THE IMPACT OF INTEREST RATE ON INVESTMENT DECISION IN NIGERIA. AN ECONOMETRIC ANALYSIS (1981-2010)

BY

UDONSAH IDORENYIN L.
EC/2008/614

DEPARTMENT OF ECONOMICS
FACULTY OF MANAGEMENT AND SOCIAL SCIENCES
CARITAS UNIVERSITY
EMENE, AMORJI-NIKE
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TITLE PAGE

THE IMPACT OF INTEREST RATE ON INVESTMENT DECISION IN NIGERIA. AN ECONOMETRIC ANALYSIS (1981-2010) A PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B.SC) DEGREE IN ECONOMICS.

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DEPARTMENT OF ECONOMICS, FACULTY OF MANAGEMENT AND SOCIAL SCIENCE
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ENUGU STATE.

APPROVAL PAGE

This is to certify that the project title, The Impact of interest rate on investment in the Nigeria economy (1981-2010) work has been approved for the award of B.Sc in the Department.

BY

……. **…….**

Mr. R.O Ojike **Date**

Project Supervisor

……. **…….**

Barr. Onwudinjo, P.C. **Date**
(Head of Department)

……. **…….**

Dr. C.C Umeh **Date**
Dean of faculty of
Management and Social Sciences

……. **…….**

External Examiner **Date**

DEDICATION

I dedicate this research work to the Giver of life, the Giver of Wisdom and knowledge the Almighty God, and to my lovely family.

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I want to thank the Almighty God the Alpha and Omega, the beginning and the End, for seeing me through my Work.

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ABSTRACT

The focus of this research work is based on the impact of interest rate on investment decision in Nigeria. An econometric analysis between the periods of 1981-2010. Secondary data obtained from the central bank of Nigeria (CBN) statistical bulletin (volume 21) DEC 2010. Date was collected and empirical analysis made. To achieve these objective multiple regression was used in analyzing the data that the impact of interest rate on Nigeria prior to interest rate regulation in 1.986 and serve as guide to how interest rate can be fixed to enhance effective accumulation of savings that can channel to investment. Policy recommendation Government should in massively embarks on large-scale agriculture, manufacturing industrialization e.t.c and equally encourages small and medium scale enterprise (SMES). Public private partnership (ppp) should also be encouraged by government for efficient and effective production.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Investment is the change in capital stock during a period. Consequently, unlike capital, investment is a flow term and not a stock term. This means that capital is measured at a point in time, while investment can only be measure over a period of time.

Investment plays a very important and positive role for progress and prosperity of any country. Many countries rely on investment to solve their economic problem such as poverty, unemployment etc (Muhammad Haron and Mohammed Nasr (2004).

Interest rate on the other hand is the price paid for the use of money. It is the opportunity cost of borrowing money from a lender to finance investment project. It can also be seen as the return being paid to the provider of financial resources, for going the fund for future consumption. Interest rates are normally expressed as a percentage rate. The volatile nature of interest is determined by many factors, which include taxes, risk of investment, inflationary expectations, liquidity preference, market imperfections in an economy etc.

Banks are given the primary responsibility of financial intermediation in order to make fund available for economic agents. Banks as financial intermediaries move fund. Surplus sector/units of the economy to deficit sector/units by

accepting deposits and channeling them into lending activities. The extent to which this could be done depend upon the rate of interest and level of development of financial sector as well as the saving habit of the people in the country.

Hence, the availability of investible funds is therefore regarded as a necessary starting part for all investment in the economy which will eventually translate to economic growth and development (Uremadu, 2006).

Many researchers have done a lot of study on the impact of interest rate on investment. In Nigeria, Ologu (1992) in a study of “The Impart of CBN Money Policy on aggregate investment behavior”. Found out only few of the variables were significant at both the 95% and 90% confidence limits in explaining the behavior of investment during the (1976-90) period of student”. Specifically, he found out that:

1. Contrary to expectation and to change’s stock adjustment hypothesis, the existing stock of capital goods (plants and machinery) was not a major determinant of investment behavior of forms in Nigeria.
2. Interest rate was significant in influencing investment decision nothing that” this is not surprising since in a situation of limited residual funds as in Nigeria, the cost of capital should exert significant influence on both the frequency and volume of demand for invisibles funds by investors.

Lesotho (2006) studied “An investigation of the determinants of private investment “the case of Botwana”. Among his independent variable were real interest rate, credit to the private investors, public investment and trade credit to the private investors, real interest rate affect private investment positively and significantly. Other variable do not affect private investment level in the short-term as they show insignificant co-efficient. GDP growth and conform similar finding sin studies by Oshikoya (1994), Ghura and Godwin (2000) and Malmbo and Oshikoya (2001).

Aysam et al (2004) in their study “How to Boot Private Investment in the MENA countries. The role of Economic Reforms”. Among their independent variables were accelerator, real interest rate, macroeconomic stability, structural reform, external stability, macroeconomic volatility, physical infrastructure. Their studies ranged from 1990 to 1990 comprising of panel of 40 developing countries. They used co-integration technique to determine the existence of a long-term relationship between private investment and its determinants. They fund out that almost all the explanatory variables exhibit a significant impact on private investment, with the exception of macroeconomic stability and infrastructures. The accelerator variable (ACC) has the expected positive sign, which implies that the anticipation of economic growth induce more investment. Similarly, interest rate (r) appears to exert a negative effect on firm’s investment projects, which is consistent with the user cost of capital theory.

In the U.S, Evans, estimated that net investment would rise by anything between 5% and 10% for a 25% fall in interest rate. These percentage changes were calculated to occur over a two year period after a one year log.

A study by Kham and Reinhart (1990) observe that there is a close connection between the level of investment and economic growth. In other words, a country with low level of investment would have a low GDP growth rate. The use of ryid exchange rate and interest rate controls in Nigeria in low direct investment, the leads to financial impressions in the early 1980. Fund were inadequate as there was a general lull in turn leads to the liberalization of the financial system Omole and Falokun (1999). This may have an adverse effect on investment and economic growth.

As already discussed so far, it is quite clear that an understanding of the nature of interest rate behavior is critical and crucial in designing policies to promote savings, investment and growth. It is pertinent to note that this research attempts to investigate and ascertain the impact of interest rate volatility on investment decisions in Nigeria using time series data covering from 1981-2010.

1.2 Statement of the Problem

The financial systems of most developing countries (like Nigeria) have came under stress as a result of the economic shocks of the 1980s. The financial repression, largely manifested through indiscriminate distortions of financial prices including interest rates, has tended to reduce the real rate of growth and

the real size of financial system, more importantly, financial repression has (retarded) delay development process as envisage by Shaw (1973). This led to insufficient availability of investible funds, which is regarded as a necessary starting point for all investment in an economy. This declines in investment as a result of decline in the external resource transfer since 1982, has been especially sharp in the highly indepted countries, and has been accompanied by a slowdown in growth in all LDCs. Both public and private investment rate have fallen, although the latter more drastically than the former. If this trend is maintained, it will lead to a slowdown in medium term growth possibilities in these economies and will reduce the level of long-term per capital consumption and income, endangering the sustainability of the adjustment effort. The observed reduction in investment in LDCS seems to be the result of several factors. First, the lower availability of foreign savings has not been matched by a corresponding increase in domestic savings. Secondly, the determinating of fiscal conditions due to the cut of foreign lending, to the rise in domestic interest rate, and the acceleration in inflation forced a contraction in public investment. Thirdly, the increase in macroeconomic instability associated with external shocks and the difficulties of domestic government to stabilize the economic has hampered private investment.

Finally, the debt overhand has discourage investment, through its implied credit constraints in international capital markets Luis Serven and Falokun (1989).

In order to curb the adverse effect of the 1980s financial repression, Nigeria government deregulated interest rate in 1987 as part of the Structural Adjustment Programme (SAP) policy package. The official position was that interest rate liberalization among other things, enhance the provision of sufficient funds for investors, especially manufacturers (a priority sector) who were considered to be prime agents, and by implication promoters, of economic growth. However, in a policy reversal, the government in January 1994 out-rightly introduced some measure of regulation into interest rate management. It was claimed that there were “wide variations and unnecessary high rate” under the complete deregulation of interest rates.

Immediately, deposit rates were once again set at 12% to 15% per annum while a ceiling of 21% per annum was fixed for lending a rate. The cap on interest rate introduced in 1994 was retained in 1993 with a minor modification to allow for flexibility. The cap stayed in place until it was lifted in 1997, thus enabling the pursuit of the flexible interest rate regime in which bank deposit and lending rate were largely detrrmined by the forces of demand and supply for funds (Omole and Falokun 1999).

Declining investment ratio and level are problems; first of all, because investment matters for growth.

Secondly, because low investment increases vulnerably in the economy (Niambon and Oshikoya, 2001; 16). The main challenge that Nigeria is facing is

to make policies that will help revive and raise investment in the country in order to stimulate and sustain economic growth.

In view of the perceived challenge, this research work intends to provide answers to the under listed questions:

1. What is the impact of interest rate volatility on investment decisions in Nigeria?
2. What other variable determine investment decision in Nigeria.
3. What has been the trend profile of investment in liberalization. He used co-integration and Error Correction Model (ECM) procedure to established both short-term and term effect simultaneously. He found that public investment.

1.3 Objective of the Study

The research question above have given us an incite of the objectives the research work attempts to achieve. They are:

1. To determine the impact of interest rate volatility on investment decision in Nigeria.
2. To empirically investigate, ascertain and unravel other determinants of investment decision in Nigeria.
3. To investigate the trend profile of investment in Nigeria.

