. The reforms would be expected to improve on the information system in the market, with particular respect to their timely availability and to increase on the number of competitive securities available in both the money and capital markets with emphasis on the medium- to long-term instruments. Specifically, the study pointed out that special governmental programmes and projects aimed at achieving stated laudable objectives could easily be commercialized and financed through long/ medium term floating of securities in either of the two markets. This will enhance a direct impact on economic development similar to the desired impact being contemplated by regulating these institutions.

In addition, our investigation on the impact of the differentiated portfolio holdings in these financial institutions on economic

activity reveals that portfolio holdings, irrespective of the struc-
ture, had no significant impact on economic activity once the feed-
back effect of the level of economic activity on the portfolio struc-
ture has been accounted for. Simultaneously also, the loan port-
folio was not found to have a greater impact on economic activity
than the investment portfolio. The implication of this, as mentioned
in the study, is that policy makers should not concern themselves
with the portfolio composition of these financial institutions especially
with respect to its impact on the level of economic activity though
our study calls for caution in the administration of policies aimed
at stimulating economic growth and development. In essence,
monetary authorities should not concentrate on a portion of these
institutions portfolio, as the converse of our result, which is
believed to be true, indicates that a re-arrangement of portfolio may
affect the effectiveness of policy. This, in the main, supports our
proposition for a more complete deregulation of financial institutions.

8.2   Conclusions and Recommendations

Financial institutions have three cardinal objectives namely
profitability, liquidity and solvency which often conflict as we noted
earlier. In a developing economy like Nigeria, these institutions
are also supposed to contribute largely towards the rapid attainment
of economic growth and development.

Generally, how well these institutions have been able to
resolve the ensuing conflict in their cardinal objectives, as well
as contribute to the developmental aspirations of the country is
critically hinged on their portfolio behaviour.

From the analysis of the various model developed, the study called for elaborate reforms in the Nigerian financial sector as part of the present institutional and policy reforms to achieve desired structural reforms. The reforms should ensure the autonomy of the Nigerian money market away from the controls of the Central Bank of Nigeria. The reform package should also encompass improving the quality of information, and ensuring their timeliness so as to generate adequate information on which financial behaviour is based. It also calls for campaign against apathy in financial behaviour.

Further, following the inference that the narrowness of the financial market critically affects portfolio selection, we suggest that there should be an increase in the number/volume of competitive financial instruments available in both markets. Also, to effectively contribute to economic development, such instruments should be strictly in the medium to long term range so as to reverse the trend of negative term transformation behaviour prevalent in the insurance and merchant banking firms as well as ensure a direct impact on economic activity and complement or replace existing policies. Particularly, competitive corporate securities for the Directorate of Employment (NDE), Directorate of Foods, Roads and Rural Infrastructure (DFRRI), among others, as well as other socially and economically viable projects should be introduced in both markets. This will be a better alternative to existing regulatory practices striving to achieve similar long-term developmental objectives thus entrenching also the guiding philosophy of the Structural Adjustment Programme (1986-88) in the financial sector. This is more the case

taking cognisance of the result of our empirical analysis regarding the effect of government regulation in the insurance industry.

With regards to governmental regulation of financial institutions, we advocate that it should be done away with in its entirety, while calling for a comprehensive review of both the Banking and Insurance Acts to be in line with national developmental philosophy and to take cognisance of recent observed shifts in financial behaviour. In the case where regulation is unavoidable, stiffer penalties should be put in place and enforced coupled with moral suasion to ensure the effectiveness of the policy.

In our study, we found that the responsiveness of portfolio holding to the interest rate expectation vector is both asset-specific and institution specific. This is apart from the observed situation whereby some of the various substitutability and complementary relationships are not as theoretically postulated. Thus, there is need for a more elaborate model of behaviour in the entire financial sector on which economic policy will be based. There should also be caution in the formulation and administration of monetary policy, moreso as the adjustment process is generally non-rapid. In essence, the ad-hoc approach to monetary management should be discontinued and replaced with a policy package based entirely on a thorough understanding of the Nigerian financial environment. This will also further allow for efficiency, and remove impediments to the optimal holding of bank portfolio.

From our analysis also, we found that there was apathy in the behaviour of financial institutions. This calls for the setting up of a virile and active portfolio management and investment department in

individual financial institutions to ensure that holdings are optimal in terms of achieving the critical objectives of profitability, liquidity and solvency as well as contributing to long-term development of the economy. For financial firms already having such departments, it should be ensured that they are staffed with seasoned professionals who will perform efficiently and reverse the current trend whereby there is an inherent desire to keep on holding to assets irrespective of the going yields on these assets.

