



**Dissertation**

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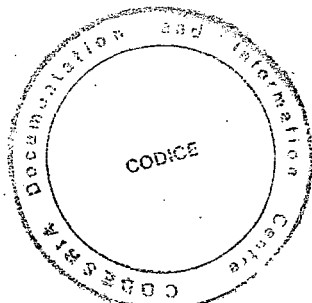
**The Impact of Structure and Policy Variables on  
Profitability Performance of Selected Commercial  
Banks in Nigeria : 1980-1990**

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THE IMPACT OF STRUCTURE AND POLICY VARIABLES  
ON PROFITABILITY PERFORMANCE OF SELECTED  
COMMERCIAL BANKS IN NIGERIA (1980 - 1990).

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A PROJECT REPORT PRESENTED TO THE DEPARTMENT  
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ECONOMICS.

BY

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FEBRUARY, 1994.

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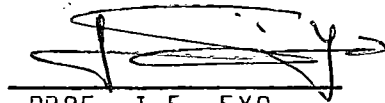
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DEDICATION

Dedicated to the loving Memory of my dear Mother,  
Mrs Apeke Abibat Fawole.

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In the course of this study, I have benefitted immensely from the Council For the Development of Social Science Research in Africa (CODESRIA). The Council provided the grant that was used in conducting this research, bore the cost of production, binding and other general expenses that led to the successful completion of this thesis.

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## ABSTRACT

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The aim of this study is to test empirically the structure-performance (S-P) hypothesis and find out the factors that determine profitability within the institutional context of the Nigerian Commercial Banking system. The study utilized annual time-series data collected from five selected commercial banks over the eleven consecutive years from 1980 to 1990. To fulfil its aim, a bank profitability model is formulated under the methodological guidelines of the existing studies.

The study did not present any empirical evidence in support of the S-P hypothesis. However, the deposit mix appeared as a potentially influential factor in the bank profitability relation.

INTRODUCTION

1.1 Background to the Problem

Since bank started operating as money lending institution, it has constituted one of the most high yielding but equally high risky business venture ever known to man. This is in consonance with the risk-return rule which states that "investment with high returns carry commensurately high risks" (Archer and D'ambroesio, 1976).

The various dimensions of structure of any industry have substantial influence on the economic performance of such industry. There is, however, no consensus of opinion as regards the influence of some structural elements particularly concentration on bank economic performance. To some school of thought as represented by Bain (1951:293) profitability levels (and hence economic performance) tend to increase with concentration. To others as in Mayer (1969:104) profitability levels tend to be negatively correlated with share of the industry output in the hands of the fifth to eighth largest firms. Hart (1968) found no evidence that high profits and high concentration were correlated. On structure and technological progressiveness some believe that high concentration (large size) is conducive to technological progress (Nelson, 1959:297), while

to some, high concentration by giving firms increasing discretion and high profits, reduce the incentive to invent and innovate (Pickering 1978:24).

In Nigeria, commercial banks declare high profits (First bank quarterly Review, 1989). This is true of both banks with wider market in terms of coverage and those with low market share. It is the contention of this study to test the structure-performance hypothesis in the context of Nigerian situation. In the course of assessing the commercial bank performance, some variables cannot be successfully avoided. Such variables include portfolio preferences of the bank, that is, the ratio of time and savings deposit to total deposit, and the loan-deposit ratio. Their influence on bank profitability performance shall be investigated.

## 1.2 Statement of Problem

Increased gross profit generation in banking has naturally attracted more investors into the field with the remote possibility that banking like office equipment business, will provide the blue stock of the future in Nigeria. The number of commercial banks has continued to grow inspite of the stringent licensing requirements, branch banking stipulation and the economy which is currently in a state of lethargy.

Literature and public opinion have revealed that the concentrated nature of the industry has placed the commercial banks in an advantage position to earn astronomical amount of profit. In Bain's (1951:293) findings, high degrees of market concentration (structure) are extricably associated with decreased competition between firms and consequently with high levels of profits while in Mayer (1969:104), concentration was found to be negatively correlated to profits. Contrary to the above findings, some believe that there are other important factors that influence a banking system's performance other than market concentration (Byran 1972; Civelek, 1985 and Agu 1986). Thus the deposit mix, level of intermediation and the demand variable are considered the appropriate variables influencing a banking system's performance.

However, with respect to Nigeria, some banks have wider market share in terms of coverage (Union, ACB) but are not declaring more profits than those with low market share such as Universal Thrust Bank, (First Bank Quarterly Economic Review 1990).

This research therefore is mainly designed to investigate:

- i) the influence of market structure on commercial banking system's performance.

ii) the contention that economic performance of a banking system is a function of its market structure and policy variables in the context of commercial banking system in Nigeria.

The interest of economists in examining the performance of the Nigerian banking system has centred around the role of commercial banks as development institutions. The factors influencing its operating performance and in particular, studies on the impact of structure on performance have received little attention.

Empirical researches reviewed show that, there is no consensus among earlier researchers as to the influence of structure on performance and other factors determining the operating performance of the Nigerian commercial banking system. It is as a result of this inconclusive results that a research into the structure and economic performance of commercial banks in Nigeria becomes imperative. This is necessary in order to either validate or refute their findings using a somewhat different methodology. This is the goal of this research.

### 1.3 Objectives and Importance of the Study

The objectives of this study can be summarized as follows:

1. to ascertain the correlation of market structure with bank performance.

2. to find out the influence of policy variables on commercial bank profitability performance.
3. to study the speed of impact of policy variables and bank branch expansion on profit rates.

Assessment of bank profitability performance is important for the shareholders to ascertain whether or not it is worthwhile investing in commercial banking industry and to assure the depositors of the safety of their resources. Measurement of bank profitability is also important in the sense that inflation has become a permanent feature of the Nigerian economy and so profit in the real sense of it needs to be determined.

The knowledge of the above findings can be utilized as a criterion in evaluating the role of commercial banks in economic growth. Since commercial banks are primary suppliers of funds to business firms, the availability of bank credit at affordable rates is of crucial importance for the level of investments of the firms and consequently, for the healthy growth of the national economy. Thus, the above will guide the policy makers in constructing effective policy guidelines bothering on credit for the economy. The findings may inform the policy makers that directives of the central bank or any other authority, for that matter, are likely to

work when directed at goals that create the least friction between national interest and the profit maximization behaviour of commercial banks.

#### 1.4 Scope and Limitations of the Study

This research covers the period 1980-90 and the choice is guided by the following facts:

This period is considered appropriate not only because it serves as an extension to Agu's (1986) earlier study but also marks a period of rising profits in the entire commercial banking subsector.

The whole of 1970s represented a period of boom in the economy when all the sectors enjoyed the proceeds from increase in oil sales and the resultant monetization of the economy. This boom effect lingered on till the early 1980s.

However, the 1980s suffered from the depressing effect of economic recession. In the mid 1980s, some economic stabilization policies as contained in the Structural Adjustment Programme (SAP), were adopted and these were meant to restructure the economy and thereby change some policy variables particularly those bothering on credit market of which commercial bank is an important actor. The second-tier and first-tier foreign exchange markets were in operation during this period.

The withdrawal of government deposit from the commercial banks in 1987 to Central Bank also shook these banks. Consequently, a change in their portfolio management, which determines their objective function (profit), became inevitable.

Only five commercial banks that have existed for at least the past fourteen years are used for the research. We have been restricted to these five banks because getting accurate and up-to-date data on more commercial banks had been impossible. Furthermore, for analysis, we made use of annual data. We are, however, aware of the fact that in time series study such as ours, quarterly data would have presented a better result. But, because the data on the variables estimated are not given on quarterly basis and since we are not ready to risk bias arising from inaccurate estimation of the quarterly from annual data, we employed the annual data.

### 1.5 Organisation of the Research

Chapter one is the introductory chapter giving the background introduction to the study; stating the problem, objectives, importance, the scope and limitations of the study.



Chapter two treats the literature review. Critical analysis is made of existing literature (both theoretical and empirical) on the topic. The hypotheses guiding the study are also presented here. Chapter three outlines the methodology adopted in the research. It highlights the choice and specification of the model, estimation procedure and techniques of evaluation of the results. The fourth chapter reviewed the structure and assessed the conduct of the selected banks since 1980. Analysis of the relationship between profit rates and the determining variables (market and policy variables) was made. It also highlights the impact of Structural Adjustment Programmes on commercial bank profits growth and the challenges of the new banks on the old ones.

The results of the econometric estimation are presented in chapter five, where the various statistical tests are conducted to aid analysis. The working hypotheses of the research are also evaluated. Chapter six discusses the implications of the results. The conclusions are drawn and the policy recommendation made.

LITERATURE REVIEW AND STATEMENT OF HYPOTHESES2.1 Theoretical Literature Review

The central position which banks occupy in any economy but more importantly in a developing one has made and continues to make them the subject of interest of contemporary researches. As Gramley (1962) has opined, the nation's economic welfare depends very much on how efficiently resources are employed in the banking industry as a whole and in other lines of activity. Knowledge of the ways in which size and the portfolio decisions of bank management affect bank performance is, therefore, crucial because one objective of bank regulation is to ensure efficient production.

Conventional price theory predicts that industries in which output is produced by a few dominant firms may, in the long run, earn higher rates of return on the owner's investments than the opportunity cost of the equity capital, commonly called the normal or competitive rate of return. In line with the theory above, a firm with a large market share is in a position to bargain for a pattern of industry conduct which will reflect its own interests perhaps at the expense of smaller share firms if one assumes that large share firms are likely to possess, more liquid wealth than small-share firms (Bain 1951: 43).

This view is consistent with Fellner's discussion of the bargaining process among oligopolists.

Studies of market concentration have been generally restricted to the manufacturing and distributive industries with little attention paid to the markets in which financial companies operate - the market for commercial banking. But the importance of market concentration cannot be over-emphasized. As, Scherer (1971) concluded, "Concentration studies of manufacturing industries have been an important step in assessing the extent to which monopolistic or oligopolistic elements exist in an industry and the degree to which these non-competitive elements influence resource allocation and lead to excess profits, inefficiency, etc". He went further to say that "An oligopolistic structure is a more appropriate term for the type of situation where a few firms control a dominant share of the market".

In Bain's (1950) land mark study, he hypothesized that high degree of market share concentration are inextricably associated with decreased competition between firms and, consequently, with high levels of profits. These pivotal studies by Bain have initiated a heated debate on both theoretical and empirical grounds concerning the notion conventionally referred to as the Structure-Performance (S-P) hypothesis in the industrial organization literature.

On the other hand, beginning with Sheweiger and McGee (1961), this hypothesis has been introduced into the realm of the market within which commercial banks operate. Since then a considerable research effort has been devoted to test extensively whether or not concentration ratio plays prominently significant roles in determining bank profitability.

From the view point of the commercial banking industry, empirical evidence on the (S-P) hypothesis is a matter of considerable importance for several reasons:

- i) "It provides a strong rationale for banking regulatory and supervisory authorities to introduce, modify and monitor public policy measures designed to enhance social welfare.
- ii) In the advent of dramatic changes recently taking place in the international financial system, it alternatively contributes deregulation of the banking system, by providing an empirical justification for the argument that the unrestrained financial system automatically solves all its economic problems" (Good Friend and King, (1988)).
- iii) It can be utilized as a criterion in evaluating the role of commercial banks in economic growth since commercial banks are the primary suppliers of funds to business firms, the availability of bank credit at affordable rates

is of crucial importance for the level of investments of firms and, consequently, for the healthy growth of the national economy.

