Interest Rate Policy and Performance of Macro Variables: A Study of Indian Economy in the Post Reform Period

DISSERTATION

Submitted To

BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY

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LUCKNOW

BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY

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प्रज्ञा शील करुणा

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Submitted By :

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2017

Dedicated

To My

Revered Parents

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Certificate

This is to certify that the M. Phil Dissertation entitled "**Interest Rate Policy and Performance of Macro Variables: A Study of Indian Economy in the Post Reform Period**" submitted in fulfillment for the award of Masters of Philosophy in Economics has been carried out under my supervision and no part of the dissertation has been submitted for any degree or diploma to any other University.

The dissertation is forwarded for the submission to Babasaheb Bhimrao Ambedkar University for the award of Master of Philosophy in Economics.

22/12/2017

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Declaration

I hereby, declare that this dissertation entitled **"Interest Rate Policy and Performance of Macro Variables: A Study of Indian Economy in the Post Reform Period"** submitted to Babasaheb Bhimrao Ambedkar (A Central) University, Lucknow in fulfillment for the award of Master of Philosophy in Economics is my original work. It has not been submitted in part or full for any other diploma or degree of any other University. The indebtedness of the candidate to others has been duly acknowledged at relevant places.

This study is carried out under the supervision of Dr. Devendra Kumar Yadav, Assistant Professor Department of Economics, Babasaheb Bhimrao Ambedkar University, Lucknow.

Place: Lucknow

Date: 22-12-2017

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Signature of Candidate

(Arshi Zia)

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CHAPTER 1

1.1 Introduction:

Interest rate policy is a very important tool for an economy. Reserve bank of India determines the interest rate policy of India in the pre reform period, but now any bank or institution determines the interest rate policy. In the pre reform period only RBI can changes the interest rate policy. It maintains price stability and money supply in the country. Interest rate policy was administered before post reform period. In the post reform period interest rate policy is liberalized which is very affecting to the performance of macro variable. Liberalized interest rate policy started in 1990s in India. The reform did not gain momentum until mid- 1992 when rates of interest in India were gradually decontrolled in a variety of ways. In the post liberalization period, Indian economy has under gone cataclysmic policy changes with a define impacts on the way the interest rates are administered.

Interest rate affects very closely to the performance of macroeconomic variables. Macro-economic variables is usually tries to evaluate the economic growth and development of any country. Once interest rate increases, investment, net export and consumptions decrease automatically. If interest rates increase then consumers, households are paid more money for their consumption so consumption is decrease. When consumptions decrease then also demand decrease. When interests rate increase then unemployment rate also increased. In the liberalized period interest rate determines by the market. The inclusions of interest rate variables, like short-term deposit rate, SBI advance rate, and call money rate and the exchange rate for the full period (including the post reform period) significantly improves the predictive performance of the model. All these results give sufficient justification for examining the role of interest for conducting the monetary policy (Ray et al).

In India, the relationship between the nominal interest rates and the prices was not given much focus until the beginning of 1990s. According to classical monetary theory, the real rate of interest is determined by the force of productivity and thrift. It should not be affected in the long run by the nominal variables, such as monetary growth or inflation. A higher rate of inflation should be reflected in a higher level of nominal interest rate, leaving the real rate of interest

unchanged. It has been argued that the interest rates fall to adjust fully for inflation, but would adjust gradually in the long run. (Bhanumurthy and Agarwal 2003).

When the prices are rising then interest to be high but not equal to price rising and when prices are falls the rate of interest to be low but not as low as it should be to compensate for the fall. An interest rate is the rate at which interest is paid by borrowers for the use of money that they borrow from lenders. 'If inflationary pressure prevails in the country, the central bank will increase base lending rate to curtail the money supply among the people and companies to make borrowings expensive. Assuming the host country does not adjust the interest rate, this increase in one country creates in equilibrium in demand and supply for money and in turn it causes the exchange rate to move to equilibrium (Ramasamy and Karimi). The interest rate is an instrument to promote the growth and development which does not satisfy this basic criterion should be thrown away irrespective of the theology about liberalization.

Short term interest rate determines by the central bank and long term interest rates determines by market. The administered rate of interest is a part of financial sector reforms. In the financial sector reforms introduced during the period 1992-96, interest rate emerged at the centre stage of monetary management. Three distinct aspects of interest rate policy pursued during this period need to be highlighted, first dismantling of the administered interest rate structure, second , lending rates for banks are now totally free, third, distortion refers to the discriminatory policy in favor of the non – banking finance companies (N A Mujumdar).

High interest rate is the causes of recession. The zero interest rate policy is an important milestone in monetary policy because the central bank is no longer able to reduce nominal interest rates. Zero interest rate policy is very closely related to the problem of a liquidity trap, where nominal interest rate cannot adjust dow4nward at a time when saving exceed investment. Under the zero interest rate policy the central bank maintains a nominal interest rate. Lower interest rates are good for barrower and lower interest rates bad for saver. Interest rates in the unorganized market for both agriculture and for industry are very considerably.

Macroeconomic variable pay a vital role in the economic performance of any country. Macroeconomic is usually tries to evaluate the economic growth and development performance

in comparison to other economies. When we think about the macro economic variables many economist provide a workable answer some as follows.

According to Ackley, "a variable is easily defined as a measurable (or scale-able) magnitude which varies and in whole variation we have an interest, either because of its direct importance or because of its effect on other variables".

According to the Joshi and Little (1994), "it is the study of the behavior of very large economic aggregates, their relationships and their determinants…..[including] gross national and domestic product, national investment and savings, imports and the balance of overseas payment.

1.2 Theories of Interest rates

1. The classical theory

2. The loan-able funds theory

3. The Keynesian theory

1.2.1 The classical theory

The classical theory is known with name of Ricardo, Hume, and Fisher. The classical theory is a static theory. According to the classical theory the rate of interest is a real phenomenon in the sense that is determined by the real factors. The classical theory is the supply of saving and the demand for investment that determine the equilibrium rate of interest. The aggregate savings is the difference between the total consumption expenditure and the total national income. The classical theory says that the saving may be effected by household, individuals, business and government.

The various economic units can be induced to undergo the sacrifice and save if they are offered a reward for such an action. This reward is known as the 'rate of interest'. So interest rates are a reward for waiting or sacrifice or abstinence involved in the act of supplying savings. Interest rates are intimately involved with the rate of time in economic activities and in the lives of economic units.

For the greater saving is needed to be offered higher rate of interest. There will be no saving at zero interest rate of interest. While the saving diagram is upward sloping, the investment diagram is downward sloping. The equilibrium rate of interest is determined by the interaction of these saving and investment I the economy. The classical theory point of view "regards interest as determined by demand and supply, the productivity of capital goods providing the main elements of demand, and supply of capital being limited by the reluctance to abstain from current consumption and do more savings" (Samuelson, P. A.) . The rate of interest so determined is variously known as the "full stock equilibrium rate", "natural rate", "classical real rate" and "true real rate."

1.2.2 The Loan-able Fund Theory

The loan-able funds theory of interest rate is modification in the classical theory. The loan-able funds theory is a dynamic theory as opposed to the static nature of the classical theory. The loan able funds theory is combined the real and monetary factors as determination of the rate of interest. The loan-able funds theory discards the independence of the interest rate from the behavior of money and banks. According to the loan-able funds theory, the real supply and demand curve determining interest rates should have added to them a component of the supply of saving which is associated with the creation of new money or credit.

1.2.3 The Keynesian Theory

Where the classical theory represents the one extreme, the Keynesian theory represents the other extreme approach to the determination of interest rate. According to the Keynes, interest rate is a purely monetary phenomenon. This means, interest rates determined by the interaction between demand and supply of money in the economic system. The rate of interest is reward offered to the people to induce them to hold securities instead of cash. Cash is perfectly liquid and safe because there is no danger of physical deterioration or capital loss.

The demand to hold the money is called liquidity preference. According to the Keynes, there are three motives behind the demand for liquidity preference of firms, institutions and individuals.

1. Transactions motive
2. Precautionary motive

3. Speculative motive

The supply of money in the modern economies is said to be under the ultimate control of the monetary authorities. The supply of money and demand determines the rate of interest. To lower the rate of interest, it is necessary to increase the supply of money.

1.3 Review of Literature:

The review of literature plays a vital role in establishing the backdrop for any research especially in social science. It is felt that the justification of the present study can be clarified by reviewing the available literature on subject. Therefore an attempt has been made to review the available literature on the subject to find out the research gap.

Partha Ray et al (1998): In this paper authors explain a new dimension in the monetary transmission mechanism in the environment of liberalization initiated in the early 1990s and in the context of growing integration of financial markets. To see the role of two variable interest rate and exchange rate in the conduct of monetary policy chakravarty committee has an examination. This study shows that the money, income, price and exchange rates are cointegrated and that disequilibrium in money market endogenously impacts interest rates in the post liberalization period. In this period we also establish that while exchange rate was weakly exogenous to the monetary system in the pre- liberalization period, monetary shocks and exchange rate fluctuation are related endogenously in the post liberalization period.

Dua and Pandit (2001): this paper presents that the determination of interest rate in India in post reform period. The objective of this study is to examine the role of domestic and external factor in the determination of short term and long term behavior of interest rate in India in post reform period. The study presents that the empirical relationship between real interest rates real government expenditure, real money supply, foreign interest rates and inflation rate in the post reform period. The result of this study is that how market determined rates of interest in India is influenced by domestic and external factors. In this paper cointegration analysis and grager causality test in the framework of error correction model are used to examine the relationship between real interest rate, real money supply, real government expenditure and inflation rate.

Ramasamy and Karimi (2015): In this study authors used three countries yearly exchange rates with their macroeconomic variables such as relative interest rate etc to study the impact they exert on exchange rates. Author used bootstrapping technique to increase the sample size to run regression to study the effect. Author applied multi models by linking complementary variables to identify the best model. The results that model was robust which indicated all macroeconomic variables significantly influenced the exchange rates except employment and budget deficit. Most of the macroeconomic variables showed opposite sign contrary to the expectations and author concluded that the psychological factors like investor confidence dominate over economic variables in deciding exchange rate fluctuation. Exchange rates play a significant role in international trade in fixing the prices also in determining the nature of hedging to be arranged to avoid exchange rate risks.

Khan and Sattar (2014): This study is analyzed to impact of interest rate changes on the profitability of commercial banks in Pakistan by examining the financial statements of four major banks during 2008 to 2012. As the efficiency of banking sector is considered most important for macro -economic stability, economic growth and monetary policy implementation. From the few years, interest rate spread of banking sector is rising. And a result of variation, in the interest rate depress the saving and investment. To examine the impact of interest rate change on the profitability of commercial bank, used the pearson correlation method in the study. As a result it is found that there is a strong and positive correlation between interest rate and commercial bank's profitability.

Gupta and Srinivasan (1984): In this paper authors try to examine the impact of government policies relating to change in the administered prices on the sector and overall price movement of the economy. The result of this study is that the impacts of the administered price changes on relative and absolute prices of the country cannot be assessed without taking into consideration their mutual interactions. The success of administered price revisions as an instrument to generate additional resources mobilization in the public sector cannot be assessed a partial equilibrium model and the inflating potential of changes in administered price is significantly high and the potential for generating additional saving is much less than the nominal effects.

Nachane and et al (1997): The author in this paper fined out that a cheap money policy is no panacea for the high interest rate imbroglio and that the budgetary deficit actively raises interest

rate. And show that financial liberalization has taken place on a large scale. But the issue is that how interest rates are to be brought down from their current high level. And for the brought down of interest rates increase in the growth of budget deficit. The evidence of a positive association between interest rate and budget deficit is particularly strong. In this study author used monthly data and this decision restricted his choice of interest rate variables to essentially two 91-day TB yield and 364-TB yields. Both these may be considered short –term rates. Other short term rates in the Indian context could be the call money rate and the bank rate.

Goyal (2004): according to the authors, the relationship between fiscal deficit and the rate of interest is still a complicated issue. Theoretically, at least in neo classical sense, funding of government requirements through market borrowings would not only induce rise in interest rate, but the increased the funding cost in turn would also contribute to the rise in fiscal deficit. In the context of India, coexistence of falling of interest rates and growing size of fiscal deficit in the recent years, however, seems to suggest that the causation between the does not hold. Further, there is empirical evidence suggesting one way causality running only from real interest rate to fiscal deficit. This paper re-examines this issue and argues that the absence of an apparent impact on interest rate is essentially the result of higher liquidity in the system. Empirical results drown through a VAR model show that there are two ways of causality between gross deficit and the real interest rate.

L.M.Bhole (1985): in this study, author analyzed that the evolution of the system of low and administratively fixed interest rate and the discretionary ceiling of credit allocation, the alleged justification for the adaption of such a system, and its effect on the behavior of interest rates, the working of monetary control and the economic activity in India. The analysis shows that this system has been harmful and, therefore it should be replaced by the alternative system of high and free interest rates with the dependence on more than one technique of monetary control used in a well coordinated manner. Such an alternatives system would very much conductive to increasing efficiency of investment, efficiency of monetary control, increase the rate of saving and efficiency of overall economic growth.

Bhanumurthy and Agarwal (2003): The present study examines the relationship between nominal interest rate and the expected inflation rate, in Indian context. Author considered the post-reform data of short-term and long-term interest rates and the inflation rate based on WPI

and CPI. The expected inflation rate has been formed under the assumption of rational expectation. In this study author used the autoregressive distributed lag bounds test developed by Pearsan, Shin & Smith, (2001) which takes care of the problems of order of integration of the time series. The study found that, though not robust, the long-run one-for-one relationship between nominal interest rates and the expected inflation has been found only between call money rate and the WPI inflation. But this finding is sensitive to the lag length selection criteria adopted in the model. In this study author considers the monthly data on different interest rates and the inflation rates for the post reform period. The present study would examine the Fisher hypothesis in the case of India.

Arun (1994): According to this study our present policy makers appear to be believers in shock therapy. According to authors the objection to interest rates does not imply that all interest rates should suddenly and precipitately be brought down. Rather, two steps are necessary, first is a gradual lowering of the interest rate structure. Second, and more important, putting in place an institutional structure which would make adequate and timely credit available to small farmers, small industries, artisans etc… The ongoing reform of the financial sector is thus wholly misdirected, the reform has to be differently designed and implemented. The policy of imposing high interest rates on a stagnant economy is the direct result of the obsession of the present policy-makers with success in the financial markets rather than in the matter of growth of the real economy.

Jha (2002): In this paper author examines to assess why lowering interest rates is proving to be hard in India. He highlights the role of three factors, namely, high public debt and its structure, the overhang of non-performing assets and the policy being pursued with respect to accumulation of foreign exchange reserves. These three factors are causally linked to each other and should not be looked upon as mutually exclusive contributors.

