

THE EFFECTS OF THE DE-REGULATION POLICY OF
INTEREST RATES ON INVESTMENT IN NIGERIA
1987 -1996

BY

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DECLARATION

I, hereby declare that this Thesis was undertaken by me, and, to the best of my knowledge has not been previously submitted to any other university for the award of a higher degree. All references have been duly acknowledged.

UGBAJE, Z.A.

DEDICATION

This work is dedicated to:

Mr. & Mrs. J. A. Ukoje for who they are;

(Hon) Prince Simon Achuba for what he stands for;

and those who believe in their ideals.

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ABSTRACT

De-regulation policy of interest rate is the removal of controls and ceiling on interest rate such that it will be determined by the inter play of market forces of demand and supply of funds. Before the reforms, credit was administratively determined reflecting the developmental objective of the government. This was observed to hamper investment expansion as investment level was on the decline with attendant problems of low output and unemployment, consequent upon laying off of staff. Also, savings was low and as such not enough savings that will be transformed into investment. Thus, there was the need to evolve policy that would encourage investment via savings by de-regulating interest rates.

It is against this background that this research work aimed at assessing the impact of this policy on investment by comparing both the periods of regulation and de-regulation. In the course of this study, we found out that investment responded positively to interest rate in all the three equations in chapter four contrary to conventional postulation. There, it was found that the coefficient estimates of interest rate were not statistically significant in the application of t-test. On the other hand, the coefficients of profit were properly signed in equation one only but statistically significant in all the equations. The negative relationship between investment and profit may not be unconnected to the fact that public investment constitutes a greater share in aggregate investment, and, this is not hedged against interest rate and profit. And, what seemed to be expansion in level of investment was the high inflationary rate and exchange rate following the depreciation of the Naira. Secondly, In comparing average savings for regulation period with de-regulation period,

the average for regulation era, N10.30658b is higher than the average for de-regulation era, N7.93079b, implying that the effectiveness of interest rate policy depends on other factors such as saving habits, provision of adequate banking services and ensuring increase in real disposable income of the people.

Based on the problems facing investors as found in this study, a number of recommendations were made which we believe will be beneficial to all concerned. Among these were; the use of differential interest rate policy to release the scarcity of savings to stimulate savings in order to raise accessible rates of return on investments and, to discriminate between productive investment and speculative unproductive investment. That, policy of interest rates should be as flexible to take into account the realities of our economy and not necessarily be dogmatic. Also, there was the need for government intervention to minimize the divergence between the allocation of resources based on the free interplay of the market forces and the one based on government development priorities in the country. The use of selective credit control was suggested as a means of guiding economic activities in the development process.

Finally, a supportive policy and institutional framework need be provided for a more effective way to promote investment. Such includes macro stability, an environment conducive to a low cost of doing business and adequate political institutions that foster social consensus and political stability.

Chapter 1**INTRODUCTION****1.1 Background to the study**

The decline experienced in levels of output, high fiscal deficits and balance of payments problems in the early 1980s led to the adoption by government, of market-oriented adjustment strategies - the structural adjustment programme (SAP), in which one of the policy measures put in place toward the realisation of the programme's objectives of increased productivity is de-regulation of interest rates.

Before the advent of discovery of Oil in commercial quantity in 1956 at Oloibiri in Rivers State, followed by its first export in 1958, Nigeria's economy was dominated by agricultural activities which accounted for over 60% of the gainfully employed, and, until the mid 1970s was the primary foreign exchange earner. For example, it accounted for 82% of the total exports in 1962. The appearance of Oil in the scene of Nigeria's economy led to neglect of agriculture, such that its share in Gross Domestic Product (GDP) fell from about 40% in the early 1970s to about 20% in 1980. Oil alone, by later years was 22% of the GDP, 81% of the Government revenue and 96% of export earnings.

The economic problem which necessitated the introduction of SAP started when the national economy started to depend heavily on petroleum which clearly provided over 90% of government revenue before the end of the 70's. During the "Oil boom", the authorities made efforts to utilize the revenue got from oil to build social and economic infrastructures. However, the imbalances and distortions in the economy during the decade could not effect any long-term advantage. These imbalances manifested in

proliferation of some parastatals and public investments that depended heavily on imported raw materials.

The heavy dependence of the country on Oil and imported inputs exposed it to shock immediately there was a sharp fall in the World Oil market price in mid 1981 due to Oil glut. Thus, the official foreign reserve put at about \$8.50 billion at the end of May, 1981 fell sharply to about \$2.85 billion in December, 1981. There was no significant improvement in the foreign exchange position in spite of the Economic stabilisation Act of April, 1982. The stringent measures introduced in 1983, 1984 and retained in 1985 budgets could not revamp the economy. These stringent measures were so serious that many industries, short of raw materials were either forced to close down or cut down their productions, while the laying -off of staff worsened the unemployment problems. Schools in some states had to close down as teachers salaries could not be paid for up to four months. It was in the midst of all these socio-economic problems, tensed with acute foreign exchange shortage while the external debt burden was staggering that the Babangida's administration introduced SAP.

In the words of Babangida, austerity without structural adjustment is not the solution to our economic predicament, steps would have to be taken to ensure a comprehensive strategy of economic reforms. For according to him, "preceeding administrations either lacked a proper perception of what needed to be done or were simply unable to muster the necessary political courage to take the difficult, but necessary decisions that must be taken if the economy must survive." For example, policy changes required to persuade our creditors to agree to re-schedule our huge debts were not effected;

and the debts remained unpaid and unre-scheduled. Consequently, virtually all foreign banks doing business in Nigeria had to stop confirming letters of credits for Nigeria imports by June, 1986. The implication is that, in the absence of the new economic initiative in the form of SAP, a complete stop would have been put to the importation of vital imports such as raw materials, spare parts and machinery for industries, drugs and medicaments for hospitals, fertilizers, insecticides, herbicides and other chemicals for agriculture, and, books and other educational and teaching aids for schools.

Thus in order to raise the level of investment, there was the need to work on interest rate to encourage domestic savings without which the supply of investment funds would be stunted as it (saving) determines the financeable rate of capital accumulation. In the same view, it (interest rate) is de-regulated to encourage inflow of foreign capital. This is because, *external financial resources, particularly as reflected by inflow of foreign capital* is believed to help fill the gaps between domestically available supplies of savings and planned investment. It is this recognition of the relevance of foreign capital inflow, in addition to encouraging investment, the government de-regulated interest rates.

One of the problems facing developing countries, and, Nigeria in particular is the scarcity of domestic capital in relation to the size of investment required to achieve high and self-sustaining rates of growth of national and per capita real income. Although, the accumulation of capital is not the prime determinant of economic growth, its role as a necessary, even if not a sufficient condition in the economic development of Nigeria is widely recognized. But, paradoxically, positive interest rate policies have been conspicuously lacking in the country. Even in literature the emphasis has been more on

structure, behaviour, and determinants of interest rates than on policies pursued.

Summarized in international monetary funds, (1983), the basic functions of interest rates in an economy in which individual economic agent takes decisions as to whether to borrow, invest, save and/or consume are: first; interest rates, as returns on financial assets serve as incentive to savers, making them defer present consumption to a future date. In this case interest rates are deposit rates corrected for expected inflation. In this connection, interest rates affect the availability of saving; and to the extent that deposit rate vary depending on the maturity of the financial assets, they also influence the allocation of current saving among the assets. Secondly, interest rates, being a component of cost of capital affect the demand for, and allocation of loanable fund. The Applicable interest rate in this case is the bank lending rate, the changes which affect the cost of capital which influences investors' willingness to invest (real investment), in this way, the level of lending rate could influence growth in financial instrument, output and employment. Thirdly, the domestic interest, in conjunction with the rate of return on foreign financial assets, expected change in exchange rate, and expected inflation rate determine the allocation of accumulated savings among domestic financial assets, foreign assets, and, goods that are hedged against inflation. The speculative movement of funds into/out of domestic/foreign assets depends on the relative levels of interest rates and which ever is appropriate among exchange rate, inflation rate and foreign interest rates.

The argument in favour of de-regulation of interest rate, rationalized for an *economic reform programme, particularly the financial sector reform, therefore, is to create an environment that will boost domestic capital formation. This is done by*

abandoning the system of credit ceiling, leaving the interest rates to individual bank's discretion as dictated by the prevailing market conditions and setting the economy free from all forms of distortions under a well designed and managed set of economic policies and institutional arrangements so as to promote saving and, consequently, investment. The incorporation of saving into this study is because, it is one of the most important macro economic variables in any economy because of its effects on the rate of capital accumulation as well as productivity, and its impacts on the degree of dependency of a nation on foreign capital and foreign ownership of domestic assets. Historical evidence and empirical analysis indicate that high level of domestic saving will accelerate the rate of capital formation, enhance productivity and consequently improve the standard of living of the general populace.

1.2 Research problem.

Prior to adjustment, the pattern of investment was toward import-substitution under high protective barriers. As a result of reduction in protection and exposure to competition from imports, there was a heavy squeeze on profits and lower sales, while the depreciation of the Naira made imported inputs more expensive. Also, there was higher interest rates which eroded opportunities for cheap local borrowing by investors.