According to the (S-P) hypothesis costs of bank credit crucially depend upon the structural characteristics of the bank market. That is, increased bank concentration by increasing costs of credits; has a detrimental effect of reducing the demand of the firms for bank credits and the level of business investments. In the past few years, the cost of credit may not have been relevant in the analysis because it was then fixed in Nigeria. However, deregulation of the economy and the banking system in particular has now allowed the cost of credit to be determined to some extent by the forces of demand and supply in some sectors of the economy.

Commercial bank asset management is commonly described as the art of balancing liquidity against profitability (Adekanye 1983:118). However, these two objectives are inversely related in their attainment. In other words, there is an inherent conflict between the two in the management of bank funds. The sources of funds to commercial banks are short, therefore, the asset structure management demands that their liabilities be paid either on demand or at a very short notice which implies that sufficient liquid asset especially cash must be kept to meet such payments. "The process of commercial bank asset management must ensure that the institution remains

liquid, solvent and profitable even within an atmosphere of tight government regulation (Savage, 1977:89). Liquid reserves are earning asset which may be readily converted to money during a reserve deficiency period <sup>without</sup> appreciable capital loss. But the more liquid an asset, the less the yield on it and vice versa.

However, central to the management of bank funds is how to strike a proper balance between the requirements of conflicting goals of liquidity and profitability. In response to the above, certain theories of bank funds management have been developed. These include the commercial loan theory, capital adequacy theory, structure-performance hypothesis, profitability theory, among others.

#### Bank Capital Adequacy Theory

Another theory that tries to explain bank asset management behaviour is the capital adequacy theory. Bank earnings are the foundation upon which rest the two main pillars of banking strength—adequacy of capital and competence of management. In order to ensure adequate performance of banks in Nigeria, a call for adequate capitalization was made. Sequel to this, the monetary authorities consequently increased the share capital of commercial banks initially to #20 million and subsequently to #50 million in 1992 (Adekanye, 1992). Thus, earning power proved to be the first line of defence against the risks

inherent in banking (Crosse and Hempel, 1980:102). Supporting the above view, Savage (1977:89) asserted that the "basic problem of bank asset management is to allocate the available funds so as to maximise profits without endangering the solvency or the liquidity of the institution". Thus, inspite of the importance of other objectives that a bank may wish to pursue profitability performance goal must stand out head and shoulder above the other objectives if the bank is to be viable in the long-run (Agu, 1991).

Thus, the importance of profit in asset management cannot be over-emphasised. Bank earnings provide the return on capital investment in banks. It is also by retaining assets generated by earnings that the major portion of bank capital has been accumulated. Even when bank earnings are paid out as dividends, they tend to enhance the marketability and increase the value of the stock, thus enabling the bank to raise additional capital when needed (Crosse and Hempel, 1980:103). In otherwords, Bank profit functions in the generation of new capital which later serves as cushion against unforeseen and severe losses. As Bhatia (1978:54) as in Agu, 1986) opined, profits perform many useful functions in an economic system. They allocate capital, compensate investors for risks assumed, reward operating efficiency resulting from price - output decisions and provide

for future expansion.

The primary function of bank capital funds is to reassure the public and especially bank supervisors that the bank is in a position to withstand whatever strain may be placed on it. Moreover, adequate capital serves to keep banks open so that they may be able to absorb losses out of future earnings rather than out of capital funds themselves. But when the earning power is constrained by discretionary monetary policy, bank may not be able to produce efficiently. The committee of London Clearing Bankers (1978:174) observed that "unless the banks can earn an adequate return on the resources they employ, their ability to play their role in the economy fully and effectively will be prejudiced". It is of importance then to research into how commercial banks in Nigeria allocate their funds into the different asset categories so as to be able to achieve their objective and therefore be able to function efficiently in the economy.

Abong (1985) contended that for optimal application of the financial intermediation function, commercial banks need to acquire some measure of capital outlay as well as a sizeable



amount of assets, both liquid and illiquid. The capital outlay is contributed by shareholders and profits made and retained. The level or amount of deposits held by a Commercial bank is a big indicator of its ability to give out loans. Okigbo (1981) and Adekanye (1983) commenting on the importance of lending felt that lending (asset) is considered effective if it successfully reconciles the bankers obligation of maximum profitability to the shareholders and of maximum liquidity to the depositors. While they recognised the importance of profitability and liquidity to bank lending, they failed to consider the suitability of bank lending to the economic development of the nation. For instance, lending to commerce may be effective in profitability and liquidity to the bank, but may be ineffective in terms of its maximum contribution to the economic development of the nation.

The findings of Okigbo (1981), Ojo and Adewumi (1981), Nwankwo (1980) and others mostly pointed to an existing relationship between assets and asset mix on one hand and profitability on the other hand, with respect to commercial banks in Nigeria. According to Nwankwo (1980:55) the "structure of bank assets is important for bank planning". Among other things, it indicates the uses of bank funds; it shows how banks have been able to reconcile their dual

and apparently conflicting obligations (Modigliani and Miller AERP p. 261-291).

Ojo and Adewumi pointed out that since the 1970s, there has been a continuous growth in bank asset in Nigeria. Of conspicuous interest was the growth rate between 1970 and 1975 - when total assets almost tripled from a figure of ₦1,512.03 million to ₦4,307.0 million. Okigbo explained this phenomenal increase by referring to the 1972 Nigerian Enterprises and Promotion Decree (NEPD) which compelled many firms to effect their total transfer of equities through the banking system, and the sudden rise in revenue from oil sales as a result of the Yom Kippur war in the Middle East. Whatever the reasons might be, the growth in industry assets has been accompanied by shifts and variations in structure and mix. Consequently, the management techniques of the banks' asset would have been strengthened in order to enhance the banks' objectives.

Adekanye (1983:111) in his study observed that the "uses of funds distribution revealed the relatively unchallenged position of loans and advances". He adduced reasons for this dominant position of loans and advances. For one, it is the most important asset item in the balance sheets of banks because it is the largest source of income and secondly, its size can create a lot of difference in the

level of economic activity since it is from it that banks create money within any economy/.

For these reasons and coupled with the fact that money being lent is depositors' funds, the activities of Commercial banks, as regards uses of funds (loans and advances), attract the attention of monetary authorities. The commercial bank in Nigeria has been the most regulated of all the banks and the non-bank financial institutions in the economy. A catalogue of interventions by the Central Bank of Nigeria attests to the above view. These interventions range from moral suasion to selective credit controls which include forced lending to the preferred sectors of the economy.

Commenting on the above, the work done by Vuchelen on quantitative monetary policies, and the portfolio composition of commercial banks stressed that traditionally, monetary authorities influenced the asset allocation process of financial institutions, by changing the discount rate, reserve coefficients among others. By early 1960s, the above instruments were supplemented by many European Central Banks, by a more direct intervention, ceilings or floors, on the holdings of certain assets were imposed in order to strengthen the effect of monetary policies. This intervention in form of forced lending policies was reflected

in a declining share of total loans originating from Commercial banks in Korea (Arund 1985:65).

Assessing the impact of government intervention further on banking institution, Vuchelen (EER, 1980) wrote that "It is not surprising that quantitatively oriented instruments are mainly used in countries where money and capital markets are not very developed, the assumption being that offsetting will be unimportant".

Besides, a factor determining the effects of the quantitative instruments on important macroeconomic variables is the COVERAGE of the financial system. As far as Nigeria is concerned, the monetary authorities have no proper grip on the non-bank financial institutions. It is therefore noted that "it is quite clear, that, by controlling banks and money alone, leaving near-monies and near banks (or non-bank financial institutions), will not facilitate the achievement of the desired monetary policy objectives" (First Bank Quarterly Review, March edition, 1990, p. 2). Odozi in line with the thinking expressed above, (in a public lecture) complained that the effective conduct of monetary policy was being constrained by "regulatory arbitrage with many non-bank financial institutions operating as bona fide banks but not subject to banking regulations or supervision" (Newswatch, May 1991, p. 27).

Furthermore, a set of regulations was put in place from the 1960s which had the effect of limiting competition in banking. They include limitation of branching, barriers to entry, imposition of ceilings on interest payable on both deposits and loans; such limitations do not augur well for efficient allocation of resources and asset management (First Bank Quarterly Review, March 1998, p. 2).

In his view, Silverberg (1973) observed that raising or eliminating such a ceiling would enable a bank to raise its rates so as to be able to increase its deposit volume and earning. The effect of this low rate on investment in the economy was evaluated by Olashore and others (First Bank, p. 4). They observed that with inflation rate of over 20% in 1985, a ceiling of 13% as interest on loans was quite unrealistic in terms of real returns on funds invested. This, they conclude, could not make investment rather than present consumption preferable.

Some critics on the application of credit guidelines postulated that "the use of differential interest rates on loans to preferred and less preferred sectors could result in inefficient use of capital (Olaseni Akintola 1982:19-23); Nwankwo, (1990).

This criticism failed to realise that credit selection policy was designed to prevent the leakage of credits towards activities which could be highly profitable to banks but, are in the opinion of regulatory authorities, less socially productive and could have only minor or even retarding effects on the economic development of the nation. This regulation is also considered necessary in a country like Nigeria, mainly because of the imperfection of the capital market which might not allocate available funds efficiently, to protect the depositors and ensure a safe and sound banking system (First Bank Quarterly Review, March 1990).

Intervention by monetary authorities affects the banks' freedom to choose how best to diversify their portfolio and thus their overall performance might be impaired. As shown by Revell (1973) for Britain, restrictive credit controls on commercial banks alone while stifling their growth would favour the growth of secondary banks or other non-bank financial institutions to compete with the commercial banks in mobilizing deposits and granting loans and advances.

Since these credit guidelines (regulations) do not apply uniformly to all the financial institutions, the commercial banks are placed at a disadvantaged position. For instance, the effective cost of funds to them increases when reserves must be held. Ojo analysed the cost of borrowing to commercial banks. Suppose that an 18 per cent reserve requirement applies to negotiable certificate of Deposit and that the market rate is 15 per cent, the effective cost to the bank is equal to:

$$\frac{\text{Market Rate}}{1 - \text{Reserve Requirement}} \%$$

$$\text{The cost of funds therefore equals } \frac{15}{1 - 18\%} = 18.3$$

Since the bank can use only 82% of the funds borrowed, (18% must be held in non-earning reserves), it can be seen that the effective cost of funds increase when reserve must be held.

The erosion of funds (deposits) away from commercial banks by merchant banks and non-bank financial institutions is made possible by the high interest rate offered (28%) by the non-bank financial institutions on short term deposit of about 90 days. Ojo commenting on the implication of the above action has this to say: Competitive drives and

other developments (e.g withdrawal of government deposits) that have attracted deposits from the commercial banks on one hand and from the banking sector on the other has been the erosion of the liquidity base of the banks. It makes the banks to reduce the volume of loans and advances granted to the public, and even recall some of the existing loan assets. In addition, the 15% withholding tax that was introduced in 1989 on time deposits and lodgements in savings account in excess of #50,000 might also dampen the growth of time deposits which had hitherto, been one of the major sources of funds to commercial banks.

