TITLE PAGE

THE IMPACT OF INTEREST RATE ON OTHER SELECTED MACROECONOMIC VARIABLES IN NIGERIA (1970-2010)

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APPROVAL PAGE

This project was duly supervised and approved as having met the requirements for the award of Bachelor of Science Degrees (B.Sc) in Economics Department, Caritas University, Amorji-Nike, Enugu

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DEDICATION

This research work is dedicated to the Almighty and ever living God for his grace, mercy and favour during the course of this research work and for seeing me through my stay during my degree program, and to my ever loving parents MR and MRS IRABOR for their love, cares and support.

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ABSTRACT

This study was embarked upon with a view to determining the impact of interest rate on other selected macroeconomic variables in Nigeria. Data were sourced from CBN Abuja and NBS. Data were analyzed using the ordinary least square regression (OLS). Results indicate that: Interest rate is inversely related investment and also negatively related with GDP. On the basis of the above stated findings some policy recommendations were made.(1)Government should establish policies that encourage increase in savings deposit rate, reduction in lending rates and also, efficient and reliable financial institutions encourage people to save. (2) The require reserve ratio should be to strengthen the lending rate of commercial banks. (3) We recommend that the government and financial authorities should implement policies that favour income growth such as job creation and increase in salaries and wage increase as these will affect investment significantly.

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CHAPTER ONE

INTRODUCTION

1.1BACKGROUND TO THE STUDY

Interest rates play important role in controlling major macroeconomic variables. The primary role of interest rate is to help in the mobilization of financial resources and to ensure efficient utilization of resources for the promotion of economic growth and development (CBN 1970).

However, they are various states of interest rates in the financial system. They are generally classified into two categories: Deposit and lending rates. Deposits rate are paid to savings and time deposits of different maturities, while lending rates are interest rates charged on loans to customers and they vary according to cost of loanable funds and lending margins.

A number of factors influence the behaviour of interest rates in an economy. Prominent among these are the volume of savings, inflation, investment, government spending, monetary policy and taxation constitute the major source (supply) of credit while investment represents the major demand

for credit. Therefore, the level of savings partly determines the level of interest rates. For instance, a decrease in the accumulation of loanable funds (savings) is bound to exert an upward pressure on interest rates, just as the reverse situation would tend to have a moderating effect. Usually, when the structures of interest rate are changed, the resulting relative rates of return will induce shift in the assets portfolio of both banks and the non-banks public institutions. Hence, the direction and magnitude of changes in the market interest rates are of primary importance to economic agents and the policy makers.

Consequently, the Nigerian Economy has been highly prone to interest rate volatility and fragility (CBN, 2000). Interest rates of all instruments have experienced very volatile movements. Inconsistencies have been the order of the day (Adewunmi, 1997).

Prior to the structural adjustments programme (SAP), the level and structure of the interest rates were administratively determined by the Central Bank of Nigeria (CBN). Both deposits and lending rates were fixed by the bank, based on policy decision (CBN, 1962). At that time, the major reasons for administering interest rates were the desire to obtain social optimum resource allocation, promote orderly growth of the financial market and combat inflation in implementing the credit policy. During this time, the minimum rediscount rate which was very low, averaging about 7.25 percent between 1975 and 1985.

Also, preferred sectors could not access funds because financial institutions were unable to raise sufficient funds form the money market at the favoured concessionary rates (Staley and Morse, 1966). Within the general framework of deregulating the economy in 1986, in order to enhance competition and efficient allocation of resources, the CBN introduced a market based interest rate policy in August 1987 (CBN, 1987).The policy decision was not without controversy, and later,it was generally agreed that low interest rates did not encourage savings. It was feared that high interest rate which was likely to accommodate the deregulation of interest rates allowed banks to determine their lending and deposit rates according to market conditions through negotiations with their customers (CBN, 1987).

However, the minimum rediscount rate (MRR) which influenced interest rates continued to be determined by the CBN in line with changes in overall economic conditions. The MRR which was 15 percent in August 1987 was reduced to 12.5 percent in December 1987 with the objective of stimulating investment and growth in the economy (CBN, august 9, 2006). During the same period, the prime lending rates of commercial banks and merchant banks were on the average 18.0and 20.5 percents respectively. But following the need for moderate monetary expansion in 1989, the MRR was raised to 13.5 percent. It was also observed that there were wide disparities in the interest rates structure of the various banks.

As it were, the ceiling on interest rates were removed in January 1992 and retained in 1993. Interest rate in 1993 was volatile and rose to unprecedented level. On the basis of the foregoing developments, some measures of regulations were introduced in 1994. The developments in interest rates within this period were generally within the prescribed limits but the rates on the other hand were negative in real terms since inflation was estimated to be over 50 percent.

All the same, the banks still maintained the interest rate regime in 1995 with some modifications just to make it flexible. Nevertheless, it should be noted that the change in interest rates were significantly different from what prevailed during the era of regulation. Over the past three decades, high macro-economic instability has become a key determinant and the consequence of poor economic management. Nigeria, a country blessed with abundant natural resources is seen as one the countries that have the most volatile macroeconomic aggregates. This is in order with National Economic Empowerment and Development strategy (NEEDS, 2004) which says that "between 1975 and 2000, Nigeria's broad macroeconomic aggregates growth, the terms of trade, the real exchange rate, government revenue and spending were among the most unstable in the developing world".

It is these developments which have fuelled the need to embark upon this study. It could be possible that the macroeconomic instability is deep rooted in erratic movements of interest rates.

1.2STATEMENT OF THE PROBLEM

It is a well known fact that the Nigerian Economy is characterized by volatile interest rates, macro economic instability. Several measures embarked upon by the CBN failed to correct these defects in the economy. The most important of these measures were contained in the amendment of the CBN monetary circular No 21 which diverted the control of rates from CBN on August1, 1987. The bank had been in control of the cost of credit in the economy regulating the interest rates charged by the commercial and merchant banks in their lending activities.

As it is, banks determination and control of interest rates on loans did not help for the stability of major macroeconomic variables due to the volatile nature of rates during the planning period. Currently, interest rates are market determined and the study intend to investigate the impact of interest rate on some selected macroeconomic variables. In view of this, the research questions are stated as below;

1. What is the nature of the relationship between interest rates and the gross domestic product of Nigeria?

2. What is the nature of the relationship between the interest rates and the level of domestic investment in Nigeria?

1.3 OBJECTIVES OF THE STUDY

The broad objective of the study is to determine the relationship between interest rate and other selected macroeconomic variable such as Investments and Gross Domestic Product (GDP) in Nigeria.

The specific objectives are;

1. To determine the impact of interest rate on GDP.
2. To determine the impact of interest rate on investment

1.3STATEMENT OF HYPOTHESES

The research hypotheses will be formulated in the null and alternative hypothesis form.

1. Ho: Interest rate has no significant impact on GDP in Nigeria.

   Hi: Interest rate has significant impact on GDP in Nigeria.
2. Ho: Interest rate has no significant impact on investment in Nigeria.

   Hi: Interest rate has significant impact on investment in Nigeria.

1.5SIGNIFICANCE OF THE STUDY

The findings of this study will be considered significant in the following ways;

1. The major findings would be very useful to the CBN when formulating monetary policy for the country.
2. The findings will be useful to the policy makers for providing guidelines for controlling operations in money and capital market.
3. Lastly, the findings will serve as guidelines to the investing public in their decision making.