Nigeria, like many third World countries's, had in the past used governmental interventions as a tool for allocation of resources. This has been described as not only repressive but a major factor retarding the growth process of the economy in addition to being harmful to the banking sector. For example, the financial system of rigid control

as observed by meltzer (1967)"... is an inefficient means of protecting the public against the consequences of poor judgement, and is an inefficient means of protecting the public against the errors (or in rare cases, moral failure) of individual banks."

In addition, policy of regulation in form of credit ceiling leads to distortions in credit allocation as it involves allocation of credit by rationing, which stifles, competition unlike a situation where credit allocation is done through the price mechanism. The negative effects of rigid financial sector controls, especially on savings, and hence on the process of financial intermediation led many countries, including Nigeria, to under take reform of their financial sector with greater emphasis on the use of market forces. Given that the policy of regulation of credit allocation retards growth process of the economy as the allocation is not directed towards activities with the expectation of highest rates of return, the problem therefore, is to see whether the de-regulation policy of interest rates can raise investment level.

1.3 Justification of the study

There had been high interest rates which eroded the opportunities for cheap local borrowing as a result of which investment was at a low level. Also, existence of fixed interest rates regime is a characteristic feature of the regulation of financial sector. Under this situation, there is usually low savings and demand deposit leading to financial *disintermediation*. This decline in financial intermediation leads to decline in the activities of the banking system since it (intermediation) is the most crucial role of banks. Therefore, reform is required to boost re-intermediation process, through which, banks can

re-capture the share of business that is undertaken through non-banking channels (Adhikary 1989). The financial sector reform, especially as it affects interest rates, could be used to ensure that there is a positive rate of return on deposits thereby promoting savings. It could also raise the cost of credit and discourage non-essential borrowing, thereby ensuring optimal allocation of loanable funds. The rationale therefore, is to assess the efficacy of the policy in boosting investment.

1.4 Objective of the study

- i. To examine the impact of de-regulation of interest rate on investment over ten year period, that is, 1987 to 1996. This is to assess investment against interest rates, ten years of regulation preceeding de-regulation (1977 to 1986) and ten years of de-regulation (1987 to 1996).

1.5 Hypothesis

The basic approach to the study is to analyse the impact of de-regulation policy of interest rate on investment.

The research is set out to demonstrate the hypothesis that growth in investment is dependent on the de-regulation policy of interest rate. It is the desire of the researcher that at the end we shall be in position to either accept, or reject, the above hypothesis, based on the facts and figures that will be made available, and, on tests to be carried out.

1.6 Research methodology

1.6.1 Techniques of research.

This shall be both theoretical and analytical in approach. It also employs econometrics and statistical tools based on the ordinary least square (OLS) assumptions to obtain the parameters of our regression equations.

1.6.2 Sources of data

For the purpose of this study, sources of data or information to be used include text books, journals, magazines and newspapers. Various government documents and seminar papers are other sources of information. Basically, secondary data will be used in this study, and, will be obtained from Central Bank of Nigeria's published annual reports and statement of accounts, including statistical bulletin, and, financial and economic review of CBN.

Also, we shall use *NDIC quarterly* - a publication of the Nigeria Deposit Insurance Corporation (NDIC). The data to be gathered are for ten years of fixed interest rates preceding de-regulation (1977 to 1986) and ten years into de-regulation (1987 to 1996) as may be relevant. In an effort to ensure that data used are as close as possible to reality, clarifications shall be sought on doubtful data from Research Department of CBN. Thus, there may be no uniform methodology used to collect data for this study if there are no reliable sources. This notwithstanding, it is expected that results obtained will generate some policy issues which is the main purpose of this study.

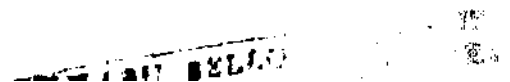
1.7 Scope and limitations of the study.

The main focus of this study is the growth in the level of investment with particular reference to de-regulation of the rate of interest. This study covers the periods ten years of fixed interest rates regime peceeding reforms and ten years of the economic reforms.

The study intends to analyze the impact of deregulation policy of interest rate on investment. The major limitation of this study is that the concept under consideration cannot be evaluated only by collecting information from official documents and paper articles because of the possibility of not recording some information in official records. It is necessary, therefore, to consult other sources, especially, which are directly or indirectly related to this study. However, it is not possible for one to consult every source regarding the impact of interest rates.

1.8 Organization of work

The proposed study is divided into five chapters, with introduction in chapter one, while chapter two deals with reviewing available literature in the area of study with a view to finding gaps that need to be filled. In chapter three, we shall look at the administration of interest rates during the periods of regulation and de-regulation, as well as the trends in interest rates, investment expansion and savings. The chapter ends with a review of other policies of reforms that are not interest rates. Chapter four focuses on data presentation, analysis, and econometrics testing and discussion of the coefficients of our models. In chapter five, we shall present the conclusion and summary of our findings, and, possible suggestions.



LITERATURE REVIEW

2.1 Introduction

The role of interest rates in helping to mobilize voluntary domestic savings merits much closer attention because of its bearing on the economic growth of countries, particularly the less developed countries, as well as the general skepticism regarding the efficacy of interest rates in mobilizing savings which is derived from the lack of a determinate causal link between rates of interest and aggregate real savings in the national accounts sense, or even between interest rates and financial savings.

2.2 Theories of interest rates

According to the classical theory, rate of interest is determined by the supply and demand of capital; as the supply of and demand for capital are governed by the time preference and the expected productivity of capital respectively. In other words, real interest rate is determined by the thrift of the community, as given by the schedule of real saving, and by the productivity of capital, as given by the schedule of investment demand. Thus, the supply of savings emanates from the degree of thriftiness of the community where thrift itself reflects the real preference of the society for consumption in the future as opposed to consumption today. The rate of interest therefore, is the reward for this *deferred consumption, or abstinence.*

Keynes defines the rate of interest as the reward for parting with liquidity for the specified period. That is, it is the price which equilibrates the desire to hold wealth in the

form of cash with the available quantity of cash, and, is determined by the demand for and supply of money. In the Keynesian framework, no individual will like to part with his liquid cash in the absence of rate of interest since there is cost associated with converting financial assets to cash. Hence, interest rate is the premium offered to an individual to part with his liquidity.

According to the modern theory of interest, otherwise known as the general equilibrium approach, interest rate is that, at which derived expenditures are equal to saving as depicted by the equilibrium in the commodity market where the money market is at equilibrium. This is the rate at which the interest rate and the level of output for which the aggregate demand for real output is equal to the aggregate supply of real output, and, for which the demand for real money balances is equal to the real quantity of money.

This shows that a fall in interest rate increases the level of investment by firms, leading to increased output, employment and the rate of growth in the economy. In the same way a fall in interest rate will also increase consumption demand by increasing household wealth, while it discourages savings through which loanable funds are made available. On the other hand, a rise in interest rate leads to a fall in investment demand as well as consumption demand while it encourages savings. However, since savings and investment are responsive to interest rate, the implication is that interest rate policy should be such that, while it encourages financial savings it should not discourage investment.

2.3 Empirical literature

The theoretical basis for the use of interest rate policy in stimulating investment as informed by the Keynesian investment theory and by the McKinnon - Shaw (1973), savings and investment hypotheses imply that, low interest rate, as a component of cost of fund encourages borrowing for investment. On the other hand, McKinnon and Shaw view administered low interest as detrimental to increased savings and hence investment demand, arguing that high interest rates induces savings which can be utilized for investment. Thus there are two transmission channels through which interest rates affect investment. These relate to interest rate as cost of capital and as encouraging financial savings which can be made available for investment.

Many studies have investigated these transmission Mechanisms which tallies with interest rate policy regimes articulated in Nigeria prior to and after the 1986 economic deregulation. Greene and Villanueva. (1991) estimated the effect of different macro economic variables and policies, including interest rates on private investment on a group of developing countries. Their results showed that private investment - GDP ratio is positively related to real GDP growth, level of per capita GDP and the rate of public sector investment, while real interest rate, domestic inflation, the debt-service ratio, and the ratio of debt to GDP negatively affected private investment ratio.

Rama (1990) investigated the theoretical and empirical determinants of private investment in developing countries, and, identified macro economic and institutional factors, such as financial repression, foreign exchange shortage, lack of infrastructure economic instability, aggregate demand, public investment, relative factor prices and credit availability as important variables that explained private investment. He however noted

that empirical results accuracies were diminished by errors in measurement of economic variables and research methodology. In an effort to examine the response of investment to interest rate changes during stabilization programmes, Hall (1977) discussed the view that stabilization policies affect short-term interest rates while long-term rates are more responsive to investments. Theoretically, he concluded that since short-term interest rate is appropriate rate used in calculating cost of capital in investment decisions, the relationship between term structure of interest rates and investment needs empirical clarification.

Khatkhate (1988) used non-parametric methodology in his study on the relationship between interest rates and other macro economic variables, including savings and investments. He grouped 64 developing countries (including Nigeria) into three based on the level of their real interest rates, and then computed economic ratios, among which were gross saving -income and investment - income for the countries. Applying the mann-whitney test, he found that the impact of real interest rate was significant for the three groups. However, his methodology was criticized by Balassa (1989), arguing that a relationship has to be established by the use of regression analysis.