T M Obamuyi (2009): This paper examines the relationship between interest rate and economic growth in Nigeria by using time series analysis and annual data from 1970-2006. The results show that there exist a long-run relationship between interest rates and economic growth. Interest rate is an important determinant of economic growth in Nigeria. The deregulation of interest rates in Nigeria may not optimally achieve its goal, if those other factors which negatively effects investment in the country. This implies that the link between interest rates, investment, and

economic growth is not automatic. The relationship between investment and growth in Nigeria may not allow for optimal benefits from interest rates reforms in the country.

Rao (2000): Author finds out that the relationship between budget deficits, money creation and debt financing suggests that interest rate targeting and inflation control are both monetary and fiscal policy issues. Author formalized these links within two analytical frameworks, static as well as dynamic. By highlighting the concepts of the high interest trap‘s and the tight money paradox‘, respectively, he suggests that, for any given deficit, there exist optimal levels of monetization and market borrowings. By ensuring this optimal split between monetization and borrowing in the present, it would be possible to balance the future needs of the economy needs of the government and therapy avoid the high interest/ inflation trap and the subsequent specter of an economic slowdown.

Prabir C Bhattacharya, M N Sivasubramanian (2001): This study examines the banking sectors reform in India, which were a part of the liberalization process of the economy. Author founds that there has been an increase in the ratio of deposits to national income in the post reform period. The declining trend in the rate of growth of deposits would seem to have been reversed. There has occurred a structural break in the movements of bank deposits, bank credit and bank investment in post reform period compared to pre reform period. The banks have invested in government securities a much larger proportion of their deposits than is warranted by the prescribed SLR. Author also finds that the high level of investment in government securities by banks has imported a certain degree of downward stickiness to the movement of interest rates in the economy.

Lekha S (2012): this paper examines whether there is any evidence of the fiscal deficit determining the interest rate in the context of India. The period of study is 2006-07 to 2011. Author used the asymmetric vector auto regressive model in this study. The paper finds that an increase in the fiscal deficit does not cause a rise in interest rates. The paper establishes that the interest rate is affected by changes in the reserve currency, expected inflation, and volatility in capital flows, but not by the fiscal deficit. This result has significant policy implications for interest rate determination in India, especially since the central bank has cited the high fiscal deficit as the prime reason for leaving the rates unchanged in all of its recent policy announcement. This paper analyze that long and short term interest rates to determine the

occurrence of financial crowding out, and finds that the fiscal deficit does not appear to be causing either shorts and longs.

Research Foundation (2002): With all round downward movement of rates of all types and maturities in the past three years, near stability in the interest rates profile has been achieved. RBI policies of low bank rate, active management of liquidity and signaling its preference for softening of interest rates have contributed to this development.

Pattnaik and Mitra (2001) According to the authors the rationale for raising the interest rate to defend an exchange rate under speculative attack is well-grounded on economic and financial theories, empirical validation of the effectiveness of such a policy stance has generally been difficult and is shrouded with conflicting findings. Assignment of Monetary Policy to the exchange rate objective in a regime of managed flexibility may involve a temporary loss of monetary independence and some sacrifice on other objectives of monetary policy, particularly growth and stability of the banking system. However, when monetary measures succeeded in ensuring an orderly condition in the foreign exchange market, the benefits may outweigh the potential costs stemming from an interest rate defense of the exchange rate. In India, such an interest rate defense seems to have worked in stemming speculation during the times when the rupee comes under pressure.

Research Foundation (2000): When the economy is in a crisis the Reserve Bank cannot sit back and say it has done enough by reducing interest rates and supplying liquidity to the market. It needs to operate on many fronts interest rates, general refinance, sector-specific refinance, directed credit norms and moral suasion to introduce dynamism into the bank‘s credit delivery system.

Datar (2001): The arguments for linking interest rates on small saving scheme to market rates and rationalizing the tax benefits available to them rest on removing the government arbitrary powers in liberalized interest rate environment. If small saving scheme become relatively unattractive as a result of the suggested measures, the government would need to borrow more from alternative sources. If total government borrowing is not kept in check, yield on government securities would go up and within the interest rates on small saving scheme would also warrant upward revision.

1.4 Objectives of the Study

The proposed research study has following objectives to fulfill.

- To examine the India's interest rate policy in the post reform period.
- To study the effects of interest rate policy on performance of macroeconomic variable in the post reform period.
- To study the effectiveness of Interest Rate Policy and make suggestions for its further improvement.

1.5 Hypothesis of study

The study may test the following hypothesis

- India's interest rate policy has consistently moved from administered rate of interest to liberalized rate policy in the post reform period.
- Liberalized interest rate policy in the post reform period has significantly affected to macro variables and contributed to improve their performance.
- Due to development of India's financial market effectiveness of interest policy has improved in the post reform period.

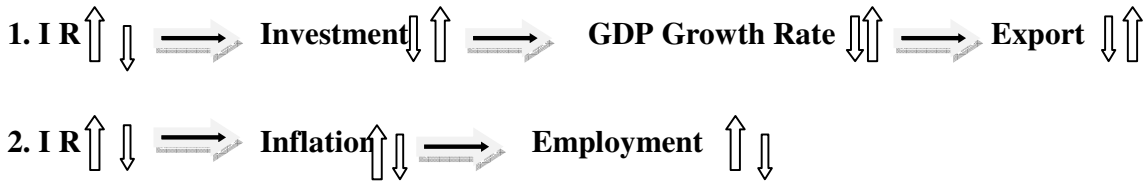
1.6 Research Methodology and data source

The whole study is based on the secondary data and time period of the study is from 1991-91 to 2013-14. The study is proposed to use the annual time series data for carrying out the empirical analysis. The secondary data have been taken from RBI bulletins, annual report of RBI, report on currency and finance, national sample survey organisation, books, journals and available literature etc. Suitable statistical and econometric techniques will be used for analyzing the casualty between interest rate policy and performance of macro variable.

The variables used in the study are interest rate, call money rate, deposits rate, prime lending rate, investment, GDP growth rate, balance of payment employment and etc. Analysis of the study is based on the simple linear regression model. Lending rate of commercial banks have been considered as proxy of prevailing rate of interest in analysis.

For analyzing the impact of interest rate policy on macro-economic variables, whole period is divided into three sub period, viz. 1991-92 to 1996-97, 1997-98 to 2002-02 and 2003-04 to 2013-14. For measuring the effectiveness of interest rate policy, two channel of interest rate policy has

been considered. Firstly, the real variables channel which works through investment and secondly monetary channel which works through inflation. Details mechanism of both channel are as follows:



1.7 Significance of the Study

The present study aims to show that the effects of liberalized interest rate policy on performance of macro variables in post reform period. This study analyze that the performance of macro variables has improved or not improved in the post reform period.

1.8 Plan of the Study:

The chapter two 'assessment of interest rate policy in post reform period' stated with the evaluation of interest rate policy. Many types of interest rates are included in this chapter. In this chapter we tries to understand that how was interest rate policy in post reform period.

The third chapter 'interest rate policy and performance of macro variables' begins with the performance of macro variables. In this chapter we show that the how performances of macro variables are improves.

The fourth chapter 'effectiveness of interest rate policy in post reform period' try to understand the effectiveness of interest rate policy. This chapter tries to evaluate that how much effective the interest rate policy is in the post reform period.

The study ends with the 'conclusion' which is the last chapter. The conclusion gives the outline and major findings of the study.

1.9 Chapter plan

Chapter 1

Introduction

Chapter 2

Assessments of interest rate policy in post reform period

Chapter 3

Interest rate policy and performance of macro variables

Chapter 4

Effectiveness of interest rate policy in the post reform period

Chapter 5

Conclusion and policy prescription

CHAPTER 2

Assessment of Interest Rate Policy in the Post Reform Period

2.1 Introduction

Interest rates are inevitable tools for an economy, which helped in the development of an economy. And interest rates have to play important role in the successful implementation of various policy measures. Interest rate is most important instrument of monetary policy in India and other countries. "The policy, structure, level and trends of interest rates in India have their own peculiar nature and varied behavior" (SMITHA T.H.).

Interest rate is a significant factor in determining the economic environment in which investment has to take place, especially when many companies are not cash rich. Interest rates have high influence on both growth and inflation the interest rate, higher is the cost of capital and contributors to show down investment in the economy. Lower the interest rate, higher is the supply of money in the economy and greater purchasing power of individuals. This will increase in the price of goods, since there is more demand and less supply of the goods.

Interest rate policy in India has gone through many variations. It is extremely difficult to understand the entire multiple and relevant issues involved in formulation and implementation of interest rate policy in country.

In this study we include these types of interest rates. Prime lending rates (PLR), bank deposit rates (BDR), call rates (CR), bank rate (BR), commercial paper rates (CP).

2.2 Interest Rate policy in the post Reform Period:

Monetary policy and fiscal policy is very important for an economy. But our study is focused on monetary policy. In the post reform period, a major change came in the monetary policy. In the post reform period RBI has brought down many changes in the interest rate policy. Interest rate policy is the most dominant transmission channel of monetary policy. If any change in interest rate policy then it immediately affect the monetary policy. In the post liberalization period Indian economy has under gone cataclysmic policy changes with a definite impact on the way the

interest rates are determined. In the post reform period it has been found that Indian financial markets are getting more integrated with rest of the world and the movement of the various interest rates in the Indian economy has been influenced by the movements in the foreign interest rates (Bhanumurthy and Agarwal).

In India, interest rates as an instrument of monetary policy were activated in 1990s. The level of all types of interest rates short term interest rate and long term interest rates in India significantly increased during the years. The extent of increase differs for different rates and in different periods of time.

During the 1990s, the interest rate structure has changed from administered interest rates to the market oriented or liberalized rate of interest. The lending rate was deregulated in respect of loans above Rs. 2 lack.

The interest rates have declined substantially after 1996-1997. Before 1996-97, when interest rates were changed, they were mostly change in upward direction. The movements in the downward direction were relatively less in number except in the case of call rate. The call rate is the only rate which used to be somewhat influenced by the market force. The behavior of call rates provide an idea how interest rates might behave if interest rates are not administered.

2.3 System of administered Interest Rates in India

In the pre reform period most of the interest rates were administered in India. Most of the interest rates were determined by the monetary authorities. The deposits rates and lending rates of commercial and cooperative banks were fixed by the authorities. Deposit rates first came to be regulated in 1966 through inter-bank agreements. Since 1969 deposit rates were fixed by the RBI. It had also been fixing the maximum and minimum lending rates of commercial banks since 1964 and 1969. The RBI fixed different deposit rates and lending rate for different types of bank, viz. large banks, smaller banks, cooperative banks, and regional rural banks.

The Indian bank association had been fixing the ceiling on call rates since 1973 until October 1998 when the call rate was free from the ceiling. The government fixed the rates on treasury bills and long term government securities. The RBI fixed different interest rates on loans to

different categories of borrowers and on loan for different purposes. It fixed interest rates on different financial instrument such as commercial bills.

The treasury bills rates is an example of the administered interest rate. Treasury bill rates remained constant from 1974-75 to 1991-92 in spite of so many significant changes in the financial market and in the economy as whole.

2.4 Problems of Administered Interest Rates

The system of administered interest rates has had a number of effects on interest rate and the credit control mechanism. The administered interest rate structure seems to have opposite affected financialisation of saving, efficiency of financial system and the independence of central bank. In many studies it was found that the system of administered interest rate has been harmful and, therefore it should be replaced by the alternative system of high and free interest rates with the dependence on more than one technique of monetary control used in a well co- ordinate manner.

The administered interest rate structure Sato (1990) found that regulation of lending rate well below the market rate force the demand for credit to equate with the supply. Sato (1990) argued that in an administered interest rate regime, regulation of one interest rate led to the regulation of other interest rates. The reserve bank of India (1985) noted that in India, regulation of banks lending rates led to the regulation of banks deposits rates which in turn has forced the regulation of interest rates on deposits with non-bank financial companies. As the lending rates low, banks were forced to pay lower deposit rates, which might have adversely affected savings.

The problems of administered interest rate structure as pointed out by chakravarty committee (1995) are following.

1. The system of interest rate structure had grown to be unduly complex, and it contained the features which had reduced the ability of the monetary system to promote the effective use of credit.
2. The low yields on treasury bills and government securities had resulted in the high level of monetization of public debt and consequent monetary expansion.

3. The captive market for government securities had adversely affected the growth of capital market and the profitability of banks.
4. Concessional rates of interest had allowed projects of doubtful viability to be undertaken.
5. Quantitative credit controls had come under severe stress in the absence of support from any price rationing mechanism.
6. The policy of insulating banks from price competition and confining to customer service has not served to promote high standard of customer service.

The system had lacked the flexibility necessary for augmenting the pool of financial savings.

2.5 Deregulation of Interest Rates:

In the post reform period, the system of administered interest rates replaced by the system of free and flexible interest rates in India. Liberalization of interest rate policy is started in late 1980s. In the post reform period banks are free to determine their lending rates. Now in the post liberalization period most of the interest rates are determined by the banks on the basis of market force. Before post reform lending rates of banks determine by the reserve bank of India.

The reserve bank of India introduced new government securities through auction sate in mid 1992. It is included 364-day treasury bills and five year and ten year bonds. "The year 1993 also the beginning of the era of a freely and floating exchange rate system. From1975 to 1992 the rupee exchange rate was officially determined by the reserve bank of India and was based on a weighted basket of currencies of India's major trading partners"(Dua and pandit).

When we compare Indian interest rate with other countries, especially with advance countries, we found that the flexibility and variability of interest rates have been much more in abroad than that prevailing in India. Short term interest rates in India have usually higher and long term interest rates have lower rates than the rate prevailing abroad. But after 1985, the long term interest rate also showed an increasing trend.

2.6 Phases of Interest Rate Policy in the post reform period

Since 1950, in India interest rate policy can divide in following phases.

I. 1951-1960 flexible interest rate policy.

II.	1961-1885	Administered or regulated interest rate policy.
III.	1986-1990	The beginning of liberalized interest rate policy or a semi administered interest rate policy.
IV.	1991-1996	The system of progressive deregulation and flexibility or the phase of deregulation and tight money.
V.	1997- 2012	The system of managed flexibility with nearly complete deregulation, and one of the lowest levels of interest rates in India.

Free and flexible interest rates would be more conducive for the promotion of saving, investment and for increasing the efficiency of monetary policy, government finance and financial system. The interest rates were further deregulated in November 1991 by Narashimha committee. In April the interest rates have been almost completely deregulated.

In 1991 interest rate policy were fully deregulated. Before 1991 interest rate policy was started to deregulation interest rate policy but nut completely deregulated.

In the starting of deregulation, the existing maturity wise prescription for interest rate on deposits were replaced by a single ceiling rate, which was subsequently varied in line with changes in the minimum lending rate. In April, a single ceiling rate of 13 percent was fixed for all deposits above 46 days maturity. This ceiling rate was reduced to 10 percent in november1994, and it was again raised o 12 percent in April 1995. In October 1995, bank deposits with maturity of over two years exempted from the prescription of the ceiling interest rate.