1.6SCOPE OF THE STUDY

Interest rates include mainly the lending rates. However, this study will be limited to lending rates during the floating interest rates regime. The study will cover the years from 1970 to 2010

CHAPTER TWO

LITERATURE REVIEW

2.1 THEORETICAL REVIEW

Interest rate has been a controversial issue since the era of the classical, neo classical and Keynesians (Gollarday 1978). In Gollarday's explanation of the classical view, he defined interest rate as a price Keynesians in their own view defined interest rate as reward.

Presently, the controversy has not been put to test as regard the general notion of interest rate. They are affected by differences in the development of financial markets, the degree of separation of savings and investments decisions and the freedom of capital movement from county to country.

2.1.1 REAL AND NORMINAL INTEREST RATE

Someone who lends money wants to be compensated for the time value of money i.e. not being able to use his money for consumption. Furthermore, the lender wants to be compensated for the risk that the purchasing power has decreased at the time of payment of the loan.

The risk described above is systematic, regulatory and inflationary risk systematic risk is the risk that the borrower will not be able to make interest and amortization payments and repay the loan at maturity. It also includes the possibility that the collateral of the loan is worth less than required in order to

cover the loan. Regulatory risk includes changes in the law and in the taxation that makes it more difficult for the creditor to collect a loan or that result in higher taxes on the repayment amount. The risk mentioned the inflationary risk, is the risk that inflation has made the money value of the loan less worth i.e. that the purchasing power of the money has decreased. Inflation is not known in advance, because of this, lender will demand risk premium for the uncertainty of the factor the interest rate that takes all these risk and the time value of money into account is the Nominal interest rate. This rate does not correct for changes in the purchasing power. The nominal interest rate is the one that is quoted in example, Newspapers, deducting the premium for the inflation risk results in the real interest rate. The real interest rate describes the relative price between consumption today and consumption in the future (William Curt Hunter, George G. Kanufman, Michael Romerleanon, 2005).

2.1.2 DETERMINATION OF LONG TERM AND SHORT TERM INTEREST RATES

Short term interest rates are determined by the central bank of the country. The primary goal of the Swedish Central Bank is to keep inflation at a level around 2 percent. Other Central Banks have similar goals.

Long term interest rate consists of the expected real interest rate inflation and a risk premium. Long term interest rates tend to follow the business cycle. When a boom is expected, the expectations of higher inflation lead to higher long term

interest rates. At the top of a boom when the market begins to weakens, the long interest rates are adjusted downwards. An exception of this trend is during periods of very unstable inflation short term interest rates on the other hand are more volatile and do not follow the business circle strictly. The central banks tend to keep their key interest rate at a high level even after a top of a boom, since the threat of higher inflation can persist. After a recession the interest rate of the central bank tends to stay low levels. The reason is that the timing is very hard for the central bank. If the central bank lowers the interest rate too early, it might cause an interruption in the recovery of the economy.

2.1.3 INTEREST RATES AND THE ECONOMIC MECHANISM

Interest rates are part of the economic mechanism. When interest rates increase, investment, net exports and consumption tend to go down. The case is the opposite when it comes to decreasing interest rates. Why is this the case? An increase in interest rate means that the consumer i.e households have to pay more to finance their consumption. Many households buy durable goods on credit such as cars and expensive goods. Higher required payments discourage the customers from buying such goods, which reduces consumption. The same goes for investments which can be seen as consumption by firms. High interest rates for financing of equipment and machinery discourage firms to do investments. In other worlds, when interest rate increases, investment goes down. Since it gets more expensive to borrow money and more tempting to save

money; thus, consumption decrease which leads to decreased demand. This keeps the process down and inflation decrease

The relation between interest rates and net exports is less straight forward (Sandra Kudlacek). Increasing rates tend to strengthen the currency of the country, since it is more appealing for foreign investors to buy that currency and invest them in that country. Thus, if a country's interest rate is high compared to foreign interest rate, capital will flow from foreign countries to this country. Such flows could be enormous if all other factors stay the same. To prevent this, the exchange rate must be strengthened as a result of the higher demand of the currency. This is called Appreciation of the currency. A higher exchange rate enhances import since foreign goods gets cheaper in comparism with goods produced domestically. At the same time it reduces exports, since it makes the goods from that country more expensive to foreigners. As a result of decreasing exports and increasing imports, net exports decline. Another effect of this is that the inflation is reduced through lower prices for imported goods historical shows that consumption is less sensitive to changes in interest rates than investments and net exports (Sandra Kudlacek).

2.1.4 INTEREST RATES AND THE MONETARY POLICY

Monetary policy refers to regulating the interest rate and the supply of money and credit. The central bank is the one with the main responsibility for the monetary policy of a country. As mentioned before, the most common goal is to

stabilize inflation and keep it at a desired level. The central banks all have their own key interest rate; which they can use to signal their intentions to the market. It is one of the important tools for monetary policy. If the central bank has monopoly on issuing money in a country, it can decide on the interest rate and conditions on the claims against the banks that are in demand of notes and coins. The central bank thus has the possibility to regulate the interest rate by charging the condition under which it is willing to enter into with banks. In this way it signal s its monetary policy to the market

2.1.5 THE DEMAND AND SUPPLY OF MONEY

The money demand is negatively affected by the interest rate level. The interest rate reflects the return on investing in the interest bearing assets. In other words, the opportunity cost to having only liquid assets. Since a higher interest bearing assets, the demand of money decreases. In contrast, a decreasing interest level results in a higher demand for money. But how is the supply of money determined? Firstly, the central bank which print bills, directly regulate the quantity of money. Secondly, the commercial bank lends money to consumers and firms that in turn will spend it on goods and services. The receivers of this money usually put the money in an account. In this way, the banks will be able to dispose of more money that they can lend. The supply of money will increase. The central bank generally set rules regarding reserves that the banks must keep in order to pay out money that the customers have deposited in the

bank. Therefore, the banks cannot lend all the money at their disposal. If the requirements concerning the reserve increases, the money supply will decrease as a result of the bank not being able to increase it's lending. Thirdly, the central bank can affect the money supply by buying or selling treasury bills or government bonds. If the central bank buys bills or bonds, it pays money to the market which increases the supply of money lastly, the currency flow from and to foreign countries changes the supply of money. If the inflow is greater than the outflow, the quantity of money will increase in the country and vice versa. The higher the interest rate relative to the rest of the world, the higher the inflow from other countries will be, the interest rate is at equilibrium at the intersection between the supply and the demand curves. A monetary policy that increases the money supply decreases the interest rate and vice versa.

2.1.6 A BROAD VIEW OF MACRO ECONOMIC SYABITILITY

The concept of macroeconomic stability has undergone considerable changes in the economic discourse over the past decides. During the post-war years dominated by Keynesian thinking, macroeconomic stability basically meant a mix of external and internal balance which in turn implied. In the second case, full employment and stable economic growth, accompanied by low inflation overtime, fiscal balance and price stability moved to centre stage, supplanting the Keynesian emphasis on real economic activity.

This policy shift led to the downplaying and even, in the most radical views, the complete suppression of the counter-cyclical role of macroeconomic policy. Although this shift recognized that high inflation and unsustainable of fiscal deficits have costs and that "fine turning" of macroeconomic policies to smooth are the business cycle has limits. It also led to an underestimation of both the costs of real macroeconomic instability and the effectiveness of Keynesian aggregate demand and management. This shift was particularly sharp in the developing world, where capital account and domestic financial liberalization exposed developing countries to the highly pro-cyclical financial swings characteristic of assets that are perceived by financial markets as risky and thus subject to sharp changes in the "appetite for risk". In the words of Stieglitz (2002) such exposure replaced Keynesian automatic stabilizers which automatically destabilizes. Thus, contrary to the view that financial markets would play a disciplinary role, dependence on financial swings actually encouraged the adoption of pro-cyclical monetary and fiscal policies that increased both real macroeconomics instability and the accumulation of risky balance sheets during periods of financial euphoria which led, in several cases to financial melt downs.