Given the surge in real interest rates observed world wide in the early 1980s which has raised wide spread concern about their possibly detrimental economic effects, numerous studies were carried out to measure the impact of high interest rates on key economic variables such as output growth, investment, factor productivity and relative factor returns. An empirical regularity observed in several cross - country studies, World Bank (1989) and Galbis (1993) is that countries with higher interest rates generally tended

to exhibit faster output growth but not higher investment rates, suggesting that higher interest rates discourage investment such that the net impact on growth is positive. While other studies (e.g. Khatkhate, 1988) have questioned the empirical findings of these studies, a basic lesson holds from this literature that higher interest rates do not automatically constitute an obstacle to growth, rather, the impact of higher interest rates on investment and growth mainly depends on what has caused interest rates to rise in the first place. This is because, on theoretical grounds one would expect a simple, invariant relationship between real interest rates, savings, investment and growth since these variables are all simultaneously determined by other more fundamental factors. For example, an increase in real interest rates due to a decline in financial savings on account of an expected devaluation is likely to be negatively related to investment and growth. In contrast, an increase in real interest rates occasioned by an investment surge, triggered by the discovery of precious natural resource would be associated with higher investment and growth, especially, as higher interest rates leading to higher productivity is only expected to apply to economies where the system of credit allocation function efficiently in channelling savings to those activities with the highest expected rates of return. This is as opposed to developing countries, and, Nigeria in particular, where credit allocation functions are inefficient. However, there is no gain saying that an environment with low real interest rates is always preferable to one with high rates, from the view points of investors. The question that arises is, to what extent can interest rate policy influence real interest rates without generating other harmful side-effects?

The literature on the determinants of interest rates in open market economies have

dealt primarily with industrial countries. The main reason why those of developing countries are not dealt with is that, historically, capital flows have been tightly restricted, financial sectors heavily repressed, and, goods markets protected from international trade. It is therefore, assumed that under such conditions, interest rates in developing countries have largely been determined by domestic factors and policies, with little, if any relationship to world interest rates.

A study on Nicaragua observed that the increase in real interest rates is primarily caused by two factors: One is the elimination of domestic interest rate and capital controls, which permitted her financial market to become connected to the international financial system. The second factor is the on-set of real devaluation which coincided with the adoption of stabilization and adjustment measures needed to reduce her unsustainable external deficit. *Since the existence of interest rates controls tends to contract the size of credit markets, their elimination should lead to an overall expansion of credit.* This is because interest rates controls introduce a wedge between the demand for and supply of credit. For the rise in interest rates triggered by the elimination of controls reduces the overall excess demand for credit but raises the supply of credit for investment which is the binding side of the market under the imposition of interest rate ceilings. The expansion of credit supply, therefore, would be the dominant factor determining the evolution of total credit. In the event that the supply of credit is completely interest-inelastic (as is sometimes claimed), the increase in interest rates following the removal of controls would still have a positive effect on growth by producing reallocation of credit towards the most productive activities. However, high rates discourage borrowing, and can undermine the financial

soundness of banks, as borrowers have more difficulty realizing the high profits needed to repay the high interest rates.

A study by Ayodele(1994)in Nigeria showed that the removal of controls on interest rates would balance the interest of savers and investors, and discourage self-investment, investment in real estates and other unproductive investments that are often observed in a fixed interest rate regime,and capable of instilling fiscal discipline in governments. That, since nothing suggests that credit squeeze resulting from fixed rates is less damaging than credits that are always available at flexible (though higher)interest rates, deregulation of interest rates is positively related to higher investment.

The establishment of interest rates that equates the demand for and supply of savings is defined as financial liberalization, which is believed to be a prerequisite economic reform for economic development, because it would encourage savings and investment, the adoption of appropriate technologies, learning-by-doing and income equalization (McKinnon, 1973 ;p.9, Shaw, 1973, p.121). For instance in the United States of America, Regulation Q set ceilings on time and savings deposit rates, and, until 1978, prevented any interest payments on current accounts. These ceilings were gradually raised until 1980 when the Depository Institutions De-regulation Act was passed. The lesson from the American experience in this respect was that as the ceilings were raised to market determined rates, the level of efficiency of financial intermediation were drastically improved with their implications for economic growth (Versluysen,1988, p.2). Besides, deregulation of interest rates often makes external(financial) liberalization possible, including the adoption of floating exchange rates ,liberalization of trade and capital

accounts - the abolition of import and capital controls as well as reducing capital flight from domestic economy (McKinnon, 1973, p.162; Shaw, 1993, p.94).

Another study by Ayodele(1992), reveals that deregulation of interest rates brought about a net capital repatriation rather than flight. In the study, looking at the capital flight from Nigeria between 1960 and 1990, capital flight has remained at a level substantially below its pre-deregulation levels. Consequently interest rate deregulation has substantially reduced the quantum of capital flight from Nigeria.

Also, a study by Eduardo (1994) shows that inflow of foreign capital is encouraged by de-regulation policy of interest rates as real interest rate will be at a market-determined rate. However, the sustainability of these inflows is to a large extent a function of domestic policies which are under the control of host countries.

In recent years, there has been a wave of voluntary capital inflows to developing countries which are seen by some people as been "pulled" by attractive conditions which open new and profitable opportunities in the domestic economy, and, improve country worthiness. Under this interpretation, successful domestic policies are the key, and, if maintained, capital inflows would be sustained. Others see these inflows as being mostly "pushed" by conditions in industrial countries, especially the low interest rates prevailing there. This calls for cautious policies as this "push" story leads to the concern that these flows are highly volatile because they are subject to factors beyond the control of policy makers. In this interpretation, capital inflows would not be sustained if international interest rates returned to their higher levels of the 1980s.

2.4 Determinants of interest rates in Nigeria since the introduction of de-regulation measures in 1987.

Discussions on interest rate policy in less developed countries have been concerned largely with the role of interest rates as 'loan' rates, that is to say, as a means of regulating the cost and availability of credit. But interest rate policy has other relevant aspects than the purely monetary, as can be viewed as instrument for more effective mobilization of savings (as deposit rates) through offering realistic rates on monetary savings, such as time and savings deposits, claims on financial institutions, and government securities. Similarly, interest rates can be viewed as a social rate of discount to determine the optimum allocation of savings between consumption and investment, and, as a rationing device for efficient allocation among alternative forms of investment. However, Dailami and Walton (1992), in their study showed that investment is determined, in addition to interest rate, by a low and predictable inflation. Also, empirically, fiscal deficits and foreign debt have strong negative effect on private investment, as well as over-valued exchange rate because, it reduces the returns in local currency received by exporting farmers and manufacturers. In the said study, it was observed that real interest rates and policies affecting them can influence private investment, but there is no empirical finding supporting this relation for developing countries. And, this is because of repressed financial markets, where credit policy and not interest rates directly affects investment levels. For, according to the authors, the most important factor affecting investment is the public sector through institutions and regulations, as investors, local and foreign are frequently hampered by legal and bureaucratic impediments. To this end, Nigeria removed controls on interest rates.

But a case study of Zimbabwe confirms the importance of government policies in stimulating investment, and concludes that the one key issue to be tackled by public policy should be to raise expected future profits by reducing perceived risk of investment, which are fairly high and the response of potential investors can be positive only if these risks are minimized or shared. In Africa, real effective exchange rates are found to significantly affect private investment. The study concluded that real interest rates do not have any significant effect on private investment.

In Nigeria, a study by Oresotu (1992) shows that the determinants of interest rates since the deregulatory measures are; inflationary expectation, expected change in exchange rate, and expected foreign interest rates. The most important factor affecting lending rate in Nigeria is the persistent exchange rate depreciation. This has caused the demand for money, especially, for transaction purposes to increase as the exchange rate depreciates. The increase in the demand for money tightens the liquidity position leading to a rise in the lending rates charged by banks.

2.5. Theories of investment

Investment is the decision made to accumulate capital over the long-run in succession of short-run period situations. Or put simply, the decision to forgo current consumption for the futures.

In the neo-classical theory of capital accumulation, Fisher, in the theory of capital (1930), stated that, capital is simply future income discounted to the present which have value only because they are expected to yield a flow of services (income) in the future.

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This is necessary because individuals are impatient and have a preference for present, rather than future enjoyment, and, as such will not engage in any economic activity whose future benefits are lower than the present's.

Analogous to Fisher's Theory of capital is Keynes' (1936) Theory of investment which involves the construction of the marginal efficiency of capital, or investment-demand schedule, defined as 'that rate of discount which could make the present value of the series of annuities given by the returns expected from the capital-asset during its life time just equal to its supply price. Therefore, an expansion of investment in fixed capital goods will take place only when their earnings increase, or when the rate of interest falls, so that their capital value now exceeds their cost of re-production.

2.5.1 Determinants of investment

Interest rate as the cost of loanable fund is one of the determinants of investment and is inversely related to investment. Too high a level of interest rates causes loss and Wastage by discouraging accumulation. However, interest rate should be neither so low as to stimulate accumulation up to the inflationary level, nor so high as to stop it short of that level by more than the minimum margin required for safety.

Keynes, however, felt that profit expectations were the most important determinant of investment spending by business. As such investors compare the marginal costs and benefits of acquiring more or less of the resource in question-capital, and, the cost of acquiring additional capital is basically the prevailing cost of borrowing loanable funds-interest rate. And how much investment a typical firm will want to carry out at different

interest rates will depend upon the rates of returns that the firm believes it can earn.