## 2.2 Empirical Literature

The keen interest of researchers in empirical testing of the Structure-Performance (S-P) hypothesis within the context of the banking industry has produced a plethora of empirical studies. The structure-performance hypothesis which states that "The structure of the market will influence the conduct or behaviour of the firms in the market and that the resulting behaviour will be reflected in the price and profit performance of the firms in the market", has been tested widely with data obtained from the industrial sector especially in the United States. On the whole, a substantial evidence that market structure (concentration) does seem to influence firm behaviour in the hypothesised manner has been found.



However, the relevance of this theory to commercial bank behaviour has been the subject of a large number of empirical studies.

Khoades (1977) reviewed forty articles and found that in ten, the results indicated a negative relationship while the remaining thirty indicated a positive relationship. Hart (1968) in his study found no evidence that high profits and high concentration were correlated.

The traditionalists empirical studies exemplified by Heggstad (1977) holds that the overall results of the existing empirical literature support the notion that the (S-P) hypothesis hold in reality.

The Neo-traditionalists, by fundamentally excepting the (S-P) hypothesis, have advanced several reasons to explain the failure of the existing research to produce consistently positive and statistically significant relationship between concentration and bank profitability.

Clark (1986), for instance, has discovered that the use of the single equation estimation methodology may depress the effect of the market concentration variable on the bank profitability variable.

Haslem (1964) conducted a statistical study between 1963-1964 using data on United States of America. The study tested whether or not management and other selected variables have significant influence on relative profitability, and if so, on the operating relationships through which these influences are transmitted. He contended that successful management was determined more by the relative use it made of funds than in the type of funds (deposits vs capital) at its disposal. He found that the ability of management to earn on bank assets appeared more important to relative profitability than the asset mix. The implication of this is that bank loan policy should stress the importance of charging interest rates comensurate with the risks involved in supplying credit.

In contrary to this finding, is the action in some developing economies, for instance, Nigeria where interest rates are institutionally determined. This does not give room for banks to earn returns on their assets that are commensurate with the risk of lending. Even though it is known that the money and capital markets in

these countries are not well developed for the forces of demand and supply to be allowed to determine the interest rate, the commercial banks' management ability should not be jeopardised by fixing an interest rate so low as to make returns on their capital employed negative. This was the case in 1985 when the rate of inflation was as high as 20 per cent whereas the rate of interest was pegged to  $8\frac{1}{2}$  - 10 per cent (Olashore and others, 1990).

Andersen and Burger (1969) reported the results of an investigation they conducted on two aspects of commercial bank portfolio management. Concerning the first aspect, two alternative hypotheses regarding bank behaviour were tested. These were the "accommodation principle" implied in the commercial loan theory of banking and the "profit maximization principle" which implies that commercial bank responses to market forces determine their portfolio behaviour. They investigated the behaviour of banks under certain conditions as regards some assets, for example, excess reserve, loan, investment and borrowing.

The result supported by the hypothesis that bank behaviour responded to changes in short term interest rate, long term interest rate and prevailing economic conditions in a manner that was in line with the hypothesis that banks attempt to manage their asset portfolio in a way that

was consistent with a profit-maximising explanation of commercial bank behaviour. In both periods of 1953-1960 and 1961-1967, the study showed that as the short term interest rate rose, banks responded by increasing the ratio of loans to deposits. As the long term interest rate rose, making investments more attractive relative to loans, banks restructured their asset portfolios by reducing the proportion of loans to investment in their portfolio. The important element in this research was the emphasis on interest rate as determinant of cost of credit.

However, the analytical setting of the research seems to be less amenable to the Nigerian situation where all the important explanatory variables like the short and long term interest rates are institutionally determined.

Lambo (1977) using decomposition analysis method studied the portfolio behaviour of Nigerian commercial banks for the period 1962-1972. The structural changes in asset portfolio were seen to be independent of structural changes in liabilities. His finding was that changes in assets were due mainly to changes in Central bank's policies within the same period.

In another related study "A structural analysis of commercial banks' loans and advances, Ajayi (1980) found out, using the same decomposition method for the entire period

1970-1977 that Central Bank's directives had effect on the size of banks' loans and advances but with no significant effect on the allocation pattern to the various sectors of the economy. The state of general economic condition also had an effect on the structural changes in loans and advances. He emphasized the fact that since economic conditions have important roles to play, the implication was that when attempts were being made to control the directions of loans, care had to be taken to bear in mind commercial banks' profit maximization behaviour. Sectoral share allocation may therefore not work when the primary objectives of banks are being sacrificed. He concluded that directives of the Central Bank or any other authority for that matter, were likely to work when directed at goals that create the least friction between national interest and the profit-maximising behaviour of commercial banks. The limitation of the model was that it was not dynamic.

In a study conducted in Nigeria by Ojo and Adewumi (1982), it was discovered that "in spite of the phenomenal increase in total assets employed, the ratio of net profit to this item has not shown any significant upward trend during the period ...". Their conclusion was that banks had not significantly improved their efficiency in using resources over the years, having maintained steady relationship between

net income and deposits, loans and advances and total assets employed. This, they contended, could be readily traceable to the fact that a disproportionately large part of their resources had been placed in short term, low yielding gilts. "Scale diseconomics and gross inefficiencies have also adversely affected the performance of the banks, while profits recorded by them have been attributable mainly to their operations in an imperfect capital market situation". Thus, profits flowed to bank coffers within the period under survey, not as a result of good asset management but particularly due to the operations of a market environment that was basically inefficient.

In line with Hart, the adherents of Efficient Structure hypothesis (Demsetz 1972; Peltzman 1977; Brozen 1982 and Smirlock 1985) by rejecting the S-P hypothesis, have found out that there is no relationship between concentration and profit, but rather between bank market share and bank profitability.

Contrary to the above findings, some researchers (Byran 1972, Agu 1986 and Civelek and Al-Alami 1991) reiterated that there are other important factors influencing a banking system's performance other than market concentration. Byran (1972) in a study of medium size banks found that the single most important factor explaining profitability is the

ratio of time plus savings deposit to total deposits. Agu (1986) applied the single equation model to Nigerian time series data and submitted that the policy and demand variables are more important in determining the economic performance of commercial banks. For Byran and Agu, the concentration variable was negatively correlated to bank profitability.

Thus, unlike the supportive results obtained from the industrial sector where a positive and statistically significant relationship between market concentration and performance has been consistently found, the empirical results from the banking studies have been rather heterogenous. It is because of the inconclusive and to some extent, contradictory results that Kaufmen (1966: 439 as in Agu 1986) recommended in his study that the experiment should be replicated for other states and other types of bank organizations before the results may be considered sufficiently persuasive for determining policy.

### 2.3 Limitations of Previous Studies

The decision to undertake this study has been necessitated by the limitations of earlier related studies to capture the issue of operating factors in commercial bank profitability performance in Nigeria. Except the works of Soyode and Oyejide (1977), Agu (1986) some other works reviewed had

concentrated on examining the performance of commercial banks around their role as development institutions. The factors influencing the operating performance of the Nigerian banking system have received little attention.

However, the work of Soyode and Oyejide in this area using cross sectional data on fourteen commercial banks in 1973/74 estimated the impact of branch network on bank profits. The policy variables were not taken into consideration, but Byran found that the single most important factor explaining profitability is the ratio of time plus savings deposits to total deposits. Lambo (1977 and Ajayi's 1980) works in this area were somehow descriptive, using decomposition analysis. Agu (1986) in his research submitted that the structure-performance hypothesis has no relevance to the Nigerian situation.

Generally, since their studies, a number of changes have taken place. Moreover, most of the works reviewed did not specify any dynamic model and hence no introduction of distributed lags into the system. Even though Andersen (1969) and Franser and Rose (1974) made use of dynamic models, their analytical settings were clearly different from the Nigerian situation. Some of them did not specify the speed of impact of shifts in market and policy variables on profit rates.



However, there are current dynamic models to undertake such tests as the stock adjustment models and computation of half-lives.

#### 2.4 Statement of Hypotheses

The study is guided by the following hypotheses:

1. The bank structure has a positive significant influence on bank performance.
2. The policy variables have significant effect on bank profitability performance.
3. Changes in policy variables affect bank performance faster than changes in bank branch expansion.

METHODOLOGY

The methodology adopted in this research is mainly econometric. This is understandable since econometric methods are best suitable for testing the specific hypothesis about the nature of any economic relationship. Under the econometric method, the modelling could be in three forms: the linear programming model; the large structural model; and the single equation model.

The strengths and weaknesses of these models were examined with particular reference to their relevance and adaptability to the research. For instance, some of them are not only complex but their basic assumptions are not amenable to the Nigerian situation.

Considering these alternative techniques of modelling a problem, and following the works of Andersen and Burger (1969), Franser and Rose (1973), Bain (1951), Rhoades and Rutz (1982), Agu (1986), the single equation linear model is chosen. Our choice is guided by its simplicity and the ability of its variants to give clearer and more definite estimates of the various impact of structure and policy variables on bank performance.

### 3.1 Behavioural Assumptions of the Model (Linear Regression Model)

The linear regression model is based on certain assumptions, some of which refer to the distribution of the random variable U, some to the relationship between U and the explanatory variables, and finally some refer to the relationship between the explanatory variables themselves (Koutsoyiannis, 1977). The assumptions are classified as stochastic assumptions and other assumptions.

The single equation model adopted in our research is a multiple regression model and some of its assumptions are:

i) The model specified takes the form:

$$Y_t = b_0 + b_1 X_{1t} + b_2 X_{2t} \dots + b_k X_{kt} + E_t$$

ii) The error term (U) is a random real variable, meaning that the value which  $U_i$  may assume in any one period depends on chance; it may be positive, negative or zero.

iii) The mean value of the error term in any particular period is zero.

iv) The error term has constant variance in each period.

v) The error variable is normally distributed.

The above four assumptions about the distribution of U may be summarized by the expression:

$$U \sim N(0, \sigma^2).$$

- vi) The random terms of different observations ( $U_i, U_j$ ) are independent.
- vii) The error term is independent of the explanatory variable(s) - meaning that the U's and the X's do not tend to vary together.
- viii) The explanatory variables are fixed.
- ix) The explanatory variables are measured without error.
- x) The explanatory variables are not perfectly linearly correlated.

The relationship is correctly specified (that we have included all the important regressors explicitly in the model) Koutsoyannis (1977).

### 3.2 Specification of the Model

To enhance the understanding of the profitability performance of commercial banks in Nigeria, the following adjusted model, in which the performance is linearly related to market share/concentration, deposit mix, loan intermediation and the lagged values of profit rate is thus specified. The general form of the model reduced from econometric models of the form:

$$Y = F (X_1, X_2)$$

Where Y = Dependent variable reflecting the banking system's economic performance;

X1 = Variables proxying the structure of the banking industry;

X2 = Policy variables reflecting the results of operational decisions regarding the input-output mix,  
are deduced and tested with annual time series data!