The long term deposits rates continued to be administered till April 1992, the banks were allowed to set interest rate on deposits with maturities between fifteen days and one year subject to a ceiling of eight percent from April 1985. Banks deposits interest rates continued to be administered for some more time. And the deregulation of bank deposits interest rate began with the deregulation of bank's lending rates. In October 1997, deposit rate were fully deregulated by removing their linkage with bank rate.

2.7 Deposits rates:

In the post reform period, interest rates on bank deposits have received a kind of stepladder treatment or bank depositors have received a new deal. Deposits rates were the last

to be really and fully deregulated. For a long period of time, deregulation took place in respect of bank lending rates than deposits rates. When the interest rate on bank deposits, government securities and small savings are all administered. The explanation of the phenomenon of relatively higher interest rates on small savings is that the government deliberately decided to offer relatively more attractive rates on these assets in order to channelize household saving to the exchequer. Interest rates on small saving have been either higher or lower than the interest rates on government securities and bank deposits.

Table 1.1
Deposits rates from the period 1991-92 to 2012-13

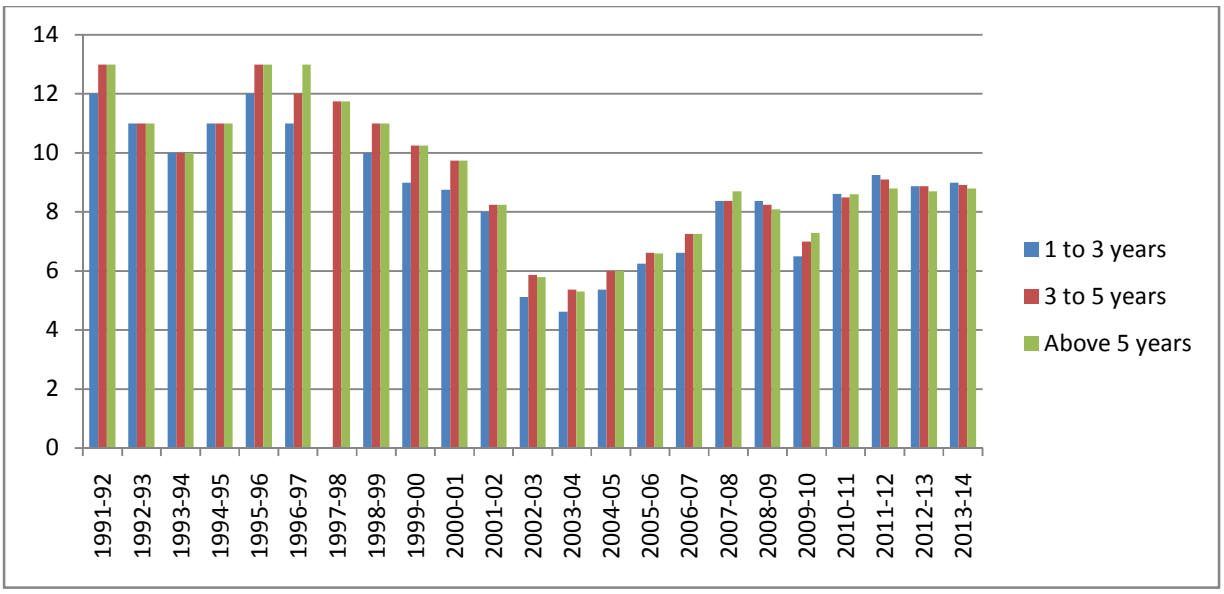
Years	Deposits rates*		
	1 to 3 years	3 to 5 years	Above 5 years
1991-92	12	13	13
1992-93	11	11	11
1993-94	10	10	10
1994-95	11	11	11
1995-96	12	13	13
1996-97	11	12	13
1997-98	10.50-11.00	11.50-12.00	11.50-12.00
1998-99	9.00-11.00	10.50-11.50	10.50-11.50
1999-00	8.50-9.50	10.00-10.50	10.00-10.50
2000-01	8.50-9.00	9.50-10.00	9.50- 10.00
2001-02	7.50-8.50	8.00-8.50	8.00- 8.50
2002-03	4.25-6.00	5.50-6.25	5.50- 6.25
2003-04	4.00-5.25	5.25-5.50	5.25- 5.50
2004-05	5.25-5.50	5.75-6.25	5,75- 6.25
2005-06	6.00-6.50	6.25-7.00	6.25- 7.00
2006-07	6.25-7.00	6.50-8.00	6.50- 8.00
2007-08	8.00-8.75	8.00-8.75	8.50- 9.00
2008-09	8.00-8.75	8.00-8.50	7.75-8.50
2009-10	6.00-7.00	6.50-7.50	7.00-7.75

2010-11	8.25-9.00	8.25-8.75	8.50-8.75
2011-12	9.25	9.00-9.25	8.50-9.25
2012-13	8.75-9.00	8.75-9.00	8.50-9.00
2013-14	8.75-9.25	8.75-9.10	8.50-9.10

Source: RBI, Handbook of statistics on India economy (various years)

*: commercial bank rates

Figure: 2.1 Deposit rate (average)



Source: RBI, handbook of statistics on Indian economy

1991-92 to 1996-97

Bank deposits rate effective 13 per cent from October 9, 1992. Bank deposits rate effective 11 per cent from March 19, 1993.Term deposit rate was reduced to 'not exceeding 10 per cent' effective from September2, 1993. Effective from February 10, 1995 banks maximum term deposits rate was increased to 'not exceeding 11 per cent' from 'not exceeding 10 per cent. Effective from April 18, 1995, the maximum term deposits rate of 46 days to 3 years and above was increased to not exceeding 12 per cent' from 'not exceeding 11 per cent'. Effective from October 21, 1996, the maximum interest rate on domestic term deposits of bank maturity

between 30 days and one year was reduced to not exceeding 10 percent per annum from 11 percent.

1997-98 to 2002-03

The interest on domestic term deposits of bank for maturity of 30 days and up to one year was changed from not exceeding 10 percent to not exceeding bank rate minus two percent per annum from April 16, 1997. Bank were free to fix their own interest rates on NRE term deposits of 6 month and over with prior approval of their boards. The interest rate ceiling on FCNR deposits of one year and above was increased by 50 basis points and that on such deposit below one year was reduced by 25 basis points. And banks were permitted to fix their own interest rate in respect of FCNR and NRE deposit. In 1999-2000, deposits rate was found between 8.50 percent to 9.50 percent for 1 to 3 years. For 3 to 5 years deposit rate was 10.00-10.50 percent and also above 5 years deposits rate were 10.00 to 10.50 percent. The reserve bank reduced the saving deposits rates of scheduled commercial banks from 4.5 to 4 percent from April 1, 2000. In 2001-02, the deposit rate for 1 to 3 years was 7.50-8.50percent. For 3 to 5 years deposit rate was 8.00 percent to 8.50 percent and also above 5 years deposit rate was 8.00 percent to 8.50 percent. The deposit rate was found between 4.25-6.00 percent for 1 to 3 years. For 3 to 5 years deposit rate was found between 5.50-6.25 percent and above 5 years deposits rate was found between 5.50-6.25percent in 2002-03.

2003-04 to 2013-14

In 2003-04, the deposit rate was found between 4.00-5.25 percent for 1 to 3 years. For 3 to 5 years deposit rate was found between 5.26- 5.50 percent and also above 5 years deposit rate was found 5.25-5.50 percent. Banks allowed reducing the minimum tenor of retail domestic term deposits from 15 days to 7 days. Banks have the freedom for differential rates of interest on wholesale domestic term deposit of Rs. 15 lack and above. The deposits rate was found between 6.00-6.50 percent for 1 to 3 years. For 3 to years deposit rate was found between 6.25-7.00 percent and above 5 years deposits rate was found between 6.25-7.00 percent in 2005-06.

The deposit rate was found between 6.25-7.00 percent for 1 to 3 years. And for 3 to 5 years deposits rate was between 6.50-8.00 percent and also above 5 years deposits rate was found between 6.50-8.00 percent in 2006-07. Ceiling interest rate on FCNR deposits reduced by 50

basis points to LIBOR/SWAP rates minus 75 basis points for respective currency/ maturity. In 2008-09, the average deposits rate was found between 8.00 percent-8.50 percent. The average deposits rate was found between 6.00 percent to 7.75 percent in the year 2009-10.In 2010-11, the average deposits rate was found between 8.25 percent to 8.75 percent during the year. In 2011-12, the deposit rate was observed between 9.00 percent to 9.25 percent during the year 2011-12. The average deposit rate was found between 8.75 percent to 9.00 percent for the year 2012-13. The average deposits rate was observed between 8.75 percent to 9.10 percent during the year 2013-14.

2.8 Lending Rates:

The prime lending rates is the rate which the lender charges the borrower of a high credit standing or credit rating. During 1995-76 to 1994-95 prime lending rates remained an administered interest rate. With effect from October 18, 1994 the lending rate was deregulated in respect of loans above rs.2 lack. In the deregulated system each of the major commercial banks and term lending institution began fixing their prime lending rates. With effect from April 19, 2001 Prime lending rate has been converted to a bench mark lending rate for banks.

Table: 1.2

Lending rates from the period 1991-92 to 2013-13

Years	Lending rates *	
	Minimum rate General	**Minimum rate selective Credit control**
1991-92	19	19
1992-93	17	17
1993-94	14	15
1994-95	15	15
1995-96	16.50	Free
1996-97	14.50-15.00	Free
1997-98	14.00	Free

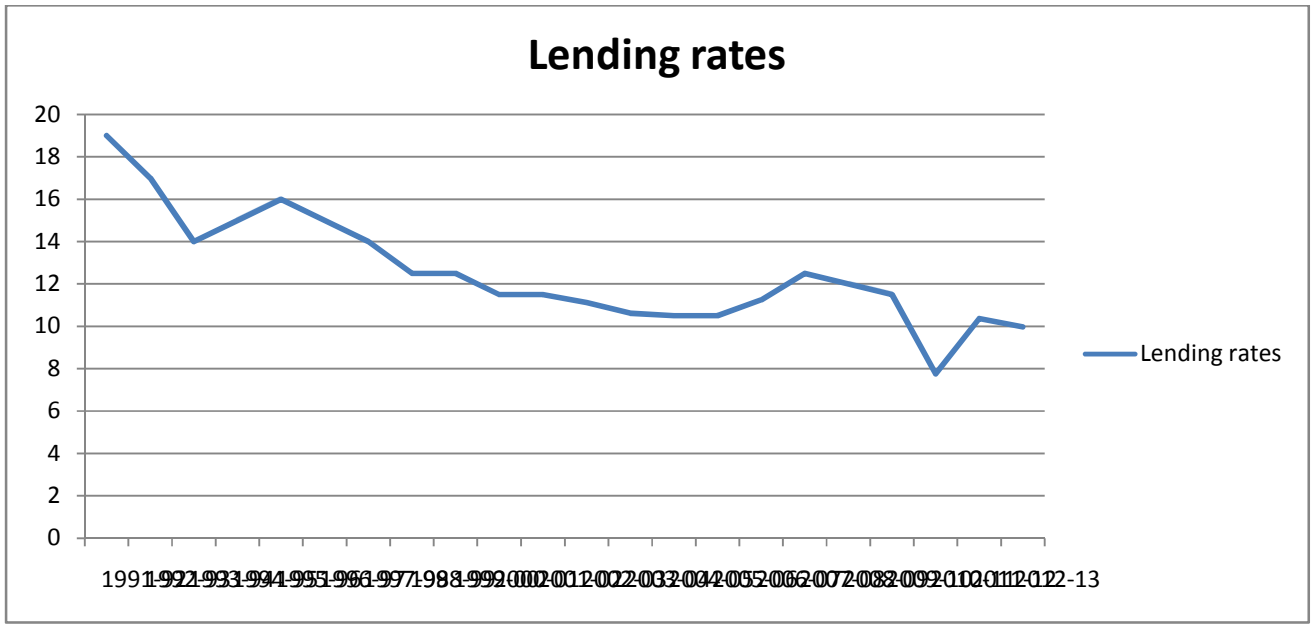
1998-99	12.00-13.00	Free
1999-00	12.00-12.50	Free
2000-01	11.00-12.00	Free
2001-02	11.00-12.00	Free
2002-03	10.75-11.50	Free
2003-04	10.25-11.00	Free
2004-05	10.25-10.75	Free
2005-06	10.25-10.75	Free
2006-07	11.00-11.50	Free
2007-08	12.25-12.75	Free
2008-09	11.50-12.50	Free
2009-10	11.00-12.00	Free
2010-11	7.50-8.00	Free
2011-12	10.00-10.75	
2012-13	9.70-10.25	
2013-14	10.00-10.25	

Source: RBI Handbook of statistics on Indian economy (various years)

*: Commercial banks rates

Table 1.2 shows the lending rates from the period 1991-92 to 2012-13. The details of interest rate reduction at different periods are given below.

Figure: 2.2 Lending rate (average)



1991-92 to 1996-97

The effective lending rates are 19 percent in 1991-92. The minimum lending rates for credit limit of over Rs. 2 lack was reduced from 20 percent to 19 percent effective from march 2, 1992. 18 percent effective from October 9, 1992 and further to 17 percent effective from march 1, 1993. MLR effective from September 2,1993 to 15 percent. MLR on term loan of 3 years and above was lowered from 15 percent to 14 percent effective from March 1, 1994. Effective from October 18, 1994 lending rates for credit limits of over Rs 2 lack was abolished and banks were free to fixed their lending rates for such credit limits. Effective from June 21, 1995 primary co-operative bank's lending rates for all categories of loans were fixed subject to MLR of 13 percent. In the context of the flexible lending rates effective from October 1, 1995, banks were allowed to fix their own interest rate on advance of over Rs. 2 lack against domestic term deposits and deposits under NRE scheme. MLR effective from July 23,1996. In the context of the need for ensuring viability of RRBs and providing greater maneuverability and ensuring the flow of adequate and sustainable credit to the rural sector, the lending rates of RRBs were freed, effective from august 26, 1996.

1997-98 to 2002-03

In the recent movements the interest rates effective from October 22, 1997, interest rates for credit limits over Rs.25000 and up to 2 lacks was stipulated at 'not exceeding 13.5 percent per annum' instead of the earlier fixed rate of 13.5 percent per annum. On October 22, 1997 banks were allowed to fix prime term lending rates on term loans of 3 years and above with approval of their boards. Banks were replenishing flexibility in regards to certain aspects pertaining to lending rates. In order to facilitate the flow of credit to small borrowers, it was proposed that the interest rates on loans up to Rs. 2 lack were not to exceed the prime lending rate of the concerned bank, instead of a specific uniform rate for all banks. Banks were allowed to operate different PLRs for different maturities instead of the existing two PLRs (short term and long term). It was decided that in cases where deposit rates are equal to are more than PLR or less than one percentage point below PLR, the banks would have freedom to charge suitable rates of interest on advances against domestic/NRE term deposit without reference to the ceiling of PLR.