The empirical study as noted, indicates that there is need for future studies of financial behaviour to be based on a more elaborate model of the entire financial sector. Such studies should also explicitly incorporate all the a priori expectations or constraints directly into model estimation. Therein appropriate linear restrictions should be imposed on the least squares estimation. In this regard, efforts should be made by the monetary authorities and authorities of educational institutions to acquire suitable and appropriate computer facilities both in terms of the hardware and software required for advanced econometric analysis of not only financial behaviour but of the overall macroeconomy. Further studies would also need to be based on disaggregated data to ensure that individual institution behaviour is captured. In this respect, the Central Bank and other financial institutions should ensure that timely, reliable and appropriate data are kept (and are readily available). The Central Bank may impose necessary stiff sanctions against institutions which do not comply with whatever directives it may give in this regard. A serious view of the above should be taken as it hampers proper planning and effective management of the economy.

Finally, alternative models of portfolio choice under uncertainty with varying assumptions relevant to the Nigerian financial environment, may be experimented with, towards developing the most suitable model for explaining behaviour in the Nigerian financial sector. An experiment of this nature will also ensure that models adopted generate valid (particularly in terms of the specific time period, and reliability) result for policy formulation, and general economic management. In conclusion, the study has been able to explain, within a simplified framework, financial behaviour in insurance and merchant banking firms, despite the limitations in terms of computer facilities and level of disaggregation of needed data. It also serve as a basis for further comprehensive research into portfolio behaviour in these institutions.

APPENDICES

APPENDIX 4.1

In the Commission on Money and Credit (CMC) (Research Study 4 pp. 162-167), Tobin has listed some of the uncertainties that affect risk rating of various securities as follows:

(1) uncertainty about purchasing power of money securities that have a fixed face value in money terms such as bonds are subject to that risk;

(2) uncertainty regarding the future interest rates. Capital gains and losses will be made on interest bearing bonds depending on whether future rates rise or fall;

(3) certain securities are tied to very specific establishments. Risk of default may enter into the portfolio choice decisions; and

(4) private equities are subject to the specific risk of uncertainty regarding the earning power of a particular firm.

Silber (1970) however observed that one other source of risk or uncertainty not discussed by Tobin is the marketability risk of a security. For instance, in the case where two securities are identical in all respects except that the other has a poor second day market; an investor in the latter runs the risk of being able to liquidate his security holding only at a depressed price compared with price offered for security with better market.