Keynes (1936) viewed investment as a decision made under uncertainty and risk that required unavoidable prospective return and capital costs. Therefore, the relationship of the level of interest rate at any moment to the level of the prospective profits on investment depends partly, upon the objective riskiness of investment and partly on the optimism of entrepreneurs. For, in so far as rate of return calculations depend upon perceptions of prices, costs, and profits in the often-distant future, a shift in expectations towards a more pessimistic outlook can cause desired investment at each interest rate to fall. And as the decision to make any business investment will depend on the expected rate of return compared to the rate of interest, the aggregate amount of business investment will be determined by comparing the rate of interest to the expected rate of return on investments.

Other factors influencing investment demand are business taxes, as investment tax incentives can shift investment demand. When tax laws are changed in such a manner as to lower the after-tax costs of investment projects, more investment will tend to be undertaken at each interest rate.

Also, political and economic crises (a large shock, a war, exacerbated socio-political conflict) hamper investment especially, when the political instability is reflected in rapid government turnover which might involve a re-definition of the basic "rules of the game" (investment codes, property rights, tax). Recent empirical studies (eg Alesina and Perroti, 1993, Mauro, 1993) Confirm the important role of political instability as an investment deterrent.

Conclusively, however, it has been found empirically that although, the cost of capital matters, the volatility of the price of capital and the output price are more important in determining investment. In a volatile environment, the impact of a change in output or in the cost of capital on private investment are significantly reduced. This confirms the result obtained from previous studies that uncertainty may out weigh the beneficial effects of reforms on private investment (see Rodrick 1991 or Serven and Solimano, 1992). If uncertainty of the price of capital is greater than the uncertainty of the change in output price, then, other things being equal, the optimal choice will contain less movement in investment. Therefore, private investment is more sensitive to variations in the price of capital or in aggregate demand if:

- (a) the volatility of the price of capital is low,
- (b) the changes in the output and capital prices are positively correlated,
- (c) the firms are less risk averse.
- (d) The volatility of the output price is higher than the volatility of the capital price.

As such, a strong positive correlation between the output and capital prices would enhance private investment because the profitability fluctuations would be minimized. And with increase in output price, if firms are risk averse then, they will attempt to minimize the fluctuations of profitability, in which case capital price should move in the same direction as output price, as changes in output and capital prices have opposite effects on profitability.

The recent literature on private investment emphasizes the role of uncertainty in which investors react negatively to an increase in uncertainty. This contrasts the most

popular policy recommendations derived from traditional literature on investment - increasing investment by reducing the cost of capital through tax incentives or exchange rate policies, as incentives would have to be prohibitively high to bolster investors. Even when interest rate is low, the cost to delay an investment project is reduced when the risk of the project is high.

However, most of these conditions are mostly applicable to advanced economies, but in developing countries these do not hold. For as observed by (Charles C. Soludo, 1998) text books analyses ignore government investment while in most developing countries public capital formation, constitutes the dominant component of total investment spending. In Nigeria for example, private investment is estimated to be in the neighbourhood of 30% of total investment which means that the share of public investment in total investment is almost 70%. Therefore it is important to note that investment may not relate to interest rate and profit as in developed countries, especially as public investment tends toward welfare maximization and, not hedged against interest rate and profit. Even though emphasis is always on private investment, the fact still remains that the term "Investment" is generally conceptualized in terms of physical capital formation.

2.6 Investment - savings link.

For at least two reasons it is important to understand investment - saving link; First, it holds the key to the positive correlation between saving and growth, and secondly, to assess the validity of the traditional recipe that raising savings is a sure way to increase growth, the interaction between savings and investment is crucial if capital accumulation

is indeed the centre piece of growth.

The empirical evidence first reported by Feldstein and Horioka (1980) and recently updated by Feldstein and Bacchetta (1991) indicates that savings and investment show a strong positive correlation in the long-run. However, this finding has generated a lot of argument among economists on the extent to which the "capital immobility implication" attributed to this correlation implies lack of financial openness.

The basic Feldstein - Horioka regression is;

$$I_t = C + bS_t + e_t \dots \dots \dots (1)$$

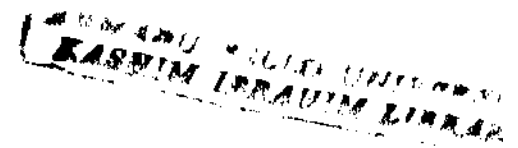
Where S_t = annual data on gross national saving-GDP ratio

I_t = gross domestic investment = GDP ratio

C = Constant term

e_t = Error term

b = Regression coefficient



According to these authors, the coefficient b measures the extent to which capital is mobile, and takes values from zero to one, that is zero if capital is perfectly mobile and one if the capital is perfectly immobile. A capital is completely immobile if domestic investment is entirely financed by domestic savings, while a perfect capital mobility implies that domestic investment is entirely financed by external financial resources.

A sample of industrial countries by Feldstein and Horioka showed a correlation coefficient of almost 0.9 which agrees with (Feldstein - Bacchetta update). A similar strong correlation for LDCs, although, somewhat lower in magnitude than for industrial countries

was found by (Dooley, Frankel and Mathieson 1987; summers 1988) in their studies. We should note, However, that savers and investors are two different economic agents as investor may plough back their undistributed profit into investment and savers may not necessarily hold their savings in financial assets, but rather in physical assets. Also, in developing countries there is the alternative substitution mechanism of raising funds such as community financing.

Some of the studies above were carried out with measurement errors, which diminished the empirical results accuracies, as well as theoretical conclusion without empirical clarification. Also, some were without the use of regression analysis, and with no empirical finding to support interest rate policies which influence investment in developing countries. This study is, therefore, poised toward using regression analysis in its investigation which would yield empirical results from which conclusions can be drawn.

to a future date. In this case interest rates are deposit rates corrected for expected inflation. In this connection, interest rates affect the availability of saving; and to the extent that deposit rate vary depending on the maturity of the financial assets, they also influence the allocation of current saving among the assets. Thirdly, the domestic interest rate, in conjunction with the rate of return on foreign financial assets, expected change in exchange rate, and expected inflation rate determine the allocation of accumulated savings among domestic financial assets, foreign assets and goods that are hedged against inflation. The speculative movement of funds into/out of domestic/foreign assets depends on the relative levels of interest rates and which ever is appropriate among exchange rate, inflation rate and foreign interest rates.

3.2 Administration of interest rate

3.2.1 Period of regulation of interest rate

Interest rate policy in the fixed era encompassed various regulations in the form of placement of controls and ceiling on interest rates to achieve the economy's objectives of growth.

The basis for regulation of interest rates were the desire to attain the socially optimum allocation of resources, combat inflation, lessen the burden of internal debt servicing on the governments and, to ensure sustained growth in output. Lending rates reflected the authorities' preferred sectors such that different lending rates were fixed for loans and advances to different

sectors. This was done to channel credit to defined priority sectors. To achieve this the sectors of the economy were categorized into three groups (1) preferred group under which came agriculture, manufacturing and residential housing; (2) less preferred group consisting of import and domestic trade and (3) "others" which were credit and financial institutions, government, and "personal and professional" sectors. With such categorization concessionary interest rates were granted to those sectors considered of national investment priority areas in a bid to direct financial resources. Because of this deliberate policy which kept interest rates lower than the level the market condition could admit, the attendant problems became unmanageable resulting to the adoption of market-determined policy - deregulation.

3.2.2 Interest rates under de-regulation policy

The introduction of Structural Adjustment Programme (SAP) since 1986 led to the adoption of far reaching economic policies, among which is the de-regulation of interest rates via the removal of controls. In line with the objectives of the adjustment programme, monetary policy is aimed at ensuring efficient mobilisation of financial savings and efficient allocation of resources through a market - oriented financial system. To this end all controls on interest rates were removed in August 1987 which gave banks the free hand in determining interest rates (deposits and lending rates) according to the dictates of the market. However, the central Bank of Nigeria continued to fix the minimum Rediscount Rate (MRR) in line with changes in over all economic conditions. In 1991 for instance, the MRR was lowered to 14.50 percent from 18.50 percent in 1989 with the objective of stimulating investment and growth. The rise in the MRR to 18.50 percent in 1989 followed the need to moderate monetary expansion that year.

It was observed that there were disparities in the interest rate structure of various banks such that the newly licensed banks offered higher deposit rates than those of the old established banks. However, both categories of banks charged lending rates at closer range. Also, it was observed that while banks raised lending rates, deposit rates were deliberately kept so low such that the difference between lending and deposit rates was very wide. In order to remove the distortions observed in the structure of interest rate CBN reached an agreement with the banks toward the end of 1989 on margins between their deposit and lending rates. Consequently, the margin between the deposit and lending rates was fixed at 7 percent points. In the same way the margin between the prime and the maximum lending rates for each bank was fixed at 4 percent points while the inter-bank rates were to be at least 1.0 percent point below the prime lending rates.

The unresponsiveness of the structure of deposit and lending rates to market fundamentals particularly the decline in inflation in 1990 and the increase in domestic liquidity led to the pegging by the authorities of a maximum of 4 percent points between the cost of funds of commercial and merchant banks and their maximum lending rate, and were therefore directed to observe a maximum lending rate of 21 percent and a minimum deposit rate of 13.5 percent extending through to 1991 to check the rapid rise in interest rate given its adverse effect on investment and growth. The banking sector claimed that the new policy measure was against the deregulatory posture of the government, and therefore, refused to operate within the guidelines because sufficient evidence abounded that actual interest rates charged were higher (table 3.2), that the benefits of the policy were largely marginal. As a result the ceiling on interest rates was

removed in January, 1992. In view of the unduly high lending rate and its negative impact on the economy in 1993, the government decided to fix the deposit and lending rates in 1994 with a view to encouraging investment in productive sectors. The savings deposit rates were then, to be within the range of 12 and 15 percent per annum, while the maximum lending rate of all financial institutions was fixed at 21 percent per annum.