In specifying the models, two measures of market structure - market concentration (MC) and number of bank branches (NB) are specified separately because of collinearity between them. The models have the following functional forms:

$$Y = F (MC, DM, LD, BS, Y_{t-1}, U)$$

$$Y = F (NB, DM, LD, BS, Y_{t-1}, U).$$

The following are the equations which are estimated for the whole of the sample banks:

$$DY = b_0 + b_1 DMC_1 + b_2 DDM + b_3 DLD + b_4 DBS + b_4 Y_{T-1} + U$$

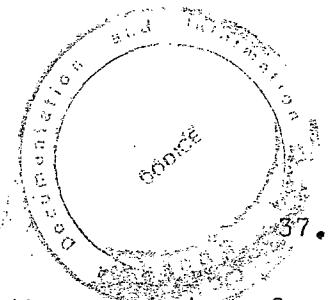
$$DY = b_0 + b_1 DMC_2 + b_2 DDM + b_3 DLD + b_4 BS + b_5 Y_{T-1} + U$$

$$DY = b_0 + b_1 DNB + b_2 DDM + b_3 DLD + b_4 BS + Y_{T-1} + U$$

Where

Y = the profitability index measured as the ratio of net profit to capital

MC<sub>1</sub> = Bank concentration.



$MC_2$  = Market share of the banks (Herdindahl index of market concentration).

NB = Number of bank branches

DM = Deposit mix (ratio of time and savings deposits to total deposit).

LD = Loan-deposit ratio.

BS = Bank size (Total assets).

YT-1 = lagged value of profit rate.

Performance Variable

Performance can be viewed from two different angles: as an appraisal of a firm's contribution relative to its potential towards achieving goals set for it by society (Caves 1967). It can also be viewed as the strategic results of market adjustments by individual firms (Bain 1959: 340). The first view refers to the social performance of a firm while the second view refers to its private performance.

Where private goals differ from social ones, government usually imposes restraints on private section. In the case of Commercial Banks, it may be argued that the control of industry (where effective) has the effect of forcing private goals to coincide with social objectives. Hence this study will concentrate on evaluating private

performance of commercial bank as this is influenced by the structure and conduct of the industry as well as the externally imposed system of regulations.

As noted by Agu (1986), a common problem in industrial organization is to define the unique product of the industry being investigated. This problem is particularly difficult in banking industry because like most services, it has no unequivocal measure of its output. Infact bank output being service is intangible and is often sold as a package (Treadway 1969, Mackera 1975 as in Agu, 1986). It is empirically impossible to isolate the various elements of the package and measure each component directly for the purpose of determining aggregate output. Some studies have tried to avoid this problem by choosing only one bank service. However, this method underestimates the total effect of structure and some other important variables on performance (Short, 1979).

The profit maximising behaviour of banks provide the rationale for the use of profitability as an appropriate measure of bank performance. The profitability index,  $Y$ , is measured as the ratio of net profit to capital (rate of return on equity). Profitability ratios are more important the the absolute level of profits as a measure of performance because an entity may improve its absolute profit performance

by employing additional resources but without improving its profitability (Agu, 1990).

### Structure Variables

In spite of the fact that the Nigerian commercial banking system consists of many competing banks; yet a few large ones seem to exert a great influence on the market, there is the need for an index that measures the relationship between the number of firms and their share of the market. The index used in this study is the five bank concentration ratio calculated as:

$$MC = \frac{\sum_{i=1}^5 D_i}{D}$$

Where

MC = Concentration ratio

$D_i$  = Deposit of the leading  $i$ th bank

D = Total deposits outstanding of the Commercial banking system.

Conc = Size distribution of firms.

One summary measure of concentration that takes into account the total number of firms in a market and their market share is the Herfindahl Index. The index is constructed by summing the squares of the market share of all firms in the market.



That is:

$$\text{Herfindahl index} = N \sum_{i=1}^N (X_i/S)^2$$

Where H = Number of firms

$X_i$  = the absolute size of each of the firms.

S = the total size of the market.

The essence is to be able to compare the estimates from two indices. The Herfindahl index has its limitation of requiring far more information in its computation. No satisfactory explanation of the size distribution of firms has yet been derived from economic theory (Curry and George, 1983). The concentration ratio, for example, can only suggest that the small number of large firms makes restrictive pricing and output decisions more possible than if there were many firms of equal size. It does not mean that large firms are actually engaging in anti-competitive conduct. The existence of a few firms may simply reflect economics of large scale (Salley, 1972:72). The shortcoming notwithstanding, the concentration ratio is regarded as one of the few general measures of structure available to the economist (Bain, 1959).

Another measure of the structure of the Nigerian banking system which is of particular concern to the regulatory authorities is the number of bank offices (geographical spread

of each bank). Economic theory contends that a banking system consisting of numerous competing banks will perform better in terms of output and prices than a banking system dominated by a few banks (Agu, 1990).

Traditionally, the structure-conduct-performance hypothesis would suggest a positive relationship between market concentration and profitability of a firm as shown below:

$$\frac{\partial Y / \partial MC_1}{Y} > 0$$

$$\frac{\partial Y / \partial NB}{Y} > 0$$

#### Policy Variables

According to the portfolio balance model of asset diversification, the optimum holding of each asset in a wealth holder's portfolio is a function of policy decisions determined by a number of factors such as vector of rates of return on all assets held in the portfolio, a vector of risks associated with the ownership of each financial asset and the size of the portfolio (Moore, 1968:33).

On a priori grounds, therefore, the deposit mix, that is, time and savings deposits to total deposit ratio and the level of intermediation indicated by loan-deposit ratio are

considered appropriate policy variables influencing a banking system's performance. The deposit mix by determining the liquidity needs of the banking system affects the volume of earning assets. The intermediation ratio reflects the credit policy formulated by the bank. These policy variables reflect the portfolio preferences of the bank (that is, the way the bank decides to hold its portfolio of assets and liabilities or input-output decisions).

A positive relationship is postulated between the bank performance and the policy variables on the basis of the following justification:

Large market size enables the bank to differentiate its products and consequently to generate higher profits (Smirlock, 1985:71).

$$\frac{\partial Y / \partial DM}{Y / DM} > 0 \text{ and}$$

$$\frac{\partial Y / \partial LD}{Y / LD} > 0$$

On the other hand, the deposit mix (DM) may be expected to be negatively related to profitability if the Nigerian banking system is committed to relatively more expensive time and savings deposits which inevitably imply higher costs and lower returns. However, the returns on the use to which the time and savings deposits is put to, may be

large enough to off-set the cost incurred in attracting the deposits.

### 3.3 Estimation Procedure

The ordinary least square method is used in estimating the parameters of the equations employed in this research. The choice is guided by a number of reasons, among which is the simplicity of its computational procedure and the optimal properties of the estimates obtained from this procedure. Among such properties are linearity, unbiasedness and minimum variance. Comparism of the ordinary least square estimates is restricted traditionally to the class of linear unbiased estimators which are popular because they are easy to analyse and understand (Wannacott and Wannacott, 1970).

Auto-correlation of the residuals is also a potential source of bias in the OLS estimates of the coefficients of the lagged dependent variable. Changes in all variables are however computed by the conventional first differences (flow form) to dampen the effects of auto-correlation.

### 3.4 Techniques for Evaluation of Results

After having obtained the parameter estimates by the use of ordinary least square, the following standard criteria are used to evaluate the results. First, the signs of the coefficients are taken into consideration to determine whether or not they have positive or negative relationship with the

dependent variable. For instance, in hypothesis one, we are interested in signs of the bank structure variable in relation to the performance index.

By computing the 't' values of the regression coefficients, the significance level of each of the coefficient is tested. The coefficient of multiple determination  $R^2$ , and partial coefficient of determination,  $\bar{R}^2$ , are computed to measure the strength of the relationship or testing the goodness of fit of the whole regression. F is also computed to test the significance of the whole regression.

To evaluate the speed of impact of an independent variable on the dependent variable, we computed the speed of adjustment using the stock adjustment model. The adjustment equation is specified as follows:

$$Y_t - Y_{t-1} = d (Y^*_t - Y_{t-1}) + U_t$$

Where  $0 < d < 1$ )

such that  $d = 1 - b_2$  (Kontsoyannis, 1977) that is, one minus the coefficient of the lagged dependent variable.

$Y_t$  is the stock on hand at time  $t$ ;

$Y^*_t$  is the desired stock

$Y_{t-1}$  is the stock in the previous period, that is, the actual existing stock of  $Y$  at  $t-1$  and  $d$  is a speed of adjustment coefficient.

A convenient statistic for summarising the implications of a given value of speed of adjustment is the half-life statistic, which is, the number of periods  $n$ , required to close one half of any gap between the constrained and unconstrained optimal quantities. To obtain the half life, we solve for  $n$  such that

$$(1-d)^n = \frac{1}{2}$$

Taking logarithm of both sides yields the equation

$$\ln n(1-d) = \ln \frac{1}{2}$$

$$n = \frac{\ln \frac{1}{2}}{\ln (1-d)}$$

(Ajayi 1986:56).

#### Data Requirements and Sources

Annual time series data on the variables under study spanning the period 1980-1990 are used in this study. The variables are:

1. Bank economic performance measure - Rate of return on capital (Net profit over capital).
2. The index of market structure:
  - a)  $MC_1$  concentration ratio = deposit of the leading  $i$ th bank over the deposits of all the banks in the market.
  - b) Herfidahl index of market concentration. =  $MC_2$ .
  - c) No of bank branches = NB

3. Time and savings deposits over total deposits = DM

4. Loans and advances over total deposit = LD.

The main sources of the data are the different annual reports of individual selected banks. The actual variables utilized are calculated on the basis of the information published in these reports.

CODESRIA - LIBRARY

THE PERFORMANCE OF SELECTED COMMERCIAL BANKS IN  
NIGERIA

4.1 The Structural Development in the Selected  
Banks between 1980-1990

Contrary to expectation, the Structural Adjustment Programme (SAP) has impacted on Commercial Bank in very significant terms. The short term impact may have tended towards being beneficial to them, the medium and the long term implications are bleaking. The banking industry has certainly become one of the most profitable sectors of the economy and this explains the large influx of new operators into the industry. The huge profits declared by banks have also become the object of public interest and controversy.

An examination of tables 1 and 2 shows that the total assets of the selected banks and banks' profitability maintained upward trends. While the annual average growth rate of assets was 14.6 per cent for the period 1980-90, that of profit was 14.9 per cent for the same period (Table 2). For the two variables, the rate of increase of profits was highest in the period 1985-1986 while that of asset was highest in 1983. A spectacular note has to be taken of the growth in profit in 1985 - 48.5 per cent while the growth in asset was just 5 per cent.