There is now overwhelming evidence that pro cyclical financial markets and pro-cyclical macroeconomic policies have not encouraged growth; they have in fact increased growth volatility in developing countries financial markets

(Prasad and others, 2003). This has generated a renewed but still incomplete interest in the role that counter-cyclical macroeconomic policies can play in smoothing out i.e. in reducing the intensify of business cycles in the developing world. At the same time, since the Asian crisis, recognition has grown that liberalized capital accounts and financial markets tend to generate excessively risky private sector balance sheets and that an excessive reliance on short term external financing enhances the risks of currency crises preventive (prudential) macroeconomic and financial policies, which aim to avoid the accumulation of unsustainable public and private sector debt and balance sheets during periods of financial euphoria have this become part of the standard recipe since the Asian crisis. This represents, however only a partial return to a counter cyclical macroeconomic framework for no equally strong consensus has yet emerged on the role of expansionary policies in facilitating recovery from crises.

Thus, the menu of macroeconomic policies has broadened in recent years. We have only come part, however to the full recognition that macroeconomic stability involves multiple dimensions, including not only price stability and sound fiscal policies, but also a well functioning real economy, sustainable debt ratios and healthy domestic financial and non financial private sector balance sheets.

A well functioning real economy requires in turn smoother business cycles, moderate long term interest rate and competitive exchange rates all of which

may be considered intermediate goals of the ultimate Keynesian objective: full employment, such as broad view of macroeconomic stability should recognise, in any case that there is no simple correlation between its various dimensions sand thus, that multiple objectives and significant trade-offs are intrinsic to the design of sound macroeconomic frameworks.

This view should lead to the recognition of the role played by two sets of policy packages, whose relative importance will vary depending on the structural characteristics the macroeconomic policy tradition and the institutional capacity of each country. The first involves a mix of counter-cyclical fiscal and monetary policies with appropriate exchange rate regimes.

The second includes a set of capital management techniques designed to reduce the unsustainable accumulation of public and private sector risk in the face of pro-cyclical access to international capital markets. To encourage economic growth, such interventions through the business cycle should lead to sound fiscal systems that provide the necessary resources for the public sector to do its job a competitive exchange rate and moderate long term real interest rates.

This paper calls for a broad view of macroeconomic stability and for active counter-cyclical macroeconomic policies supported by the equally active use of capital management techniques, it is divided into four sections.

2.1.7 RELATIONSHIP BETWEEN INVESTMENT AND INTEREST RATES

In stating the definition of interest rate, Lipsey (1963) defined interest rates as one of the major forces that can cause investment to vary. According to Keynes, if the injection of investment expenditure varies greatly from year to year, national income will vary in the same direction and by amounts magnified by the multiplier relation. The possible relation between investment and interest rate has been and still is the subject of much controversy.

He explained that the major changes in interest rates are often associated with changes in investment. If they lead to large changes in the relation between the desired and present capital stock, they may lead to changes in the rate at which the capital stock is growing. But there is no reason in theory to expect a permanent relation, Ceteris paribus, is between interest rates and the stock of capital.

Notwithstanding, since the great depression of the 1930s, many economists have stressed that the rate of interest is the critical variable determining the expected profitability of investment.

Their view is that investment demand is fairly inelastic with respect to the rates of interest. This means that change in interest rates brings about a proportionately small changes in investment demand. The logical corollary of

the argument is that the marginal efficiency of investment declines rapidly as it is considered to be highly variable s a result of changes in demand.

Hall (1977), in an effort to examine the responds of investment to interest rate changes during stabilization programmers; discussed the view that stabilization policies affect short term interest rates while long term changes are more responsive to investments. Theoretically, he concluded that since short term interest rate i the appropriate rate uses in calculating cost of capital in investment decisions, the relationship between term structure of interest rates and investment needs empirical clarification.

In outlining the role of interest rate, Baumal and Blinder (1979) asserted that as interest rate rise; business executives will find investment less attractive. They went further and contended that higher interest rate lead to lower investment spending. But investment is a component of aggregate demand, therefore when interest rate rises, total spending falls. A higher interest rate lead to a lower aggregate demand schedule conversely, a lower interest rate leads to a higher aggregate demand schedule.

2.1.8 CONCEPT OF INVESTMENT

Lipsy and Steiner (1972) opine tat investment is a key component of the circular flow. They explained that fluctuations in investment are a major cause of booms and slumps and hence, a determinant of short run changes in

economic well being. Investment is also a major cause of long term economic growth and without its industrial countries would not have experienced the spectacular rise in living standard to levels undreamed of only a century ago.

Investment is of major interest not only because it is a large injection into the circular flow, but also because it is a volatile one. Moreover, although, it results from private decision are readily influenced by government policies.

Okoro (1984) stated that investment is the purchase of capital goods by individuals, businesses and institutions which is an important determinant of national income. Basically, he distinguished two forms of investment productive investment and financial investment. Production investment includes such under takings as planting seeds as the kind of investment that necessitates a social sacrifice of current consumption, while financial investment can be the purchase of a bond.

Okafor (1989) referred to investment as economic activities designed to increase, improve or maintain the productive quality of the existing stocks of capital for an economic unit, investment occurs whenever there is an addition to capital stock. Also, it is important to carefully establish at the time of investment the value of asset since it is expected that the asset in which investment is dominated shall be retained by the investor for some reasonable period as the benefits accrue overtime. And because investment involves

forging some current capabilities for consumption and identify between the level of savings and investment is usually expected.

Rama (1990) investigated the empirical and theoretical determinants of private investment in developing countries and identified macroeconomic and institution factors such as financial depression, foreign exchange shortage, lack of infrastructure, economic instability, aggregate demand, public investment, and relative factor prices and credit availability as important variables that explained private investment. Rama noted that empirical results accuracies were limited by errors in measurement of economic variables and research methodology.

Investment or real investment is taken to mean addition to stock of productive assets like capital goods capital goods bring structures, equipment and inventories (Dornbusch and Fisher, 1994). Adding to the stock of buildings and equipment increases the nations potential output and promotes economic growth in the long run. Thus, investment plays a dual role affecting short run output through its impact on aggregate demand and influencing long run growth through the impact on capital formation on potential output and aggregate demand.

2.1.9 THE RELATIONSHIIP BETWEEN INTEREST RATE AND ECONOMIC GROWTH IN NIGERIA, T.M OBAMUYI

Interest rate reform, a policy under financial sector liberalisation, was to achieve efficiency in the final sector and engendering financial deepening. In Nigeria, financial sector forms began with the deregulation of interest rates in august 1989 (Ikhide and Alawode, 2001). Prior to the period, the financial system operated under financial regulation and interest rate were said to repress. According to Mckinnon (1973) and Shaw (1973), financial depression crises mostly when a country imposes ceiling on deposit and lending nominal interest rate at a low level relative to inflation. The resulting low or negative interest rates discourage saving mobilisation and channelling of the mobilised savings through the financial system. This has a negative impact on the quantity and quality of investment and hence economic growth. Therefore, the expectation of interest rate reform was that it would encourage domestic savings and make loanable funds available in the banking institutions. But the criticism has been that the tunnel like structure of interest rate (Ojo, 1976), in Nigeria is capable of discouraging savings and retarding growth in view of the empirical link between savings, investment and economic growth. The critical question, therefore, is whether real interest rates have any positive effect on economic growth in Nigeria

2.2 EMPIRICAL REVIEW

Oresotu (1992) in reference to international monetary fund (1983) reviewed interest rate as a return on financial assets serves as an incentive to savers

making them to defer present consumption to a future date. The relevant interest rates in this context are the deposit rates. Second interest being a component of cost of capital, affects the demand for and allocation of loanable funds. The applicable rates of interest in this are the bank lending rates, the changes which affects the cost of capital which influences investor's willingness to invest in machine and equipment (seal investment). In this way, the level of interest (lending rate) could influence growth in financial instruments, output and employment. Third, the domestic interest rate in conjunction with the rate of foreign financial assets, expected change in exchange rate and expected inflation rate determine the allocation of accumulated savings among domestic financial assets, foreign assets and goods that are hedged against inflation.