The reserve bank advised that the interest rate on advances for fixed rate loans would be available to banks for all term loans and for all purposes including small loans up to Rs. 2 lack subject to conformity with ALM guidelines. There was no policy announcement during 2000-01. The reserve bank reduced the minimum lending rate of urban co-operative banks from 13 percent to 12 percent, effective from March 2, 2001. The decision was taken in the wake of representation from UCBs which felt that such a reduction would help them offer competitive rates to their borrowers. Banks to report to the reserve bank the minimum and maximum lending rates to exporters, with effect from fortnight beginning June 15, 2002 for placing in public domain. Co-operative banks free to determine the lending rates with withdrawal of MLR concept. Co-operative banks to publish the minimum and maximum lending rates and display the same in every branch.

2003-04 to 2013-14

In the year 2003-04 lending rates found between 10.25 to 11.00 percent. In 2004-05 lending rate was found between 10.25 to 10.75 percent. Banks were allowed to determine rates of interest on loans and advance for purchase of consumer durables, to individuals against shares and debenture/bonds and other non-priority sector personal loans without reference to PLR and

regardless of the size of loan subject to the transparent. There was no policy announcement during 2004-05. Indian bank's association asked to review the benchmark prime lending rate system and uses transparent guidelines for appropriate pricing of credit. There was no policy announcement during 2006 to 2009. The benchmark PLR was fixed in the range of 11 to 12 percent during the year. The BPLR was decided in between 7.5 and 8 percent. In 2011-12 lending rate was found between 10.00 to 10.75 percent. In the year 2012-13, lending rate was between 9.70 to 10.25 percent. In the year 2013-14 lending rate was found between 10.00 to 10.25 percent.

2.9 Call Money Rate:

The rate at which the call loans are issued is the call rate. The call money market works with loans of very short term duration. The call money market deals with one day loans. This loan may be or may not be renewed the next day. Call money market loans are given for a very short period of 24 hours. The loan period of call money market cannot extend seven days under any circumstance securities. The rate of interest on call loans is very low and changes several time during the course of the day. Call loans are useful to the commercial banks because commercial banks can be converted into cash any time.

Table 2.3

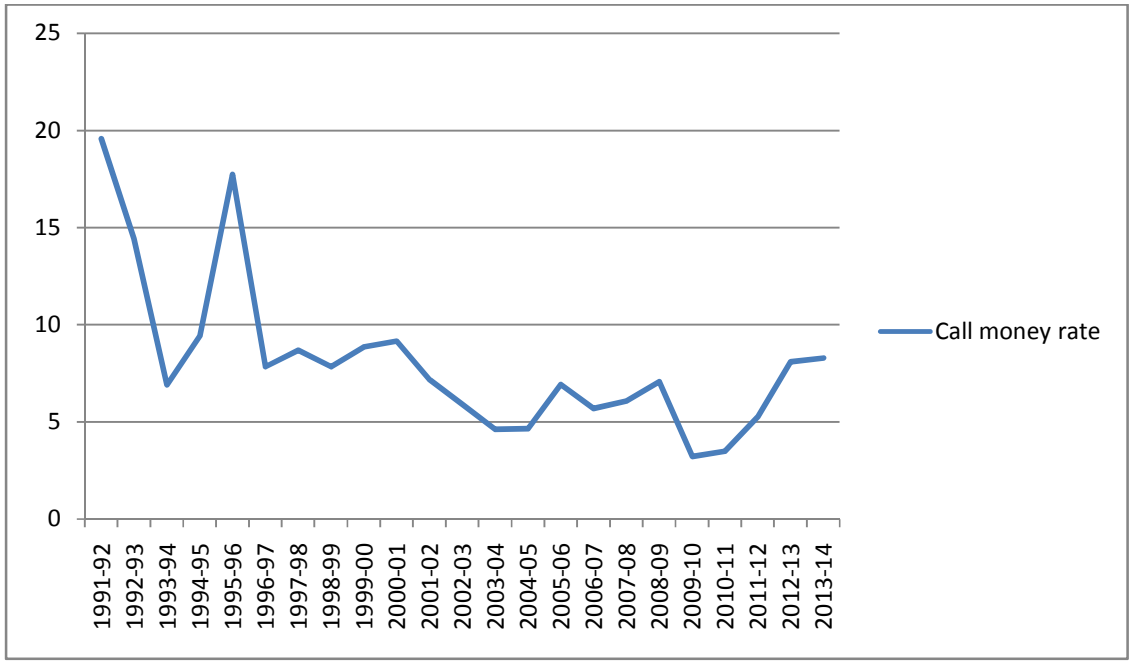
Call money rate from the period 1991-2013

Years	Call money rate
1991-92	19.57
1992-93	14.42
1993-94	6.9
1994-95	9.40
1995-96	17.73
1996-97	7.84
1997-98	8.69
1998-99	7.83
1999-00	8.87
2000-01	9.15
2001-02	7.16

2002-03	5.89
2003-04	4.62
2004-05	4.65
2005-06	6.93
2006-07	5.69
2007-08	6.07
2008-09	7.06
2009-10	3.22
2010-11	3.50
2011-12	5.25
2012-13	8.09
2013-14	8.28

Source: RBI, handbook of statistics on Indian economy

Fig: 2.3



RBI, handbook of statistics on Indian economy

1991-92 to 1996-97

In the starting of post reform period, call money rate was very high. In the year 1991 call money rate was 19.57 percent. In 1992-93 call money rate was 14.42 percent. In the year 1993-94, call money rate has been decreased and it reached at 6.9 percent. In the year 1995-96 call money rate 17.73 percent. Call money rate effective from June 27, 1995, private sectors mutual funds were allowed to operate only as lenders in the call money market. In the year 1996-97, call money rate was found at 7.84 percent.

1997-97 to 2002-03

In the year 1997-98, call money rate was 8.69 percent. In April 1997, entities are able to provide evidence to the reserve bank bulk lend able resources were extended the facility of routing call/notice money transactions through all the PDS and the minimum size of operation per transactions was reduced from Rs. 20 crore to Rs. 10 crore. In the year 1998-99 call money rate found at 7.8 percent. In 2000-01, call money rate was 9.15 percent. The call money rate was found between 7 to 8 percent from the year 1996-97 to 2001-02. In the tear 2002-03 call money rate was 5.8 percent.

2003-04 to 2013-14

In the year 2003-04 call money rate was low at 4.62 percent. In 2004-05 it was found at 4.65 percent. In the year 2005-06, call money rate was 6.93 percent. In 2006-07 call money rate was found at 5.69 percent. In 2008-09 call money rate was 7.06 percent. In the year 2009-10 to 2010-11 call money rates was found more than 3 percent. In 2011-12, call money rate was 5.52 percent. In 2012-13 call money rate was 8.09 percent. In the year 2013-14 call money rate was found 8.28 percent.

2.10 Bank rate:

The bank rate is the rate at which reserve bank of India provides loans to commercial bank. Bank rte determined by the reserve bank of India. Now bank rate is also known as base rate. Bank rate is also called as the minimum lending rate.

The reserve bank of India act defines bank rate as "the standard rate on which it is prepared to buy or rediscount bills of exchange or other commercial papers eligible for purchase under this act." So bank rate is also known as the rediscount rate.

The bank rate aims at influencing the level of economic activity and money supply in the country. The changes in the bank rate from the period 1991-92 to 2011-12 are as follows.

TABLE 1.4

Bank rate from the period 1991-2013

Year	Effective since	Bank rate	Change
1992-93		12	
1993-94		12	
1994-95		12	
1995-96		12	
1996-97		12	
1997-98	April 16,1997	11	(-1)
	June 26, 1997	10	(-1)
	Oct 22, 1997	9	(-1)
	Jan 17, 1998	11	(+2)
	March19, 1998	10.50	(-0.50)
1998-99	April 3,1998	10	(-0.50)
	April 29,1998	9	(-1)
	March 2,1999	8	(-1)
1999-2000		8	No change
2000-01	April 2,2000	7	(-1)
	July 22,2000	8	(+1)
	Feb 17, 2001	7.5	(-0.50)
	March 2, 2001	7.0	(-0.50)
2001-02	Oct 23,2001	6.5	(- 0.50)
2002-03	Oct 30, 2002	6.25	(-0.25)

2003-04	April29, 2003	6	(-0.25)
2004-05		6	No change
2005-06		6	No change
2006-07		6	No change
2007-08		6	No change
2008-09		6	No change
2009-10		6	No change
2010-11		6	No change

Source: RBI, Handbook of statistics on Indian economy (various years)

The changes in the bank rate from the period 1991 to 2012 given are follows.

1991-92 to1996-97

From 1991-92 to 1996-97 the bank rate was remained at 12 percent. There was no change in the bank rate from the period 1992-97.

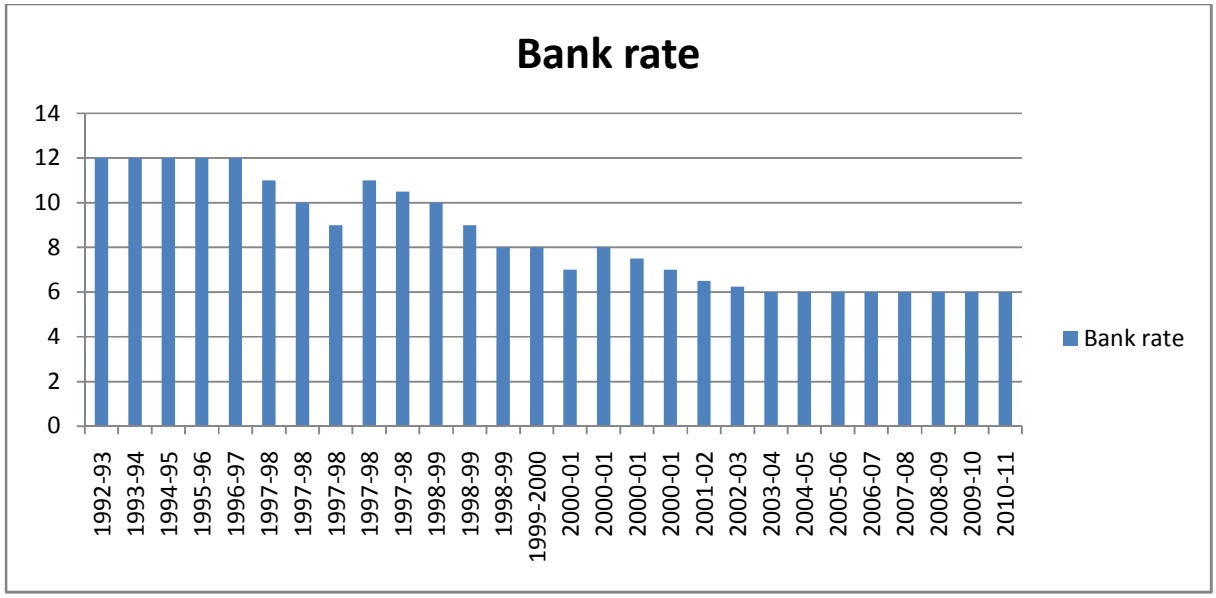
1997-98 to 2002-03

Bank rate effective from April 16, 1997, the bank rate reduced by one percent from 12 percent per annum to 11 percent per annum. It was again reduced on June 26, 1997, from 11 percent per annum to 10 percent per annum. Effective from october22, 1997, the bank rate was further reduced by 1 percent to 9 percent from 10 per cent. On Jan 17, 1998, bank rate was in ceased to 11 percent from 9 percent. The bank rate reduced by 50 basis points to 10.50 percent from 11 percent on March 19, 1998. Effective April 3, 1998, bank rate was reduced from 10.50 percent to 10 percent. On April 29, 1998, bank rate was further reduced from 10 percent to 9 percent. The bank rate was reduced by 1 percent to 8 percent from 9 percent. There was no change in the bank rate from the period 1999-2000. Bank rate was remained at 8 percent. On April 2, 2000, bank rate reduced to 7 percent from 8 percent. The bank rate was increased by one percent to 8 percent from 7 percent on July 22, 2000. Effective from Feb 17, 2001, bank rate reduced by 50 basis points to 7.5 percent from 8 percent. Bank rate further reduced to 7 percent from 7.5 percent on march2, 2001. Bank rate was reduced to 6.5 percent from 7 percent on October 23, 2001. On October 30, 2002, bank rate was reduced to 6.25 percent from 6.5 percent.

2003-04 to 2010

On April 29, 2003, bank rate was further reduced by .25 basis points to 6 percent from 6.25 percent. There was no change in the bank rate from the period 2004 to 2010. Bank rate was kept at 6 percent.

Figure: 2.4



Source: RBI, handbook of statistics of Indian economy

2.11 Commercial Paper:

Commercial paper is an instrument of short term money market. Commercial paper is used as promissory note issued by a company. Commercial paper may be sold either directly to investors or though agents like merchant bankers or security house.

The issuance of commercial paper has generally been observed to be inversely related to call rate. Banks prefer investing in commercial papers during credit downswing as the commercial paper rate works out higher than the call rate.

During 1993-94 commercial papers declined from Rs. 2280 crore to Rs. 442 crore during 1995-96. Commercial papers moved up to Rs. 17285 crore during 2005-06. Commercial paper further increased to Rs. 21314 crore during 206-07.

2.12 Conclusion:

We can conclude this chapter that in the pre reform period interest rate policy was administered. Liberalization of interest rate policy was started from the 1991. In post reform period interest rate policy became liberalized interest rate policy which was very effective. Liberalized interest rate policy improves the performance of macro variables. Liberalized interest rate policy would be more supportive for increasing the efficiency of monetary policy. It shows that India's interest rate policy has consistently moved from administered rate of interest to liberalized interest rate policy in the post reform period.

CHAPTER 3

Interest Rate Policy and Performance of Macro Variables:

3.1 Introduction:

Interest rate policy plays an important role in deciding the performance of macro variables in an economy. This chapter is focused on assessing the performance of macro variables with respect to interest rate policy. In this chapter we investigated India's macroeconomic performance since 1991-91 for a long term perspective. In this study we will discuss the performance of GDP growth rate, investment, inflation rate and external sector and employment as indicator of macro variables. This chapter divided in three sub period.

In the post reform period investment, and growth rate has increase and inflation is decrease. In 1991-92 inflation rate was 13.7 percent. When deregulation was started, inflation rate was high but slowly it is become low. Crises of 1990-91 affect the India's balance of payment. After the deregulation of interest rate the performance of macro variables is improved.