APPENDIX 4.2

DEFINITION OF CONSOLIDATED BALANCE
SHEET CATEGORIES

I. LIABILITIES

A. MERCHANT BANKS

(a) Capital accounts

(i) Capital accounts

(b) Cash balance held with the bank

(i) Balances held for banks in Nigeria

(ii) Balance held for banks outside Nigeria

(iii) Balance held for offices and branches outside Nigeria

(c) Money at call

(i) Money at call from banks in Nigeria

(ii) Money at call from banks outside Nigeria

(d) Certificates of deposit issued

(i) Certificates of deposit issued

(e) Loans and advances taken

(i) Loans and advances taken from banks in Nigeria

(ii) Loans and advances taken from banks outside Nigeria

(iii) Loans and advance from 'other' sources

(f) Demand deposits

(i) Demand deposits

(g) Time deposits

(i) Time deposits

(h)   Other liabilities

    (i)   Other liabilities

B.   LIFE INSURANCE FUND

(a)   Paid up capital

    (i)   Paid up capital

(b)   Reserves

    (i)   Contingency reserves

    (ii)   Other reserves

(c)   Total amount due to others

    (i)   Amount due to insurers

    (ii)   Amount due to insurance agents

    (iii)   Amount due to policy holders

    (iv)   Outstanding claim admitted or intimated

    (v)   Other sums owing by insurer

(d)   Life fund

    (i)   Life fund

(e)   Other liabilities

    (i)   Other liabilities

    (ii)   Balance of profit and loss appropriation account

C.   NON-LIFE INSURANCE FUND

(a)   Paid up capital

    (i)   Paid up capital

(b)   Reserves

    (i)   Contingency reserves

    (ii)   Other reserves

(c)   Total amount due to others

    (i)   Amount due to insurer

    (ii)   Amount due to insurance agents

    (iii)   Amount due to policy holders

    (iv)   Outstanding claims admitted or intimated

    (v)   Other sums owing by insurer

(d)   Non-life fund

    (i)   Accident insurance fund

    (ii)   Fire insurance fund

    (iii)   Workmen's compensation insurance fund

    (iv)   Motor vehicle insurance fund

    (v)   Marine insurance fund

    (vi)   Miscellaneous insurance fund

(e)   Other liabilities

    (i)   Other liabilities

    (ii)   Balance of profit and loss appropriation account

II.   **ASSETS**

II.1   **CASH BILLS RECEIVABLE PLUS OTHER CASH ITEMS**

A.   **MERCHANT BANKS**

(a)   Cash balance with the Central Bank

(b)   Balances held with banks in Nigeria

(c)   Balances held with offices and branches abroad

(d)   Balance held with banks abroad

B. <u>INSURANCE COMPANIES (LIFE AND NON-LIFE FUND)</u>

(a) Balance of profit and loss appropriation account

(b) Outstanding premiums

(c) Amount due to insurer

(d) Amount due from insurance agents

(e) Cash in deposit and current account

(f) Interest dividends and rents

(g) Bills of exchange held

II.2 <u>MORTGAGES AND LOANS</u>

A. <u>MERCHANT BANKS</u>

(a) .Loans and advances to banks in Nigeria

(b) Loans and advances to subsidiaries of banks in Nigeria

(c) Loans and advances to other customers

(d) Money at call outside Central Bank

(e) Factored debt

(f) Bills discounted and payable in Nigeria

B. <u>INSURANCE COMPANIES</u>

(a) Mortgage loans on real estate

(b) Loans to policy holders

(c) Other loans

II.3 <u>INVESTMENT IN SECURITIES (PRIVATE AND PUBLIC)</u>

A. <u>MERCHANT BANKS</u>

(a) Treasury bills

(b) Treasury certificates

(c)   Balances with call money fund

(d)   Bankers unit fund

(e)   Stabilization securities

(f)   Certificates of deposits held

(g)   Other investments (including Federal Government stocks, ordinary and preferences shares and debentures).

B.   INSURANCE COMPANIES

(a)   Federal Government securities

(b)   State government securities

(c)   Securities of semi-government institutions

(d)   Other bonds, stocks and shares held.

II.4   PROPERTY, INVESTMENT IN REAL ESTATE, AND EQUIPMENT LEASE

A.   MERCHANT BANKS

(a)   Equipment on lease.

B.   INSURANCE COMPANIES

(a)   Equipment and furniture

(b)   Direct investment in real estate

II.5   OTHER UNCLASSIFIED ASSETS

A.   MERCHANT BANKS

(a)   Other assets - item no. 21 in the Statement of Assets of Merchant Banks (see Economic and Financial Review) defined to include all other asset items not specified earlier.

B. INSURANCE COMPANIES

(a) Other assets - this is also defined to cover all asset items
     not previously specified in the Statement of Assets for the
     Insurance Companies. (Item No. 20 in the Statement of
     Assets of Insurance Companies culled from the record at the
     Insurance Division, Federal Ministry of Finance, Lagos).

APPENDIX 4.3

SUMMARY TABLE OF COMPUTED PARAMETERS FOR VARIANCE ANALYSIS OF ASSET HOLDING PATTERNS

Year	Source of Variance	Sum of Squares	Degree of Freedom	Variance Estimate	FC
1980	Between sample	55194.6	2	27597.3	1.6
	Within sample	206518.6	12	17209.0	
	Total sample	261713.2	14	–	
1981	Between sample	265661.3	2	132830.7	2.2
	Within sample	719567.8	12	59964.0	
	Total sample	985229.1	14	–	
1982	Between sample	939909.4	2	469954.7	3.8
	Within sample	1493465.6	12	124455.5	
	Total sample	243375.0	14	–	
1983	Between sample	1727526.1	2	863763.1	4.2
	Within sample	2457606.5	12	204800.5	
	Total sample	4185132.6	14	–	
1984	Between sample	1778623.3	2	889311.7	4.6
	Within sample	2322094.6	12	193507.9	
	Total sample	4100717.9	14	–	
1985	Between sample	2194348.8	2	1097174.4	4.9
	Within sample	2701301.9	12	225108.5	
	Total sample	4895650.7	14	–	

APPENDIX 4.4

CLASSIFICATION OF BALANCE SHEET ITEMS BY MATURITY

I.(A)   MERCHANT BANKS' ASSETS

(a)   LONGER TERM ASSETS

(i)   Loans and advances with maturity over one year (see Table 5.8)

(ii)   Treasury certificates

(iii)   Stabilization securities

(iv)   Certificates of deposits held

(v)   Equipment lease

(vi)   Banks unit fund

(b)   SHORTER TERM ASSETS

(i)   Cash balance with the Central Bank

(ii)   Total cash balances held with other banks, etc.