The speculative movement of funds into or out of domestic foreign asset depends on the relative levels of interest rates. In the view of the determinants and structure of interest rate in Nigeria, Agu (1988) also noted the existence of very low real interest rate o savings and investment using the usual Mekinon's financial depression diagram.

Agboola (1990) however stated the importance of interest rates as a macroeconomic policy which affects significantly and to a large extent of determines the extent of resources that could be mobilized and made sufficiently attractive the mortgage borrowers irrespective of a nation's savings and its operators.

Thus, interest rate is the cost of funds to the borrower and a return on savings to the saver or lender. Anyanwu (1993) explained why much emphasis is on external reorientation and deregulation of the financial sector; especially (interest rates) without delay. The indirect monetary control instrument (OMO) works through the market determined interest rates by adjusting the underlying demand for and supply of bank reserves. With those measures that CBN is able to determine the supply of money.

Uden (1999) stated that interest is the payment for the use of capital, while capital can be defined as a form of wealth used in the production of more wealth. As stated that interest payable on capital, therefore determines how much people are prepared to obtain from spending in order to save. Also, apart from the payment for postponing consumption, gross interest rate also includes the cost of managing the money by the saver, a fee as an insurance against probable default in repayment and the money cost in inconvenience to the saver.

Mekinon-Snow (1973) viewed administered low interest rate as detrimental to increased savings and hence, investment demand. They argued that high interest rate induce savings which can be utilized investment. Thus, there are two transmission channels through which interest rate affect investment. They relate to investment cost of capital. Also, interest rate encourages financial savings which can be invested (self finance) or lent out to borrowers as loans (external finance).

In the classical view, Mekinon (1979) state with the premise that an individual has many desires to life which prompts him to save. Some of these require immediate gratification which usually necessities savings: the individual is concerned with the opportunity cost of each alternative measure by the real rates of interest. For instance, if the current real rate is 5percent by consuming 1 dollar worth of real goods and services one year from today. Thus, the higher the current rate, the greater the opportunity cost of present as to the future consumption, as a result the relative desirability of present income real rate, the greater the portion of full employment income which is saved and available for non-consumption purposes, which in a closed economy consist of private summary of the classical view. The classical theory suggested that savings was mainly determined by the rate of interest on domestic savings (bank accounts). If interest rates were high, then people would save more and of course a low rate of interest would reduce the incentive to save and so cause an increase in consumption. In testing the classical, neo –classical and Keynesian theories, Harvey suggested that the only way to decide which theory does not take full account of interest paid on savings. He argued that the effect of a rise in interest rates might be negative on the volume of savings for instance, if the rate of interest rises, people's savings will be more in future, so that the need to save is reduced and people may save less. Golladay (1978). In his explanation of the classical view stated that higher rates of interest would provide still greater incentive to invest or save. As interest rates increase, other families would

sacrifice more of the present and ensure a still brighter future. Thus the supply of funds (the amount saved) will look like any other supply curve. As price (interest rate) increases, so the quantity supplied. Thus, the market might be expected to ensure that persons who did not use their claims on production for current consumption would transfer those might to someone else in return of r interest. If too much was saved, savers would be disappointed by low interest rates and would reduce savings. Even if people were saving for other reasons (perhaps for the proverbial “rainy days”) surely they would prefer earning interests to not earning interests. Any funds that were lying idle in the house might just as well be invested in savings account or bonds where they would provide a small income.

However, Jhinghan (1995) opened that some people save irrespective of the rate of interest were zero. There are others who save because the current rate of interest is just enough to induce them to save. They would reduce their savings if the rate of interest fell below market level. Still there are the potential savers who would be induced to save if the rate of interest were raised the higher the rate of interest, the larger will be the community savings and more will be the supply of funds for investment.

Lipsey (1986) asserted that the classical theory of savings, investment and interest is built on two important assumptions;

First; the investment schedule is sufficiently interest elastic. That suitable variation in the rate of interest can bring about investment sufficient to match any volume of free to vary so as to bring about savings and investment on equality.

The sensitivity of savings to the level of interest rate depends fundamentally on the level of development a country is on (Ayodele 1988). For a poor country, savings will definitely not responsive to changes in the level of interest rate. In Nigeria, there is no major difference in the savings rate before and a deregulation of interest rate. The average savings rate declined from 21.6 percent in 1975-1984 to 15.3 percent in 1985-1989 and mildly rose to 20.3 percent in 1990-1994.

Khat-Khat (1988) used non-parametric methodology in his study on the relationship between interest rate and other macroeconomic variables include savings and investment. He grouped 64 developing countries (including Nigeria) into three, based on the level of their real interest rate. He then computed economic ratios among which were gross savings-income and investment income for the countries applying the Mannwhitney tests. He found that the in fact of interest rate was not significant for the three groups.

Cho and khat (1987) stated that increased real interest rates supposed to encourage savings but increased interest rate only has negative effect on savings particularly when the economy is bed eviled with macroeconomic instabilities.

In fact, there are convincing theoretical evidence that increased rate of real interest rate will necessarily be a sufficient condition for improved savings and allocation efficiency. Theoretical evidence however abound that the sensitivity of savings to increase interest rate will be ambiguously determined.

Balassa (1989) stated that the interest rate policy is one of the emerging issues, current economic issue in Nigeria that is expected to induce savings which can be channelled to investment in the deregulated economy so as to increased employment and efficient financial resources utilization.

When households are assumed to maximize utility, or welfare, subject to a resource constraint, the interest rate sensitivity of household saving depends on how easily household can substitute future consumption for current consumption (technically known as the Inter-temporal Elasticity or Substitution (IES) in consumption). If a given change in real interest rates induces large shifts in consumption, then the IES one of the parameter; describing household preference will be correspondingly large. In our work on this issue, macroeconomic data from a sample of countries were used to evaluate the magnitude of the IES for households from developing countries with diverse income levels.

The association between interest rates and economic growth as recognised in the literature on growth can be found in neo classical growth frame work and the Mckinnon shaw hypothesis for instance, Mckinnon Shaw (1973) argued that

financial prices including interest rates reduces real rate of growth. One of the basic arguments of Mckinnon Shaw model is an investment function that response negatively to the effective real loan rate of interest and positively to the growth rate. Mckinnon shaw school expects financial liberalisation to exert a positive effect on the rate of economic growth in both the short and medium runs. Abu (2006) used tow partial models to investigate the impact of investment on GDP growth rate and the relationship between interest rate and investment in the case of Romanian economy.

He found that the behaviour of the national economic system and the interest rate investment economic growth relationships tend to converge to those demonstrated in a normal market economy.

Oosterbaan et al (2000) estimated the relationship between the annual rate of economic growth (YC) and the real rate of interest (RR) in equations of the basic form.