1.4 Statement of Hypotheses

Based on the above stated research objectives, conclusions would be drawn from the following research hypotheses:

1. Interest rate has no significant impact on investment.
2. Investment has no other determinants.
3. Investment has no trend profile in Nigeria.

1.5 Significance of the Study

This work is mainly for academic purpose. However, it will be of great importance to my researcher who would want to embark on any research on interest rate and investment decision.

Also this piece of research work would go a very long way in assisting any person or growth of persons who would wish to know the place of interest rate and investment decision in Nigeria.

Though for academic purpose, this work would be of great important of anybody who would want to embark on investment.

1.6 Scope of Limitation of the Study

The study focuses on the impact of interest rate on investment decision in Nigeria starting from 1981-2010 using annual time series data. Upon the assertion that every pros have some cons, this study cannot be exception. Some hitches and setback were encountered in the process. First among the list is data

unavailability. For this reason, investment variable would be provided by Gross Fixed Capital Formation (AFCF).

Secondly, time and financial construct cannot be left out in the list setback and hitches.

The cost of sourcing materials from the internet is exorbitant because of epileptic and erratic power supply of the Power Holding Company of Nigeria (PHCN). Thus, the cyber café power their systems with power generating sets which increases their cost of production which they eventually pass to us (the consumers of their services).

Despite all these hitches and setbacks mentioned above, this research work would have been a perfect work.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 THEORETICAL LITERATURE

2.1.1 Interest Rate Volatility and Investment Determination in Nigeria.

The variation of short-term and long-term interest rate is a prominent feature of the economic events such as changes in Federal Policy. Crises in domestic and international financial market in the prospects for long-term economic growth and inflation. However, economic event such as these, tends to be irregular (Keith 1996). There is a more regular volatility of interest rate associated with the business cycle. The expansions and contraction that the economy experience overtime. For instance, short- term interest rate rise in expansions and fall in recessions. Long-term interest rate do not appear to be the term cyclical volatility of interest rates which refers to the variability of interest rate over periods that correspond to the length of the typical business cycle.

The variation of interest rates affects decision about how to save and invest. Investors differ in their willingness to hold risky assets such as bonds and stocks. When the holding stocks and bonds are highly volatile, investors who rely on these assets to provide their consumption faces a relatively large chance of having low consumption at any give time. For example, before retirement, people receive a steady stream of income that helps to buffer the changes in wealth associated with changes in the returns of their investment portfolios. This steady return from working helps them maintain a relatively steady level of consumption.

After retirement, people no longer have steady portfolios stream incolme from working hence a less volatile investment portfolios is called for. The lower volatility of investment returns allows retiree to maintain a relatively even level of consumption overtime. Nigeria experienced severe macroeconomic problems towards the end of 1970s through the first half of 1980s when output declined substantially. The real GDP growth rate averaged only 1.5% per annum during the period 1973-1980 (registering negative growth rate in 6 years during the period) (CBN, 1990) In response of this deteriorating economic situation, the Nigeria authorities launched policy programmes contained in the Structural Adjustment Programme (SAP). Several forms of corrective measures were undertaken including financial sector reform policies.

Prior to 1986 in Nigeria, a common practice has been the support of certain economic projects considered to be essential part of development strategy. Government adopted policies aimed at accomplishing specified objective such as interest rate ceilings and selective sectoral policies. Those policies were introduced with the intension of directing credit, to priority sectors and securing in expensive funding for their activities. The ceiling on interest rates and quantity restrictions on loanable funds for certain sectors ensures that a larger share of funds is made available for favoured sectors. Such a practice hinders financial intermediation since the financial markets will only be accommodating the credit demands of the government plan ad ignoring risk. The practice has been disfavoured as a growth policy by the repressionist school led by Makinnoa (1973) and Shaw (1973).

According to the Mckinnon (1973) and Shaw (1973) financial repression paradym, governments effort to promote economic growth by such indiscriminate measure have repressed financial system. This discourages financial intermediation. Thus, the repressionist schools calls for financial liberalization the removal of ceiling on interest rates among others as a growth promoting policy. According to the removal of interest rates ceiling because the interest elasticity of private savings is positive.

The interest rate policy in Nigeria perhaps one of the most controversial of all financial policies. The reason for may not be fetched because interest rate policy has direct bearing on many other economic variables such as investment decision. Interest rates play a crucial role in the efficient allocation of resources aimed at facilitating growth and development of an economy and such as a demand management technique for achieving both internal and external balance.

According to Ocnenon (1973), interest rate policy is among the emerging issues in current economic policy in Nigeria in view of the role it is expected to play in the deregulated economy in inducing savings which can be channel to investment and thereby increasing employment, output and efficient financial resource utilization. Also, interest rates can have a substantial influence on the rate and pattern of economic growth by influencing on the volume and disposition of saving as well as the volume and productivity of investment (Leahy, 1993).

Rema (1990) investigated the theoretical and empirical determinant of private investment in developing countries and identified macroeconomic and institutional factors such as financial repression, foreign exchange shortage, lack of infrastructure and economic instability as important variables that explained private investment.

Chetty (2004) shown that the investment demand curve is always a backward bending function of the interest rate in a model with non-convex adjustment costs and the potential to learn. At low interest rates, an increase in the rate of return raises the cost of learning and increases aggregate investment by enlarging the set of firms for when the interest rate exceeds the rate of return to delay. An increase in interest rate is more likely to stimulate investment when the potential to learn is larger and in the short run rather than the long run. Akintoye and Olowolaju (2008) examined optimizing macroeconomic investment decision in Nigeria. The study employed both the ordinary least square and rector auto regression frame works to stimulate and project inter inter-temporary private response to its principal stocks namely: public investment, domestic credit and output stocks. The study found low interest rate to have constrained investment growth, the study the resolved that only government policies produce sustainable output, steady public investment and encourage domestic credit to the private sector will promote private investment.

Obanuyi (2009) studies the relationship between interest rate and economic growth in Nigeria. The study employed co integration and error correction

modeling techniques and revealed that lending rate has significant effect on economic growth, the study then postulated that investment friendly interest rate policies necessary for promoting economic growth needs to be formulated and properly implemented.

Aibu (2006), studied trends in the interest rates investment, GDP growth relationship, the study used two partial models to examine the impact of investment on GDP growth and the relationship between interest rate and investment in the case of the Romanian economy. The study found that the behavior of the national economy system and interest rate-investment relationship tend to converge to those demonstrated in the normal market economy. Oosterbanan (2009) examined the relationship between the annual economic growth rate and real rate of interest. The study employed the ordinary least square method of econometric analysis. The study revealed that the relationship between the real rate of interest and economic growth might be a inverted u-curve.

To date, Nigeria has pursued two-interest rate regime. 1960s to mid 1980s with the administration of low interest rates which was intended to encourage investment. However, the advent of the Structural Adjustment Programme (SAP) in the third quarter of 1986 ushered in an era when fixed and low interest rate regime, where rate were more influenced by market forces. Hence, the pursuit of the two interest rate regime in Nigeria provided a case study of the Keynesian

interest-rates investment relationship and Mckinnon (1973) and Shaw (1973) interest and investment hypotheses.

The gradual deregulation of the Nigeria economy between 1986 and 1992 affected these key economics variable interest rates and investment in the Nigeria context, interest rates, were extensively regulated prior to the adoption of SAP in 1986. But the economic rationale behind this control of interest rate and other elements of financial markets has been motivated by a variety of factors including the desire to influence the flow of credit to preferred sectors of the economy and the concern that market determined interest rate could result in serious imperfection in the market.

Moreover, the upsurge in real interest rate observed Worldwide in the early 1980s has raised wide spread concern about their possible detrimental economic affects. Therefore, in response to these concern, numerous studied were carried out to measured the effect of high interest rate on the key macroeconomic variables. Nevertheless, the concurrent increase in interest rate resulting from the deregulation seem to lay credence to Mcknnon (1973) and Slaw (1973) interest rate and investment hypotheses. The main threst of this study is to examined what happened to investment variation in interest rates and what is the relationship between short-term and long-term interest rate and investment in Nigeria. This is necessitated by the fact. What previous studies in this area never examined variations in interest rate and its effect on investment in Nigeria and the more reason that investment which is the demand for credit might have

impact on the determinant of interest rate and this study intends to examine the impact of investment on interest rate variation in Nigeria.

2. 1.2 INTEREST RATE AND CORPORATE FINANCE

There is no doubt a theoretical link exist between interest rates and the financial structure of firms. Interest rate operate through their influence on the cost of capital to the investors as well as a returns to various groups of savers. A change in the interest rate affects the debt-equity choice of a firm, the overall cost of capital and real interest rates, and thereby sets in motion a chain of responses influencing the desired level of the capital stock and consequent speed of adjustment of the actual capital stock to its desired level. The debt-equity ratio is important because the overall cost of capital to investors, which influences fixed investments, their efficiency and profits can be expressed as a weighted sum of the opportunity cost of bank debt and of equity, with the weight depending upon the debt equity ratio. Therefore, the multiple effects of changes in the cost of bank debt, on the overall cost of capital, depend among other things on the overall cost of capital, depend among other thing on the share of debt in investment financing and on the induced adjustment in this share and in the cost of equity. Further, the cost of equity is said a corporate a risk premium that first falls and then rises as the debt-equity ratio rises. The resulting U- shaped cost of capital has been proved to have far-reaching implications for the effectiveness of interest rate policy (Sundararajan, 1987).