3.3 Trends in interest rates, investment expansion and savings

3.3.1 Trends in interest rates

The nature of the trend in interest rates in the period under consideration is that of upward movement except in few years where there were falls before rising again. In 1977 for example, average lending rate which was 6 percent rose to 9.67 percent in 1978, fell to 8.50 percent in 1980 and rose to 10.83 percent in 1984. On the other hand, average savings and fixed deposit rates which were 4 percent and 3.13 percent respectively in 1977 rose to 6 percent and 6.13 percent respectively in 1980. While savings rate exhibited a continuous upward movement reaching 18.80 percent in 1990 before falling to 14.29 percent in 1991, fixed deposit rate fluctuated up and down. From 6.13 percent in 1980, it fell to 6.06 percent in 1981, rose to 15.28 percent in 1987 then dropped to 13.38 in 1988 before it shot to 21.30 percent in 1990. (See appendix 1).

As shown on table 3.2 the growth of deposit rate was sluggish during regulation and, as such did not encourage financial savings. This accounted for inadequate financial savings for investors to borrow even with the low lending rate. Consequently, investment expansion and

growth were constrained.

Immediately after deregulation, interest rates rose. From an average of 11.0 percent in 1986 a year preceeding deregulation lending rate rose to 18.57 percent in 1987. However, it fluctuated throughout the entire period under consideration. From 18.57 percent in 1987, it fell to 17.13 percent in 1988, rose to 26.40 in 1990 and fell to 20.44 in 1991 before rising to 31.16 percent in 1993 (Table 3.1). The upsurge in the lending rate spurred the banks toward mobilization of deposit. This was accompanied with increases in savings and deposit rates. From their respective averages of 9.50 and 9.63 in 1986, savings and deposit rates rose to 14.0 percent and 15.28 percent in 1987 (appendix 1) and then to 16.66 percent and 24.72 percent in 1993.

The sudden rise witnessed in all interest rates following de-regulation was not unexpected. The usual thing was the persistent rise in interest rate despite the fall in inflation. this is because a persistent decline in inflation rate is expected to reverse the expectation of economic agents that determine lending rate by translating the change in expectation to decline in the nominal lending rate. Paradoxically, the Nigerian case presented a situation in which interest rates continue to rise in an uninterrupted situation of a decline in inflation rate that lasted for more than one year. The excess liquidity in banks in greater part of 1990 did not even succeed in bringing down the rates such that all levels of interest rates exceeded their levels in 1989. For while lending rate was 26.40 percent on the average, savings and fixed deposit rates reached 18.80 percent and 21.30 percent compared to their corresponding levels of 25.77 percent lending rate, 16.40 and 20.78 percent for savings and deposit rates in 1989.

3.3.2 Trends in investment

Investment during the regulation period exhibited a negative relationship with interest rates (lending rate) which agrees with our expectation, except in two years where they moved together. However, the trends in investment is that of fluctuations up and down, from the 1977 level of ₦1.3133b to N1.75b in 1986 with fluctuation in the lending rate. For example, the level of investment in 1977 which was N1.3133b at interest rate of 6.00% fell to -N0.03436b in 1978 with interest rate rising to 9.67 percent. The two years in which investment moved together with interest rate are 1979 and 1986, for while interest rate fell from 9.67 percent in 1978 to 9.17 percent in 1979 investment fell from -N0.0343b to -N0.2918b correspondingly, and, in 1986 where interest rate rose to 11.00 percent from 9.83 percent in 1985, investment rose from -N0.1566b in 1985 to N1.75b in 1986. But from 1979 to 1985 investment fluctuated negatively with fluctuation in interest rate. For example, a fall in interest rate from 9.17 percent in 1979 to 8.60 percent in 1980 brought an increase in investment from -N0.2918b in 1979 to N1.746b in 1980, and, a rise in interest rate from 8.50 percent in 1980 to 9.92 percent through to 1982 is accompanied with a fall in investment from N1.7467b to - ₦1.293b correspondingly.

During the de-regulation years under consideration investment moved together with interest rate which is not unexpected given expectations of investors to reap the benefits derivable from the adjustment programme. For example, with falling interest rate from 18.57 percent in 1987 to 17.13 percent in 1988, investment fell from N3.338b in 1987 to N1.7227b in 1988. From the rate of 1988 interest rate rose continuously to 30.60 percent in 1992, and, investment in the corresponding years moved to a peak level of N23.2164b. However, a further rise in interest rate

to 31.16 percent in 1993 from the 1992 rate of 30.60 percent brought about a fall in investment from N23.2164b in 1992 to N22.3078b in 1993 after which they moved together again. See table 3.1 below

Table 3.1 LENDING RATE AND INVESTMENT

YEAR	AVERAGE LENDING RATE (%)	INVESTMENT (N'B)
1977	6.00	1.3133
1978	9.67	-0.0343
1979	9.17	-0.2918
1980	8.50	1.7467
1981	9.17	1.3738
1982	9.92	-1.293
1983	10.42	-2.787
1984	10.83	-2.718
1985	9.83	0.156
1986	11.00	1.75
1987	18.57	3.338
1988	17.13	1.7227
1989	25.77	6.0304
1990	26.40	12.2127
1991	20.44	4.7971
1992	30.60	23.3078
1993	31.16	22.3078
1994	20.67	4.0737
1995	20.82	6.0469
1996	19.10	-84.8687

Sources: 1.

CBN: Statistical Bulletin Vol. 6 No. 2, Dec. 1995

2. CBN: Annual report and statement of accounts December, 1996.

1. Lending rates are calculated from appendix 1 while Investment is calculated from appendix 11

3.3.3 Effects of interest rate on saving

The interest rates used in this study are the commercial banks' rates. In the same way, the savings used are the savings and time deposit of the commercial banks as these constitute almost 70.0 percent of total savings in the country, if not more than that.

There was a positive growth in savings throughout the period of regulation under consideration . From N2.2551b in 1977, the total saving rose to N5.1632b, N8.0829b and N11.4877b in 1980, 1983 and 1986 respectively. Also, average deposit rates rose from 3.30 percent in 1977 to 6.10 percent, 7.60 percent and 9.60 percent in 1980, 1983 and 1986 respectively. (See table 3.2 below). This shows a positive relationship between deposit rates and savings though, the movement in savings was a gradual one which may not be unconnected to the low level of interest rates.

Immediately the reforms took-off in 1987, savings rose from the 1986 level of N11.4877b to N15.0887b in 1987, and, rose further to N18.3972b, N23.1371b and, to an all time high of N60.8959 in 1988, 1990 and 1993 respectively. Correspondingly, deposit rate which was 15.02 percent in 1987 fell to 13.60 percent in 1988, and, rose to 20.80 percent and 24.54 percent in 1990 and 1993 respectively. There is therefore, a positive relationship between deposit rate and saving except in 1988 where, despite a fall in deposit rate to 13.60 percent from 15.02 percent in 1987 saving still increased from N15.087b in 1987 to N18.3972b in 1988. However, financial savings during this period of -deregulation are higher than their regulation period because of the rise in interest rates. This shows that mobilization of savings is enhanced during deregulation.

TABLE 3.2 AVERAGE DEPOSIT RATES* AND TOTAL DEPOSIT

YEAR	AVERAGE DEPOSIT RATES(%)	TOTAL DEPOSIT (N'B)
1977	3.30	2.2551
1978	3.65	2.6017
1979	5.15	3.7021
1980	6.10	5.1632
1981	6.05	5.7961
1982	7.60	6.3382
1983	7.60	8.0829
1984	9.70	9.3913
1985	9.60	10.5509
1986	9.60	11.4877
1987	15.02	15.0887
1988	13.60	18.3972
1989	19.90	17.8133
1990	20.80	23.1371
1991	17.46	30.3597
1992	20.36	43.4388
1993	24.54	60.8959
1994	14.70	73.9092
1995	13.49	88.6580
1996	10.10	125.9979

Sources: 1. CBN: Statistical Bulletin Vol. 6 No. 2, Dec. 1995

2. CBN: Annual report and statement of accounts December, 1996.

* Average deposit rates are calculated from appendix 1

3.4 Non interest rate structural adjustment policies

3.4.1 Inflation and exchange rate policies

Put at 54.2 percent, 55.3 percent and 72.3 percent for 1993, 1994 and 1995 respectively, inflation rates rose rapidly during the period of de-regulation as compared to the pre-deregulation period (See table 3.3). For example, the average inflation rates for 1977 to 1986 was 15.6 percent compared to 36.55 percent for the period of deregulation - 1987 to 1996. This may not be unconnected to the rising cost of production due to the non-interest rate structural adjustment policies. For instance, the deregulation of Foreign exchange market is accompanied with large and sustained depreciation of the Naira which necessitated sharp increases, in the local currency required for financing activities having off-shore components. The aggregate increase in the financial requirement to meet the exchange rate of depreciated naira became high due to high import content of domestic activities as opposed to pre-SAP era.