The study shows that effect of a rising real interest rate on growth and claimed that growth is maximized. When the real rate of interest lies within the normal range of say -5 to +15%. De Gregorio and Guidotti (1995) cited in Oosterbaan et al (2000) suggest that the relationship between real interest rates and economic growth might resemble an inverted U-curve: Very low (and negative) real interest rates to cause financial disintermediation and hence to reduce growth. However, the World Bank reports, cited in Oosterbaan, et al (2000)

show a positive and significant cross section relationship between average growth and real interest rates over the period 1965 to 1985.

Chetty (2004) showed that the investment demand curve is always a backward bonding function of the interest rate in a model with non convex adjustments costs. At low interest rate, an increase in the rate of return raises the cost of lending and increases aggregate investment by enlarging the set of firms for whom 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 earn is larger in the short run rather than the long run.

Akintoye and Olowolaju (2008) examine optimizing macroeconomic investment decision in Nigeria. The study employed both the ordinary least square and vector. Auto regression framework to stimulate and project interest temporally private investment response to its principal shocks namely public investment domestic credit and output shocks. The study found low interest rate to have constrained investment growth. The study then resolved that only government policies produce sustainable output, steady public investment and encourage domestic credit to the private sector which would promote private investment.

Obamuyi (2009) studies the relationship between interest rate and economic growth in Nigeria. The study modelling techniques and revealed the 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.

Albu (2006) studied trends in the interest rate, 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 behaviour of the national economy system and interest rate investment relationship tend to converge to those demonstrated in the normal market economy.

Iyoha (2004) postulated based on the combination of all the theories of investment ranging from the classical to Keynesian and a study on sub-sahara African countries, identified macroeconomic factor such as income, interest rate, exchange rate and debt overhang provide by debt income ratio variable as his investment determination model.

De Gregoti and Guidotti (1995) cited Oostergaan et al (2000) studies the effect of a rising real interest rate on growth and claime that growth is maximize when the real rate of interest lies within the normal range of -5 to +15%. Green and Vilanueva (1991) find a negative relationship between real interest rates and investment.

World Bank report cited in Oosterbaan et al (2000) show a positive and significant cross section relationship between average investment and real interest rates over the period 1965 to 1985. The empirical works by Mackinnon (1994) and Fry (1995) have shown evidence to support the hypothesis that interest rate determine investment. Thus, there are two transmission channels through which interest rate affects investment. They relate to investment as cost of capital. They also opined that interst rates encourage loans (external finance). Many studies have investigated these transmissions mechanisms, which tallies with interest rate policy regimes articulated in Nigeria prior to and after the 1986 deregulation.

Khat and Bathia (1993) used non parametric method in his study of the relationship between interest rate and other macroeconomic variable, including savings and investment. In hisstudy he grouped (64) sixty four developing countries including Nigeria into three bases on the level of their real interest rate. He then computed economic rate among which were gross savings, income and investment for countries applying Mann Whitney test, he found that the impact of real interest was not significant for the three groups.

However, his method of study was criticized by Balassa (1989) that a relationship has been established by the use of regression analysis.

Agu (1988) reviewed the determinants and structure of real interest rates in Nigeria between 1970 to 1985. He demonstrated the negative effect of low

interest rate on savings and investment using the usual mackinnon financial repression diagram. His main conclusion was that the relationship between real interest rate, savings and investment is inconclusive

2.3 SUMMARY OF REVIEW

The research observed from the review that some author are emphasizing on the import and dominating role of interest rate on economic development. Others opined that the interest rate plays a less crucial role in less monitised economy because of the separation of savings and investment decision and the freedom of capital movement from country to country. There is also existence of nominal and negative real interest rates. The negative effect of low interest rates was demonstrated on savings and investment.

In the case of investment, it was observed that investment is of a major interest in the economic well being of the economy. It is also found that some authors are of the opinion that a relationship exist between interest rate and investment. Thus changes in interest rates are often associated with changes in investment. But most economists stress the fact that the rate of interest is not the critical variable determining investment demand, rather the critical variables are those determining exported profitability of investment. Their view is that investment demand is fairly inelastic with respect to interest rate. In addition, some authors asserted that investment and interest rate move in opposite direction.

CHAPTER THREE

3.1 RESEARCH METHODOLOGY

A number of statistical techniques of analysis have been used by researches in a bid to explore the factor responsive for the variability in macroeconomic variables.

However, this study will extensively make use of (regression) analysis to explore the nature of the relationship or the extent of association between the interest rate and major macroeconomic variables.

3.1.1 METHODOLOGY

To explore the relationship between interest rate and macroeconomic variables (GDP and investment) various models will be employed. These models include the model of GDP and interest rate and the model of investment and interest rate.

Model Specification

3.1.2 MODEL 1: IMPACT OF INTEREST RATE ON GDP

This model will be used to estimate the impact of interest rate on GDP in Nigeria. The model is specified as below

GDP=F(NS, RIR, FB, DFD)……..(1)

Where GDP= Gross domestic product

NS=National savings

RIR=Real interest rate

FB=fiscal balance

DFD=Degree of financial development

The linear form of the above equation is,

$GDP_t=\beta_0+\beta_1 NS_t+\beta_2 RIR_t+\beta_3 fb_t+\beta_4 DFD_t+\mu_{1t}$ …… (2)

3.1.3 MODEL II: IMPACT OF INTEREST RATE ON INVESTMENT

Here, we shall estimate the impact of interest rate on investment in Nigeria. Specifying the model, we have:

INV=F(RIR, log(GDP), RER,INF)……..(5)

When the model is made linear, we have,

$INV_t=\pi_0 + \pi_1 R1R_t + \pi_2 \log(GDP_t) + \pi_3 RER + \pi_4 INF_t$……(6)

Where ∏1<0, ∏2, ∏3 $ ∏4 x and Inv=investment.

Gov exp= government expenditure

Dpt=gross domestic product

Inf=inflation

3.2 EVALUATION TECHNIQUES

Evaluation Based on Economic a priori Criteria.

This test is carried out to check if the signs and Magnitudes of the estimated parameters conform to what economic theory postulates.

3.2.1 Evaluation Based on statistical criteria

The coefficient of determination (R^2)

The R^2 explains the total variation in the dependent variable (GDP) accounted for by variations in the explanatory variables included in the model.

The F – Test

This test is used to test whether all the variables included in the work are significant or not in determining the level of domestic saving in Nigeria. Each element of Ps follows the distribution with n-k degree of freedom.

3.2.2 EVALUATION BASED ON ECONOMETRIC CRITERIA

TEST FOR AUTOCORRELATION.

This is to test whether the errors corresponding to different observations are uncorrelated. The test will adopt the Durbin –Watson statistic because of the absence of the lagged dependent variables as one of the regressors.

TEST FOR NORMALITY

This test will carried out to test whether the error term follows the normal distribution. The normality test would adopt the Jarque-Bera (JB) test of normality. The JB tests normality is an asymptotic or large sample test. It is also based on the OLS residuals.

TEST FOR HETEROSCEDACITY

This test would be conducted to ascertain whether the error terms (μs) have common or constant variance. The white's heterscedesticity test will be adopted in respect to this.

For the purpose of this study, data were accumulated for the following variables: Interest rate, gross domestic product (GDP), exchange rate of naira, savings, and level of domestic investment. Data were sourced from CBN statistical bulletin.