In general, the desired debt-equity ratio will be positive related to the implicity interest subsidy on credit from the regulated financial markets. Therefore, the direct effects of interest rates on savings and investment can be reinforced or off set by the substantial indirect effects a rising from the optimal adjustments in the implicity interest subsidy, and hence induce a fall in the debt equity ratio. Other channels through which the interest rate influence the financial structure of firms include the nec-classical rentalwage ratio by which higher interest rate raise the relative price of capital and thereby encourage more intensive use of capital and capital labour substitution.

Another is the project evaluation mechanism by which higher real interest rate may improve the quality and efficiency of bank credit retaining, thereby weeding out projects that were profitable only with lower interest rate and encouraging those with higher yields. The financial depending that directly influences factor productivity through higher real rates of interest is another channel, and finally, there is the portfolio choice that diverts savings from low-yielding self-financed assets, through higher yields (Mckinnon, 1973, Shaw 1973) Try, 1982, Sundararajan 1987). From all indications however, the link between the interest rates and corporate capital structure as well as the pattern of influence of corporate financing strategies on the effectiveness of interest rate policies, warrant attention because of its, for resource mobilization, production and growth.

2.1.3 VOLATILITY'S IMPACT ON MARKET RETURNS

Many investors realize that the stock market is a volatile place to invest their money. The daily quarterly and annual moves can be dramatic, but it is this volatility that also generates the market returns investors experience.

Volatility is a measure of dispersion around the means or average return of a security. One way to measure volatility is by using the standard deviation, which tells you how tightly the price of a stock is grouped around the means or moving average (MA). When the prices are tightly bunched together, the standard deviation is small. When the price spread apart, you have a relatively large standard deviation.

For securities, the higher the standard deviation, the greater the dispersion of returns and the higher the risk associated with the investment. As described by modern portfolio theory (MPT), volatility creates risk that is associated with the degree of dispersion of returns around the average. In other words, the greater the chance of a lower than expected return, the riskier the investment. (For more insight, real modern portfolio theory: why it is still hip and find the highest return with the sharp ratio.

Another way to measure volatility is to take the range of each period, from the low price valve to the high price valve. The range is then expressed as a percentage of the beginning of the period. Larger movements in price creating a higher price range result in higher volatility lower price ranges result in lower volatility with average true range).

2.1.4 MARKET PERFORMANCE AND VOLATILITY

There is a strong relationship between volatility and market performance. Volatility tends to decline as the stock market rises and increase as the stock market falls. When volatility increase, risk increase and returns decrease. Risk is represented by the dispersion of returns around the means the greater the dispersion of returns around the means, the larger the drop in the compound return.

In a 2011 report, Crestmont Research examined the historical relationship between stock market performance and the volatility of the market. For this analysis Crestmont used the average range for each day to measure the volatility of the standard and poor (S&P 500) index. Their research tells us that higher volatility corresponds to a higher probability of a declining market. Lower volatility corresponds to a higher probability of a rising market.

For example, as shown in the average daily range in the S&P 500 index is low (the first quartile 0 to 1%) the odds are high (about 70% monthly and 91% annually) that investor will enjoy gain of 1.5% monthly and 14.5% annually.

When the average daily range moves up to the fourth quartile (1.9 to 5%), there is a probability of a 0.8% loss for the month and a 5.1% loss for the year. The effects of volatility and risk are consistent across the spectrum.

This research shows that we need to be aware of the volatility in the market if we hope to adjust our portfolio as it changes.

2.1.5 FACTORS THAT AFFECT VOLATILITY

Region and country economic factor such as factor and interest rate policy, contribute to the directional changes of the market and thus volatility. For example in many countries, the central bank sets the short-term interest rates for overnight borrowing by banks. When they change the overnight rate can cause stock markets to react, sometimes violently.

Changes in inflation trends influence the long term stock market trends and volatility. Expanding price-earning ration (PIE ratio) tend to correspond to economic periods when inflation is either falling or is low and stable. This is when markets experience low volatility as they trend higher, on the other hands, period of falling PIE ratios tend to relate to rising or higher inflation periods when prices are more unstable. This tends to cause the stock markets to decline and decline and experience higher volatility.

Industry and sector factor can also caused increased stock market volatility. For example, in the oil sector, a major weather storm in an important producing area can cause price of oil to jump up. As a result, the price of oil-related stocks will suit some benefit from the higher price of oil, other will be hent. This increase volatility affects overall markets as well as individual stock.

Assessing current volatility in the market.

Using crestmont's research, investors can use their understanding of the longer term volatility of the stock market to align their portfolios with the expected returns. But, how do we know if the market is experiencing higher volatility?

One way is to use the (BCE volatility index (vix). The vix measures the implied volatility (iv) in the prices of a basket of pin and can opinion on the S&P 500 index. The vix is used as a tool to measure investor risk. A higher reading on the vix makes periods of higher stock market bottoms. Low readings on the vix market periods of lower volatility. The periods of low volatility may last several years and are not a good, for identifying market tops. The vix is intended to be forward looking, measuring the market is expected volatility over the next 30 days.

As a general trend, when the vix rises the S&P 500 drops. When the vix is at a high, the S&P 500 is at a low which may be a good time to buy. However, if the vix is high, there is a concern that the market is going continue to go down. This fear makes it difficult method of econometric analysis. The study revealed that the relationship. The fear makes it difficult to buy during high stock market volatility. But, investor who used the high on the vix to time their buy entered the market at or new the low volatility works well to help identify market bottoms based on high volatility. For long-term investors, it also does a pretty good job of helping to identify that the stock market is at or near a top, when volatility is very low, keep in mind that this indicator is not intended to time the exact top. But rather that the volatility of the market does not stay substantially below the mean for a long period of time. As the volatility increase, then the market performance will tend to decrease.

2.1.6 THE CYCLICAL VOLATILITY OF INTEREST RATES

The variability short-term and long-term interest rate is a prominent feature of the economy. Interest rates change in response to a variety of economic events, such as changes in federal policy, crises in domestic and international financial markets, and changes in the prospects for long term economics growth and inflation. However, economic events such as these tend to be irregular. There is a more regular variability of interest rate associated with the business cycle, the expansions and contractions that the economy experience overtime. For example, short-term interest rate rise in expansions and fall in recessions. Long term interest rate do not appear to co-vary much with the level of economic output.

The term cyclical volatility of interest rate refers to the variability of interest rate over periods that correspond to the length of the typical business cycle. In this article, we will example some facts and theory about the cyclical volatility of short-term and long-term interest rate. Why should we care about interest rate volatility? How do short term and long time interest rate behave over the business cycle! What determines the cyclical volatility of interest rate associated with different maturities of government bonds? These questions are important to ask and answer as we seek a fuller understanding of the dynamic of the business cycle in market economic.

2.1.7 WHY DOES INTEREST RATE VOLATILITY MATTER?

The variability of interest rates affects decision about how to save and invest. Investors differ in their willingness to hold risky assets such as stocks and bound. When the returns to holding stocks and bonds are highly volatile, investors who rely on these assets to provide for their consumption face a relatively large chance of having low consumption at any given time. For example, before retirement, people receive a steady stream of income that helps to buffer the changes in wealth associated with changes in the returns on their investment portfolios.

This steady return from working helps than maintain a relatively steady level of consumption. After retirement, people no longer have steady stream of income from working (though it will in part, be replaced by pension income and social security). So a less volatile investment portfolio is called for the lower volatility of investment returns allows return to maintain a relatively even level of consumption overtime, young investors, who are saving for retirement, are better able to absorb the risk of holding assets with highly volatile price and returns. They can weight than portfolio more heavily toward risky stocks and bonds because they are recurring a steady return from working. For holding these risk or assets, the young investor will be rewarded with a higher average return on their investment.

Just as individuals care about managing risk in their investment portfolios, so do firms. To manage risk, firm must pay attention to interest rate volatility and the

composition of their portfolios. Many business firms hold portfolios containing large numbers of assets and, thus are interested in qualifying the risk of losing large sum of money. As risk in the economy change, the expected gain and losses from the investment portfolio change. Measuring the risk involves knowing how volatile prices of return on assets change together overtime. The volatility of interest rates is likely to be an important component in quantifying risk and guiding the investment decisions of these institutions. Interest rate volatility also has implications for how the prices of certain types of assets are determined. Options are assets that give investors the right, but not the obligation, to buy (call options) or sell (put options) other assets (such as stocks or bonds) at a perspecified time in the future. For options purchased on interest bearing securities, modern finance theory demonstrates that the option price depends on the volatility of returns on the underlying asset. The volatility of interest rates in related to the volatility of returns on these assets.

Thus, interest rates and their volatility have important implications for how both individuals and firms make investment decisions. These investment decision are part of the process whereby resources are allocated in the economy. To begin, we will briefly discuss how bond prices, interest rates and maturities bonds are related and how interest rates can determined from bond prices.

2.1.8 INTEREST RATES, BOND PRICES, AND THE TERM STRUCTURE

There is a very close connection between bond prices and interest rates. We will focus on interest rate calculated from prices of traded US government securities

and show how the interest rate on a particularly simple type of security can be derived solely from it price. We focus on yields derived solely from it price. We focus on yields derived from US government securities because these assets are backed by the full faith and credit of the government and, therefore, have virtually no default risk.

The US government issues securities of many different maturities: the maturity is the length of time until the final payment on the security is made by the issuer. Treasury bonds are fixed coupon security with initial maturities of more than 10 years. Treasurers note are fixed coupon securities with initial maturities of the year or less.