**TABLE 1: PROFITS, ASSETS, DEPOSITS AND THE NUMBER OF BANK BRANCHES OF THE FIVE SELECTED NIGERIAN BANKS 1980-1990 (₦ MILLION).**

YEAR	NET PROFIT	TOTAL ASSETS	TOTAL DEPOSITS	SHARE-HOLDER'S CAPITAL	TIME AND SAVINGS DEPOSIT	LOANS AND ADVANCES	NUMBER OF BRANCHES
1980	43.3	5714.3	4869.5	219.1	2169.2	2671.5	391
1981	68.0	6791.0	5905.1	287.2	2644.3	3613.6	418
1982	72.0	7970.1	6947.9	340.3	4493.5	4263.9	468
1983	75.4	10013.1	8688.4	388.2	4311.3	4182.0	511
1984	72.7	11327.5	9604.6	435.3	4505.6	4312.9	540
1985	108.0	11895.9	9687.9	519.7	4660.5	4413.4	584
1986	154.2	14118.1	10894.3	692.6	5337.2	5430.2	605
1987	142.0	16097.8	12497.0	887.1	6200.6	5969.0	647
1988	170.1	18006.0	14511.1	1041.5	7619.9	6739.0	686
1989	192.0	21313.0	16208.7	1294.7	8533.1	7001.0	731
1990	116.6	22543.0	17672.1	1594.9	9315.9	8678.0	784

**Source:** Annual reports and statement of Accounts of the selected commercial banks for various years (1978-91).

**TABLE 2: PROFITABILITY OF THE NIGERIAN BANKING SYSTEM  
AND ITS DETERMINANTS (PERCENTAGES)**

YEAR	NET PROFITS CAPITAL	DEPOSIT CONCENTRA- TION	TIME AND SAVINGS DEPOSIT	LOANS & ADVANCES	NUMBER OF BANKS BRANCHES	LAGGED PROFIT
			TOTAL DEPOSIT	TOTAL DEPOSIT		
1980	19.7	48.6	44.6	54.9	39.1	26.1
1981	23.7	55.3	44.8	61.2	41.8	19.7
1982	21.1	57.8	64.7	61.4	46.5	24.0
1983	19.4	62.3	49.6	48.1	51.1	21.0
1984	16.7	61.0	46.9	44.9	54.0	19.4
1985	20.8	55.1	48.1	45.6	58.4	16.7
1986	22.3	60.1	49.0	49.8	60.5	20.8
1987	46.5	54.1	49.6	47.8	64.7	22.3
1988	16.4	49.9	52.5	46.4	68.6	46.5
1989	14.8	59.7	52.6	43.2	73.1	16.4
1990	7.3	62.1	52.7	49.1	74.8	14.8

Source: Table I

In 1987 when the total asset growth rate dropped to 14 per cent from 18.7 per cent, that of profits fell drastically from 42.8 per cent to as low as -7.5 per cent. This could be as a result of withdrawal of Government accounts from commercial banks to central bank. However, the banks picked up in 1988. This spectacular increase in profit in 1988 could be attributed to the gains from the SFEM which did not last for a long time. As was noticed by Ogundipe and company "It is true in the initial stage of SFEM the assets and profits of banks rose quite significantly as a result of the boost in Naira holdings of the financial institutions when their foreign balances were converted to Naira". However, this development had the effect of strengthening the balance sheet of banks in the short term.

The levels of growth witnessed in the sector in the last two years are somehow temporary and may not continue in the coming years. The above statement is consistent with what is happening in the commercial banking sector particularly in the selected banks. The decline in profits since 1988 (19.5 per cent) up till 1990 negative 39.3 per cent has validated the above statement.

When the relationship in the growth trend between total deposits, loans and advance on one hand, and bank profits on the other hand is examined, the picture is not the same as

above. Both loans and advances and total deposits of banks maintained similar upward trend with banks profits to a certain extent. The annual average growth rate of 9.2 per cent for loans and advances is lower than that of 14.1 per cent and 14.0 per cent for profits and total deposits respectively. In 1987 when the growth rate of loans and advances rose from 2.3 to 9.9 per cent, profit declined substantially from 42.8 per cent to negative 7.5 per cent. Again in 1990, when loans and advances rose from 3.9 (1989) to 24 per cent in 1990, profit dropped drastically from 12.6 per cent to negative 39.3 per cent. The explanation could be that the banks were not earning as much as they should from their loans and advances probably because of the controlled and administered loan rates. Another reason could be high rate of bad and doubtful debts and stoppage of interests charges on such accounts. This could mean that their profits of yester-years were not real profits. In support of the above, Ogundipe and Company (1988) reiterated that "the levels of growth witnessed in the sector in the last two years are however temporary, and will not continue in the coming years". (first bank 1988). Further to this is the fact that SAP has placed a considerable strain on financial institutions. The escalation of overhead and replacement costs, restrictive credit guidelines, stretched organizational and executive capacity, reduced profit

margins etc are only a few of the current issues which have been impacted on financial institutions as a result of SAP.

#### 4.2 Profit-Bank Branches Relationship

Apart from market concentration index, bank branch is another measure of structure of the Nigerian banking system since it is of particular concern to the regulatory authorities. Economic theory implies that a banking system consisting of numerous competing banks will perform better in terms of output and prices than a banking system dominated by a few banks. Specifically, micro-economic structure holds that competitive economic structure results in allocational efficiency of resources by competitive forms through cost minimization, and an efficient level of output by firms at the point of average revenue (AR) marginal cost (MC) equality (as in Agu 1990). On the other hand, an industry with an imperfectly competitive structure may, all things being equal, achieve cost minimization but not efficient level of output and it may require regulation to achieve maximum efficiency (Leland, 1974).

The regulatory authorities came out with the finding that Nigeria was under bank and under branched and so specified that each bank must open up new branches particularly in the rural areas.

**TABLE 3: ANNUAL CHANGES IN PROFITS, ASSETS, TOTAL DEPOSIT  
TIME AND SAVINGS, LOANS AND ADVANCES AND NUMBER OF  
BRANCHES OF THE FIVE SELECTED NIGERIAN BANKS  
1980-1990 (PERCENTAGES)**

YEAR	NET PROFITS	TOTAL ASSET	TOTAL DEPOSIT	SHARE-HOLDERS' FUND	TIME AND SAVING	LOANS AND ADVANCES	NUMBER OF BRANCHES
1981	57.0	18.8	21.3	31.1	21.9	35.3	6.9
1982	5.6	17.4	17.7	18.5	69.9	18.0	11.2
1983	5.17	25.6	25.1	14.1	-4.1	1.9	9.9
1984	-3.66	13.1	10.5	12.1	4.5	3.1	5.7
1985	48.5	5.0	0.9	19.4	3.4	2.3	8.1
1986	42.8	18.7	12.5	33.3	14.5	2.3	3.6
1987	-7.5	14.0	14.7	28.1	16.2	9.9	6.9
1988	19.5	11.9	16.1	17.4	22.9	12.9	6.0
1989	12.6	18.4	11.7	24.3	12.0	3.9	6.6
1990	-39.3	5.8	9.0	23.2	9.2	2.4	2.3
Average Annual Growth Rate	14.1	14.9	14.0	22.2	17.0	9.2	6.7

Source: Table 1

An examination of Table 1 again shows that bank profits increased per se with increase in bank branches up to 1989. Between 1980 and 1985 the highest rate of increase in bank profits was recorded in 1985 and the growth rate in bank branches of 8.1 per cent was recorded in the same year. The implication derived is that the branch expansion from 1980 to 1985 might have been accompanied by a significant expansion in the deposit base, hence a positive contribution to banks' profits is made through the expansion in the average size of asset holdings.

The situation was a bit different in the period 1986-90. While the average annual growth rate of bank offices during this period was 4.2 per cent, that of bank profits was 5.62. In 1987 when the rate of increase in bank offices was 6.9 per cent, that of bank profit was negative 7.5 per cent. An explanation which could be offered might be that the expansion in bank offices instead of being accompanied by a significant expansion in bank deposit base became a source of decreasing return due to the problem of co-ordination or control as well as high input price at the branch level (Barnes 1982). The branch banking literature suggests that any economies of scale which accrue through branch banking expansion may be offset by the greater cost of operating multiple facilities. This

is why the big banks are fussy about opening new branches particularly in the rural areas. It is important to note that the branch expansion between 1970-1980 was more lucrative than that of the mid 1980 up till date because the former was concentrated in the urban while the latter is rural and more of a social service. The year 1990 witnessed a drastic fall in profit growth rate from 12.6 per cent in 1989 to -39.3 per cent in 1990. The lowest growth rate of 2.3 per cent in branch banking expansion was also recorded this same year. One reason that could be adduced for this was the stoppage of interest charges on accounts considered bad and doubtful as was mandated by the federal government. This drastically reduced not only the asset composition of the banks but also the income earned on this asset.

#### 4.3 The Relationship Between Profit and Concentration

The ability of a company to use available resources to generate economic values in excess of the cost of required inputs is a measure of its profitability. It can be said to be an operational concept and should be of interest to the management and shareholders of companies alike since it is truly related to growth. High profits, overtime, tend to provide more finance for new investments and increased returns on equity both of which, in turn, generate company growth. It is in this sense that profitability can be said to be positively related to size.



In Shepherd's (1970:50) opinion "profits, the residual revenue after all costs have been met, are sought by firms as a reward and as a means of gaining more market power and so future profits. Clark (1900: 411) supported the contention that profits are a result of the imperfections in the market system. He said, inter alia:

"... If competition worked without let or hinderance, pure business profits would be annihilated as fast as it would be created. Were it if not for that interval (of imperfection), entrepreneur as such would get nothing however much they might add to the world's productive power", p. 411.

In a perfectly competitive world, Clark expected profits to be non-existent. The simple equation of profit is given by

$$\pi = f(g, k) \text{ where}$$

- $\pi$  = Profit margin
- $g$  = The Proportional growth in sales revenue
- $k$  = The investment coefficient.

Conventional price theory predicts that industries in which output is produced by a few dominant firms may in the long run earn higher rates of return on the owners' investment than the opportunity cost of the equity capital, commonly called the normal or competitive rate of return (Bain 1951).

Table 4: Deposits of all Commercial Banks in Nigeria Vs Deposits of the Selected Banks (# Million)

Year	Total Deposits of all Commercial Banks in Nigeria <sup>1</sup>	Total Deposit of the 5 selected Banks. <sup>2</sup>	Deposit Concentration (2 <sup>1</sup> )%
1980	10,009.1	4,869.5	48.6
1981	10,676.9	5,905.1	55
1982	12,018.9	6,947.9	57.8
1983	13,938.5	8,688.4	62.3
1984	15,734.8	9,604.6	61.0
1985	17,597.1	9,687.9	55.1
1986	18,137.6	10,894.3	60
1987	23,086.7	12,497.0	54.1
1988	29,065.1	14,511.1	49.9
1989	27,164.9	16,208.7	59.7
1990	28,477.3	17,072.1	62.1

Source: CBN: Statement of Accounts.

Concentration is conventionally defined as the number and size distribution of firms in the market (Civelek and Al-Alami). It is meant to show whether or not the number and size distribution of firms in the commercial banking market affect the level of competition and the resultant effect on profit levels. Concentration studies of manufacturing industries have been an important step in assessing the extent

to which monopolistic or oligopolistic elements exist in an industry and the degree to which these non-competitive elements influence resource allocation and lead to excess profit. Scherer (1971) defines an oligopolistic situation as "where the leading four firms control 40 per cent of the total market, Examining the table above, we will notice that the five leading firms have more than 50 per cent on the average of the total deposits of the Nigerian Commercial banking industry. This is in consonance with Scherer's belief about an Oligopolistic market structure.

#### 4.4 The Challenges of New Banks on the Established Banks

Among the industrial sectors in the country today, it can be said that the banking industry arouses the most public interest. This could be due to its important position as the medium of implementing a number of sensitive Government policies and programmes which directly affect the lives of Nigerians. The banking sector in Nigeria can be categorised into the new and the established banks. It is however acclaimed that the new banks are more efficient than the established ones especially the large retail banks. There are some environmental factors not of the making of these established banks that have contributed to their relative inefficiency.