CHAPTER FOUR

4.1 PRESENTATION AND INTERPRETATION OF RESEARCH FINDINGS

In this chapter, the results of the ordinary least square (OLS) regression are presented. The analysis of the results involve subjecting the parameter estimates of the model to various theoretical (a prior expectation), statistical and econometric test to determine their reliability. Three OLS models were estimated. Model I was estimated to ascertain the impact of interest rate on Gross Domestic product (GDP), model II was estimated to ascertain the impact of interest rate on investment

OBJECTIVE I

4.1 Impact of interest rate on GDP

Log (GDP)	Coefficient	Standard error	t-statistic	Probability
Log (NS)	0.454654	0.040351	11.26758	0.0000
RIR	-0.009409	0.006648	-1.415404	0.1655
FB	-0.026886	0.021251	-1.265196	0.2139
DFD	0.038477	0.015149	2.359958	0.0155
C	6.22991	0.538896	11.54766	0.0000

R^2 = 0.849237, d = 0.437753,F-Statistic = 50.69635

4.1.1 Evaluation Based on Economic Criterion

The result in the table above shows the impact of interest rate on GDP. The result shows that there is a negative relationship between interest rate and GDP. It suggests that increase in interest rate brings about a fall in GDP. This negative relationship between interest rate and GDP conforms to the economic theory that a rise in interest rate brings about a fall in GDP. This is because, a rise in interest rate which is a rise in the cost of borrowing discourages investment and when investment falls GDP will be reduced.

The control variables like savings (NS) and degree of financial development (DFD) also conformed to their expected signs. A positive coefficient of NS implies that an increase in savings increase GDP. This is true because savings are mostly used for investment, as it rises investment also rises. This rise in investment further brings about a rise in GDP. On the other hand, when savings rise, interest rate will fall and this raises investment. The positive effect of degree of financial development as well implies that as financial institutions become more developed, the GDP will also rise.

The sign of the fiscal balance (FB) is negative and this suggests that a rise in the fiscal balance reduces the GDP, it should be noted that FB can assume either negative or positive impact GDP.

4.1.2 Evaluation Based on Statistical criterion

Goodness of fit Test (R^2)

To measure how the sample regression line fit the data, we use the coefficient of determination (R^2). In other words, it measures how the variation in the dependent variables is being accounted for by the independent variation. From our result, we got R^2 to be 0.849237. This implies that approximately 85% variation in the GDP is being explained by the RIR, NS, DFD and FB.

Student's t-Test

This is used to test the explanatory power of the individual coefficient.

The result shows that there is a negative relationship between interest rate and GDP, which is in accordance with the economic theory. However, for the period under study, interest rate does not significantly impact on the GDP. This is because the absolute t-statistic of 1.415404 for the coefficient of interest rate is less than the critical t-value of 2.021. In the same vein, fiscal balance (FB) does not exert any significant influence on GDP within the period under study. This is because the absolute t – statistic of 1.265196 is less than the critical t – value of 2.021.Therefore, though interest rate and fiscal balance impact negatively on GDP (as shown in the above table), they do not significantly affect GDP within the period. This is because of their weak explanatory powers.

Both the savings and degree of financial development have higher explanatory powers to determine their magnitude of impacts on GDP. Savings and degree of financial development are statistically significant at 5% because their absolute t-statistics for their coefficient which are 11.26758 and 2.539958 respectively are greater than the critical t-value of 2.021. The value of 0.454654 which is the coefficient of savings indicates that 1% increase savings will lead to approximately 0.45% increase in GDP. The coefficient of 0.038477 for the degree of financial development indicates that a unit increase in the degree financial development leads to about 0.038% rise in GDP.

F-test

Despite the fact that some of the variables are significantly equal to Zero, the f-statistic shows that all the variables used are jointly significant. This is because the estimated f-statistic of 50.69635 is greater than the critical F-value of 2.6060.

4.1.3 Evaluation Based On Econometric Criterion

The economic criterion is applied to check the reliability of the parameter estimates. To do that, we apply the following tests: autocorrelation, normality and hetereoscedasticity.

Autocorrelation Test

This test is undertaken to know whether the residuals are correlated with one another. To test for autocorrelation we use the Durbin Watson d-test with the null hypothesis written as follows.

Null Hypothesis	Decision	If
No positive autocorrelation	Reject	0<d <dl
No positive autocorrelation	No decision	dl < d < dl
No negative Correlation	Reject	4-dl $\leq$d $\leq$ 4
No negative Correlation	No decision	4-du $\leq$ d $\leq$ 4-dl
No autocorrelation Positive or negative	Do not reject	du <d<4-dl

From the Durbin Watson d table, we got dl = 1.048 and du = 1.584. Given that d = 0.4375, then, 0 < d = 0.4375 < dl = 1. 048. Therefore we reject the null hypothesis of no positive correlation. This implies that the error terms are correlated.

NORMALITY TEST

This test is carried out to check whether the error terms follow normal distribution. The null hypothesis is that the error terms follow normal distribution. To test for normality, we use the Jarque Bera test for normality

follows chi-square distribution with two degrees of freedom. Given that the Jarque Bera Statistic = 2.713 < 5.99, we accept the, null hypothesis and conclude that the error terms follow normal distribution.

Hetereoscedaticity Test

This is done to determine if the error have constant variance. We apply this test using white's hetereoscedaticity test which follows chi-square distribution. The null hypothesis is that the errors do have constant variance (homoscedaticity) or there is no hetereoscedaticity. At 5%, the critical chi-square value at 4 degree of freedom is 9.49 which is less than $n.R^2 = 35.22$

Given the above, we reject the null and conclude on the basis of white test that there is hetereoscedaticity in the errors

OBJECTIVE II

4.2 Impact of interest rate on Investment

Log (INV)	**Coefficient**	**Standard error**	**t-statistic**	**Probability**
Log (GDP)	1.041668	0.162749	6.400465	0.0000
RIR	-0.062886	0.046619	-1.348924	0.1858
INF	-0.084625	0.044718	-1.812424	0.0665
RER	-0.009149	0.00182	-4.192088	0.0002
C	1.765381	1.960175	0.900624	0.3738

R^2 = 0.822831, d =0.53733,Jarque Bera =2.098650,F-stat =41.79903.

4.2.1 Evaluation Based on Economic Criterion

The above table illustrates the impact of interest rate on investment. As the result shows, log (GDP) and RIR conform to the a priori expected signs while inflation and real exchange rate do not. The log (GDP) with positive coefficient implies that the growth rate of GDP influence investment rate positively.

The real exchange rate has a negative relationship with the investment rate. This means that a rise in the real interest rate has the tendency to reduce the investment rate. This is because interest rate is a cost of borrowing to finance investment project, so when it rises the profitability of any investment is reduced and thus investment falls.

Inflation as shown impacts negatively to investment and this implies that a rise in the rate of inflation discourages the level of investment. In like manner, a rise in real exchange rate is detrimental to investment as suggested by their negative relationship.

4.2.2 Evaluation Based on statistical criterion

Of the entire variables that appeared in the model only log (GDP) and RER have significant impact on investment. The growth rate of GDP (log GDP) has significant impact on the rate of investment because the t-statistic for its coefficient which is 6.400465 is greater than the critical t-value of 2.021. The

coefficient of 1.041668 for the log (GDP) indicates that the rate of investment will grow at about 1.04 for percent one percentage point increase in the GDP.

For the RER, the result revealed that it has significant negative impact on investment because the absolute t-statistics of 4.192088 is greater than the critical t-value of 2.021. Thus one percent increase in the real exchange rate reduces the investment by 0.009 percentage point.

However, RIR and INF have low explanatory powers because their absolute t-statistic of 1.348924 and 1.892424 respectively is below the critical t-value of 2.021. Thus both the real interest rate and inflation rate do not have significant impact on investment as the result suggest.