If we know a bonds current price and payments that the bondholder will receive over the course of the bond's life. We can calculated the implied interest rate on the bond. This interest rate called yield-to-maturity, equates the current price of the bond to the present valve of the bond's payment stream. The relationship between the maturity of bonds and the interest rate implied by bond prices is called the term structure of interest rates. A plot of the relationship between interest rates on short-term. Bonds are lower than interest rates on long-term. Bonds as shown for the third quarter 1989. The shape of the typical yield curve shows that interest rates often vary with maturity. We might also suspect that the volatility of interest rates varies with maturity. But before we turn to how volatility is measured and how volatility is related to maturity. It's clarify the relationship between interest rates and the price of particularly simple type of bond. Interest rates and bond prices. Interest rates on certain types of bonds can be derived

solely from the bonds price and maturity. Let's look at a particular type of bond called a discount, or zero. Coupon bond. A discount bond sells at a discount from its face valve and makes no interest payments over its life time. When the bond matures, the bondholder received the bond's face valve. For example, a one-year treasury bill with a face valve of $10,000 is a discount bond that promises to pay the holder &10,000 in one year's time. Such a bond may sell for a current price of $9434, in which case the implied interest rate on the bond is 6 percent ($10,000-$9434) $9434 = 06) clearly, as the current price of the bond changes, the implied interest rate will change. For example suppose the current price of the bond falls to $9009. The implied interest rate on the bond is 11 percent C$i0,0000-9009) 1 $9009=11).

So as the price of the bond falls, the interest rate rises, as the price of the bond falls, the interest rate falls. The US Treasury does not issue discount bonds with maturities greater than one year. However, financial market participants create pure discount bonds from long-term, coupon-paying treasure bonds by "stripping" the coupon (semi annual interest) payments from the principal payments and selling the components as separate discount securities. In February 1985, the treasury announced the STRIPS (Separate Trading of Registered Interest and Principal of Securities) program, which facilitated the "stripping" of long term treasury bonds. Under the Strips program, all newly issued treasury bonds and notes with maturities of 10 years of publications such as the wall Street journal.

Since there is a clearly defined relationship between interest rates and prices for discount bonds we need to refer to only one of those elements, not both. When we consider discount bond prices, we can easily derive the implied interest rates. Similarly, when we talk about the volatility of discount bond prices, we will easily be able to make inferences about the volatility of interest.

Trends and cycles in interest rates: we can plot the interest rate on discount bonds with a 10 year maturity from 1959 to the early 1980s, after which it generally declined.

We can discern two types of variability in interest rate and hence in discount bond prices.

Long term and short-term, long term variability refers to broad trends in interest rates, such as the upward trend until the early 1980s and the downward trend since then. Short term variability refers to how interest rates, we would like to remove that part of interest rate volatility associated with swings of longer duration than the typical business cycle.

The National Bureau of Economic Research defined minor cycles as recurrent fluctuations lasting from two or four years and major cycles as recurrent lasting about eight years. The long-term trends in interest rates that are of greater duration than typical business-cycle lengths. This long term trend is chosen in such a way that it removes the swings in interest rates associated with periods longer than about eight years. The remaining short term variability than

corresponds more closely to variability that is part of the business-cycle movement in interest rate. We will define the difference between the actual interest rate and the long-run trend as the cyclical component of the interest rate. The long swings in interest rates have been taken out, and all the variability in interest rate is around zero because of the long term trend.

2.1.9 MEASURING THE VOLATILITY OF INTEREST RATES

We will measure interest rate volatility using a statistic called the standard deviation. The standard deviation. The standard deviation measure how dispersed a variable is around its average valve, If the standard deviation is high, observations on a variable tend to be for away from the variable tend to be clustered around the average valve. Therefore, as the standard deviation increases, there is a greater chance that will see large changes in the valve of the variables.

The volatility of interest rates can be calculated over the entire term structure of interest rate; we supply use of historical data to calculate the standard deviation of interest rates for each maturity. In describing the cyclical volatility of interest rate, we would like to know not just how much interest rates ray but also how they vary with the state of the economy. During recessions, real output is declining; during expansion, its rising. We can get an idea of the behavior of interest rate over the business cycle by evaluating how interest rates aid the level of real output-co-vary over the business cycle. The correlation coefficient is a measure of the strength of the co-variation between two variables, and it can

take on valves between minus one and one when the correlation coefficient between two variables track each other closely and move in the same direction; when one variable is high, the other variable is very likely to be high. If the correlation coefficient is negative and close to one, the two variable track each other close but move in opposite direction: when one variables is high, the other is likely to be low. When the correlation coefficient is zero, the two variable do not track each other closely in either duration. Maturity, the contemporaneous correlation is negative, though quite small. This implies that there is little co-variation between the cyclical movements in current real output and the cyclical movements in current real output and the cyclical movements in current real output and the cyclical movements in long-term interest rates. These facts can be expressed by saying that short- term interest rates are procyclincal and long-term interest rates are cyclical. The result in table 2 suggest significant business cycle using the data in table 2. We have seen that short-term interest rates tend to move up when output moves up but that the correlation tends to decline as the maturity of the bond increases. Thus, when current output rises, the yield-curve tends to flatten, since short term interest rates tend to rise and long term

Interests rare move relatively little. Similarly, when current output declines, the yield curve tends to steepen, since short term interest rates tend to fall with output and long term interest rates tend to remain about the same.

We have seen how the volatility of interest rates changes with maturity and how interest rates move in relation to real rates on bonds of different maturity lets take

the case of the interest rates on a secondary with one quarter maturity. We see that the one quarter interest rate is most highly correlated with the interest rate on a bond with two-quarter maturity, and that the correction declines, though remains strong, as we compare bonds with increasingly different maturities. These current to shift up and down, while allowing for the possibility that the shape of the yield curve can change.

Finally, if we re-examine figure 3, we might suspect that the measured volatility of interest rates depends on the period we're look t. Since the late 1970s, long-term interest rate appear to have shown more short—run variability, and the deviations of the interest rate on 10-year bonds from the trend live have been large and persistent (Sill 1994).

In fact, the results in table 4 show that interest rates at all maturities may have been more variable since that time. The table shows the standard deviation of interest rates using the same data, but the sample is divided into two sub samples: from first quarter 1959 to first quarter 1979 and from second quarter 1979 to first quarter 1990. We see that iterest rates at all maturities have been more volatile since 1979. This result suggests the possibility that some structural change in the economy has affected the variability of interest rates and bond prices.

2.10 WHAT DETERMINES INTEREST RATE VOLATILITY

The post war data imply that prices of long term discount bonds are more variable than those of short term discount bonds and that long term interest

rates, measured by yield-to-maturity, are less volatile than short term rate. In addition, we find that short-term interest rate are procyclical, while lay-term interest rates vary little with current output. What economic factors influence interest rate variability? If we can isolate some economic determinants of the levels of interest rates, and bond prices, we will b e well on our way to funding determinants of this variability.

DETERMINATION OF SHORT-TERM ENTERPRISES: A standard economic model will help us think about how the interest rate on short term discount bonds is determined. Let's consider the case of a discount bond that will pay off $100 with certainty in one year. Suppose a prospective bond buyer expects her real income over the coming year to be higher than usual (real income refers to income adjusted for any change in the general level of prices over time). In that case, she has less of an incentive to increase her savings by purchasing a bond today. In fact, she may well decide to borrow against some of her expected increase in income. If all prospective bond purchasers expected high real income over the coming year, demand for current one-year bonds will fall, and their prices will fall as well, which means that the one year interest rate will rise. On the other hand, investor may decide to hedge against the risk of lower future income by purchasing bonds today that provide a guaranteed future pay off. If current real output (can thus aggregate real income) is low, investors may expect future output to be low, because there is some persistence to output movements. Hence a downward movement in current output is consistent with a downward movement in current short-term interest rates if people expect output and income

in the near future to be low as well. This theory is consistent with procyclical movement in short-term interest rate.

The yield curve tends to flatten when output is high and tends to steepen when output is low. Suppose we are currently in a boom, but people expect recession in one year. Investors may buy one year bonds to hedge the risk of low future income, and they may pay for these bonds, in part by cashing in their shorter-term assets. This portfolio reallocation tends to lower one- year interest rate and raise shorter-term interest rates, this leading to a flatter yield curve. Empirical studies have found that the shape of the yield curve does help predict recessions and expansions.

Expected inflation is also a determinant of interest rates. Consider against case of a discount bond that pays $100 with certainty in one year. Suppose now that prospective bond purchasers expect inflation to rise over the coming year. When inflation rises, the curved price of one year bonds will fall because investors realize that their dollars buy less when prices rise. For example, if the price of a cup of coffee one year from now is $1, bond holders can buy low cups of coffee with the $100 that the bond pays off. But if the price of a cup of coffee is expected to rise to $1.05, bond holders will be able to buy only 95 cups of coffee. To be compensated for the loss in

Purchasing power, investors must get a higher dollar return on their investments. Thus, bond prices will fail and interest rates will rise when expected inflation rises (Harvey 1993).

This model suggests that when expected income or expected inflation rises, bonds prices will fail. This fall in bond prices translates into higher interest rates. So, when we think about how short term interest rates are determined, we want to think about people's forecast for real income growth and inflation. Any current economic variables that helps to predict real income growth and inflation will help to determine current short time bond prices and interest rates.

DETERMINATION OF LONG TERM INTEREST RATES: Long term interest rates can be linked to short term interest rate by the expectation theory of the term structure. This theory says that long term interest rates are equal to an average of expected short-term interest rates plus a risk premium. The risk premium accounts for the co-variation over time of variable like income growth and inflation that could influence the level of interest rates.