Over the years, these banks have strived to carry banking activities to nooks and crannies of the country, some voluntarily, and a significant number had branches enforced on them through the various phases of the Rural Banking Programme e.g the 'Big 3' have between them about 40% of their network of branches as rural. They provide the retail banking services which are crucial to the process of monetization of the economy and facilitation of exchange. All these important functions are capital and labour intensive and involve a lot of capital outlay as well as overheads. These services, in addition have to be provided within the environmental constraints of poor infra-structural facilities like generation of electricity, telecommunication. On the other hand, new banks have a choice of prime location where infrastructure is relatively developed and also have the privilege of identifying and segmenting their markets leaving the least attractive ones to the established banks.

However, these are not the odds that these banks (old) are complaining of. The narrow areas of comparative advantage of the big banks are now being eroded, perhaps, inadvertently by the introduction of certain measures by the regulatory authorities with the introduction of premium

on deposits to the Nigerian Deposit Insurance Co-operation (NDIC), the payment of interest on current accounts, mopping up of excess liquidity through stabilization securities, etc, these banks' margins have been eroded to the minimum. Unless these issues are re-addressed by the authorities and the inadvertent discriminations reversed, these old banks will not be able to compete effectively against the new banks and the long-term repercussions on the industry and the economy may not be favourable.

Two solutions can be proffered. Either the social costs and overheads imposed on the established banks by the authorities are removed so that all banks, both new and old, large and small are placed on the same pedestal or the new banks must be made to absorb some of these social costs through discriminating levies, for example taxation, levies on deposits etc.

PRESENTATION AND ANALYSIS OF REGRESSION RESULTS

The results of the regression equations specified by the functional relations in Chapter three are presented in this chapter. The estimates are subjected to various statistical tests. On the basis of the empirical evidence provided by the results, the hypotheses of the research are evaluated.

5.1 Presentation of Regression Results

Using annual data for the period 1980 through 1990, the ordinary least squares regression technique yields the following results:

$$1.1 \quad DY_t = -0.939 - 3.10MC_1 - 1.165DM - 0.165LD + 0.890 Y_{t-1}$$

$$\quad \quad \quad (-2.63)^* \quad (2.86)^* \quad (-0.260) \quad (3.55)^*$$

$$R = 0.84, \quad R^2 = 0.70, \quad \bar{R}^2 = 0.50 \quad F = 5.45^* \quad DW = 2.0$$

$$1.2 \quad DY_t = -0.00124 - 8.90MC_2 - 3.29DM + 0.474LD + 0.270 Y_{t-1}$$

$$\quad \quad \quad (4.58)^* \quad (4.23)^* \quad (0.99) \quad (1.61)$$

$$R = 0.92, \quad R^2 = 0.85, \quad \bar{R}^2 = 0.75, \quad F = 8.65 \quad DW = 2.19$$

$$1.3 \quad DY_t = -0.128 + 0.0054NB - 0.411DM + 0.543LD + 0.624 Y_{t-1}$$

$$\quad \quad \quad (1.39) \quad (-0.68) \quad (0.53) \quad (2.20)$$

$$R = 0.71 \quad R^2 = 0.51 \quad \bar{R}^2 = 0.18 \quad F = 1.54 \quad DW = 1.26$$

The variable BS (Bank Size) was dropped in the final analysis because its significance level was very low.

TABLE 5 - SUMMARY OF REGRESSION RESULTS AND OTHER RELEVANT STATISTICS

Equation : FORM	b0 Constant	b1 MC <sub>1</sub>	b1 MC <sub>2</sub>	b1 NB	b2 DDM	b3 DLD	b4 Yt-1	R	R <sup>2</sup>	R <sup>2</sup>	S.E.	F*	DW	0.025 t	Ftab
1. DY = f(DMC <sub>1</sub> , DDM, DLD, DYt-1)	-0.929	-3.10* (-2.63)			-1.165* (2.86)	-0.165 (-0.260)	0.890* (3.55)	0.835	0.700	0.50	0.0849	5.45*	1.997	2.45	4.53
2. DY = f(DMC <sub>2</sub> , DDM, DLD, DYt-1)	-0.00124		-8.90* (-4.58)		3.29* 4.23*	0.474 (0.99)	0.270 (1.61)	0.92	0.85	0.75	0.0692	8.65*	2.19	2.45	4.53
3. DY = f(DNB, DDM, DLD, DYt-1)	-0.128			0.0054 (1.39)	-0.411 (-0.68)	0.543 (0.53)	0.624 (2.20)	0.71	0.51	0.178	0.1083	1.539	1.26	2.45	4.53
4. DY = f(DMC <sub>1</sub> , DYt-1)	0.092	-3.149* (3.09)					0.880* (4.00)	0.83	0.69	0.61	0.074	8.96*	2.02	2.31	4.46
5. DY = f(DMC <sub>2</sub> , DYt-1)	0.0425		-1.051 (1.07)				0.571 (2.196)	0.64	0.41	0.26	0.1026	2.79	1.44	2.31	4.46
6. DY = f(DNB, DYt-1)	0.0908			0.0039 (1.44)			0.592 (2.38)	0.68	0.47	0.33		3.52	1.16	2.31	4.46
7. DY = f(DDM, DYt-1)	0.047				-0.11 (-0.25)		0.563 (1.99)	0.58	0.34	0.165	0.109	4.49*	1.40	2.31	4.46
8. DY = f(DLD, DYt-1)	0.039					-0.348 (0.52)	0.573 (2.06)	0.59	0.35	0.19	0.107	2.13	1.19	2.31	4.46

Note: Values in parenthesis represent the t-values of the parameter estimates.

\*The Stars indicate significant variables and regression at 5% significant level.

Source: Computer Print-out.

The figures in parentheses under the parameter estimates are the corresponding t-ratio, R, the coefficient of correlation measuring the degree of association of the regressors and the regressand.  $R^2$ , the coefficient of multiple determination measures the proportion of the variations in the dependent variable, profitability performance, which is explained by variations in the explanatory variables. The Durbin-Watson (D.W) statistic is useful for testing auto correlation. In the summary table (table 5), the F\* ratio is the variance ratio used to test whether or not the joint influence of the regressors on the regressand is statistically significant. The  $\bar{R}^2$  is the coefficient of multiple determination (adjusted for the degrees of freedom). It is a general indication of the goodness of fit or the explanatory power of the equation.

## 5.2 Correlation Coefficients

To ascertain the nature and degree of relationship amongst the variables, the correlation coefficients were estimated as given in the correlation matrix below.



**TABLE 6: SIMPLE CORRELATION COEFFICIENTS BETWEEN COMMERCIAL BANK PROFITABILITY PERFORMANCE AND ITS DETERMINANTS**

	DY	DMC1	DMC2	DDM	DLD	DNB	DYt-1
DY	1.0000	-0.23869	-0.24165	0.04772	-0.04272	0.30221	0.57157
DMC <sub>1</sub>	-0.23869	+1.00000	0.27153	0.13782	0.19104	-0.43602	0.01295
DMC <sub>2</sub>	-0.24165	0.27153	1.0000	0.54282	0.61413	-0.07988	0.08267
DDM	0.04772	0.13782	0.54282	1.0000	0.55318	0.11176	0.20788
DLD	-0.04270	0.19104	0.61413	0.55318	1.00000	-0.46044	0.17814
DNB	-0.30221	-0.43602	-0.07988	0.11176	-0.46044	1.0000	-0.12333
DYt-1	0.57157	0.49835	-0.08267	0.20788	0.17814	-0.12333	1.00000

Source: Computer Print-out.

Since the estimated  $b_0$ ,  $b_1$ ,  $b_2$  to  $b_4$  are sample estimates, we must test for their statistical reliability. The importance of this test, arises from the fact that, it attempts to indicate the usefulness of the variable to which it relates in the regression conducted.

In this study, the student 't' test is used in verifying whether or not the estimates are significantly different from zero. The chosen level of significance is 5 percent with  $(n-k)$

degrees of freedom and for a two-tailed test. We test the null hypothesis.

$$H_0: b_1 = b_2 = b_3 = b_4 = 0$$

as against

$$H_1: b_1 = b_2 = b_3 = b_4 = 0$$

and the  $t$  statistic

$$t^* = \frac{b_i}{S(b_i)}$$

where  $b_i$  is the parameter estimate

$S(b_i)$  is the standard error of the parameter estimates.

Decision rule.

If  $t^*$  falls in the critical region, we reject the null hypothesis, that is, accept that the estimate  $b_i$ 's are statistically significant.

If  $t^*$  falls in the acceptance region, that is, if  $-t_{0.025} < t^* < t_{0.025}$  (with  $n-k$  degrees of freedom), we accept the null hypothesis and conclude that the estimate  $b_i$ s are not statistically significant at 5 per cent level of significance.

The result of the tests are as shown in Table 6.

A quick glance at the result of the regression points out that, given the size and the time series nature of the data, the summary statistics of the estimated equations are quite plausible. On the other hand, a critical examination of

the size and statistical significance of the coefficients of the independent variables in the estimated equations, reveal the following:

- a) Contrary to a priori expectation, the market structure variable proxided by market concentration did not come out with the anticipated positive sign but statistically significant at 5 per cent level for bank profitability performance. The number of bank branches as a proxy for bank structure came out with positive sign but not statistically significant.

The policy variables have produced plausible results and appeared to be relatively significant determinants in the bank profitability equation. This is in line with the a priori expectation. The deposit mix (time and savings deposit over total deposit) exhibited a positive relationship with bank profitability performance. It is also significant. The intermediation variable came out with a negative sign. Its estimate is however not significant.

In line with a priori expectation, the past profit specified as lagged dependent variable ( $Y_{t-1}$ ) exhibited a positive sign and it is statistically significant in the model equation 1.

### 5.3 Test of the Overall Significance of the Regressions

The F-test is to ascertain the joint impact of the explanatory variables on the dependent variable. This aims at finding out whether or not the regressors (MC, DM, LD,  $Y_{t-1}$ ) do actually have any significant joint influence on the bank profitability performance, as the dependent variable (Y).

Generally, the test involves testing the null hypothesis:

$$H_0: b_1 = b_2 = \dots = b_k = 0$$

as against the alternative

$H_1$ : not all  $b_i$ 's are zero.

If the null hypothesis is true, that is, if all the true parameters are zero, there is no linear relationship between profitability performance and the regressors as specified in equations 1, 2, and 3 on page 61.

Using the  $F^*$  ratio

$$F^* = \frac{R^2/K-1}{(1-R^2/N-K)}$$

where  $K$  = number of parameters ( $b_1 - b_n$ )

$N$  = number of observations in the sample = 11

This observed  $F$  ratio,  $F^*$ , is compared with the theoretical  $F$ -ratio,  $F_{0.05}$ , which has degrees of freedom  $V_1 = K-1$  and  $V_2 = n-k$ . ( $K$  is the number of parameters estimated).