When the deregulation was started, the economic condition of India was not good, and India's economy was facing the problems of balance of payment crises. Balance of payment crises of 1991 is most serious crises in Indian economy. India's balance of payment crises started from seventh five year plan in the year 1990-91. So the year 1990-91 can be considered as the most difficult year in the economy from the India's balance of payment point of view. The balance of payment crises was considered as the fourth largest macro economic crises. In the crises of balance of payment Virmani noted, "The balance of payment crises hit India in 1990-91, but it had been building for at least half a decade preceding that year. The rising fiscal deficit and gradually increasing overvaluation contributed to the rising imbalance. Inadequate exchange rate adjustment in response to the external and domestic shocks during 1990-91 trigged the crises". Considering the trends of interest rate policy, study divided in three sub period.

This study divided in the following sub period.

1. 1991-92 to 1996-97

2. 1997-98 to 2002-03
3. 2003-04 to 2013-14

1991-92 to 1996-97

Since the period 1991-91 is called liberalization period. Many changes came in the interest rate policy and macro economic variables in liberalization period. How many changes came in the growth rate, investment and saving is given below for the period 1991-92 to 1996-97.

3.2 Investment

The low interest rates are supposed to encourage the investment in theory. But in reality a negative relationship has been found between interest rate and investment. When interest rates increase then investment rates decrease automatically. From the period 1991-92 to 1996-97 investment rates were increased. Annual average growths of investments were 14.9 during the 1991-92 to 1996-97.

Table: 3.1
Annual growth rate of investment during 1991-92 to 2013014

Years	Investment
1991-92	13.1
1992-93	14.7
1993-94	14.2
1994-95	17.1
1995-96	17.2
1996-97	15.6
1997-98	18.0
1998-99	17.3
1999-00	19.6
2000-01	16.7
2001-02	16.5
2002-03	17. 3
2003-04	19.5

2004-05	25.5
2005-06	27.8
2006-07	29.2
2007-08	32.2
2008-09	27.9
2009-10	30.9
2010-11	32.5
2011-12	31.1
2012-13	30.9
2013-14	

Source: handbook of statistics on Indian economy

3.2. 1 1991-92 to 196-97

In 1991-92, the growth rate of investment was 13.1 percent. From 1994-95 to 1995-96, the growth rate of investment is more than 17 percent. And next year, in 1996-97 the annual growth rate of investment is 15 percent.

This table shows that in the sub period 1st and 3rd investment is continueously increased and in the sub period 2nd less improvement in the investment. Because in the sub period 1st and 3nd interest rate policy is much effective and in the 2nd sub period interest rate policy is ineffective.

3.2. 2 1997-98 to 2002-03

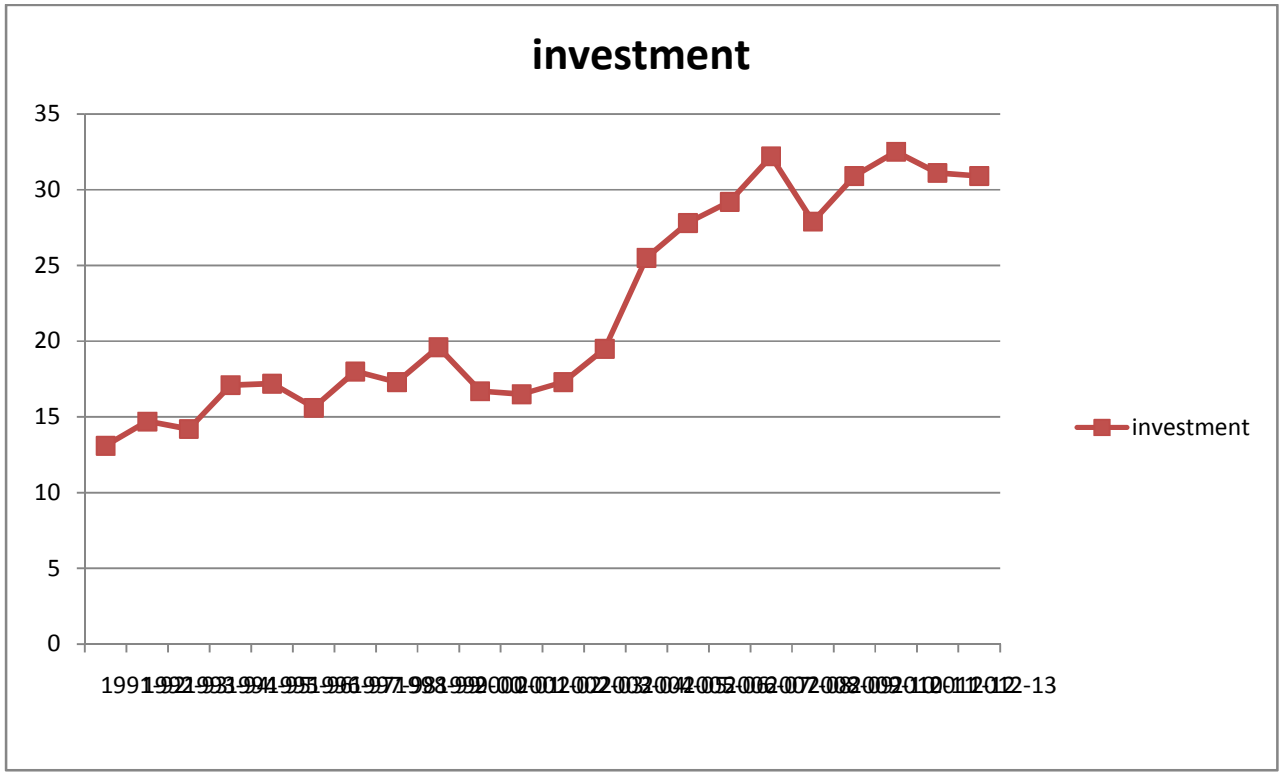
The low interest rates are supposed to encourage the investment in theory. But in reality a negative relationship has been found between interest rate and investment. When interest rate is increased then investment is decreased automatically. For the period 1997-98 to 2002-03, growth rate of investment was less than the period 1991-91 to 1996-97. In 1997-98, we achieved the growth rate of investment is 18 percent. From 2000-01 to 2001-02, the growth rate of investment was low and it found above 16 percent.

3.2. 3 2003-04 to 2013-14

Since the period 2003-04 to 2013-14, the annual growth rate of investment was increased. In 2003-04, annual growth rate of investment is 19.5 percent.

In 2003-04, annual growth rate of investment is 19.5 percent. After 2003-04, growth rate of investment has continueously increased. In next year, in 2004-05 growth rate of investment is achieved 25.5 percent. In 2007-08 it was very high at 32.2 percent and very next year it was on 27.9 percent. In 2010-11, growth rate of investment was again high on 32.5 percent. From 2011-12 to 2013-13, annual growth rate of investment is above 31 percent.

Figure: 3.1



Source: RBI, handbook of statistics on Indian economy

3.3 Growth rate

Economic growth is the principal indicator of macro-economic performance. By this basic, the two decades since 1980-81, have been easily the best in the last half century of India's macro-economic performance. In starting of 1990s, growth rate have been increase continueously. Certainly, if the crises affected year of 1991-92 is overlooked, as it logically should be, GDP growth in the past nine years from 1992-93 to 20001-01, averaged an extraordinary at 6.1 percent.

Table: 3.2

Annual growth rate of GDP at factor cost during 1991-92 to 2013-13

Years	Annual growth rate of GDP at factor cost
1991-92	1.4
1992-93	5.4
1993-94	5.7
1994-95	6.4
1995-96	7.3
1996-97	8.0
1997-98	4.3
1998-99	6.7
1999-00	8.0
2000-01	4.1
2001-02	5.4
2002-03	3.9
2003-04	8.0
2004-05	7.1
2005-06	9.5
2006-07	9.6
2007-08	9.3
2008-09	6.7
2009-10	8.6
2010-11	8.9
2011-12	6.7
2012-13	4.5
2013-14	4.7

Source: RBI handbook of statistics on Indian economy

The table shows that the GDP growth rate is continueously increased In the 1st sub period but in the 2nd sub period GDP growth rate is stable above 5 percent. And in the 3rd sub period from

2003 to 2014 is much improvement in GDP growth rate because interest rate policy was much effective in 3rd sub period.

3.4.1 1991-92 to 1996-97

Since 1991-92 to 1996-97 the growth rate of GDP at factor cost were progressive. Growth rate were improved betweens 1991-92 to 1996-97. The annual average growth rate of GDP at factor cost was about 5.6 percent during 1991-92 to 1996-97. Annual growth rate of GDP at factor cost at constant price are given in table 3.1 from the period 1991-92 to 1996-97. In the year 1996-97, the GDP growth rate has increased and it found 8 percent. The GDP growth rate at factor cost has increased during the first phase of reform period.

3.4.2 1997-98 to 2002-03

Annual growth rate of GDP at factor cost at constant price are given in table 3.2 from the period 1997-98 to 2002-03. From the period 1997-98 to 2003-04 GDP growth rate at factor cost was low in comparison than 1991-92 to 1996-97. During the period 1991-92 to 1997-98 GDP growth rate were lowest GDP growth rate. The year 1997-98 GDP growth rate has a very low growth rate, ie.4.3 percent. The year 1997-98 facing very low growth rate in compared to the previous year growth rate which was 8 percent with reduction of 3.7 percent.

And in the next year, the economy achieving the growth rate of 6.7 percent and it considered as India's average or moderate rate of growth. After the reform period, the lowest growth rate was found 3.9 percent in 2002-03. In the very next year, in 2003-04, we achieved a growth rate of 8.0 percent.

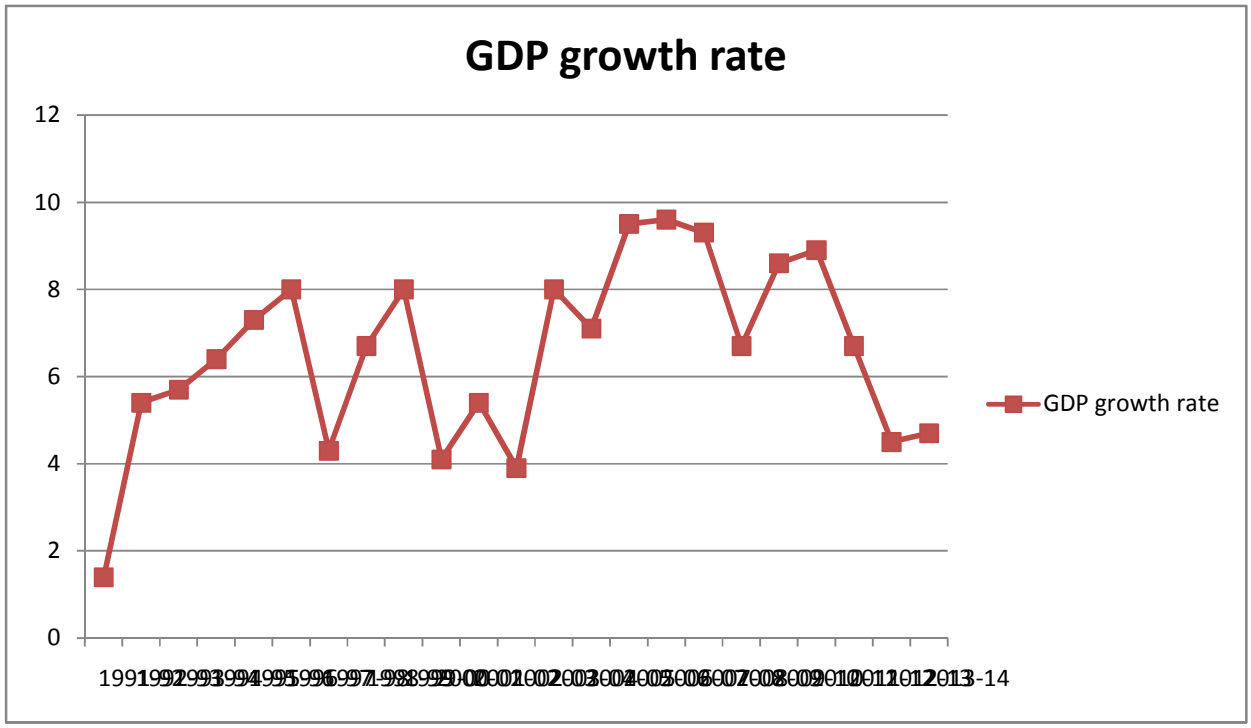
3.4.3 2003-04 to 2013-14

From the period 2003-04 to 2013-14, GDP growth rate at factor cost has increased progressively during the period. In the year 2003-04 we achieved the growth rate of 8.0 percent. In the period 2005-06 to 2007-08, has achieved a higher growth rate of more than 9 percent. So, in this period we can say that the Indian economy has got a progressive rate of growth during the post reform period.

In the next year, in 2008-09 GDP growth rate has found 6.7 percent again which was low growth rate. In 2009 to 2011, the GDP growth rate has been achieved more than 8 percent. GDP growth rate at factor cost was continuing increased the year 2011-12. In 2012-13 to 2013-14, 4.5 percent and 4.7 percent growth rate has found and it was lowest growth rate during the post reform period.

The GDP growth rate is an indicator of economic development of a nation. Development in GDP will developed in employment opportunities and personal income.

Figure: 3.3



Source: RBI, handbook of statistics on Indian economy

Wholesale Price Index (WPI):

Wholesale price indexes are measures of the price level of the average prices of goods and services in the economy. Wholesale price index is formulated on the basis of the wholesale prices of certain important commodities. The commodities included in the preparing WPI are

mainly raw materials and semi finished goods. Only the most important and most price sensitive and semi finished goods which are bought are sold in the wholesale market are selected and weights are assigned in accordance with their relative Importance.

The wholesale price include is generally used to measure change in the value of money. The main problem of the WPI is that this index includes only the wholesale price of raw materials and semi finished goods. The wholesale price index do not considered the retail prices of goods and services which generally consumed by the common man. So wholesale prices index does not reflect their accurate changes in the value of money.

3.4 Inflation

Inflation rate is the rate of change in the price level. Inflation rates confirmed as a percentage change on an annual basis. We know that the inflation rate is a determined general rise in the average price of all gods. If the price of only increases by 5 percent, that increase does not reflect inflation rate but it is an increase in the price of that singe commodity. If the average prices of all goods in the economy increase each year by, then we say that the inflation rate is 5 percent.