F-Test

The f-statistic reveals that all the variables used for the study are jointly significant. This is shown by the fact that the critical f-value 2.61 is less than the calculated f-value of 41.79903.

CHAPTER FIVE

SUMMARY, CONCLUSION AN POLICY RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

1. It has been shown that interest rate and fiscal balance impact negatively on GDP as shown in chapter four. They do not significantly affect economic growth within the period. On the other hand savings and degree of financial development has positive and significant impact on GDP within the period under study. An increase in savings and DFD results to an increase in GDP

2. From our result, we can see that only GDP is positively related to investment. Interest rate (RIR), inflation (INF) and real exchange rate (RER) are negatively related to investment. Of all the explanatory variables, GDP and RER are statistically significant, while Interest rate (RIR) and INF are not statistically significant.

5.2 POLICY RECOMMENDATIONS

1. From the summary of our findings we can deduce that saving (NS) and degree of financial development (DFD) are statistically significant and impact positively on GDP, hence, we recommend that government and other

financial authorities should implement policies in favour of NS and DFD. Policies that favour increase in savings include increase in savings deposit rate, reduction in the lending rate and also, efficient and reliable financial institutions encourage people to save. To ensure that financial sector development affect GDP, the CBN should regulate adequately the financial institutions to avoid mismanagement of funds. Also, reducing the required reserve ratio and the bank rate by CBN can also enhance the financial sector contribution to income growth.

2. From our findings, it can be ascertained that GDP has positive and statistically significant impact on investment. Based on this, we recommend that government and financial authorities should implement policies that favour income growth such as job creation and increase in salaries and wage increase as these will affect investment significantly.

CONCLUSION

From this research work, it can be concluded that interest rate has impacts on GDP and investment. Interest rate impacts negatively on GDP and investment. Increase in interest rate results to a decrease in savings because the cost of borrowing becomes more expensive and therefore it results to a fall in the level savings which thereby discourage investment. If the interest rate is increased, people will be discouraged to borrow from financial institutions. An increase in interest rate also results in the decrease of GDP, when savings is low, investment is low, and when investment is low, output will be reduced, therefore resulting to a low GDP.

From this research work, it can be seen that interest rate significantly impacts on GDP and investment.

BIBLIOGRAPHY

Blejer, M.I. and M.S. Khan. (1984), *Private Investment in Development Countries*. Finance and Development (Washington).

Blejer, M.I and M.S. Khan. (1984), *Government Policy and Private Investment in Developing Countries*. IMF Staff Papers.

Dailami, Mansoor. (1990), *Financial Policy and Corporate Investment in Imperfect Capital Markets: The Case of Korea.* PRE Working Paper 409. Washington D.C.: The World Bank.

Dixit, A.K. and R.S. Pindyck. (1994*), Investment Rider Uncertainty*. Princeton: Princetion University Press.

Elbadwi, I. (1995), *Consolidating Macroeconomic Stabilization and Restoring Growth in Sub-Saharan Africa*. Mimeo. AERCS.

Greene, J. and D. Villaneuva. (1991), *Private Investment in Developing Countries*. ZMF Staff Papers.

Hall, R.E. (1997), *Investment, Interest Rates and the Effects of Stabilization policies.* Brookings Papers on Economic Activity.

Jorgenson, D.W. (1967), *The theory of Investment Behavior*. In R. Ferber,

Keynes, J.M. (1936) *The General Theory Employment, Interest and Money*. London Macmillan.

Khan, M.S. and M.D. Knight. 198 1. *Stabilization Programmes Developing Countries*. A Formal Framework. ZMF

Klein, L.R. (1974), *Issues in Economic Studies of Investment Behavior*. *Journal of Economic Literature* (Nashville, Tennessee).

Naho, A. (1983) *The Department for Money in Developing Countries the Empirical Evidence from the Eastern African Countries*. Economic Research Bureau paper 85.2. Dar es Salaam.

Shapiro, M.O. (1986), *Investment, Output and the Cost of Capital*

Sundarajan, V. and S. Thakur. *Public Investment, Crowding Out, and Growth: A Dynamic Model Applied to India and Korea*. IMF Staff Papers.

Weisskop f' T.E. (1982) *The Impact of Foreign Capital Inflow on Domestic Savings in Undeveloped Countries.*

APPENDIX I

Dependent Variable: LOG(GDP)

Method: Least Squares

Date: 07/24/12 Time: 20:49

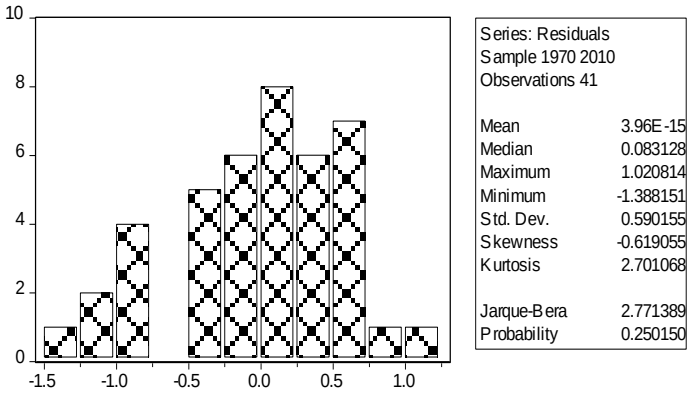
Sample: 1970 2010

Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(NS)	0.454654	0.040351	11.26758	0.0000
RIR	-0.009409	0.006648	-1.415404	0.1655
FB	-0.026886	0.021251	-1.265196	0.2139
DFD	0.038477	0.015149	2.539958	0.0155
C	6.222991	0.538896	11.54766	0.0000

R-squared	0.849237	Mean dependent var	11.85955
Adjusted R-squared	0.832486	S.D. dependent var	1.519912
S.E. of regression	0.622078	Akaike info criterion	2.002346
Sum squared	13.9313	Schwarz criterion	2.21131

resid	0		8
Log likelihood	-36.04809	F-statistic	50.69635
Durbin-Watson stat	0.437753	Prob(F-statistic)	0.000000



White Heteroskedasticity Test:

F-statistic	11.33754	Probability	0.000000
Obs*R-squared	35.22928	Probability	0.001359

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 07/24/12 Time: 20:52

Sample: 1970 2010

Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.479661	0.696739	9.299980	0.0000
LOG(NS)	-0.338509	0.212812	-1.590647	0.1238
(LOG(NS))^2	-0.001412	0.011141	-0.126749	0.9001
(LOG(NS))*RIR	-0.003106	0.002129	-1.458372	0.1567
(LOG(NS))*FB	0.012076	0.005660	2.133506	0.0425
(LOG(NS))*DFD	0.011360	0.003290	3.452860	0.0019
RIR	0.055068	0.033508	1.643451	0.1123
RIR^2	1.52E-05	0.000144	0.105611	0.9167
RIR*FB	-0.000754	0.001011	-0.746455	0.4621
RIR*DFD	-0.00056	0.000621	-0.903810	0.3744

	2			
FB	-0.256996	0.044533	-5.770939	0.0000
FB^2	-0.000287	0.001287	-0.223167	0.8251
FB*DFD	0.005491	0.002276	2.412544	0.0232
DFD	-0.294514	0.075750	-3.887997	0.0006
DFD^2	0.003027	0.001350	2.241604	0.0337