The logic of the expectation theory of bond prices is most clearly seen in an example in which we ignore the risk premium. Take the case of an investor who has a two year investment horizon. The investor can purchase two year bond, or he can purchase a one-year bond today and, when that bon mature, purchase another one year bond. The expected return on there alternative investment strategies should be equal. Since there is a direct relationship between interest rates on bonds and bond prices, the expectations theory also links long-term discount bond prices to expected short-term discount bond prices over the life of the long term bond.

In terms of expected future short term bond prices, the same variables that affect short term bond prices basically determine long term bond prices and interest. Thus, expected future income growth and expected inflation are also determinants of long term bond prices, but now the forecasts of income growth and inflation are for further in the future it is till the case that if over the life of the bond, expected future incorQe growth or expected future inflation rises, long term interest rates will rise. Including a risk premium does not alter these basic conclusions about the determinants of interest rates. However, the risk premium can be an additional source of variability for interest rates because it picks up some induced effects of income growth and inflation on interest rates as well as other risk factors, (chatterjee (1995).

This model helps us think about why long-term interest rates co-vay less with current output than do short-term interest rates. Current movements in real output are much more closely current movements in reI output are much more closely corrected with output movements in the near future than they are output movements in the far future. Since the payment steam on a long term bon extends further out into the further than that on short term bond, long-term interest rates are less likely to have a strong covariation with current output movements. Determinants of interest rates and the prices o bonds also determine the volatilities of interest rates and bond prices. This economic model suggests that expected real income growth and expected real income growth and expected inflation determine bond prices and interest rates. If follows that the

volatility of expected real income growth and the volatility of expected inflation, as well as the correlation between the two, determine the volatility of interest rates and bond prices.

The reasoning behind this conclusion is straight forward. Take the case of real income growth. We saw above that if real income growth is expected to be high, current bond prices will fall and interest rates will rise, the higher real income growth is expected to be, the higher interest rates will be. This large changes is expected real income growth are associated with large changes in interest rate. When real income growth has high volatility, large changes in real income growth occur more frequently, and hence large changes in current bond prices and interest rates occur ore frequently. When large change in interest rates occur more often, interest rates are more volatile. Similar reasoning holds for the case of inflation. When large changes in expected inflation occurs laye, changes in current bond prices and interest rates occur also. So, more volatile inflation translates into more volatile bond prices and interest rates (Sill 1994).

What determines how volatile income growth and inflation will be? One factor is monetary policy. Take the case of monetary policy and inflation. Economists generally believe that a persistent inflation has its root causes in monetary policy, in particular, how fast the money supply grows relative or real income growth. If growth of the money supply is excessive, inflation, highly volatile growth in the money supply can lead to volatile inflation. This does not mean that every

change in the money supply necessarily leads to a change in inflation: Rather, if on average, money supply growth becomes more volatile, inflation can become more volatile as well. As we have seen, the model than suggests that bond prices and interest rate will also be more volatile. King et al (1993).

Monetary policy could also have an effect on real income, although economists disagree on the mechanism by which this occurs. One theory is that workers write contracts with their employers that fix a nominal wage rate over the contract period. Workers and firms negotiate the contracted wage based, in part, on their expectations of what inflation will be over the contract period. Since monetary policy affects inflation, this requires workers and firms to forecast what monetary policy will be over this same period. If monetary policy and the price level turn out to be different from what workers and firms expected. When they wrote the contract employment and output could be affected because firm's demand for workers depends on the real wage rate that must be paid. If nominal wages are fixed by a contract and prices rise unexpectedly, read wages fall, and firms demand more workers and produce more output. If prices fall unexpectedly, real wages rise, firms layoff workers and output falls. Thus, variability of the money supply, through its impact on prices, could have an impact on the variability of real income.

Economic models and interest Rate volatile: This economic model for determining bond prices and interest rates suggests that investors expectations of future real income growth and inflation are the primary determinates of current

bond prices and interest rates. There are, of course, other determinates of interest rates and interest rate volatility in the economy. But we can try to asses how well this view of interest rate determination explains the interest rate volatility that we observe in the actual economy.

One approach to assessing how well a model performs is to use the model to simulate interest rates and then compare the properties of the simulated interest rates to the properties of actual interest rates. For example, we can set up models and use them to simulate price data on discount bonds for various maturities. We can then calculate the standard deviation of these simulated data and compare it to the standard deviation of deviation of discount bond prices implied from the interest rate we observe in the economy. We can also examine how the simulated bond prices and interest rates co-ray with simulated output and compare the correlations to the correlations we find in the actual data. In this way, we can access the ability of the model to account for the cycled volatility of interest rates.

A lot of researchers and authors have studied investment decision in different research in sure.

2.2 EMPIRICAL LITERATURE

A lot of researchers and authors have studied investment decision in their different research in some countries. Attention has been focused on the stable long-run relationship between real money balances and economic activity, inflation and some measure of the opportunity cost of holding money Amadi,

C.W. (2000) Millar (1991). Hater and Jansen (1991) have investigated the long-rum properties of investment functions for the development countries under the assumption that there is an equilibrium relationship between real interest balances and some macroeconomic variable that explains it.

Unlike the development economic, studies on the interest rate function for developed countries are lacking due to some institutional constrain are lacking due to some institutional constrain inherent in them. A notable exception is the work of Darrat (1986) on the interest rate or money demand for some major OPEC members. One of these countries is Nigeria. Empirical studies on the interest rate function in Nigeria dates back to Tomori (1972) which triggered a very lively debate on the subject (see Tomori (1972) and (1974) Ajayi (1974), Teriba (1974): Ojo (1974) and Odama (1974) for what is commonly referered to as the “TATOD Debate” on interest rate in Nigeria, the TATOO Debate went a long way in clarifying the issues involved in the econometric modeling of interest rate in Nigeria and gave some indications of the likely feature of the interest rate in Nigeria. Issues addressed in the debate included:

a) Choice of the most appropriate proxies for the variables of the interest rate model.

   (i) **Interest rate:** The choice of the most appropriate interest rate for use in the demand for money function was addressed by Tomori (1972), Ajayi (1974) and Teriba (1974), with Teriba insisting the empirical tests were necessary to determine which ones the wide variety of interest rates available were the most relevant opportunity

cost variable. His empirical test revealed that interest rate on time deposits, treasury bills. Long-term government bonds, and savings deposits in that order, were the important opportunity cost variables of the interest rate function.

(ii) **The role of Inflation:** Ojo (1974) argued for the use of inflation in place of interest rate on the grounds that the rudimentary nature of the Nigeria financial system made real, not financial assets, the close provided some empirical evidence in support of this assertion (Ojo, 1974).

b) The Question of Stability: All the contributors to the debate addressed stability of the interest rate relationship. Although these were largely discussed in terms of such statistical feature as size, signs and statistical significance of coefficients of key explanatory variable, notably income and interest rate model explanatory power, stability of the regression equation over the sample period (Ajayi, 1984) and outside the sample period (Odoma 1974).

c) Reliable estimates of model coefficients: All the contributors expressed concerns about statistically reliable estimates of the elasticity of the demand for money function.

d) Adjustment Mechanism: Dynamic adjustment mechanisms were investigated within the partial adjustment framework by Tomori (1974) who concluded that the speed of adjustment was fast; and Ajayi (1972) and

Teriba (1972) and Teriba (1974) both of whom concluded that the speed of adjustment was very slow.

e) Policy Relevance: Odoma (1974) and Tomori (1972) addressed the very important question of the policy relevance of the empirical interest rate model.

Judging from the scope of the debate and the rich conclusions that emerged from it, the debate is dearly a watershed in the history of monetary modeling in Nigeria. However, data institutional and methodological situation at the time the devote took place would make one to easily agree with assertion by Tomori (1974) that while “they have by their work provided us with important insights....their contributions, although quite constructive, cannot be regarded as definitive, more work still needs to be done in this area of study. This assertion also quite aptly suggested that the focus of future research works will be mainly to derive more definitive conclusions about the various in Nigeria that the debate brought to the fore as deserving of researcher’s attention.

2.2.1 The Investment Function

Although the estimation of investment function requires some discussion on the nature of interest rate and the factors that affect it, as examined for example by Laidler (1985). This section concentrates on those issues that are pertinent to less developed countries and Nigeria in particular.

In general interest for real cash balance (1)R is a function of real expected income (yc) they yield on physical and financial assets: the expected rate of

inflation (1e) are normally used to represent the yields on physical assets and financial assets respectively, thus the general interest rate function can be expressed above. Thus, the return on financial assets and the rate of inflation reflect the opportunity cost of holding money.

Unlike the developed economies, the financial markets outside the commercial banks are very rudimentary. Thus there is no suitable substitute for interest in the form of financial assets.

Furthermore, because the authorities in Nigeria usually control money supply and make changes in these rates very frequently, data for money demand certain to little variation over time to detect any empirical relationship between money holding and interest rates.

Secondly, basic economic issue is the appropriate definition of interest stock in the interest rate function. In this paper, the appropriate interest stock used is 12 currency plus interest deposit plus time and saving deposits. This choice is in keeping with the findings of Pairat (1986) based on its stability.

2.2.2 MONETARY POLICY IN NIGERIA: A REVIEW MONETARY POLICY, SINCE 1986

The Structural Adjustment Programme (SAP) was adopted in July 1986 against the cash in the international oil market and the resultant deteriorating economic conditions in the country. It was designed to achieve fiscal balance and balance of payment viability by altering and restricting the production and consumption

patterns of the economy, dominating price distortions, reducing the heaving dependence on crude oil exports and consumer goods inputs, enhancing the non-oil expert based achieving sustainable growth. Other aims were to rationalize the role of the public sector and accelerate the growth potential of the private sector. The main aim strategies of the programme were the deregulation of external trade and payment arrangement, the adoption of a market determined exchange rate for the Naira, substantial reduction in complex price and administrative controls and more reliance on market forces as a major determinant of economic activity.