TABLE 3.3

INFLATION RATES (PERCENT)

YEAR	INFLATION RATES
1977	15.4
1978	16.6
1979	11.8
1980	9.9
1981	20.9
1982	7.7
1983	28.2
1984	39.6
1985	5.5
1986	5.4
1987	10.2
1988	38.3
1989	40.9
1990	7.5
1991	13.0
1992	44.5
1993	54.2
1994	55.3
1995	72.3
1996	29.3

Sources: 1. CBN: Statistical Bulletin Vol. 5 No. 1, June 1994

2. CBN: Statistical Bulletin Vol. 6 No. 2, December, 1995.

3. CBN: Annual report and statement of accounts December, 1996.

Table 3.4 below shows the exchange rate of the naira in relation to the dollar over the years under consideration. Except for the year during regulation where exchange rates fluctuated up and down, it rose continuously reaching N21.8861 to the dollar in 1995 at official rate while it was N80.5183 to the dollar at the Autonomous foreign Exchange. Market (AFEM).

TABLE 3.4 AVERAGE ANNUAL EXCHANGE RATE (₦/US \$1.00)

YEAR	AVERAGE ANNUAL RATE (₦)
1977	0.6466
1978	0.6060
1979	0.5957
1980	0.5464
1981	0.6100
1982	0.6729
1983	0.7241
1984	0.7649
1985	0.8938
1986	2.0206
1987	4.0179
1988	4.5367
1989	7.3916
1990	8.0378
1991	9.9095
1992	17.2984
1993	22.0502
1994	21.8861
1995	21.8861
1996	22.00

Sources: 1. CBN: Statistical Bulletin Vol. 6 No. 2, Dec, 1995.

2. CBN: Annual report and statement of accounts December, 1996.

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Calculating averages for the periods of regulation and deregulation shows that the average exchange rate for the period of deregulation which is N13.90143 to the dollar is far higher than N0.8081 for the period of regulation under consideration.

4.1 Models specification

One model is specified for this study based on our stated hypothesis, but three sets of regressions shall be run. The first one looks at the impact of interest rate on investment during the period of regulation, the second looks at the impact of interest rate on investment during the period of de-regulation while the third one combines the two periods.

The choice of the investment model used in this research follows the Neo-classical theory of capital accumulation and keynes theory of investment, which involve the construction of the marginal efficiency of capital or investment demand schedule where marginal efficiency of any capital asset is defined as "that rate of discount which would make the present value of the series of annuities given by the returns expected from the capital asset during its life just equal to its supply price. Therefore, our model is specified thus;

$$I_t = f(R_t) \dots\dots\dots (1)$$

where I_t and R_t stand for investment, and Lending rate respectively.

But because profit expectation is one of the most important determinants of investment, our model shall be specified as follows;

$$I_t = f(RL, \pi) \dots\dots\dots (2)$$

Where I_t and R_t are as defined above, and, π stands for profit expectation which is proxied by output (GDP).

However, we shall include time trends to capture the investment opportunities that become discernible with time, and lag value of investment because of the dependent nature of current period's investment spending on previous period's. Thus our investment function becomes,

$$I_t = f(R_L, \pi, I_{t-1}, t) \dots \dots \dots (3)$$

The functional form of equation (3) which shall be estimated for this study is;

$$I_t = \beta_0 + \beta_1 R_L + \beta_2 \pi + \beta_3 I_{t-1} + \beta_4 t + U \dots \dots \dots (4)$$

where I_t , R_L and π are as defined previously while I_{t-1} and t are lagged investment and time trend respectively, U the error and β s are the parameters to be estimated.

Using data over the periods of 1977 to 1986 and 1987 to 1996, it is expected that the level of investment from 1987 to 1996 is significantly influenced by the de-regulation policy of interest rates:

Coefficient of determination (R^2) defined as the test of goodness of fit would be employed which aims at judging the goodness of fit of the parameter estimates. T-Test would also be employed to find out whether the independent variables are explanatory variables of the dependent variable. The choice of T-Test is informed by the size of the observation which, is less than 30. Lastly, this will be corroborated further with F-test to test the overall significance of the regression models. All the tests would be applied using 5% level of significance, and, are two tails tests.

The hypothesis test is:

HO: $\beta_i = 0$, that is, β_i is not significant.

H1: $\beta_i \neq 0$, that is β_i is significant.

where $i = 1, 2, \dots \dots \dots, n$

4.2 Presentation of models and expected results

One model is used in this research work, and, the variables are defined as follows:

DEPENDENT VARIABLE

I_t = INVESTMENT

INDEPENDENT VARIABLES

R_t = lending rate

π = Profit expectation

I_{t-1} = Lagged I_t

t = Time trend

D = Dummy variable

U = error term

Thus the regression equations are as follows:

$$I_t = \beta_0 + \beta_1 R_{tL} + \beta_2 \pi + \beta_3 I_{t-1} + \beta_4 t + U \dots\dots (a)$$

$$I_t = \beta_0 + \beta_1 R_{tL} + \beta_2 \pi + \beta_3 I_{t-1} + \beta_4 t + U \dots\dots (b)$$

$$I_t = \beta_0 + \beta_1 R_{tL} + \beta_2 \pi + \beta_3 I_{t-1} + \beta_4 D + \beta_5 t + U \dots\dots (c)$$

Where equations (a) and (b) look at investment during regulation and de-regulation periods respectively while equation (c) looks at investment for the combined periods. Note that the dummy (D) is introduced to take care of those reform policies that are not quantifiable such as removal

of subsidy, exchange rate de-regulation, privatization, etc.

Our expectation is that β_1 s are negative while β_2 s, β_3 s, β_4 s and β_5 are positive. This means that investment is expected to be negatively related to interest rate, and, positively related to profit expectation, its previous value, time and the dummy.

4.3 Data presentation

The available data for the periods; 1977 to 1996 disaggregated into regulation and de-regulation periods looking at the effects of interest rate on investment are tested in our regression analysis. Table 4.1 shows the data.

TABLE 4.1: INVESTMENT, LENDING RATES AND PROFIT

YEAR	*INVESTMENT (N'B)	**LENDING RATE %	PROFIT (N'B)
1977	1.3133	6.00	32.7473
1978	-0.0343	9.67	36.0836
1979	-0.2918	9.17	43.1508
1980	1.7467	8.50	50.8486
1981	1.3738	9.17	50.7491
1982	-1.293	9.92	51.7092
1983	-2.787	10.48	57.1421
1984	-2.718	10.83	63.6081
1985	0.156	9.83	72.3354
1986	1.75	11.00	73.0619
1987	3.338	18.57	108.8851
1988	1.7227	17.13	145.2433
1989	6.0304	25.77	224.7969
1990	12.2127	26.40	269.6367
1991	4.7971	20.44	324.0100
1992	23.2164	30.60	549.8088
1993	22.3074	31.16	701.4729
1994	4.0737	20.67	914.3343
1995	6.0469	20.82	1436.6485
1996	-84.8687	19.10	2356.600

*Investment and profit are calculated from appendix 2

** Lending rates are calculated from appendix 1

4.4 Models estimation and discussion of findings

4.4.1 Models estimation

Using the data in tables 4.1, estimates of our equations (a) to (c) are presented.

	PARAMETE RS	T*	F*	R ²	EQUATION a
Constant	-23.829	-8.460	53.974	0.9774	
R _L	0.290	1.810			
π	0.686	11.045			
I _{t-1}	1.147	10.940			
t	-2.820	-9.615			
Tt = 2.571 Ft = 5.19 D.W = 1.353					

	PARAMETE RS	T*	F*	R ²	EQUATION b
Constant	-20.402	-0.878	10.032	0.8892	
R _L	0.466	0.412			
π	-0.082	-3.882			
I _{t-1}	-0.754	-0.914			
t	13.360	2.505			
Ft = 5.19 Tt = 2.571 D.W = 1.79					

	PARAMETERS	T*	F*	R ²	EQUATION b
Constant	-17.293	-1.807	8.296	0.7477	
R _L	1.557	1.725			
π	-0.035	-4.257			
I _{t-1}	0.700	1.350			
d	-12.141	-0.854			
t	0.786	2.565			
F _t = 3.96 T _t = 2.145 D.W = 2.277					

Where T* and F* stand for calculated values of T and F respectively, and F_t and T_t stand for table values of F and T respectively.

In analysing our estimates in equation (a), The regression coefficient of lending rate is 0.290 and its calculated and tabulated t-values are 1.810 and 2.571 respectively. The calculated t-value is less than the tabulated t-value at 5% level of significance, therefore, the study's null hypothesis is accepted that the B₁ is equal to zero. However the coefficients of profit (0.686) and lagged investment (1.147) are statistically significant as their calculated t-values, 11.045 and 10.940 respectively are greater than the tabulated t-value which is 2.571. Also, the coefficient of time trend, -2.820 is statistically significant, this is because, the calculated t-value which is 9.615 is greater than the tabulated t-value. With the application of F-test, the over all parameters are statistically significant as 53.974, the calculated F-value is greater than the tabulated f-value (5.19). The R² = 0.9774 is quite high showing that the variations in the dependent variable are explained by 97.74% variations in the independent variables. And, the signs of the coefficients of profit and lagged investment satisfy our apriori expectation of positive relationship while those

of lending rate and time trend disagreed with our expectation.