Table: 3.3

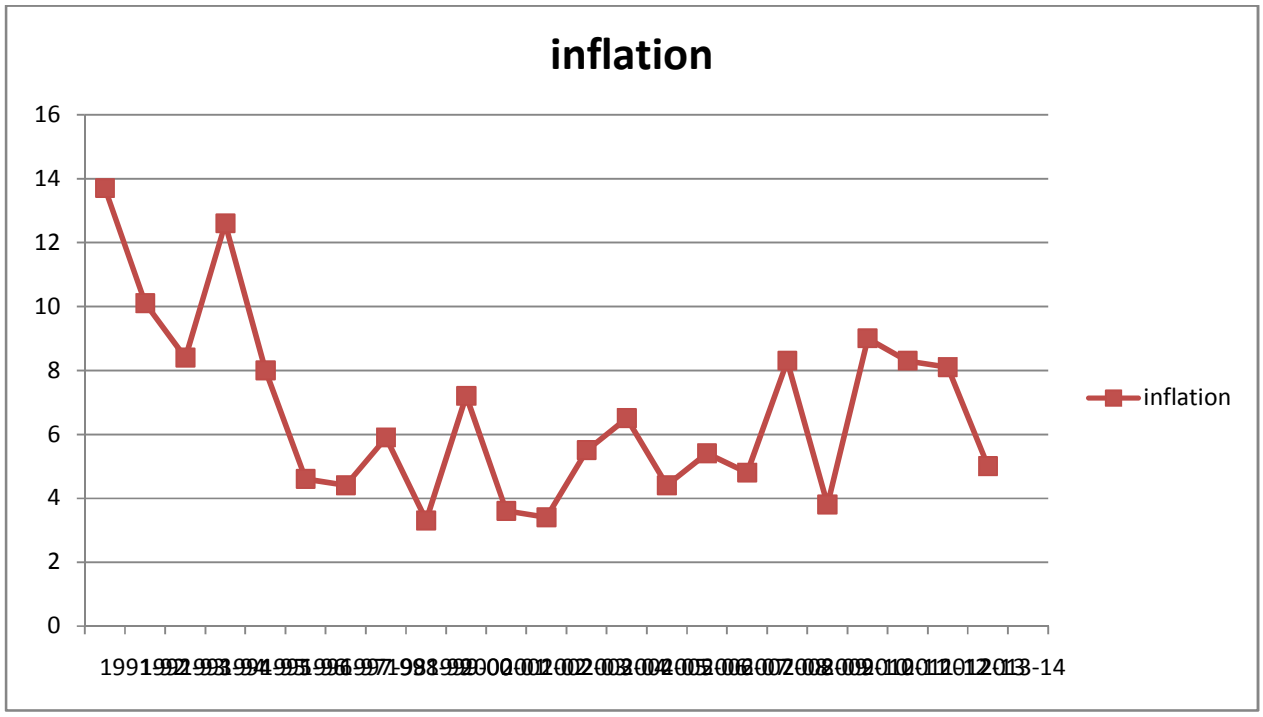
Annual rate of inflation from the period 1991-92 to 2013-14

Years	WPI (Base 1993-94)	Annual rate of inflation
1991-92	83.86	13.7
1992-93	92.29	10.1
1993-94	100.0	8.4
1994-95	112.6	12.6
1995-96	121.6	8.0
1996-97	127.2	4.6
1997-98	132.8	4.4
1998-99	140.7	5.9
1999-00	145.3	3.3
2000-01	155.7	7.2

2001-02	161.3	3.6
2002-03	166.8	3.4
2003-04	175.9	5.5
2004-05	187.3	6.5
2005-06	206.1	4.4
2006-07	215.9	5.4
2007-08	233.9	4.8
2008-09	242.9	8.3
2009-10		3.8
2010-11		9
2011-12		8.3
2012-13		8
2013-14		5

RBI, handbook of statistics on Indian economy

Figure 3.3



RBI, handbook of statistics on Indian economy

This table shows that in the 1st sub period from 1991 to 1997 inflation is very high. But in the sub period 2nd and 3rd it is decrease. Because in the 1st sub period, interest rate policy was administered. And in the sub period 2nd and 3rd interest rate policy became liberalized and it affect the inflation.

3.5.1 1991-92 to 1996-97

Table 3.4 shows the annual rate of inflation. In this table, we have seen that in the first sub period, from 1991-92 to 1996-97 annual rate of inflation is much higher. Higher annual rate of inflation is not good for an economy. In 1991-92, inflation rate is 13.4 percent which is not good for economy.

In the year 192-93 inflation rate has decrease and it was on 10.1 percent. In 1993-94 inflation rate was 8.4 percent. In 1994-95, inflation rate has increased achieved at 12.6 percent. In 1995-96, inflation rate has low at 8.0 percent which was profitable for economy. In the year 1996-97 inflation rate was 4.6 percent.

3.5.2 1997-98 to 2002-03

In the second sub period, from 1997-98 to 2002-03, the inflation rate has low in comparison the period 1991-92 to 1996-97. In the year 1997-98, inflation rate was 4.4 percent. In 1999-2000, inflation rate was very lowest at 3.3 percent. Inflation rate has very low at first time in post reform period. In 2000-01, it has increased and found at 7.2 percent. And very next year, in 2001-02, inflation rate has low at 3.6 percent. In 2002-03 it has 3.4 percent.

3.5.3 2003-04 to 2013-14

In the third sub period, from 2003-04 to 2013-14, the inflation rate has low many times. This period is good for the economy. The higher rate of inflation for this period was 9 percent. In 2003-04 inflation rate was 5.5 percent. In 2004-05 it has increased and achieved at 6.5 percent. In the year 2005-06, inflation rate has decrease and it found at 4.4 percent. In 2006-07, the inflation rate has gone at 5.4 percent. In 2007-08, inflation rate has decreased and gone at 4.8 percent.

And very next year, in 20008-09, it has increased and found at 8.3 percent. In 2009-10, inflation rate has decreased and gone at 3.8 percent. In the year 2010-11, inflation rate has increased and found at 9 percent. In 2013-14, the inflation rate was 5 percent.

3.5 External sector (balance of payment)

Balance of payment is the monetary expression of trade balance which is the balance between total export and imports. There was a frequent change in the export and import in balance of payment over the year. The year 1991 was suffering from the crises of balance of payment. The crises of 1991 is explained by Joshi and Little (1993), "the macro economic crises that erupted in july 1991 was brought about to a head by a steep fall in foreign exchange reserve to about 1 dollar (equals to about 2 weeks imports), a sharp downgrading of India's credit rating and a cut off of foreign lending. But the basic underlying features of the crises were high inflation (12 percent and rising), large fiscal and current account deficit (approximately 10 percent and 3 percent respectively) and a heavy and growing burden of domestic and foreign debt."

The reasons of the balance of payment crises were both external and external. There are some important external causes behind the crises, break down of soviet block and Iraq- Kuwait war. Some important internal causes behind the crises of balance of payment were fiscal indiscipline, political uncertainly and instability, loss of invertors, fall in invisibles surplus and rising external debt.

Table 3.7 shows the export and import from the period 1991-92 to 2013

Table 3.4

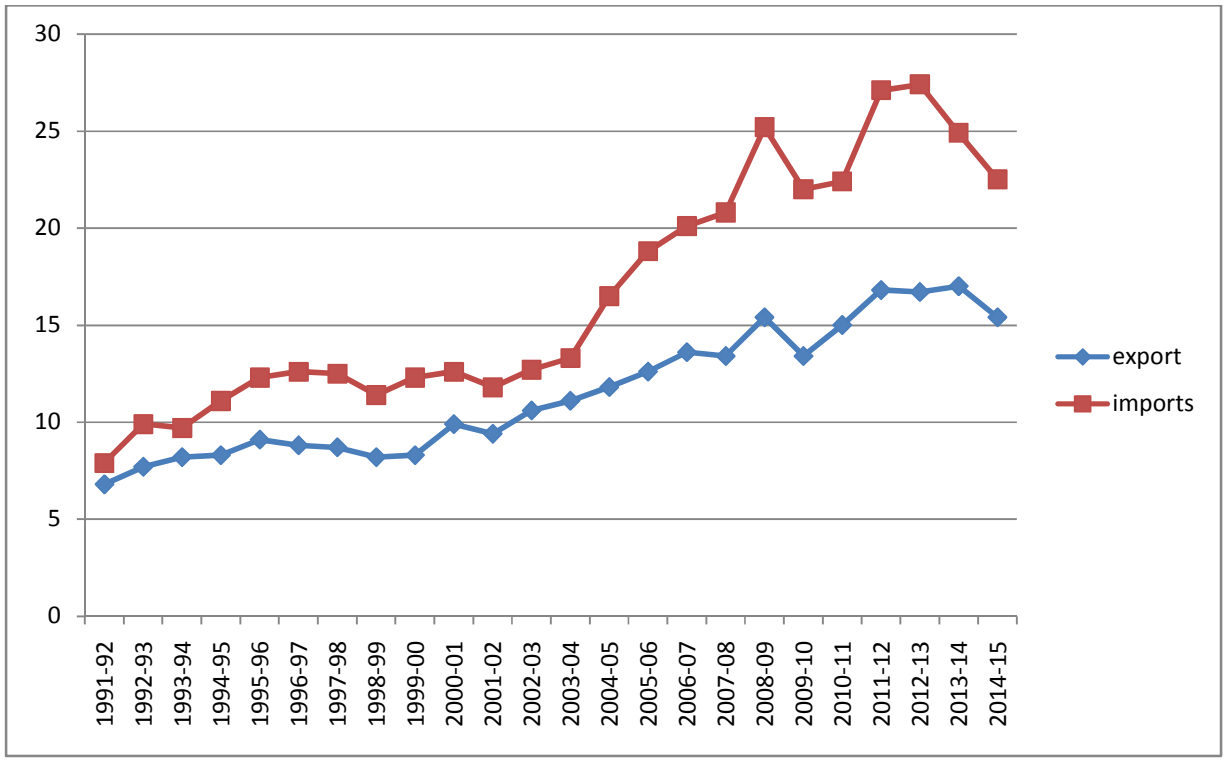
Balance of payment (in %)

Years	Exports	Imports
1991-92	6.8	7.9
1992-93	7.7	9.9
1993-94	8.2	9.7
1994-95	8.3	11.1
1995-96	9.1	12.3
1996-97	8.8	12.6

1997-98	8.7	12.5
1998-99	8.2	11.4
1999-00	8.3	12.3
2000-01	9.9	12.6
2001-02	9.4	11.8
2002-03	10.6	12.7
2003-04	11.1	13.3
2004-05	11.8	16.5
2005-06	12.6	18.8
2006-07	13.6	20.1
2007-08	13.4	20.8
2008-09	15.4	25.2
2009-10	13.4	22.0
2010-11	15.0	22.4
2011-12	16.8	27.1
2012-13	16.7	27.4
2013-14	17.0	24.9
2014-15	15.4	22.5

Source: RBI handbook of statistics on Indian economy

Figure: 3.4



Source: Annual report of RBI

3.6.1 1991-92 to 1996-97

Table 3.9 has shown the export and imports since the period 1991-92 to 2013-14.

Export-

In the first sub- period 1991-92 to 1996-97, export has increased. In the year 1992-93 export was 7.7 percent. In 1993-94 it was 8.2 percent. In the year 1995-96 export has increased and it was 9.1 percent. In 1996-97 export was 8.8 percent.

Imports-

In 1991-92 import was 7.9 percent. From 1992-93 to 1993-94 import was above at 10 percent. In 1994-95 import was 11.1 percent. In the year 1995-96 it was 12.3 percent.

3.6.2 1997-98 to 2002-03

Export-

In the year 1997-98 export has less decreased and it was found at 8.7 percent. From 1998-99 to 1999-2000 export was above at 8 percent. In 2000-01 it has increased and found at 9.9 percent. In the year 2002-03 export was 10.6 percent.

Imports-

In 1997-98 import was 12.5 percent. In 1998-99 it has less decreased and found at 11.4 percent. From 1999-2000 to 2000-01 import was more than 12 percent. In 2001-02 import was 11.8 percent.

3.6.3 2003-04 to 2013-14

Export-

From 2003-04 to 2004-05 export was more than 11 percent. From 2006-07 to 2007-08 export was more than 13 percent. In 2008-09 it has increased and found at 15.4 percent. In 2009-10 it has decreased and found at 13.4 percent. From 2011-12 to 2012-13 export was more than 16 percent. In the year 2013-14 it has increased and found at 17.0 percent.

Imports-

In 2003-04 import was 13.3 percent. In 2004-05 it has increased and found at 16.5 percent. From 2006-07 to 2007-08 import was more than 20 percent. In 2008-09 it has significantly increased and found at 25.2 percent. From 2009-10 to 2010-11 it has decreased. It has found above 22 percent. From 2011-12 to 2012-13 it has increased and it has more than 27 percent. In 2-13-14, import was 24.9 percent.

3.6 Employment

Table 3.5

Employed person in India annual (in billions)

Years	Employed person(annual)
1990	26.5
1991	27.5

1992	27.1
1993	27.3
1994	27.6
1995	27.8
1996	28.2
1997	28.1
1998	28.5
1999	27.9
2000	27.7
2001	27.25
2002	27.0
2003	26.5
2004	26.5
2005	25.9
2006	27.3
2007	27.6
2008	28.2
2009	28.8
2010	29.0
2011	29.8

Source: ceic.data.com

This table shows the employed person in India. In the year 1990, employed person in India were 26.5 billion. In 1991 employed person in India were 27.5. And in the year 1996 employment was 28.2 billion. It shows that in the 1st sub period, from 1990 to 1997 employment is continueously increased.

In the 2nd sub period, from 1998 to 2003 less improvement in employment. In the year 1999 employment in India was 27.9 billion. In the year 2000 employment in India was 27.7 billion. And in the year 2002 employment in India was 27.0 billion. And in 2003 and 2004 employment was 26.5 billion.

And in the year 2005, employment was 25.9 billion. In the 2006 employment is increased and it reached at 27.3 billion. And in 2008 and 2009 employment is more than 28 billion. And in the 2010 and 2011 employment is more than 29 billion. It shows that employment is increased in 3rd sub period.

Figure: 3.5

Source: ceic.data.com

3.7 Conclusion

In this chapter we have seen that the performance of macro variables has improved in the post reforms period. We have seen that GDP growth rate, saving rate and investment rate has increased and inflation rate has decreased. In the first sub-period, from 1991-92 to 1996-97 the performance of macro variables has significantly improved. In the second sub-period, from 1997-98 to 2002-02 has less improvement in the performance of macro variables in the comparison of 1st sub period. And in the sub-period third, from 2003-04 to 2013-14 has much improvement in the performance of macro-variables.

So we can conclude that the performance of macro variables has improved in the post reform. And liberalized interest rate policy in the post reform period has significantly affected the performance of macro variables.

CHAPTER 4

Effectiveness of Interest Rate Policy in the Post Reform Period

4.1 Introduction:

In this chapter we will analyze that the effectiveness of interest rate policy in post reform period. Interest rate policy was very effective in post reform period. We select the lending rate to see the effectiveness of interest rates in post reform period. Interest rate policy was administered in the pre reform period. Interest rate policy became liberalized in the post reform period which affected the performance of macro variable. Liberalized interest rate policy started in 1990s in India.