The objective of monetary policy since 1986 have remained as in the earlier period the stimulation of output and employment, and the promotion of domestic and external stability. In line with the general philosophy of economic management under SAP, monetary policy was aimed at inducing the emergence of a market oriented financial system for effective mobilization of financial savings and efficient resource allocation. The main instrument of the market-based framework is the open market operations. This is complemented by reserve requirement and discount policy the adoption of a market based framework such as Omo in an economy that had been under direct control for longs required substantial improvement in the macroeconomic, legal and regulatory environment.

In order to improvement macroeconomic stability, efforts were directed at the management introduced to reduce liquidity in the system, these included the

reduction in the maximum ceiling on credit growth allowed for banks, the recall of the special deposits requirements against outstanding external payment arrears to CBN from banks, abolition of the use of foreign guarantees currency deposits as collateral for Naira loans; and the withdrawal of public sector deposit, from banks to the CBN. The use of stabilization securities for purposes of reducing the bulling size of excess liquidity in banks was re-introduced. Commercial bank's cash reserve requirements were increased in 2003, 2004, 2005 and 2006. The rising level of fiscal deficits was identified as a major sources of macroeconomic instability. Consequently government agreed not only to reduce the size of its deficits but also to synchronize fiscal and monetary policies.

In recognition of the fact that well capitalized banks would strengthen the banking system for effective monetary management, the monetary authority increased the minimum paid up capital of conical and mechanist banks. Minimum paid-up capital of merchant and commercial banks has been reduced to a minimum level of 500 million with effect from 1St January, 2003. All existing banks are to recapitalize by 31st December, 2004.

By way of inducing efficiency and encouraging a good measure of flexibility in banks, credit operations, the regulatory environment was also improved. Consequently, the sector-specific credit distributed targets were compressed into four sector in 2002, all mandatory credit allocation mechanisms were abolished by the authorities. The commercial and merchant bank were subjected to equal treatment since their operations were found to produce similar effects on the monetary process. Area of perceived disadvantaged to merchant bank were

harmonized in line with the need to create a conducive environment in their operations. In August, 2005. All controls on interest rate were removed. However, in 206, bank maximum lending rate were pegged at 21.0 percent, while a minimum of 13.5 percent was stipulated for interest rate controls.

However, control measures were reintroduced in 2002. But in October, 2003, the control on interest rates were abolished to give way to an era of deregulated interest rate regime.

2.3 LIMITATIONS OF THE PREVIOUS STUDIES

This section is centered on the review of empirical finding on related to this research work and Its limitations. A number of studies have been conducted on the impact of interest rate volatility on investment decision in Nigeria. Among these studies is the work done by EKWENEM (2005), interest rate and investment behavior in Nigeria. From the period 1976- 2006 Data used was gotten from secondary source i.e central bank statistical bulleting NDIC journal, Federal office of statistic. The study used time series data for the period 1980-1981. The proxy variable for inflation is the annual percentage change in the GDP deflation.

Hypothesis was tested to decide whether to accept the alternative otherwise reject null hypothesis or vice-versa. The researcher found out that the behavior for investment have no significant influence on interest rate and inflation rate.

The acceptance of full hypothesis implies that the investment have influence in interest rate.

In addition, researcher concluded that, the Nigeria financial market has developed beyond our current definition of m, at such the m2 does not capture all the development in the market.

This study cover the period location 1973-2006 which makes it different from the present work 1981-2010.

Also another work done by Okeke (2005) on econometric analysis of the impact of monetary policy on interest rate and investment from 1984- 2006) data from this work was collected from secondary data of money supply interest rate, investment exchange rate, GDP, inflation rate form (1975-2006). The source of data used in this research work of the interest rate (saving rate, investment, exchange rate, GDP and the inflation rate are the Central Bank of Nigeria statistical bulletin “Volume 17 December 2006 and National Bureau of Statistics (2000).

The econometric methodology adopted for this research is the ordinary least method (OLS) this is backed by a priority economic theory and relevant time series data, which span a period of 23 year from (1984-2006). The research used auto correlation test using Durbin Watson d-statistics to test the randomness of the residual. They was inconclusive evidence of positive auto correction in the regression result. He further tested for Hypotheses will be accepted (Hi)/rejected (H2). The researcher accepted the null hypotheses and concluded that there is no link between monetary policy and inter rate. (interest rate channel exist in Nigeria) and there is statistical relationship between interest rate and investment in Nigeria.

A multiple regression analysis was used to run, the ordinary least square (OLS) method. The econometric package that was used was the E-view 5.0 making it different from the present econometric package P.C. give 8.0 soft were package to run the ordinary least square (OLS) method that will be used for these present research work.

This work was investigated as an econometric Analysis of the impact of monetary policy on interest rate and investment from (1984-2006) making it different from the Presat work on the impact of interest rate volatility on investment decision in Nigeria. An econometric analysis from (198-2010).

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

In any empirical study, the study and procedures to be adopted by the researcher are all determined by the nature of the problem being investigated and the objective of the study. This chapter therefore describes the methodology of the research work.

The sources of data collected, procedures and method gathering data as well as techniques for testing the hypothesis. In other hands, the challenges posed in the study of impact of interest rate volatility on investment decision in Nigeria hinges on the ability to specify a reliable and dependable model to capture the relationship between the two variables and also ascertain other determinants and investment decision.

3.1 THE MODEL SPECIFICATION

Koutsoyians (1997), has it that model specification refers to the statement of maintain hypotheses.

An econometric investigation begins with the specification of the econometric model underlying the phenomenon of interest Gujarat: (2007).

Specification of a model generally is a function of the theoretical relationship between or among variables, the nature of study objectives and type of data Asogwa (2009) this has to do with expressing the model in mathematical and econometric from which would be used to explore the economic phenomenon. Apart from invest rates there are other macroeconomic variables, which would

affected investment. Keynes posited that investment is affected by interest rates and income (ADP). We would extend the Keynes model specification to-incorporate some other determinants of investment decision in Nigeria. We would include manufacturing capacity utilization Pate (MCUR) and exchange rate. It is worthy of note at this juncture that because paucity and death of requirement statistical data on investment, investment is provided by Gross Fixed Capital Formation (GFCF). The variables highlighted above are considered to be the core determinant of investment decisions in Nigeria. The specification of the functional form the model gives:

INV=FCADP, INTR, MKCUR, EXR

Where INV= Gross Domestic Product INTR= Interest Rate.

MCUR= Manufacturing Capacity Utilization Rate. EXR = Exchange Rate

F = Functional Relationship.

3.1.1 MATHEMATICAL SPECIFICATION OF THE MODEL

Mathematician would always believe that their model is deterministic, i.e. all the explanatory variables included in the model give a cool explanation of the courses of the change in the mathematical specification of our model yields.

$INV=B_o+B_1$, $GDP+B_2$ $INTR+B_3$ $MCUR+B_4$ $EXR+U_t$

3.1.2 ECCONOMETRIC SPECIFICATION OF THE MODEL

Econometricians assures a stochastic model that accounts for a random variable (UT) that can not be explained on the dependent variable. The random variable introduce take into account or captures other factors which affect investment model specification in its stochastic form yield:

$INV=B0+B_1$, GDP+B 2INR+B_3 MCUR+B_4 EXR+U_t

Where UT id the stochastic error term introduced of our variables, we take composition of some convenience of analysis. Our model then gives:

$INV=B_0+B_1ADP+B_2$ INTR+B_3 MCUR+B_4 EXR+U_t…… (4)

Where B_0=intercept term explaining investment when the explanatory variables are equal to zero. B_1 B_2 B_3 and B_4 are coefficients attached to the explanatory variables explaining their affects on the pendent variables.

3.2.2 METHOD OF EVALUATION

We will use three criteria to evaluate the results obtained from the regression analysis.

They are:

i. Evaluation based on economic criteria.

ii. ii. Evaluation based on statistical criteria.

iii. Evaluation based on econometric criteria.

i. Evaluation based on economic criteria (A PRIOR EXPECTATION)

This entails examining the economic meaning fullness of the model with regard to the expected signs of the parameters and their conformity/non-conformity to economic theory.

The intercept term (B0) i.e. expected to separate because investment would fall if the other factors affecting it equal to zero. B1 is expected to have a positive signs since increase in GDP would bring about an increase in investment. B2 is expected to have a negative signs since investment according to Keynes has an inverse relationship with interest rate. B3 being the coefficient of manufacturing capacity utilization is

expected to be positive because investment would increase if terms increase the rate at which they utilize their capacity. Finally, B4 is expected to have positive signs since exchange rate of today is partly dependent on the exchange rate yesterday.

ii. Evaluation based on statistical criteria (Fest Order Test)

a. The coefficient of determination (R2) the (R2) is summary measure that tells us has the sample regression line fits the data (Gujarat: 2007:83). It also known as goodness of fit. It tells us by what percentage the variation in the dependent variable is explained by the independent variable of the model.

b. The T-Test

The test is carried out to ascertain whether the individual variables are statistical significant or not is determine investment decisions.

c. The F-Test

This is used to test the overall statically significant of the variables.

iii. Evaluation Based on Econometric criteria:

a. Normally Test

This test is carried out to check whether the error term follows normal distributions. The normality adopted in the Jargue Bera (JB) statistic, which follows the Chi-Square distribution.

b. Autocorrelation Test.