The $D.W = 1.353$, shows existence of auto correlation.

In equation (b), the coefficient of lending rate is 0.466, and not statistically significant as the tabulated t-value is greater than the calculated t-value, that is $2.571 > 0.412$. The coefficient of profit which is -0.082 is statistically significant as the calculated t-value (3.882) is greater than the tabulated t-value (2.571). The regression coefficient of lagged investment (-0.754) and time trend (13.360) are not statically significant as their calculated t-values, 0.914 and 2,505 respectively are less than 2.571 the tabulated t-value. However, employing f-test, the over all regressors showed statistically significance as calculated f-value (10.032) is greater than the tabulated f-value (5.19). the variations in the dependent variable is explained by 88.92% of the variations in the independent variables. This is because our $R^2 = 0.8892$. However, all other coefficients except the coefficient of time trend are wrongly signed.



Analysing the regression coefficients in equation (c) shows that the coefficient of lending rate (1.556) is not statistically significant because its calculated t-value is less than the tabulated t-value, that is, $1.725 < 2.145$, and it is wrongly signed disagreeing with our priori expectation. However, the coefficient of profit, though, wrongly signed is statistically significant as its calculated t-value is greater than the tabulated t-value ($4.257 > 2.145$). On the other hand the coefficient of lagged investment (0.700) is not statistically significant as its calculated t-value is less than the tabulated t-value, that is, $1.350 < 2.145$, but properly signed. The parameter estimate of the dummy variable is -12.141 and it is very high, but not statistically significant as its calculated t-value (0.854) is less than the tabulated t-value (2.145) and not properly signed. Lastly, in equation (c) the regression coefficient of time which is 0.786 and properly signed is not statistically significant as its calculated t-value is less than the tabulated t-value, that is,

$0.565 < 2.145$. Applying f-test shows statistical significance of over all parameters, this is because the calculated f-value is greater than the tabulated F-value ($8.296 > 3.96$). Also, here, R^2 , 0.7477 is quite high, that is, 74.77% showing over 70% variations in the dependent variable been explained by the variations in the independent variables.

4.4.2 Discussion of findings

It is observed from results obtained that equations (a) to (c) disagreed with our expectation with respect to the relationship between investment and interest rate (lending rate). This is because we had positive relationship throughout instead of negative ones. In the case of profit we had a positive relationship between investment and profit in equation (a) only, and, negative through out in equations (b) and (c). The findings from the results of the estimates show that lending rate is wrongly signed in all the three equations, and, not statistically significant in the application of t-test, while the coefficient of the profit which is properly signed in only equation (a) is statistically significant in all the three equations with the use of t-test. Considering the lagged investment, it is wrongly signed in equation (b) only, and statistically significant in equation (a) only. The time trend is properly signed in equations (b) and (c) but not statistically significant in any equation. Lastly, the dummy variable introduced in the combined regression is wrongly signed and not statistically significant. However, the overall parameters in all the three equations are statistically significant with the application of F-test, showing that at individual level a variable may not be statistically significant.

Also, in this chapter, the results from our equations showed that the relationship between investment and lending rate contradicts economic theory. This is not surprising because in most developing countries of which Nigeria is one, public investment accounts for over 60% of total

investment. This was observed by (Charles C. Soludo) in a paper titled "Investment in the growth process, a measure of the economists' ignorance in Africa", presented at the Nigerian Economic Society (NES) Conference 1998 in Kano, where he said that "private investment in Nigeria does not exceed 30%. Looking at the behaviour of investment toward profit in equations (b) and (c) it appeared as if investment rose with falls in profit levels which is unacceptable to private investors. Again, considering huge investment by the government that is not tied to profit, such relationship is not unexpected. Even if investment does rise with rise in lending rate and fall in profit level, the high inflationary rate in the country could be responsible for what seems to be the increase in the level of investment, particularly during the de-regulation period under consideration as shown in table 4.1. Comparing average inflation for the two periods, it is observed that average inflation, during de-regulation which is 36.55% as against 15.0% for the period of regulation contributed to what might seem increase in investment level, and not necessarily the de-regulation policy. In the same way comparing annual average exchange rate of the Naira for the two periods shows that the figure for the de-regulation period, 13.90143 Naira is far higher than the figure for the era of regulation, 0.8081 Naira. And, given that the financing of investment activities requires off-shore components, the aggregate increase in the financial requirement to meet the exchange rate of depreciated Naira became high due to high import content of most of our domestic investment.

Conclusively, the coefficient of determination (R^2) in all the equations are quite high, in fact above 70% signifying that over 70% of the variations in the dependent variable are explained by the variations in the independent variables. And, the values of Durbin-Watson statistics for the de-regulation period (1.79) and for the combined regression (2.277) show absence of serial correlation, however, the Durbin-Watson for the regulation era (1.353) shows existence of serial correlation.

Chapter 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

In the background to this study, we saw that the emergence of oil into the Nigerian economy consequent upon the discovery of oil in commercial quantity and its first export in 1958 led to the neglect of agriculture which before then, was the main stay of the economy, accounting for over 60 percent of the gainfully employment, and, the primary foreign exchange earner. The result of this was a fall of agriculture in its share in Gross Domestic Product (GDP) from about 40 percent in early 70's to about 20 percent in 1980 with oil alone, by later years contributing 22 percent to the GDP, 81 percent of Government revenue and 96 percent of export earnings. Consequently, Nigerian government embarked on building social and economic infrastructures by utilizing the huge revenue got from oil which created imbalances and distortions manifested in proliferation of some parastatals and public investments as these depended heavily on imported raw materials. With the heavy dependence on oil and imported inputs, Nigeria was exposed to shock immediately there was a sharp fall in the world oil market price in mid 1981 due to oil glut. When the stringent measures introduced in 1983, 1984 and retained in 1985 budgets could not revamp the economy as they were so serious that many industries, short of raw materials and as such were forced to either close down or cut down their production with the attendant laying-off of staff which worsened unemployment problems, the Babaginda's administration introduced structural adjustment programme (SAP) in which one of the policy instruments in the realisation of the programme's objective is the de-regulation of interest to encourage saving which will be transformed into investment.

Chapter two focused on the review of relevant literature. There it was revealed that

interest rate which is determined by the demand for, and, the supply of capital is the premium offered to any individual for parting with his liquidity. In other words, it is determined by the thriftiness of the community as given by the schedule of real saving, and, by the productivity of capital as given by the investment demand schedule. Thus, a fall in interest rates discourages saving but increase the level of investment leading to increased output, employment and the rate of growth in the economy. The reverse is the case if there is a rise in interest rate. However, since savings and investments respond to interest rates, the implication for policy should be such that while it encourages savings it should not discourage investment. That, given the repressed nature of financial sector in developing countries interest rate is in indeterminate, as such its de-regulation would balance the interests of savers and investors, and, discourage self-investment in the sense that financial liberalization is the establishment of interest rate that equilibrates the demand for and supply of savings. In Nigeria, a study carried out in (1992) by Oresotu shows that the determinants of interest rates since de-regulation are: inflationary expectation, expected exchange rate changes and expected foreign interest rates. Also, in this chapter, we saw that investment, as the decision to accumulate capital over the long-run in succession of short-periods which was stated by Fisher (1930) as future income discounted to the present, and, defined by Keynes (1936) as the rate of discount which could make the present value of the series of annuities given by the returns expected from the capital-asset during its life time just equal to its supply price is determined by a number of factors. In addition to interest rates, Keynes felt that the most important determinant of investment is profit expectation as at a given interest rate investment can either fall or rise, depending on the expectation of profit.

In chapter three we looked at the administration of interest rates, trends in investment expansion and savings. In the administration of interest rate we looked at the pre-SAP era and SAP era. During the regulation period was the placement of controls and ceilings on interest rates to

achieve set goals of growth. Thus, lending rates reflected authorities' preferred sectors such that different rates were fixed for loans and advances to different sectors. The de-regulation period witnessed the removal of controls such that interest rate was determined by the inter play of market forces. With this development, banks raised lending rate and kept deposit rate very low so much so that the difference between lending rate and deposit rate was very wide, and the government had to intervene through Central Bank to remove the distortions observed by reaching an agreement with the banks toward the end of 1989. It was observed from the tables in chapter three that while investment fluctuated with the fluctuation in interest, some times in the same direction as with the period of de-regulation, and, in opposite direction during the era of regulation, saving moved in the same direction with interest rate. Lastly in chapter three we saw that the rise in inflation over the years and the depreciation of the Naira have increasing effects on saving and investment.

Chapter four looked at the presentation of the results of the data analysed. Using three regression equations, the first for the period of regulation, the second for de-regulation period, and, the third for the combined periods. With investment as the dependent variable while lending rate, profit, lagged investment, time trend and dummy variable for the combined regression as independent variables, lending rate was found to be statistically insignificant with the application of t-test, and, wrongly signed. Profit though, properly signed during regulation era only was significant in the application of t-test; lagged investment was statistically significant only during regulation period and wrongly signed during de-regulation while time trend which was wrongly signed during regulation was statistically significant only in that period. The dummy variable which captures the impact of non-interest rates reform policies on investment has a negative regression coefficient and not statistically significant. The dummy though, not significant contributes great information for the downward trend of investments as its coefficient, -12.141 is high.