(iii)   Loans and advances with maturity less than one year (see Table 5.8)

(iv)   Bills discounted and payable in Nigeria

(v)   Money at call outside Central Bank

(vi)   Factored debts

(vii)   Treasury bills

(viii)   Balance with call money fund

(c)   UNCLASSIFIED ITEMS

(i)   Other assets

I.(B) MERCHANT BANKS' LIABILITIES

(a) LONG TERM LIABILITIES

  (i) Capital accounts

  (ii) Certificates of deposits issued

  (iii) Time deposits with maturity over one calendar
  year (see Table 5.7).

(b) SHORTER TERM LIABILITIES

  (i) Total cash balance held with the bank

  (ii) Money at call from banks in Nigeria

  (iii) Loans and advances taken

  (iv) Demand deposits

  ·(v) Time deposits with maturity less than one year
  (see Table 5.7)

(c) UNCLASSIFIED LIABILITIES

  (i) Other liabilities

II.(A) LIFE INSURANCE FUND ASSETS

(a) LONGER TERM ASSETS

  (i) Federal and state governments securities

  (ii) Securities of semi-government institutions

  (iii) Other bonds and shares

  (iv) Investment in real estate

  (v) Mortgage loans on real estate

(b) SHORTER TERM ASSETS

  (i) Total cash amount due from various sources

  (ii) Cash in current and deposit accounts

(iii)   Bills of exchange

(iv)   Other cash items (for example interest, dividends
and rent, etc.)

(v)   Loans made to policy holders

(vi)   Other loans

(c)   UNCLASSIFIED ASSETS

(i)   Other assets

II.(B)   LIFE INSURANCE FUND LIABILITIES

(a)   LONGER TERM LIABILITIES

(i)   Paid-up capital

.(ii)   Reserves

(iii)   Life fund

(b)   SHORTER TERM LIABILITIES

(i)   Total amount due to others held by the companies

(c)   UNCLASSIFIED LIABILITIES

(i)   Other liabilities

III.(A)   NON-LIFE INSURANCE FUND ASSETS

(a)   LONGER TERM ASSETS

(i)   Federal and state governments securities

(ii)   Securities of semi-government institutions

(iii)   Other bonds and shares

(iv)   Investment in real estate

(v)   Mortgage loans on real estate

(b) SHORTER TERM ASSETS

    (i)   Total cash amount due from various sources

    (ii)   Cash in current and deposit account

    (iii)   Bills of exchange

    (iv)   Other cash items

    (v)   Income made to policy holders

    (vi)   Other loans

(c) UNCLASSIFIED ASSETS

    (i)   Other assets

III.(B)   <u>NON-LIFE INSURANCE FUND LIABILITIES</u>

(a) . LONGER TERM LIABILITIES

    (i)   Paid-up capital

    (ii)   Reserves

(b) SHORTER TERM LIABILITIES

    (i)   Total amount due to others held by the companies

    (ii)   Total non-life fund

(c) UNCLASSIFIED LIABILITIES

    (i)   Other liabilities

APPENDIX 4.5

COMPUTED PARAMETERS FOR STATISTICAL ANALYSIS OF TERM TRANSFORMATION IN INSURANCE AND MERCHANT BANKING FIRMS

We have that

1. Y = Longer term assets

2. X_i = Shorter term

3. X_2 = Longer term liabilities

4. $$\bar{Y} = \frac{\sum_{i=1}^{NY} Y_i}{NY}$$

5. $$\bar{X}_1 = \frac{\sum_{i=1}^{NX_1} X_{1i}}{NX_1}$$

6. $$\bar{X}_2 = \frac{\sum_{i=1}^{NX_2} X_{2i}}{N X_2}$$

7. $$S_y = \sqrt{\frac{\sum (Y-\bar{Y})^2}{NY - 1}}$$

8. $$Sx_1 = \sqrt{\frac{\sum (X_1-X_2)^2}{NX_1 - 1}}$$

9. $$Sx_2 = \frac{\sum (X_2-\bar{X}_2)^2}{NX_2 - 1}$$

10. Term transformation summary (TTS) = $\bar{Y} - \bar{X}_1$.

11. If $TTS > 0$ then

    Sufficient term transformation summary (TTSS) = $\bar{Y} - X_2$

12. $\quad tc = \dfrac{\overline{Y} - \overline{X}_i}{\sqrt{\dfrac{1}{NY} + \dfrac{1}{NX_i}}}$ $\qquad i = 1, 2$