The decision rules are:

- A) If  $F^* > F_{0.05}$ , reject  $H_0$ . This implies that the explanatory variables have a significant joint influence on the regressand.
- B) If  $F^* < F_{0.05}$ , accept  $H_0$ . This implies that the joint influence of the explanatory variables on the regressand is not significant.

$$\text{Eq. 3. } DY_t = -0.128 + 0.005NB - 0.41DM + 0.543LD + 0.624 Y_{t-1}$$

$$F^* = 1.54, F_{0.05} = 4.53.$$

Since  $F^* < F_{0.05}$  in equation 3, we accept the null hypothesis (i.e) that the regression is not significant and hence the regressors. The bank structure proxied by number of bank branches, the loan-deposit ratio and the deposit mix are not significant variables in determining the profitability performance of commercial banks.

$$1. \quad DY_t = -0.939 - 3.10MC_1 - 2.165DM - 0.165LD + 0.890 Y_{t-1}$$

$$F^* = 5.45 \quad F_{0.05} = 4.53$$

$$2. \quad DY_t = -0.00124 - 8.90MC_2 - 3.29DM + 0.474LD + 0.027 Y_{t-1}$$

$$F^* = 8.65 \quad F_{0.05} = 4.53$$

$$N = 11, K = 5,$$

$$V_1 = K-1 = 5-1 = 4, V_2 = N-K = 11-5=6.$$

With  $F^* = 8.65$  or  $5.45 > F = 4.53$ , we reject the null hypothesis and accept that the regressions using equation 1 or 2 is

indeed significant and the regressors ( $MC_1$  or  $MC_2$ , DM, LD and  $Y_{t-1}$ ) are important determinants of the changes in bank profitability performance ( $D Y_t$ ).

#### .4 Test of the Forecasting Power of the Model

The forecasting performance of an econometric model, is judged on the basis of the differences between predictions and realisations. The smaller the differences between predictions ( $p_i$ ) and realisations or Actual values ( $A_i$ ) of the dependent variables, the better the forecasting power of the model (Koutsoyiannis 1983:490). This test, is in furtherance of the attempt at assessing the determinants of profitability and hence the bank performance.

Several tests exist including: Prediction-realisation diagrams, Theil's Inequality coefficient and the Janus quotient. In this study, Henry Theil's Inequality coefficient is used in view of its advantage over the others. Janus quotient involves predicting rather for the future and hence inappropriate for an appraisal of the past.

A systematic measure of the accuracy of the forecasts obtained from an econometric model has been suggested by Theil (Theil, H 1962: 31-48). This measure is called the "Inequality Coefficient" and is defined by the expression:

$$U^2 = \frac{\sum (P_i - A_i)^2 / n}{\sum A_i^2 / n} \quad \text{or} \quad U = \sqrt{\frac{\sum (P_i - A_i)^2 / n}{\sum A_i^2 / n}}$$

Where  $A_i$  - Actual (realised) changes in the dependent variable.

$P_i$  - Predicted (forecast) change in the dependent variable.

The value that the inequality coefficient assumes lies between 0 and 1 (i.e)  $0 \leq U \leq 1$ . The smaller the value of the inequality coefficient, the better the forecasting performance of the model. The numerator of the coefficient is the root-mean square prediction error (RMS prediction error) while the denominator is a way of achieving the independence of  $U$  from the unit of measurement of the variables. See table 3 for the realised and predicted levels of profitability changes.

**Table 7: REALISED AND PREDICTED LEVELS OF PROFIT RATE CHANGES**

Forecast Period	Predicted Changes in Profit Rates ( $P_i$ )	Actual Changes ( $A_i$ )	$A_i^2$	$(P_i - A_i)^2$
1980	0.034	-0.025	0.0006	0.0035
1981	0.047	0.040	0.0016	0.0070
1982	0.063	-0.030	0.0009	0.0087
1983	0.068	-0.017	0.0003	0.0072
1984	0.041	-0.027	0.0007	0.0046
1985	0.021	+0.041	0.0017	0.0004
1986	0.048	-0.015	0.0002	0.0011
1987	0.055	0.024	0.0586	0.0350
1988	0.183	0.030	0.0906	0.0139
1989	-0.122	-0.016	0.0003	0.0112
1990	0.0096	-0.075	0.0056	0.0072
			0.1611	0.0998

For the model estimated

$$A_i^2 = 0.1611, (P_i - A_i)^2 = \underline{0.0998}$$

$$U = \sqrt{\frac{0.0998/11}{0.1611/11}} = \sqrt{\frac{0.0085}{0.0147}}$$

$$= 0.786$$

$$0 < 0.786 < 1$$

U is less than one in our model. Given that the value of the inequality coefficient is low, ( $U < 1$ ) we conclude that the forecasting performance of the estimated profitability performance function (from which the predictions were observed) is fairly good (Koutsoyiannis: 494).

### 5.5 Test of The Validity of the Assumption of OLS Estimates

The statistical tests of the reliability of the parameters in 5.2, are valid only if the assumptions of the linear regression models are satisfied. To attach importance to these earlier tests and validate the behavioural pattern of the U's, we should conduct tests of the basic assumptions of the classical least squares.



### 5.5.1 Test for Autocorrelation (i.e Assumption of NO Auto Correlation)

It was assumed that the successive values of the random variable "U" are temporarily independent, i.e. that the values which U assumes in any one period is independent of the value which it assumed in any previous period. This assumption implies that the covariance of  $U_i$  and  $U_j = 0$  i.e

$$\begin{aligned} \text{Cov}(U_i U_j) &= E[U_i - E(U_i) (U_j - E(U_j))] \\ &= (U_i U_j) = 0 \text{ for } i \neq j \end{aligned}$$

various tests exist for the detection of this occurrence known as autocorrelation. For example the Durbin Watson statistic. In this test, the theoretical lower and upper limits of the Durbin-Watson statistic  $d_L$  and  $4-d_L$  respectively are compared with the observed D.W statistic  $d^*$ . If  $d_L < d^* < (4-d_L)$  autocorrelation is not a serious problem in the equation. If  $d^* < d_L$  or  $d^* > 4-d_L$ , there is serious autocorrelation. In this test, the D.W limits are based on a 5 per cent level of significance and K degrees of freedom, where K is the number of regressors in the equation under examination.

However, we are not able to test for autocorrelation in the regression equations specified. This is because the sample size,  $n$ , is smaller than the  $n$ , for which the values are presented in the  $d_L$  tables (i.e 15). We are equally aware of

the arithmetical possibility of intrapolating the sample size  $n$  to our required size in order to obtain the  $d_L$  values. However, because of precision, we do not intend to proceed with the exercise in this circumstance. The values of the Durbin-Watson statistic shown in the regression results of section 5.1 of this chapter are not significantly different from 2, the value they will assume if there is no autocorrelation in the error terms. The use of Durbin-Watson statistic, therefore, shows that the assumption of  $Cov(U_t, U_s)$  is not violated.

#### 5.5.2 Test for Multicollinearity

A crucial condition for the application of least squares, is that the explanatory variables are not perfectly linearly correlated (Koutsoyiannis, 233). The importance of this test stems from the fact that its violation leads to the breakdown of the least squares technique which was wholly used in our estimation. Its breakdown will make it difficult to establish the influence of each of the independent variables used, on profitability performance, that is, the estimates of the coefficients become indeterminate and the standard errors infinitely large.

Multicollinearity in practice, does and should exist since economic variables tend to relate, but the problem centres on the severity which this test aims at detecting. Unfortunately no firm rules have been established for assessing the severity

of multicollinearity. However, Fox (1968) and Farrar and Glanber (1967) have shown that there is some evidence that increasing multicollinearity produces various changes in the values of the parameters depending on the importance of each explanatory variable. "Importance" here is measured by the simple correlation coefficient of the dependent variable on each of the explanatory variables. This evidence has led to the conclusion that the effect of multicollinearity on the parameter estimates, depends on the severity and interdependence as well as importance of the variables which happen to be collinear.

Klein (1974) seems to accept that multicollinearity is not necessarily a problem unless it is high relative to the overall degree of multiple correlation among all the variables. He argued that collinearity is harmful if the simple correlation between any two explanatory variables is greater than the multiple correlation of the relationship i.e

$$\text{if } r_{xi \ xj} > R_{y \ xi \ xj}.$$

From the correlation matrix, the multiple correlation coefficient is 0.85 which is greater than each of the correlation coefficients among the variables. We can, therefore, conclude that multicollinearity is not serious in our model.

### 5.6 Speed of Adjustment

As has been stated in chapter three, we use the stock Adjustment model and the half-life statistic to evaluate the speed of adjustment and time lag of determinants of bank performance. Below is a table showing the speed of adjustments and half-lives of our regression results.

Table 8: SPEED OF ADJUSTMENT AND HALF-LIVES  
(1980 - 1990)

COEFFICIENT OF LAGGED DEPENDENT VARIABLE	SPEED OF ADJUSTMENT	HALF LIVES	PERIOD	MODEL
0.56	0.44	1.19	14 months	$DY_T = b_0 + b_1 DDM_T + b_2 DY_{T-1}$
0.57	0.43	1.23	15 months	$DY_T = b_0 + b_1 DLD_T + b_2 DY_{T-1}$
0.59	0.41	1.31	16 months	$DY_T = b_0 + b_1 DNB_T + b_2 DY_{T-1}$

From the table above, it could be seen that the determinants of bank profitability take effect between 14 and 16 months to affect profit rates. The deposit mix (the input decision) has a faster speed of impact on bank profitability performance than other determinants. This suggests that the deposit mix if well combined and managed can have a faster adjustment in contributing to profit rates (performance). The

speed of adjustments for other determinants - intermediation ratio and number of bank branches are 0.43 and 0.41 respectively. It should be noted that the nearer the adjustment coefficient,  $0 < \alpha < 1$ , to unity, the faster the speed of adjustment.

### 6.7 Evaluation of the Working Hypotheses

The empirical evidence from the analysis is used to evaluate the hypotheses of this study.

The first hypothesis that bank structure has a positive significant influence on bank performance is not validated. The bank structure proxied by concentration ratio (MC) appears to be a statistically significant variable in the bank profitability at five per cent level of significance. The  $t^*$  values for  $b_1$  in the first two equations, 1 and 2 are -2.63 and -8.90 and are greater than 2.45 which is the tabulated value of  $t$  at five per cent level of significance. However, it is quite interesting to observe that its estimated coefficient does not have the anticipated positive sign. This does not support the hypothesis but it is in accordance with Professor Philip's findings (1972) for United Kingdom manufacturing industry that concentration ratio does not have the expected positive sign except in equation having total net assets as dependent variable.

The implication of this is that increased share of firms in total deposit will not necessarily lead to increased profit rates. It may therefore be meaningless interpreting negative profit - concentration ratio as an indication of monopoly power. This first hypothesis is based on the acceptance of the relevance of the structure-performance (S-P) hypothesis to the commercial banking industry. Based on the evidence, the S-P hypothesis cannot be accepted in the Nigerian situation. Furthermore, the second hypothesis that the policy variables are important determinants of bank profitability performance is supported by the empirical findings. The deposit mix is found to have a significant influence on profit rates at five per cent level of significance since  $t^*$  in the equations 1 and 2 are 2.86 and 4.23 respectively and are greater than 2.45 which is the tabulated value of  $t$ . The loan-deposit ratio on the other hand, is not significant but positively related to profit rate.

The third hypothesis that changes in policy variable, as the input-output decision of bank, affect bank performance faster than changes in bank branch expansion is also upheld. From table 8, it is observed that while changes in branch banking policy takes about sixteen months to have a noticeable effect on bank performance, with the speed of 0.41, it takes the policy

variable an average of fourteen months to reach the same target with the speed of 0.44. Note that the closer the adjustment coefficient is to one ( $0 < d < 1$ ), the faster is the speed.