R-squared	0.859251	Mean dependent var	0.339788
Adjusted R-squared	0.783463	S.D. dependent var	0.448674
S.E. of regression	0.208784	Akaike info criterion	-0.018801
Sum squared resid	1.133360	Schwarz criterion	0.608115
Log likelihood	15.38543	F-statistic	11.33754
Durbin-Watson stat	1.836313	Prob(F-statistic)	0.000000

APPENDIX II

Dependent Variable: LOG(INV)

Method: Least Squares

Date: 07/24/12 Time: 21:13

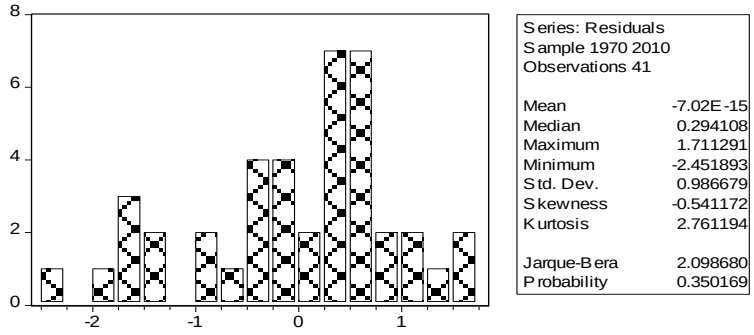
Sample: 1970 2010

Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDP)	1.041668	0.162749	6.400465	0.0000
RIR	-0.062886	0.046619	-1.348924	0.1858
C	1.765381	1.960175	0.900624	0.3738
INF	-0.084625	0.044718	-1.892424	0.0665
RER	-0.009149	0.002182	-4.192088	0.0002

R-squared	0.822831	Mean dependent var	10.98386
Adjusted R-squared	0.803146	S.D. dependent var	2.344134
S.E. of regression	1.040051	Akaike info criterion	3.030267
Sum squared	38.9414	Schwarz criterion	3.23923

resid	5		9
Log likelihood	-57.12047	F-statistic	41.79903
Durbin-Watson stat	0.537333	Prob(F-statistic)	0.000000



White Heteroskedasticity Test:

F-statistic	0.606075	Probability	0.835727
Obs*R-squared	10.08805	Probability	0.755718

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 07/24/12 Time: 21:16

Sample: 1970 2010

Included observations: 41

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	18.73742	60.43612	0.310037	0.7590
LOG(GDP)	-5.706091	9.230157	-0.618201	0.5418
(LOG(GDP))^2	0.317635	0.341600	0.929843	0.3610
(LOG(GDP))*RIR	-0.185325	0.128564	-1.441505	0.1614
(LOG(GDP))*INF	-0.182953	0.132643	-1.379285	0.1796
(LOG(GDP))*RER	0.002135	0.008454	0.252527	0.8026
RIR	2.642532	1.539826	1.716124	0.0980
RIR^2	-0.004714	0.021483	-0.219422	0.8280
RIR*INF	-0.012625	0.039785	-0.317324	0.7535
RIR*RER	-0.000972	0.002472	-0.393035	0.6975

INF	2.674249	1.621543	1.649200	0.1111
INF^2	-0.007908	0.018873	-0.419003	0.6787
INF*RER	-0.001102	0.002369	-0.465354	0.6456
RER	-0.002687	0.081750	-0.032864	0.9740
RER^2	-2.24E-05	3.26E-05	-0.687152	0.4981

R-squared	0.246050	Mean dependent var	0.949791
Adjusted R-squared	-0.159923	S.D. dependent var	1.276127
S.E. of regression	1.374385	Akaike info criterion	3.750121
Sum squared resid	49.11228	Schwarz criterion	4.377038
Log likelihood	-61.87749	F-statistic	0.606075
Durbin-Watson stat	0.778350	Prob(F-statistic)	0.835727

APPENDIX III

year	DFD	FB	GDP	INF	INV	NS	RER	RIR
1970	14.95	-5.06	4219	13.8	1246.5	411.8	334.72	-6.8
1971	14.61	5.19	4715.5	16	1573.9	464.2	337.3	-9
1972	14.69	5.46	4892.8	3.2	1725.6	566.6	341.16	3.8
1973	14.67	8.48	5310	5.4	3632.6	721.1	347.15	1.6
1974	9.32	16.04	15919.7	13.4	4383	1137.1	333.18	-6.4
1975	14.12	12.94	27172.02	33.9	5019.8	1815.2	299.3	-27.9
1976	16.92	11.07	29146.51	21.2	8107.3	2255.3	277.96	-15.2
1977	19.5	13.4	31520.34	15.4	9420.6	2592.8	246.11	-9.4
1978	21.4	6.89	29212.35	16.6	9386.3	3009.7	234.62	-9.6
1979	21.88	13.53	29947.99	11.8	9094.5	4161.8	227.59	-4.3
1980	23.89	16.5	31546.76	9.9	10841.2	5769.9	345.5	-2.4
1981	30.39	5.6	205222.1	20.9	18220.6	6562.6	259.24	-13.15
1982	32.17	0.64	199685.	7.7	17145.8	7514.4	280.7	2.55

			3				8	
1983	33.31	2.86	185598.1	23.2	13335.3	9443.9	325.52	-13.2
1984	33.72	2.41	183563	39.6	9149.8	10988.1	401.53	-27.1
1985	32.84	3.57	201036.3	5.5	8799.5	12521.8	573.5	3.75
1986	34.43	0.39	205971.4	5.4	11351.5	13934.1	313.3	5.1
1987	26.2	0.46	204806.5	10.2	15228.6	18676.3	120.2	7.3
1988	27.58	-2.75	219875.6	38.3	17562.2	23249	120.5	-21.8
1989	21.17	-0.05	236729.6	40.9	26825.5	23801.3	107.6	-14.1
1990	19.76	0.72	267550	7.5	40121.3	29651.2	100	18
1991	24.16	-2.38	265379.1	13	45190.2	37738.2	85	7.01
1992	20.86	0.04	271365.5	44.5	70809.2	55116.8	70.5	-14.7
1993	24.18	-1.56	274833.3	57.2	96915.5	85027.9	77.2	-38.88
1994	25.59	0.07	275450.6	57	105575.5	108460.5	142.8	-36
1995	14.95	6.32	281407.4	72.8	141920.2	108490.3	122.1	-52.62
1996	12.8	9.06	293745.4	29.3	204047.6	134503.2	167.7	-9.565

1997	14.75	9.45	302022.5	8.5	242899.8	177648.7	193.1	5.0425
1998	18.02	6.48	310890.1	10	242256.3	200065.1	203.6	8.2925
1999	19.69	6.67	312183.5	6.6	231661.7	277667.5	78.9	14.72
2000	19.17	2.96	329178.8	6.9	331056.7	385190.9	81	11.08
2001	26.86	4.61	356994.3	18.9	372135.7	488045.4	79.95	-0.6075
2002	21.82	0.29	433203.5	12.9	499681.5	592094	80.48	11.95
2003	23.01	0.46	477533	14	865876.5	655739.7	81	6.71
2004	18.68	1.93	527576.1	15	863072.6	797517.2	80.74	3.78
2005	18.1	3	561931.4	17.9	804400.8	131695 7	81.32	0.05
2006	20.47	2.94	595821.6	8.2	154652 6	173963 7	81.94	8.86
2007	24.88	3.6	634251.1	5.4	269355 4	269355 4	81.87	11.5375
2008	33.05	4.43	672202.6	11.6	411817 3	411817 3	82.28	3.635431
2009	38.14	2.08	716949.7	12.4	459976 8	576351 1	82.57	5.961937
2010	37.78	3.4	916949.7	13.8	479894 4	595426 1	82.86	6.7