This test is carried out to check whether the error corresponding to different observations re-uncorrelated. The test statistic adopted is the Durbin-b statistic.

c. Multicollinearity Test

This test is used to check their linear collinearity among the correlation coefficient between Paris of regressors. Using correlation matrix table.

d. Heteroscedasticety Test

This test is used to test whether the error term in the regression model have a common or constant variance. The white hetenoscedasticity test (with no cross term) is adopted.

e. Specification Error Test

This test is used to ascertain whether the estimated model is correctly specified or not. The Ramsey-Reset test is adopted.

3.3. JUSTIFICATION OF THE MODEL

The econometric modeling procedure adopted for this research is the ordinary least square (OLS) of the classical linear regression model (Gujarati 2007). It consists of best linear unbiased estimators making it recommendable for the study.

3.4 DATA REQUIRED AND SOURCES

Data used in this research work are obtained mainly from the secondary sources which include the NDIC Journals, the CBN Statistical bulletin and journals. The aim of this is to ascertain the effect of documented operational performance data of interest rate volatility on investment in Nigerian using econometric analysis.

3.5. The econometric software package for estimation Excel and P.C give 8.00 econometric packages will be used.

CHAPTER FOUR

The results of the ordinary last square method (OLS) for the model are presented below, the estimates of the regression models are subjected to statistical and econometrics tests.

4.1 Presentation of Regression Result

The result of the estimated models are presented in the table below:

Variable	Co-Efficient	Standard Error	t-valve	t-prob	Party py
Constant	-1.4076	5.8019	-0.243	0.8103	0.0023
GDP	0.097204	0.018366	5.293	0.0000	0.5284
INTR	-7264.6	18051	-0.402	0.6913	0.0064
MCUR	5632.8	9182.4	0.613	0.5451	0.0148
EXR	1444.6	2570.7	0.562	0.5792	0.0125

R^2= = 0.82123

F-Statistic = 28.11

Durbin Watson = 1.15

RSS = 4.994567084

The interpretation of the above result in terms of the coefficient is given as follows:

The intercept is = 1.4076, this shows that all explanatory variable are held constant, investment will be-1.4076. The coefficient of GDP is 0.09720 this indicate a positive relationship between GDP and investment and that a unit increase in the GDP will increase investment by 0.09720. Interest rate will also

has a negative coefficient-7264.6. This implies a negative relationship with investment and that a unit increase in interest rate will reduce investment by 72646units The coefficient of manufacturing capacity utilization rate has a positive relationship between MCUR with investment. It indicate that an appreciation in the MCUR will increase investment by 56328units. Exchange rate also has a positive coefficient .this indicate that a unit change in exchange rate will change investment by 1444.6units

4.2 Evaluation of Result

4.2 Evaluation Based on Economic Criteria

This test is carried out to ascertain/Evaluate if the parameters conform what the economic theory postulates. The prior test is summarized in the table below.

Variable	**Expected sign**	**Obtained signs**	**Conclusion**
GDP	Positive(+)	Positive(+)	Conforms
TNTR	Negative (-)	Negative (-)	Conforms
MCUR	Positive (+)	Positive (+)	Conforms
EXR	Positive (+)	Positive (fl-)	Conforms

4.2.2 Evaluation Based on statistical criteria the R-squared

The R2 form the regression result is 0.82123 this means that the explanatory available explain the variation in investment to be 82% in other words 82% of the variation in investment is explainable by the independent variables in the models.

THE T-TEST

The T-test is employed to test the individual significance of the explanatory variables. The test is carried out under the following hypothesis.

H° = Null hypothesis

H^1 = Alternative hypothesis

DECISION RULE

Reject H° if Tcal > (T tab) or accept if otherwise. n = number of observation

k = number of parameters

From the t distribution of two-tail test for 25 observation and four (4) variables (n-k) = 25-4 = 21 degree of freedom (df) the table valve 28.711 = ± 0.208

Variable	**t-computed**	l **t-tab**	**Decision**	**Conclusion**
Constant	-0.243	± 0.208	t°cal< t tab	Not significant
GDP	5.2933	±0.208	t°cal>ttab	Significant
INTR	-0.402	± 0.208	t°cal< t tab	Not significant
MCUR	0.613	± 0.208	t°cal< t tab	Not significant
EXR	0.562	± 0.208	t°cal< t tab	Not significant

THE -F-TEST

The F-test is used to test the overall significant of the model. It follows F-distribution with k-freedom in the number and n-k degree of freedom in the denominator.

$$F= R^2/k-1$$

$$(1-R^2)/n-k$$

Decision Rule is reject H0 if F* cal > F(tab) or to accept HO if F* cal < F(tab): the calculated F-statistics as shown in the table is 28.711 which is greater than the crucial F of 2.84. From the Decision Rule we reject H0 and accept H1. Thus, this implies that the impact of all.the independent variables are significantly different from zero (0).

4.4 ECONOMETRIC TEST OR SECOND ORDER TEST

TEST FOR AUTOCORR ELATION

From the Durbin Watson table, we found DL (lower limit) to be 1.038 and the Du (the upper limit) to be 1.767, then the Durbin Watson calculated is 0.0258, comparing the upper limit and Durbin Watson statistics, thus the range o<d<dl. we reject the null hypothesis of positive autocorrelation and conclude that there is positive auto correlation.

TEST FOR HETERSDASTICITY

Hetersdasticity has never been a reason to throw out an otherwise good model. But it showed not to be ignored either (Mankw na, 1990). This test is carried out using White's general hetersdasticity test (with cross term).

The test asymmetrically follows a chi-square distribution with degree of freedom equal to the number of regression (excluding the constant term) the auxiliary model can be stated as $B_0 + B_1$ GDP + B_2 INTR + B_3 MCUR + B_4 EXR+V_1

Where Vi = pure white noise error

This model Vi = pure white noise error

This model is run as auxiliary R^2 as we obtain

THE HYPOTHESIS TO BE TESTED

$H_0 = B_1 = B_2 = B_3 = B_4 = 0$(Homoscendasticity)

$H_1 = B_1 = B_2 = B_3 = B_4 = 0$ (Heterscendasticity)

Note: The sample size (n) multiply by R2 obtained from the auxiliary regression assymptically follows the Chi-square distribution with degree of freedom equal to the number of regressions (excluding constant term) in the auxiliary regression using the P.C give 8.00 software package it saves as the above calculating the chi-square valve.

Decision Rule

Reject H_0 if X^2 cal > X^2 tab at 5% level of significant but otherwise accept H0, from the obtained result X^2 cal = 13.833 while X^2 table = 26.564 since X^2 cal > X^2 tab we accept the Heteroskedasticity.

NORMALITY TEST FOR RESIDUAL

The JB test of normality is an a symptotic or large sample test and it is based on the OLS residuals the test computes the skewness and excess kurtosis. The null hypothesis for the test

H0:b_1=0

(The error term follows a normal distribution) against the alternative H_1:

$b_1 = 0$ (The error term does not follow a normal distribution.) This means that if the error term follows a normal distribution at 5% level of significant under 2 degree of freedom less than critical JB we accept the H0 and reject H1 but if otherwise we reject H_0 and accept H_1.

From the table critical JB = 14.576 while critical J.B under two (2) degree of freedom 5.991

14.576 > 5.991 at 5% level of significant we reject Ho and conclude that the error term is not normally distributed.

TEST FOR MULTICOLLNEARITY

is used to check the linear collinearity among the explanatory variables used in the model, the test was carried out using correlation matrix according to Barry and Feldman (1985) criteria, multicollnearily is not a problem if no correlation exceeds “O.80”.

	GDP	**INV**	**INTR**	**MCUR**	**EXR**	**REMARK**
GDP	1.000					-
INV	0.9016	1.000				M
INTR	0.09428	0.03795.	1.000			M, NM,
MCUR	0.5023	0.5177	-0.2733	1.000		NM, NM, NM,
EXR	0.8151	0.7609	02186	0.4478	1.000	M,NM, NM, NM

From the table above shows that INV and GDP correlated and INTR AND

GDP correlated

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATION

5.1 Summary

This study has revealed in detail the varying impact of interest rate volatility on investment decision in Nigeria. An Econometric Analysis between the period 1981-2010. The macro economic variables used were GDP, INTR, MCUR, and EXR.

This is in line with the important role' of investment in the efficient operation of the deregulated economy; investment is mainly determined by the availability saving level of output expected.

The Nigeria economy witnessed such financial repression on the early 1980s there were rigid exchange and interest rate controls resulting on lower direct investment. Funds were inadequate as there was a general problem in the economy.

Monetary and credit aggregate moved rather sluggishly, consequently, there was a persistent pressure on the financial sector, which in turn necessitated a liberalization of the financial system. In response to those developments, the government deregulated interest rate in 1987 as part of the Structural Adjustment Programme (SAP) policy package. The government in January 1994 out rightly introduced some measures of regulation into interest rate management.

The regression analysis through the least square (OLS), used 30 observation with a model which show that interest rate has a negative relationship with investment.

From above chapter the importance of investment cannot be over emphasized. It also showed that in a developing nation like Nigeria, savings encourage investment.

5.2 CONCLUSION

These research work shovs that savings showed be encourage by reducing interest rate which will ultimately lead to an increase in saving and hence increase investment.

It has been showed through this research work that interest rate could be used to mobilize financial savings into productive investment.

Finally, the anticipated increased relationship between interest rate and investment was not established by this study and hence in order to facilitate increase investment in the Nigeria economy saving should encourage through the increase interest rate.