Summarily, several tests were conducted to support the statistical reliability of the results. The first two equations, that is regressions 1 and 2 are significant with  $F$  being 5.45 and 8.65 respectively as against the tabulated  $F^*$  value of 4.53. The last equation is not significant with  $F^* = 1.54$  as against the tabulated  $F$  value of 4.53. The models specified proved free from autocorrelation and multicollinearity.

The  $R^2$  in equations 1 and 2 are 0.70 and 0.85 respectively. The dependent variables are not perfectly linearly correlated since in the correlation matrix, table 6, the correlation coefficients among the variables are less than the multiple correlation coefficient specified above.

CHAPTER SIXSUMMARY, IMPLICATION OF THE RESULTS, POLICY  
RECOMMENDATIONS AND CONCLUSION6.1 Summary of Findings

The application of tools of industrial analysis to commercial banking industry in Nigeria, has revealed to us, its structure and economic performance. Impact of structural dimensions on performance indicator was examined with a view to bringing out factors at play on profitability performance using regression analysis. The results revealed the following:

1. The bank structure proxied by concentration ratio has some apparent effect on bank performance. It is significant at 5 per cent level but contrary to expectation is negatively correlated to bank performance. However, the bank structure proxied by the number of bank branches is not significant at 5 per cent level even though positive.
2. The policy variables, that is, the deposit mix and the loan-deposit ratio are found to be negatively related to performance indicator while they are positively related to it in the second equation. Deposit mix is however significant.
3. The econometric models specified have a fairly good predictive power using Theil's inequality coefficient and is equal to 0.786. They also show that 70, 85, 51 per cent respectively of the variations in profit rates is explained



jointly by the independent variables (concentration ratio, deposit mix, loan-deposit ratio and the lagged profit) in each of the equations. Some of the variables are not significant. Thus, we think this may be due to quality of data and the small sample size.

## 6.2 Policy Implications And Conclusion

The bank structure and economic performance relationship, depend on the industry being studied in relation to the economic and political environment in which it operates rather than a specific standard (Bain, 1968). Our findings in this study either conform to general consensus in the literature or deviate a bit due to specificity of the commercial banking industry in Nigeria, a peculiar environment of economic and political ambiguities.

The empirical results from our study indicate that bank structure as measured by concentration ratio has no positive relationship with bank performance, even though its coefficient is significant. The five bank concentration showed consistently that more than fifty per cent of the total commercial banking deposit is controlled by the leading five firms analysed and hence the significance of the concentration variable. This reflects an oligopolist structure - where few firms dominate the industry. This is in consonance with Scherer's (1971)

belief that "An Oligopolistic structure is a more appropriate term for the type of situation where a few firms control a dominant share of the market". He defines an Oligopolistic situation as "where the leading four firms control forty per cent of the total market ..."

The implication of this negative but significant association of bank share (concentration) with performance is that increased bank share of deposit will not necessarily lead to increased bank performance. It means that the dominance of these large banks in the market does not lead to efficient profitability performance. This is contrary to the structure-performance hypothesis and this indicates the existence of X-inefficiency in the industry (Leibenstein, 1976).

However, bank structure proxied by the number of bank branches was found to be positively related to bank performance, even though, its estimate is not significant. The positive association indicates its importance as a measure of structure. Expansion of branches is therefore desirable for increased bank performance. Implied here is that the banking system in the process of expanding its branch network appears to attract more new business than would otherwise be expected (Willson Committee 1980 as in Agu 1986). On the other hand, the insignificance of the variable could be attributed to the problem of control or

co-ordination as well as high fixed cost at the branch level, which result if a given level of assets is split among more branches.

This negative and apparent association between market structure and bank performance, on the whole, somehow reflects the centralization and rigidities of bank management particularly that of big banks. These deprive them of the flexibility needed to exploit their geographical environment and to meet the ever increasing demand for bank services. The big banks that own most of the bank offices in the large cities tend to scale down their desire to grow and have therefore increased their deposits less quickly. Caves (1970:284 as in Agu 1986) adduced reason for this poor performance when he wrote that "there is the oft-ignored aspect of the large firm behaviour: that a significant portion of the potential profits latent in its position of market power is taken in the form of avoiding uncertainty". Therefore, they tend to restrict output by maintaining few bank branches. In Leland's (1974) contribution, he opined that "an Industry with an imperfectly competitive structure may, all things being equal, achieve cost minimization but not efficient level of output and it may require regulation to achieve maximum efficiency". Consequent on the above, is the fact that commercial banks are fussy about opening new branches

especially in the rural areas. They see it as a kind of social service (obligation) that must be performed and not for profit making.

The implication of the above is that the government should continue with the policy of compelling the old and the <sup>new</sup> banks to open branches in the rural areas for increased bank performance. The community banks should also be encouraged as part of rural banking policy. This will go a long way to cultivating banking habit in the people which is necessary for the ~~continued develop-~~ment of the country's financial system.

The achievement of bank expansion through branching may be elusive to the nation if the high cost that attends this expansion particularly in the rural areas is taken into consideration by the bank management.

In a nutshell, the impact of market structure on the Nigerian banking system's performance is not strong enough for us to accept the structure-performance hypothesis in the experience of the Nigerian banking system. This is because the concentration ratio may suggest that the small number of large firms makes restrictive pricing and output decisions more possible than if there were many firms of equal size. It does not mean that firms are actually engaging in anti-competitive conduct (Salley 1972: 72).

The policy variable (deposit mix) on the other hand has been significant in influencing the profit rates even though its coefficient is negative. This shows the importance of deposit mix in contributing to increased profit rates. The negative sign may imply that the banks have not been able to minimise their total resource costs by a clever combination of cost effective source of deposits. "This is necessary because expense control is the most important factor in achieving high bank profitability (Agu, 1986: ). Surprisingly, the loan-deposit ratio has a negative and weak statistical association with the bank performance indicator. The weak and inverse relationship of  $-0.043$  for the measure of profitability may imply that the banking system increased loans and advances by reducing interest charges. This means that banks do not earn as much as they should on their loans and investments. This could be attributed to control of interest rates by the regulatory authorities and granting of risky loans to some preferred sectors which result, in some cases, to bad and doubtful debts and a reduction in bank's profits. Recently the government mandated the banks (public banks) to stop computing interest on bad and doubtful debts and this has greatly affected their performance. On the other hand, the banks seem to be greater risk avoider than is socially and economically desirable.

On the whole, the deposit mix has been found to be an important determinant of commercial bank profit performance. This is in accordance with Bryan's (1972) finding when he studied medium size banks and found that the most important single factor explaining profitability is the ratio of time plus savings deposits to total deposits. The deposit mix by determining the liquidity needs of the banking system affects the volume of earning assets.

The implications of these findings for regulatory authorities are:

The regulatory emphasis should be more on policy variables as they contribute more to the explanation of bank performance. Through this, the authorities should create a condition necessary to remove the risk avoiding attitude of the banks. In other words, an encouraging environment to enable banks adopt policies that will enhance their performance should be created. Such conducive factors will include fulfilling the guarantees on mandatory risky loans to certain sectors that are meant for the development of the economy.

The banks, on the other hand, should strengthen the monitoring and supervision of their lending operations, so as to reduce the risk content of their transactions to certain risky sectors (Owualah, 1986).

The insignificance of loan deposit ratio calls on the banks to increase their research effort towards improving their method of transacting business and designing new products that could be marketed for good result. In essence, the orthodox retail banking act should be modernized to realise the full economies of scale in commercial banking in a growing economy such as Nigeria.

The recent release of firm control on interest rate structure is a right step in the right direction. Such a measure will lead to a positive and dynamic portfolio decisions by the banks and this would enhance their performance.

The lagged dependent variable showed a positive significant relationship with bank performance. This implies that the profit generated a year ago will enhance the performance of the bank in the current year.

The negative statistically significant concentration variable is a sign of inefficiency in the commercial banking system. This shows that the huge profits declared by these banks is not as a result of efficiency in production but due to imperfections in the capital and money markets in the economy.

For instance, many of these banks that pose huge profits especially the new generation banks, deal on foreign exchange which gives them a high profit margin since they buy at low rate from Central Bank of Nigeria (CBN) and sell at high rate. As soon as it becomes difficult or probably impossible to get foreign exchange at low rate, some of the banks profits will be reduced greatly. If such

banks do not have solid capital base, good management and could venture into new product in banking, they would eventually collapse.

However, it is heartwarming to note that the initial imperfections<sup>1</sup> in the country's financial system which made it possible for all banks to operate profitably are gradually being removed through deregulation of the economy. With the entry of new banks and the elimination of other imperfections - merging of the official and parallel market rates of foreign exchange, mandatory stoppage of interest charges on bad and doubtful debts, it is wise to expect that only those banks which can exploit potential economies of scale in their operations can hope to continue to post profits.

It is therefore recommended that:

1. More banks should be established in rural areas to gather the resources in such areas for productive activities.
2. The banks in the economy should increase their research effort towards improving their method of transacting business and designing new products that could be marketed for good result instead of the orthodox retail banking.
3. The banks should be compelled to increase their capital with the Nigerian Insurance Deposit Corporation (NDIC) to strengthen their capital base.

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1. These are exogenously determined interest rates on deposits and loans, over concentration of bank branch offices in major commercial and industrial centres, underbanking of the economy.



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PROFITABILITY OF THE NIGERIAN COMMERCIAL BANKING SYSTEM AND ITS DETERMINANTS  
(FIRST DIFFERENCE FORM)

UNIVERSITY OF NIGERIA  
COMPUTING CENTRE  
General Purpose Coding Form

PROGRAM	DATE	PUNCHING INSTRUCTIONS	GRAPHIC PUNCH	PAGE	OF
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	ΔY <sub>1</sub>	ΔZ	ΔMC <sub>1</sub>	ΔMC <sub>2</sub>	ΔBS	ΔDM	ΔLD	ΔNB	ΔYT-1	IDENTIFICATIONS SEQUENCE
80	-0.025	-0.002	-0.008	-0.003	1.542	0.005	-0.021	22	-0.022	
81	0.040	-0.002	-0.067	-0.004	1.074	0.002	-0.063	27	-0.025	
82	-0.030	-0.001	-0.025	-0.075	1.179	0.199	+0.002	47	-0.043	
83	-0.017	-0.001	-0.045	-0.068	2.043	-0.052	-0.133	46	-0.030	
84	-0.027	-0.002	-0.013	-0.001	1.314	-0.027	-0.032	29	-0.016	
85	0.041	0.003	-0.059	-0.004	0.563	+0.012	+0.007	44	-0.027	
86	0.015	0.002	-0.050	-0.001	2.222	0.009	+0.042	21	0.041	
87	-0.242	-0.002	-0.060	-0.017	1.979	0.006	-0.020	42	0.015	
88	-0.301	-0.001	-0.042	-0.016	1.909	0.029	-0.014	39	0.242	
89	-0.016	-0.001	-0.098	-0.008	3.307	0.002	-0.032	45	-0.301	
90	-0.075	-0.004	-0.024	-0.011	1.230	0.000	-0.059	17	-0.016	



LIST OF SELECTED COMMERCIAL BANKS IN NIGERIA  
(1980-1990)

1. First Bank of Nigeria PLC
2. Union Bank of Nigeria PLC
3. African Continental Bank PLC
4. Savannah Bank of Nigeria PLC
5. New Nigeria Bank PLC.

CODESRIA - LIBRARY