where $\qquad = \sqrt{\dfrac{(NY - 1)SY + (NX_i - 1)SX_i}{NY + NX_i - 2}}$

(1) FOR MERCHANT BANKS

Year	Y	X_1
1980	351.96	357.1
1981	535.24	669.32
1982	856.26	1282.21
1983	995.29	1629.94
1984	1146.45	1381.90
1985	1305.80	1441.80

The data information above programmed into the calculator of the computed parameters as follows:

$\overline{Y}$	=	865.17	NY	=	6	SY	=	364.01
$\overline{X}$	=	1127.03	NX	=	6	SX	=	498.66
TTS	=	-261.86						
tc	=	-21.73						

(2) FOR LIFE INSURANCE FUND

Year	Y	X_1	X_2
1980	135.33	22.93	256.57
1981	180.22	29.29	342.57
1982	268.45	103.39	407.82
1983	271.08	59	473.86
1984	301.87	65.57	541.30
1985	419.67	70.16	631.38

The data information were programmed into the calculator and the following results obtained:

$$NY \quad = \quad 6, \quad NX_1 = 6, \quad \text{and} \quad NX_2 = 6$$

$$\bar{Y} \quad = \quad 262.77 \qquad\qquad SY = 99.30$$

$$\bar{X}_1 \quad = \quad 57.16 \qquad\qquad SX_1 = 29.52$$

$$TTS \quad = \quad 205.61$$

Since TTS > 0 = Need for TTSS,

$$\bar{X}_2 \quad = \quad 439.25 \qquad\qquad SX_2 = 130.87$$

$$TTSS \quad = \quad -176.48$$

$$tc_1 \quad = \quad tc\ (TTS) = 44.22$$

$$tc_2 \quad = \quad tc\ (TTSS) = -28.37$$

(3) ### FOR NON LIFE INSURANCE FUND

Year	Y	X_1
1980	130.52	319.72
1981	180.28	447.97
1982	220.02	549.75
1983	257.01	612.14
1984	496.69	829.48
1985	553.89	883.03

The obtained parameters following computation by programming data into the calculator are as follows:

$$NY \quad = \quad 6$$

$$NX_1 \quad = \quad 6$$

$$\bar{Y} \quad = \quad 306.40 \qquad SY \quad = \quad 175.61$$

$$\bar{X}_1 \quad = \quad 607.02 \qquad SX_1 \quad = \quad 217.67$$

$$TTS \quad = \quad -300.62$$

$$tc \quad = \quad -36.97$$

APPENDIX 5.1

DESCRIPTION OF APPROACHES TO BALANCE SHEET CONSOLIDATION

(A)   MERCHANT BANKS

I.   CHOICE SET ITEMS

1.   Total Loans and Advances

   - Banks in Nigeria and subsidiaries of banks in Nigeria

   - Other customers

   - Money at call outside CBN

   - Bills discounted and payable in Nigeria

   - Factored debts

2.   Money Market Instrument

   - Treasury bills

   - Treasury certificates

   - Stabilisation securities

   - Bankers unit fund

   - Certificate of deposits

3.   Other investment

   - Equipment on lease

   - Investment in Federal Government stocks, ordinary shares, preference shares, debentures etc.

4.   Borrowed Funds

   - Time deposits

   - Loans and advances from other banks

   - Certificates of deposits issued

II.   EXOGENOUS ITEMS

- Capital account

- Demand deposit

- Other liabilities

- Other assets

Net cash balances held.

that is, balances held for banks in Nigeria, banks outside Nigeria, offices and branches outside Nigeria, deducted from cash balances held with the Central Bank of Nigeria, banks in Nigeria, offices and branches abroad and banks abroad.

(B)   INSURANCE COMPANIES

I.   CHOICE SET ITEMS

1.   Government securities

- Federal government securities

- State government securities

- Securities of semi-government institution.