5.3 RECOMMENDATIONS

Our objective in the study is to estimate the impact of interest rate volatility in investment decision. An econometric analysis between the period 181-2010.

To give suggestion as how to manage successfully the public sector for an optimum investment in the country. Also to proper suggestion for sound interest rate management that will make for an optimum investment climate in Nigeria. This is because economic growth and development came from investment, in the light of the researcher's finding. The recommendations are:

1. Government should massively embark on large-scale agricultural, manufacturing, industrialization etc and equally encourage Small and Medium Scale Enterprises (SMEs). PUBLIC Private Partnership (PPP) should also be encourage by government for efficient and production. These would go a long a way to relieve our country which has been living solely on crude petroleum.
2. Monetary authorities should make policies which would help to boost the saving culture of the people. This could be done by increasing the deposit rate which would lure the people to deposit their money in banks thereby increasing the supply of loanable funds. This would lead to a fall in interest rate and eventually rise in investment.
3. The CBN should be autonomous from the control of the government. In this way, the CBN can establish open market operation omo for government borrowing. This will not only limit government expenditure to their revenue but will help to stabilize the investment rate according to the dedicate of the free market by this the traditional relationship between interest rate and public investment will be restored.

4. The policy market should embark on a policy that will reduce interest rate as will stimulate investment and increate output, proper implementation and co-ordination of policy objective should be rigorously pursed implementation of policy is usually multidimensional and hence calls for effective co-ordination among the various government department, banks and other relevant sectors.

Since savings encourage investment and income lead to savings, the researcher therefore recommend programme or polices by government that will facilitate increased income level of under developed citizen order to ensure sufficient serving that bring about high rate of investment which will eventually lead to economic growth and development.

BIBLIOGRAPHY

Abolo, M. L.. (1993) *Economic Growth and Macro Economic Adjustment in Nigeria.* A research Proposal Presented at AERC Workshop, Nairobi.

Afolabi, J.A. (2003) *Determinants of Interest rate spread in Nigeria*: An Empirical Investigation NDU Quarterly.

A Koutsoyiannis. T*heory of Econometrics:* an Introductory exposition of Economic method Second edition.

Asogwa Fredrick O. (2009) Fundamentals of research methodology.

Asante, Y. (1993), Determinants of Investment behaviour in Ghana, report to the AERC Workshop, Nairobi..

Anyanwu, A. (1995). *Macroeconomics, policy modeling of Africa Economic.* Lagos: Acera Publisher.

Baird, W.C. (1973). *Macroeconomics. An Introduction of monetary search and income theories*. Science research associates, USA.

Cole, A. and Obstraid, S. (2995). *The International Economy*. London: me Craw hill inc.

Oguonu, C.N. and E.E Anugunom (2006) *Research Methods in Social Sciences.*

Omole, A. And Falokun, G. (1999). *The impact of interest rate liberalization on the corporate financing strategies of quoted companies in Nigeria.* AERC.

Soludo, C.C (1998). *Macroeconomics*. *Policy modeling of African Economic.* Lagos: Acera Publisher.

Sleka, P. (2004) *Macroeconomics. Theory and practice*. Lagos: CBN Publication.

Robert, J.C. (1998). *International economics United States.* Little. Brawn and Company Inc. Analysis.

Chaptterfee, Satyaj .T. (1995). *Productivity and the America Business Cycle*, Federal reserve bank of Philadelphia

Harvey, Campbell, (1993). Term Structure forecast Economic Growth. Financial Analysts Journal.

Kiy Robrt G, and Sergio T Rebelo. (1993). I on Frequency *filtering and real business cycles*. Economic Dynamic and control.

Sill, Keith. (1994) *Money output and the cyclical volatilily of the term structure.* Reserve Bank of Philadelphia.

Sill Keith. *Managing the Public Debt*. Federal reserve Bank of Philadelphia.

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Data loaded from: udonsah. wks

EQ (7) Modelling INV by OLS

The present sample is: 1981 to 2010

Variable	Coefficient	Std. Error	t-value	t-prob	PartRy
Constant	-1.4076e+005	5.8019e+005	-0.243	0.8103	0.0023
GDP	0.097204	0. 018366	5.203	0.0000	0.5284
INTR	-7264.6	18081.	-0.402	0.6913	0.0064
MCUR	5632.8	9182.4	0.613	0.5451	0.0125
EXR	1444.6	2570.7	0.562	0.5792	0.0125

Ry = 0 . 82123 F (4, 25) = 28.711 [0.0000] a = 446971 DW = 1.15 RES = 4.994567084e+012 for 5 variables and 30 observations

Testing for Error Autocorrelatiozx from J.ags 1 to 2

Chiy (2) = 7..3105 [0.0258] * and F-Form (2, 23) = 3.7106 (0.0401*

Error Autocorrelation Coefficients:

	Lag 1	Lag 2
Coeff.	0.4209	0.3387

Normality test for Residual

The present sample is: 1981 to 2010

Sample Size	30
Mean	- 0.000000
Etd.Devn.	408026.432307
Skewness	1.852302
Excess Kurtosis	6.043113
Minimum	-840505.605635
Maximum	-1505958.601110
Normality Chi (2) =	14.576 [0.0007] **

Testing for Heteroscedastic errors

Chi' (8) = 13.303 [0.0993] and F-'Form (8, 16) = 1. 6107 (0.1984)

V01=CDP V02=INTR V03=MCUR V04=EXR

Hoteroscedasticity Coefficients:

	Constant	V01	V02	V03	V04	V01y
Coeff.	-6.3e+011	-1.63e+005	2.189e+010	2.277e+010	9.594e+009	0.004236
t-value	-0.2504	-2.363	0.1649	0.2636	0.5069	1.798

	V02y	V03y	V04y
Coeff.	-1.016e+009	-1.911e+008	1.52e+007
t-value	-0.2971	-0.233	0.09965

RSS = 3.70456e+024 a = 4.81181e+011

Test of functional form

Chiy (14) = 26.564 (0.0219)* and F-Form (14, 10) =5.5227 (0.0050)**

Hoteroscedasticity Coefficients:

	Constant	V01	V02	V03	V04	V0ly
Coeff;	-1.116e+012	-2.016e+005	-6.748e+009	5.584e+010	2.544e+010	0.006053
t-value	-0.3548	-0.4093	-0.04131	0.5022	0.4798	1.479

	V02y	V03y	V04y	V02 * V01	V03 * V01	V03 * V02
Coeff:	1 -191e+009	-3.875e+008	-1202e+008	1.124e+004	-1902	-1.607e+009
t-value	0.7914	-0.4414	-0.4615	0.5305	-0.2843	-0.5655

	V04 * V01	V04 * V02	V04 * V03
Coeff:	-935.6	-1.89e+009	8.032e+008
t-value	-0.4649	-1.361	1.837

RSS = 7.65941e+023 a = 2.76756e+011

Descriptive statistics

The present sample is: 1981 to 2010

Means

GDP	INV	INTR	MCUR	EXR

5. 438e+006	5.961e+005		17.80	45.49	56 .32

Standard Deviations

GDP	INV	INTR	MCUR	EXR
8.090e+006	9.815e+005	5.202	11.47	50.53

Correlation matrix

	GDP	INV	INTR	MCUR	EXR
GDP	1.000				
INV	0.9016	1.000			
INTR	0.09428	0.03795	1.000		
MCUR	0.5023	0.5177	-0.2733	1.000	
EXR	0.8151	0.7609	0.2186	0.4478	1.000

YEAR	GDP	INV	INTR	MCUR	EXR
1981	47619.66	18220.59	7.75	73.3	0.61
1982	49069.28	17145.82	10.25	63.6	0.6729
1983	53107.38	13335.33	10	49.7	0.7241
1984	59622.53	9149.76	12.5	43	0.7649
1985	67908.55	8799.48	9.25	38.3	0.8938
1986	69146.99	11351.46	10.5	38.8	2.0206
1987	105222.84	15226.58	17.5	40.4	4.0179
1988	139085.3	17562.21	16.5	42.4	4.5367
1989	216797.54	26825.51	26.8	43.8	7.3916
1990	267549.99	40121.31	25.5	40.3	8.0378
1991	312139.74	45190.23	20.01	42	9.9095
1992	532613.83	70809.16	29.8	38.1	17.2984
1993	638869.79	96915.51	18.32	37.2	22.0511
1994	899863.22	105575.49	21	30.4	21 .8861
1995	1933211.55	141920.24	20.18	29.29	21.8861
1996	2702719.13	204047.61	19.74	32.46	21.8861
1997	2801972.58	242899.79	13.54	30.4	21 .8861

1998	2708430.86	242256.26	18.29	32.4	21.8861
1999	3194014.97	231661.69	21.32	34.6	92.6934
2000	4582127.29	331056.73	17.98	36.1	102.1052
2001	4725086	372135.65	18.29	42.7	111.9433
2002	6912381.25	499681.53	24.85	54.9	120.9702
2003	8487031.57	865876.46	20.71	56.5	129.3565
2004	11411066.91	863072.62	19.18	55.7	133.5004
2005	14572239.12	804400.82	17.95	54.8	132.147
2006	18564594.73	1546525.65	17.26	53.3	128.6516
2007	20657317.67	1935040.14	16.94	53.38	125.8331
2008	2429632.29	2050762.63	15.14	53.84	121.9045
2009	24794238.66	3048023.41	18.98	58.92	150.0124
2010	29205782.96	4007832.4	17.92	64	162.0124

Source; CBN Statistical' Bulletin [Volume 21] Dec 2010