In this chapter we select the four macro economic variables. These macro economic variables are, investments GDP growth rate at factor cost, balance of payment (export), inflation and employment. In this chapter we will see the effectiveness of interest rate policy on investment, GDOP growth rate, balance of payment (export), inflation and employment.

4.2 Interest Rate Policy and Macro economic variables:

In this section we wants to see that how lending rates affects the performance of macro-variables. We want to see that when lending rates increases how it effects on investment rate, GDP growth rate, export, inflation and employment when lending rates decreases then how it effects.

After the deregulation of interest rates, annual growth rate of savings, GDP growth rate and investment has increased.

4.3 Data and Methodology

The chapter based on secondary data. To analyze the effectiveness of interest rate policy, secondary data is collected from RBI, handbook of statistics on Indian economy, report on currency and finance, rbi.org.in. For the measurement of the effectiveness of interest rate policy, we will use the regression model, which will be suitable.

4.4 Lending rate and Investment

Table: 4.1

Relationship between lending rates and Investment

Years	Lending rates	Investments
1991-92	19	13.1
1992-93	17	14.7
1993-94	14	14.2
1994-95	15	17.1
1995-96	16	17.2
1996-97	15	15.6
1997-98	14	18.0
1998-99	12.5	17.3
1999-00	12.5	19.6
2000-01	11.5	16.7
2001-02	11.5	16.5
2002-03	11.12	17.3
2003-04	10.62	19.5
2004-05	10.5	25.5
2005-06	10.5	27.8
2006-07	11.25	29.2
2007-08	12.5	32.2
2008-09	12	27.9
2009-10	11.5	30.9
2010-11	7.75	32.5
2011-12	10.37	31.1
2012-13	9.97	30.9

Source: RBI handbook of statistics on Indian economy

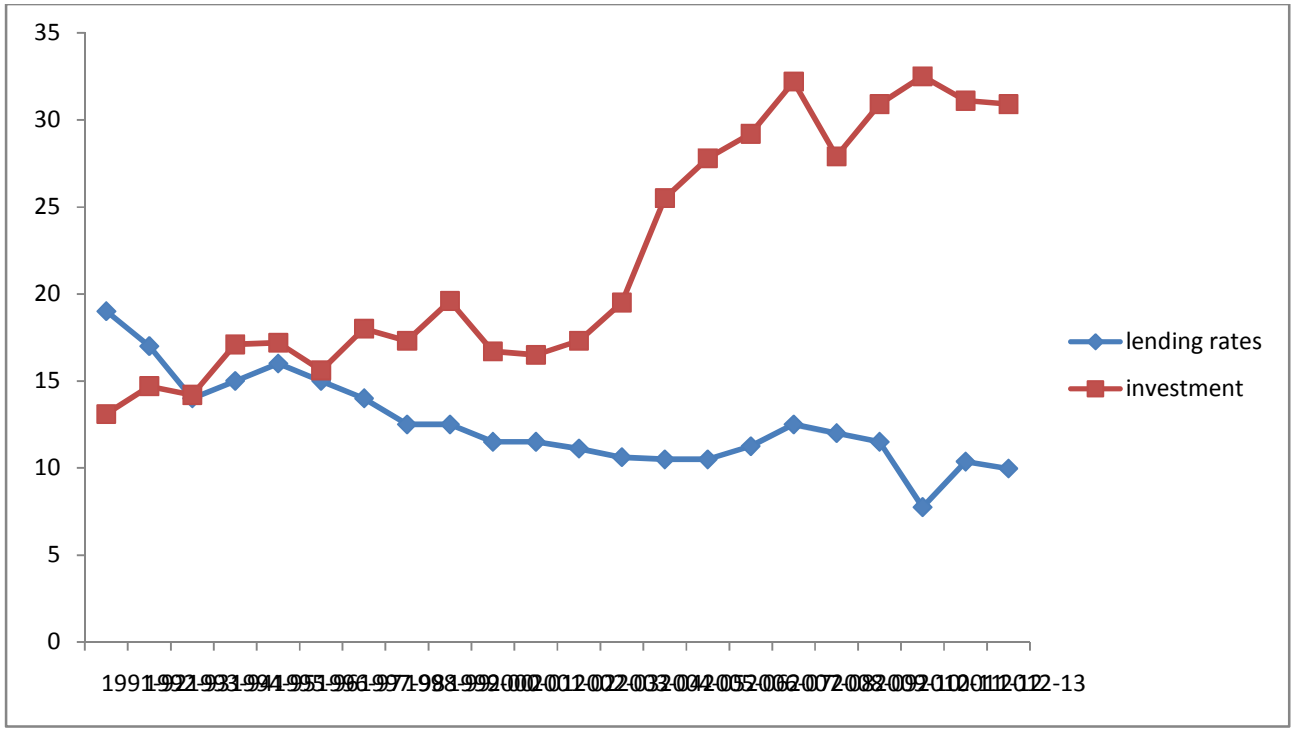
Table 4.1 shows that the relationship between lending rate and investment rate. This table shows that when lending rate is high then investment rate is less and when lending rate is low then investment rate is high. In the year 1991-92, where lending rate is 19 percent and investment rate

is 13.1 percent. In 1992-93, investment was 14.7 percent and lending rate was 17 percent. In 1997-98, lending rate was 14 percent and investment rate was 18 percent. In the year 1999-2000 investment rate was 19.6 percent. In next year, in 2000-01 where lending rate was 11.5 percent and investment was 16.7 percent.

In the year 203-04 lending rate is 10.6 percent where investment rate is 19.5 percent. In next year in 2004-05 investment rate has increased and it achieved at 25.5 percent. After 2004-05 the investment rate has continueously increased. In 2006-07, investment was 29.2 percent. In the year 2007-08, lending rate was 12.5 percent and investment rate was32.2 percent. In 2009-10 investment was 30.9 percent. In the year 2010-11, the lending rate was 7.75 percent and investment rate was 32.5 percent. In the year 2012-13, where lending rate was 9.97 percent and investment rate was 30.9 percent.

Fig 4.2 shows the relationship between lending rate and investment rate.

Fig: 4.1



Source: RBI, handbook of statistics on Indian economy

Model 1

Table: 4.1.1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.694[a]	.481	.455	5.09274

a. Predictors: (Constant), Lending Rate

The first table shows the model summery table. This table provides the values of R and R square. The R value represents the simple correlation, which indicates a high degree of correlation. The R square value indicates how much of the total variation in the dependent variable.

Table: 4.1.2

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	481.191	1	481.191	18.553	.000[b]
	Residual	518.720	20	25.936		
	Total	999.911	21			

a. Dependent Variable: Investment

b. Predictors: (Constant), Lending Rate

The second table is the AVOVA table. The ANOVA table represents how well the regression equation fits the data. This indicates that the regression model predicts the dependent variable significantly well.

Table 4.1.3

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	45.020	5.445		8.268	.000
	Lending Rate	-1.832	.425	-.694	-4.307	.000

a. Dependent Variable: Investment

The third table is the regression coefficient table.

Investment = f (lending rate)

Where, Y = investment

X = lending rate

Regression equation-

$$Y= f(X)$$

$$Y= \beta 0 +\beta 1\ X+ \mu i$$

$$Y= (45.02)+(-1.832)X + \mu i$$

This model is statistically significant with 1% level of significance. Constant and dependent variables are also significant with 1% level of significance. The dependent variable is investment and independent variable is lending rate. If lending rate is declined one percent, investment would be increase with 1.832 percent. The standard error is fluctuated with 0.425 from mean of lending rate.

Our regression results shows that both the lending and and investment is sgnificantly related. The variable are showing postive relation in between.Therefore both the lending and investment rate are working oppostively if one increases other decreases and so on.

4.5 Investment and GDP growth rate

Table 4.2

Years	Investments	GDP growth rate
1991-92	13.1	1.4
1992-93	14.7	5.4
1993-94	14.2	5.7
1994-95	17.1	6.4
1995-96	17.2	7.3
1996-97	15.6	8.0

1997-98	18.0	4.3
1998-99	17.3	6.7
1999-00	19.6	8.0
2000-01	16.7	4.1
2001-02	16.5	5.4
2002-03	17.3	3.9
2003-04	19.5	8.0
2004-05	25.5	7.1
2005-06	27.8	9.5
2006-07	29.2	9.6
2007-08	32.2	9.3
2008-09	27.9	6.7
2009-10	30.9	8.6
2010-11	32.5	8.9
2011-12	31.1	6.7
2012-13	30.9	4.5
		4.7

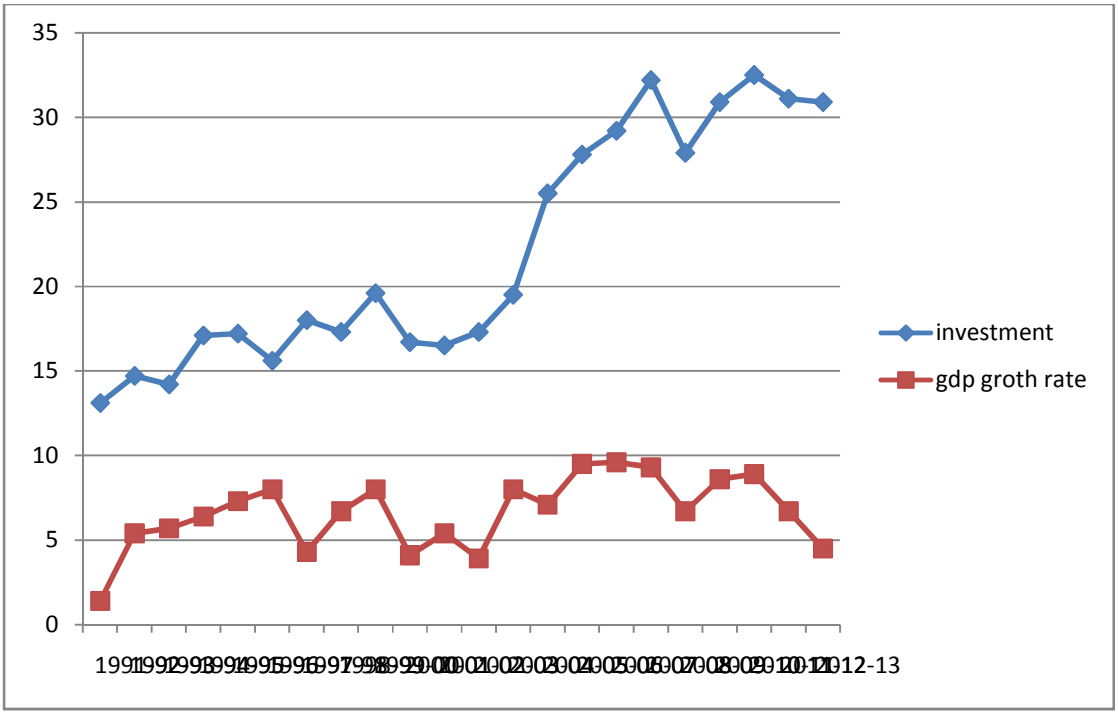
Source: RBI, handbook of statistics on Indian economy

Table 4.2 shows thre relationship between investment and GDP growth rate. It shows when investment is incresed then growth rate is also incresed. In the year 1991-92, where investment is 13.1 percent and growth rate is rate 1.4 percent. And next year in1992-93, when investment is reached at 14.7 percent then growth rate is also incresed at 5.4 percent. In the year, 1994-95 investment was 17.1 percent and growth rate was 6.4 percent. In 19995-96 investment was 17.2 percent and growth rate was 7.3 percent.

In the year 1997-98, when investment was 18.0 percent then growth rate was 4.3 percent. In the year, 1999-2000, investment was 19.6 percent and growth rate was 8.0 percent. And next year when investment is decrease at 16.7 percent then growth rate is also dercease at 4.1 percent. In 2001-02, investment was 16.5 percent and growth rate was 5.4 percent. In the year 2003-04, investment was 19.5 percent and growth rate was 8.0 percent. From the year 2005-06 to 2007-08, average investment was above 29 percent and growt rate was more than 9 percent. In 2008-

09, investment was 27.9 percent and growth rate was 6.7 percent. In the year 2009-10, investment was 30.9 percent and growth rate was 8.6 percent. In the year 2010-11, investment increased at 32.5 percent and growth rate is also increased at 8.9 percent. And next year in 2011-12, investment decrease at 31.1 percent and growth rate is also decrese at 6.7 percent.

Figure 4.2



Source: RBI, handbook of statistics on Indian economy

Model 2

Table: 4.2.1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.577[a]	.333	.300	1.77631

a. Predictors: (Constant), Investment

The first table shows the model summery table. This table provides the values of R and R square. The R value represents the simple correlation, which indicates a high degree of correlation. The

R square value indicates how much of the total variation in the dependent variable. The value of R is .577 and value of R square is .333.

The second table is the ANOVA table. The ANOVA table represents how well the regression equation fits the data. This indicates that the regression model predicts the dependent variable significantly well.

Table: 4.2.2

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31.541	1	31.541	9.996	.005[b]
	Residual	63.105	20	3.155		
	Total	94.646	21			

a. Dependent Variable: GDP Growth Rate

b. Predictors: (Constant), Investment

The next table is the regression coefficient table.

Table: 4.2.3

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.700	1.295		2.086	.050
	Investment	.178	.056	.577	3.162	.005

a. Dependent Variable: GDP Growth Rate

GDP growth rate = f (investment)

$$Y = f(X)$$

Where, Y = GDP growth rate

X = investment

Regression equation- $Y=\beta 0 +\beta 1 X$

$$Y = (2.700) + (.178X)$$

This model is statistically significant with 1% level of significance. The dependent variable is GDP growth rate and independent variable is investment. Constant and dependent variables are also significant with 1% level of significance. If investment rate is increased one percent, investment would be increase with 1.78 percent. Our regression results shows that both the GDP groeth rate and investment is significantly related. If emvestment is incresse then GDP growth rate is also increse.

4.6 GDP growth rate and Export

GDP growth rate is effected the export. In 1st sub-period from 1991-92 to 1996-97, growth rate and export has continueously improved. From the period 1991-92 to 1996-97 export has continueously increased because growth rate is also increased.