The values of Durbin-Watson statistics for de-regulation period equation and the combined regression equation which are 1.79 and 2.277 respectively show absence of auto correlation, however the Durbin Watson for the regulation period (1.353) shows existence of auto correlation. But R^2 for the three equations were quite high, infact, over 70% variations in our dependent variable were explained by the variations in the independent variables. Finally, worthy of note is that the over all parameters are statistically significant in applying F-Test, And what seems to be increase in investment with rising lending rate as signified by the positive relationship in our equations, and, the negative relationship between investment and profit in two of the equations may not be unconnected to the fact that public investment which accounts for over 60% of total investment is not hedged against interest rate and not profit-oriented.

5.2 Conclusion

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Based on our stated hypothesis and findings from our regressions and analysis, the following conclusions are drawn:

1. While it would normally be expected that investment responds to interest (lending) rate negatively, the opposite is sometimes the case, particularly in developing countries. As such there is the tendency for interest rate to rise as a result of the reforms as this is determined by the inter-play of market forces of demand and supply, but most interest rate policies, especially in African countries have failed to discriminate between more and less productive investment possibilities. The de-regulation policy has not been able to raise investment level appreciably as the

estimates of our interest rate did not show statistical significance to investment. And, as there is the substitution of alternative mechanism of raising funds such as community financing, re-ploughing back of undistributed profit, the empirical significance of interest rate as a determinant of investment is often difficult to establish. On the other hand, the harsh effects of the adjustment programme which has eroded the purchasing power of the people has led to fall in effective demand which in turn has affected profit expectation, so that what is experienced is a rise in investment level as a result of inflation, depreciation of the Naira and contribution of public investment. Also, the fact that the de-regulation policy has worked in some countries does not mean it will work everywhere as there is no guarantee that investors will respond positively to reforms. For while it responded forcefully to the launching of reforms in Chile in the second half of the 1970s, and in Argentina and Peru in the early 1980s, it responded modestly in Israel, Mexico and Bolivia by contrast in the second half of 1980s. And as observed by (Charles C. Soludo) in his paper titled "investment in the growth process: A measure of the economists' ignorance in Africa" presented at the Nigerian Economic Society 1998 conference at Kano, "Despite the rectified distortions of policies, resumption of investment and growth would be a push-button affair as such countries as Uganda, Ghana etc. have earned near full marks in these respects but investment has not flourished". As such income policy reflecting the given economy's peculiar situation should determine the design and implementation of interest rate policy. This can work effectively in industrialised market economies which have advanced and integrated money and capital markets and where private investment constitutes

a significant share of total investment. But in developing African countries, and Nigeria in particular, none of these factors currently exist. Even though market-oriented policy advisers argue that market-determined interest rates in combination with appropriate external and macro policies are the fundamental conditions for channelling financial resources at the "right prices" through the banking system from savers to investors, there is resistance to the liberalization of interest rates in most developing countries. Thus, no clear consensus has been reached on whether the financial system-distorted as it is in developing regions like Africa, will efficiently operate within the context of free markets to provide a pattern of credit allocation that is socially and economically most desirable and effective.

2. Even the analysis made on table 3.2 on saving does not show any improvement in the level of saving in real terms as the averages computed for periods of regulation and de-regulation, ₦10,30658b and ₦7,98079b respectively, show that, that of regulation period is higher than the de-regulation period. As it is theoretically argued that financial reforms such as removal of control on interest rates would raise the average return on savings and would, consequently result in a continuing increase in the flow of savings as a proportion of income, the fact still remains that the low saving in developing Africa, and Nigeria as a case study is also related to factors other than interest rate; namely, low income, and, high and skewed consumption patterns. Thus, the low level of per capita income in Nigeria is the principal reason for low savings despite increase in saving deposit rates. Infact,

interest rates are viewed to play only a minor role in the determination of savings as supported by empirical results in a study of African countries conducted by the African Centre for Monetary Studies (ACMS) in 1985 (AAF-SAP)* where it has been shown that changes in the real interest rate have mixed results. For while there is positive correlation between interest rate and savings in some countries, in others, it is a negative relationship. This is because in many developing countries, a large proportion of savings is not held in the form of financial assets as in advanced countries, but in form of real assets. Be that as it may, one of the most important factors that affect the role of interest policy in developing African countries is the level of the development of their financial structures. In most developing countries, the ratio of currency to the stock of money is relatively large and this, together with the small number of banks, affects the capacity of the banking system to create additional credit on the basis of an increase in the reserves of commercial banks. Also largely because the subsistence part of the economy including the informal sector which is not susceptible to the banking influence and, because of the fragmentation or non-existence of money and capital markets, many monetary instruments which can be used effectively in advanced countries are subject to severe constraints in the developing countries. As such the effectiveness of interest rate policy depends on factors such as saving habits, provision of adequate banking services and, extent of monetization of the economy. In any case, ensuring adequate levels of savings still remains a central policy concern in order to guarantee sufficient financing for capital accumulation and avoid an excess of

investment over saving that can create inflationary pressure and/ or balance of payment disequilibria.

5.3 Policy recommendations

A major objective of any study is to make recommendations, therefore, based on the problem identified from our findings, the following recommendations are made:

1. *In Nigeria where there exist underdeveloped and unintegrated money and capital markets, with a developing financial sector such that interest rates do not behave in the same manner as in financially developed and relatively stable system in developed countries, there is the need for differential interest rates, given the different institutional structures. The essence of this differential interest rate policy is to release real rates of interest to disclose the scarcity of savings in order to stimulate investment through savings; to raise accessible rates of return on investment and discriminate more effectively between investments so as to promote productive investment, and discourage speculative unproductive investment. However, this should be of temporary nature until such a time the market forces of supply of, and demand for loanable funds can function properly.*
2. *Importantly, the empirical ambiguity about the effect of real interest rates on savings is that policy of interest rate should not be dogmatic, rather it should be flexible enough to take into account the realities of our economy. Moreover, theoretically, savings are a function of income. Although, this is not suggesting a*

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APPENDIX 1

COMMERCIAL BANKS INTEREST RATES

	DEPOSIT RATES					Lending Rate		
	TIME DEPOSIT				FIRST PRODUCE SAVINGS	OTHER CLASS		OTHER ADVANCE
	3 Month	3 - 6 Months	6 - 12 Months	OVER 12 Months		Advance	Advance	
1977	3.50-3.00	3.50-3.00	2.50-3.00	3.00-3.50	4.00	6.00	6.00	6.00
1978	2.00-4.75	2.50	2.50-5.25	3.00-5.50	4.00-5.00	7.00	11.00	11.00
1979	4.75	5.00	5.50	5.50	5.00	7.50	9.00	11.00
1980	5.75	6.00	6.25	6.50	6.00	7.50	8.50	9.50
1981	5.50	6.00	6.25	6.50	6.00	7.75	9.75	10.00
1982	7.25	7.50	7.75	8.00	7.50	10.25	7.75	11.75
1983	7.25	7.50	7.75	8.00	7.50	10.00	9.75	11.50
1984	9.75	9.50	9.75	10.00	9.50	12.50	7.00	13.00
1985	9.25	9.50	9.75	10.00	9.50	9.25	8.50	11.75
1986	9.25	9.50	9.75	10.00	9.50	10.50	10.50	12.00
1987	14.90	15.50	15.10	15.80	14.00	17.50	19.00	19.20
1988	13.40	12.10	13.70	14.30	14.50	16.50	17.00	17.60
1989	18.90	21.60	21.40	21.20	16.40	26.80	25.90	24.60
1990	19.60	20.50	22.10	23.00	18.80	25.50	26.00	27.70
1991	15.71	17.09	20.10	20.10	14.29	20.01	20.51	20.80
1992	20.80	22.30	22.10	20.50	16.10	29.80	30.80	31.20
1993	23.60	23.26	23.99	28.02	16.16	36.09	39.06	18.32
1994	15.00	15.00	15.00	15.00	13.50	21.00	n.a	21.00
1995	13.39	13.57	13.86	14.11	12.54	20.24	n.a	20.82
1996	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a

sources: 1. C.B.N. Statistical Bulletin, Vol 5, No. 1 June 1994

2. C.B.N. Statistical Bulletin, Vols. 6, No.2 December, 1995, n.a not available

APPENDIX 11

YEAR GFCF¹ AT CURRENT PRICES (N'M) | GDP² AT CURRENT MARKET PRICES(N'M)

1977	9,420.6	32,747.3
1978	9,386.3	36,083.6
1979	9,094.5	43,150.8
1980	10,841.2	50,848.6
1981	12,215.0	50,749.1
1982	10,922.0	51,709.2
1983	8,135.0	57,142.1
1984	5,417.0	63,608.1
1985	5,573.0	72,355.4
1986	7,323.0	73,061.9
1987	10,661.1	108,885.1
1988	12,383.7	145,243.3
1989	18,414.1	224,796.9
1990	30,626.8	260,636.7
1991	35,423.9	324,010.0
1992	58,640.3	549,808.8
1993	80,948.1	701,472.9
1994	85,021.8	914,334.3
1995	91,068.7	1,436,648.5
1996	6,200.0	2,356,600.0

1. GFCF = Gross Fixed Capital formation

2. GDP = Gross Domestic Product

Sources: 1. CBN, Statistical Bulletin Vol 6 No. 2, Dec. 1995

2. CBN, Annual Report and Statement of Accounts Dec. 1996.