2.   Other Investment

- Bonds, Stocks and Shares held

3.   Total Loans and Mortgages

- Mortgage loans on real estate

- Loans to policy holders

- Other loans

4.   Premium supply (life and non-life)

- For life insurance (total life premium fund)

- For non-life insurance (total non-life premium fund)

- For Joint insurance fund (total of life and non-life premium fund).

II. EXOGENOUS ITEMS

- Capital account

  (i)   Paid-up capital

  (ii)   Issued capital

- Total reserves

  (i)   Contingency reserves

  (ii)   Other reserves.

- Net cash holding as amount due, i.e. deduction of all sources of amount due held on behalf of other categories from cash amount due held with other parties.

- Other liabilities.

- Other assets

- Balancing items

  i.e. Balance of profit and loss appropriation account.

APPENDIX 6.1

DEFINITION OF VARIABLE NAMES

TLM   =   Total loans and advances Merchant Banks

TBM   =   Treasury Bills Merchant Banks

TCM   =   Treasury Certificates Merchant Banks

ELM   =   Equipment Leasing Merchant Banks

OIM   =   Other Investment Merchant Banks

BDF   =   Borrowed Funds Merchant Banks

TDP   =   Time Deposit Merchant Banks

NECM   =   Net Exogenous Portfolio Component Merchant Banks

MMI   =   Money Market Instruments Merchant Banks
             (Balance Sheet type B)

MMR   =   Money Market Rate (Pooled average)

NBFD   =   Borrowed Funds Merchant Bank (Balance Sheet
             Type B)

MOI   =   Merchant Bank Other Investment
             (Balance Sheet type B)

STR   =   Short Term Interest Rate (Pooled average)

BFR   =   Borrowed Fund Rate (Balance Sheet A)

TBR   =   Treasury Bill Rate

TDR   =   Time Deposit Rate

TCR   =   Treasury Certificate Rate

ELR   =   Proxy for Equipment leasing rate of return

OIR   =   Rate of Return on Other Investment

NBFR   =   Borrowed Fund Rate (Balance Sheet B)

CWDM   =   Civil War Dummy

TLMG   =   TLM (-1)

TBMG   =   TBM (-1)

TCMG	=	TCM (-1)
ELMG	=	ELM (-1)
OIMG	=	OIM (-1)
BFDG	=	BFD (-1)
TDPG	=	TDP (-1)
MMIG	=	MMI (-1)
NBFG	=	NBFD (-1)
MOIG	=	MOI (-1)
STRG	=	STR (-1)
BFRG	=	BFR (-1)
TBRG	=	TBR (-1)
TCRG	=	TCR (-1)
TDRG	=	TDR (-1)
ELRG	=	ELR (-1)
OIRG	=	OIR (-19)
NBRG	=	NBR (-1)
SVP	=	Stability Variable Test Proxy
TLJ	=	Total Loan Joint Insurance Fund
GSJ	=	Government Securities Joint Insurance Fund
OIJ	=	Other Investment Joint Insurance Fund
PSL	=	Premium Supply Life Insurance Fund
PSN	=	Premium Supply Non-Life Insurance Fund
NECJ	=	Net Exogenous Portfolio Component Joint Insurance Fund
RDM	=	Regulation Dummy
TLJG	=	TLJ (-1)
GSJG	=	GSJ (-1)
OIJG	=	OIJ (-1)

PSLG   =   PSL (-1)

PSNG   =   PSN (-1)

OIR   =   Rate on other investment categories

GSR   =   Rate on government securities

GSRG   =   GSR (-1)

NPR   =   Rate on Non-Life Insurance Premium Supply

NPRG   =   NPR (-1)

LPR   =   Rate on Life Insurance Premium Supply

LPRG   =   LPR (-1)

NECN   =   Net Exogenous Component Non-Life Insurance Fund

NECL   =   Net Exogenous Component Life Insurance Fund

TLN   =   Total Loans Non-Life Insurance Fund

TLL   =   Total Loans Life Insurance Fund

TLNG   =   TLN (-1)

TLLG   =   TLL (-1)

GSL   =   Government Securities Life Insurance Fund

GSN   =   Government Securities Non-Life Insurance Fund

GSLG   =   GSL (-1)

GSNG   =   GSN (-1)

OIL   =   Other Investment Life Insurance Fund

OIN   =   Other Investment Non-Life Insurance Fund

OILG   =   OIL (-1)

OING   =   OIN (-1)

C   =   Intercept Term

LLF   =   Log of Likelihood Function

SER   =   Standard Error of the Regression

XG   =   One-period lag of dependent variable

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