Table: 4.3

Link between GDP growth rate and export

Years	GDP growth rate	Export
1991-92	1.4	6.8
1992-93	5.4	7.7
1993-94	5.7	8.2
1994-95	6.4	8.3
1995-96	7.3	9.1
1996-97	8.0	8.8
1997-98	4.3	8.7
1998-99	6.7	8.2
1999-00	8.0	8.3
2000-01	4.1	9.9
2001-02	5.4	9.4
2002-03	3.9	10.6
2003-04	8.0	11.1
2004-05	7.1	11.8
2005-06	9.5	12.6

2006-07	9.6	13.6
2007-08	9.3	13.4
2008-09	6.7	15.4
2009-10	8.6	13.4
2010-11	8.9	15.0
2011-12	6.7	16.8
2012-13	4.5	16.7
2013-14	4.7	17.0

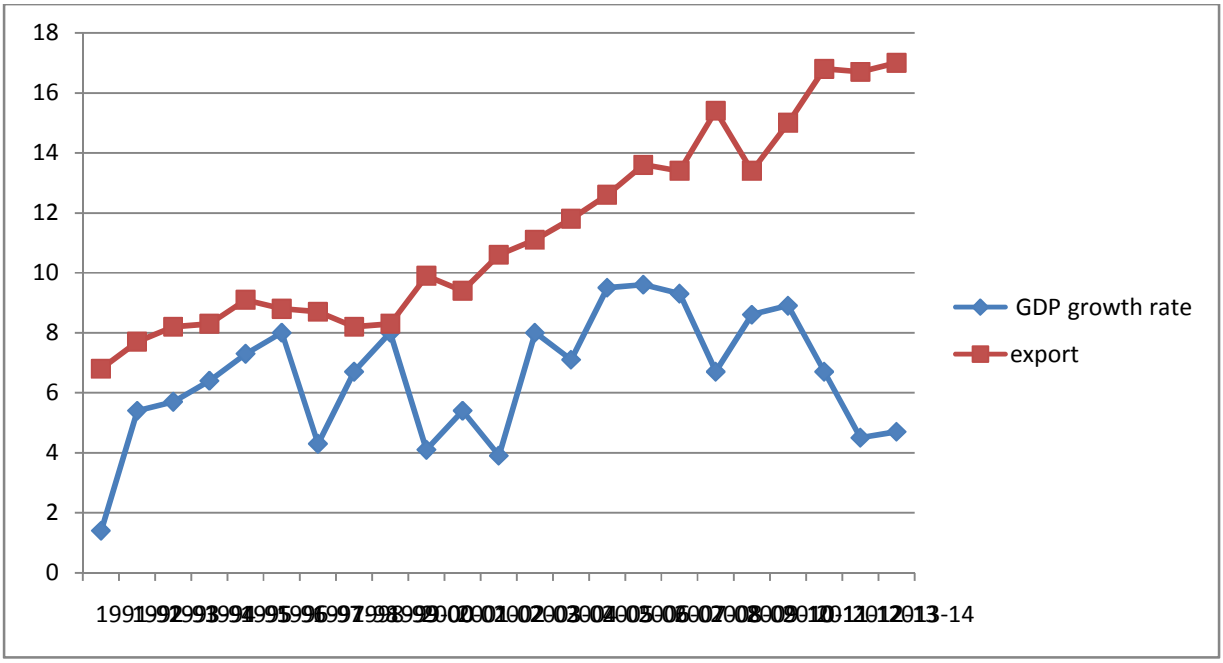
Source: RBI, handbook of statistics on Indian economy

Table 4.3 shows the relationship between GDP growth rate and export. In the year 1991-92 growth rate was 1.4 percent and export was 6.8 percent. In the year 1992-93 growth rate was 5.4 percent and export was 7.7 percent. And in the year 1993-94, growth rate was 5.7 percent and export was 8.2 percent. In the year 1994-95 growth rate was 6.4 percent and export was 8.3 percent. In 1995-96, growth rate was 7.3 percent and export was 9.1 percent. And in the year 1996-97, growth rate was 8.0 percent and export was 8.8 percent.

In the year 1997-98, when growth rate is decrease and it reached at 4.3 percent and then export is also decrease at 8.7 percent. In the year 1999-2000, growth rate was 8.0 percent and export was 8.3 percent. In 2000-01, growth rate was 4.1 percent and export was 9.9 percent. In 2002 -03 growth rates was 3.9 percent and export was 10.6 percent.

And in the year 2003-04, growth rate was 8.0 percent and export was 11.1 percent. In the year 2004-05, growth rate was 7.1 percent and export was 11.8 percent. From the year 2005-06 to 2007-08, growth rate was more than 9 percent and average export was more than 30 percent. In the year 2009-10 growth rate was 8.6 percent and export was 13.4 percent. And in the year 2010-11 growth rate was 8.9 percent and export was 15.0 percent. From the year 2012-13 to 2013-14 growth rate was more than 4 percent and export was more than 16 percent.

Figure 4.3



Source: RBI, handbook of statistics on Indian economy

Model 3

The first table shows the model summery table. This table provides the values of R and R square. The R value represents the simple correlation, which indicates a high degree of correlation. The R square value indicates how much of the total variation in the dependent variable. The value of R is .393 and the value of R square is .154.

Table: 4.3.1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.393[a]	.154	.112	2.90327

a. Predictors: (Constant), GDP Growth Rate

The second table is the AVOVA table. The ANOVA table represents how well the regression equation fits the data. This indicates that the regression model predicts the dependent variable significantly well. The ANOVA table shows the level of significance of the dependent and

independent variable. This table shows the level of significance of the dependent and independent variables.

Table: 4.3.2

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	30.713	1	30.713	3.644	.071[b]
	Residual	168.580	20	8.429		
	Total	199.293	21			

a. Dependent Variable: Export

b. Predictors: (Constant), GDP Growth Rate

Table: 4.3.3

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.314	2.068		3.536	.002
	GDP Growth Rate	.570	.298	.393	1.909	.071

a. Dependent Variable: Export

The third table is coefficient table.

Balance of payment (export) = f (GDP growth rate)

$$Y = f(X)$$

Where, Y = export

X = GDP growth rate

Regression equation- $Y = \beta 0 + \beta 1 X$

$$Y = (7.314) + (.570X)$$

This model is statistically significant with 7% level of significance. The independent variable is GDP growth rate and independent variable is export. Constant and dependent variables are also

significant with 7% level of significance. Regression result shows that if GDP growth rate is increase then export is also increase.

4.7 Lending rate and Inflation

Inflation and interest rate are linked, and frequently referenced in macro economics. Inflation refers to the rate at which prices for goods and services rise. When interest rate is low, more people are able to borrow more money. The result is that the consumers have more money to use, causing the economy to grow and inflation to increase. As interest rate are increased, consumers tend to save as returns are higher with less disposal income to spend as a result of the increase in saving, the economy slows and inflation decrease.

Table: 4.4

Link between lending rates and inflation

Years	Lending rates (average)	Inflation
1991-92	19	13.7
1992-93	17	10.1
1993-94	14	8.4
1994-95	15	12.6
1995-96	16	8.0
1996-97	15	4.6
1997-98	14	4.4
1998-99	12.5	5.9
1999-00	12.5	3.3
2000-01	11.5	7.2
2001-02	11.5	3.6
2002-03	11.12	3.4
2003-04	10.62	5.5
2004-05	10.5	6.5
2005-06	10.5	4.4
2006-07	11.25	5.4

2007-08	12.5	4.8
2008-09	12	8.3
2009-10	11.5	3.8
2010-11	7.75	9.0
2011-12	10.37	8.3
2012-13	9.97	8.1
2013-14	11.12	5.0

Source RBI handbook of statistics on Indian economy

Table 4.4 shows the performance of lending rate and inflation rate. We can see that when lending rates are low then inflation rate is also low. In the year 1991-92, where lending rate is more than inflation rate is also more. It shows that the deregulation of lending rate has effective the performance of inflation rate.

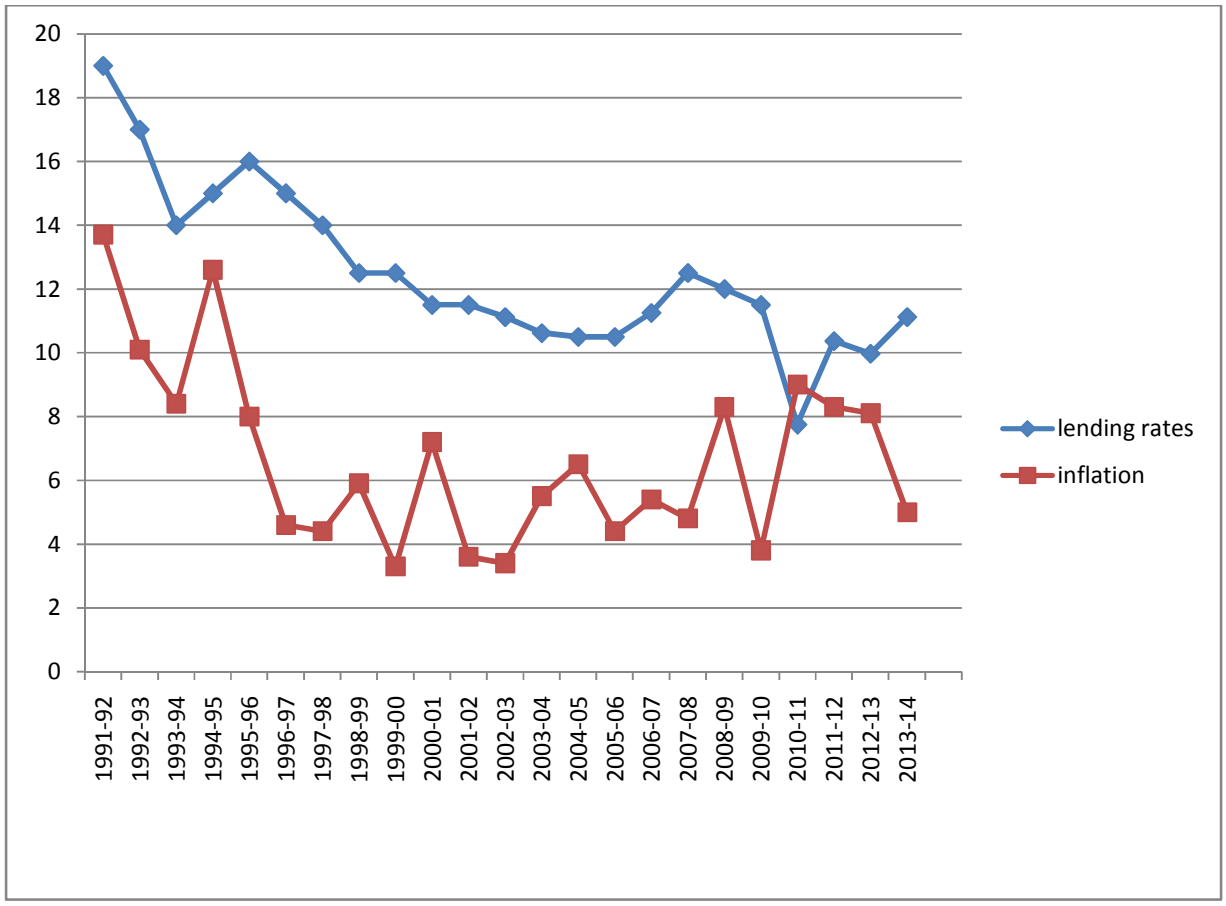
In the year 1991-91, the lending rate was 19 percent and inflation rate was 13.1 percent. In 1992-93, lending rate is 17 percent and inflation rate is 10.1 percent. In the year 1993-94, lending rate is 14 percent and inflation rate is 8.4 percent. In 1994-95 lending rate is 15 percent and inflation is 12.6 percent. It shows that when lending rate increase than inflation rate is also increase and when lending rate is decrease than, inflation rate also decrease.

In the 1996-97, lending rate was 15 percent and inflation rate was 4.6 percent. In 1997-98, lending rate was 14 percent and inflation rate was 4.4 percent. In the year 1998-99, lending rate is 12.5 percent and inflation rate is 5.9 percent. In the year 1999-2000, lending rate was remained at 12.5 percent but inflation rate was on lowest at 3.3 percent. In 2000-01 lending rate was 11.5 percent and inflation rate was7.2 percent. In 2001-02, inflation rate was 3.6 percent. Next year in 2002-03, inflation rate was on 3.4 percent.

In the 2003-04, lending rate was 10.62 percent and less improvement in the inflation rate and I gone at 5.5 percent. From the year 2004-05 to 2007-08 inflation rates was above 5 percent. In the year 2008-09 lending rate was 12 percent and inflation rate was 8.3 percent. In the year 2009-10, lending rate was 11.5 percent and inflation rate decreased and gone at 3.8 percent. And very next year in 2010-11, inflation rate has increased and achieved at 9.0 percent. From the year 2011-12

to 2012-13, inflation rate has more than 8 percent. In the year 2013-14, lending rate was 11.12 percent and inflation rate was 5.0 percent.

Figure 4.4



Source: RBI, handbook of statistics on Indian economy

Model 4

The first table shows the model summery table. This table provides the values of R and R square. The R value represents the simple correlation, which indicates a high degree of correlation. The R square value indicates how much of the total variation in the dependent variable. The value of R is .469 and the value of R square is .220.

Table: 4.4.1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.469[a]	.220	.181	2.61220

a. Predictors: (Constant), Lending Rate

The second table is the AVOVA table. The ANOVA table represents how well the regression equation fits the data. This indicates that the regression model predicts the dependent variable significantly well.

Table: 4.4.2

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	38.561	1	38.561	5.651	.028[b]
	Residual	136.471	20	6.824		
	Total	175.033	21			

a. Dependent Variable: Inflation

b. Predictors: (Constant), Lending Rate

The third table is coefficient table.

Table: 4.4.3

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.275	2.793		.099	.922
	Lending Rate	.518	.218	.469	2.377	.028

a. Dependent Variable: Inflation

Inflation = f (Lending rate)

Y = f (X)

Where, Y = inflation

X= lending rate

Regression equation-

$$Y=\beta 0 +\beta 1 X$$

$$Y = (.275) + (.518X)$$

This model is statistically significant with 5% level of significance. The dependent variable is inflation and independent variable is lending rate. Constant and dependent variables are also significant with 5% level of significance. If lending rate is declined five percent, inflation would be decrease with .518% percent.

4.8 Inflation and Employment

Table 4.5 shows the link between inflation and employment. Table shows that inflation is not much effective. We can see that employment in not increase when inflation is decrease. So we can say that inflation is not effected the employment.

Table: 4.5

Link between inflation and employment

Years	Inflation	Employment
1991-92	13.7	26.5
1992-93	10.1	27.5
1993-94	8.4	27.1
1994-95	12.6	27.3
1995-96	8.0	27.6
1996-97	4.6	27.8
1997-98	4.4	28.2
1998-99	5.9	28.1
1999-00	3.3	28.5
2000-01	7.2	27.9
2001-02	3.6	27.7

2002-03	3.4	27.25
2003-04	5.5	27.0
2004-05	6.5	26.5
2005-06	4.4	26.5
2006-07	5.4	25.9
2007-08	4.8	27.3
2008-09	8.3	27.6
2009-10	3.8	28.2
2010-11	9	28.8
2011-12	8.3	29.0
2012-13	8	29.8

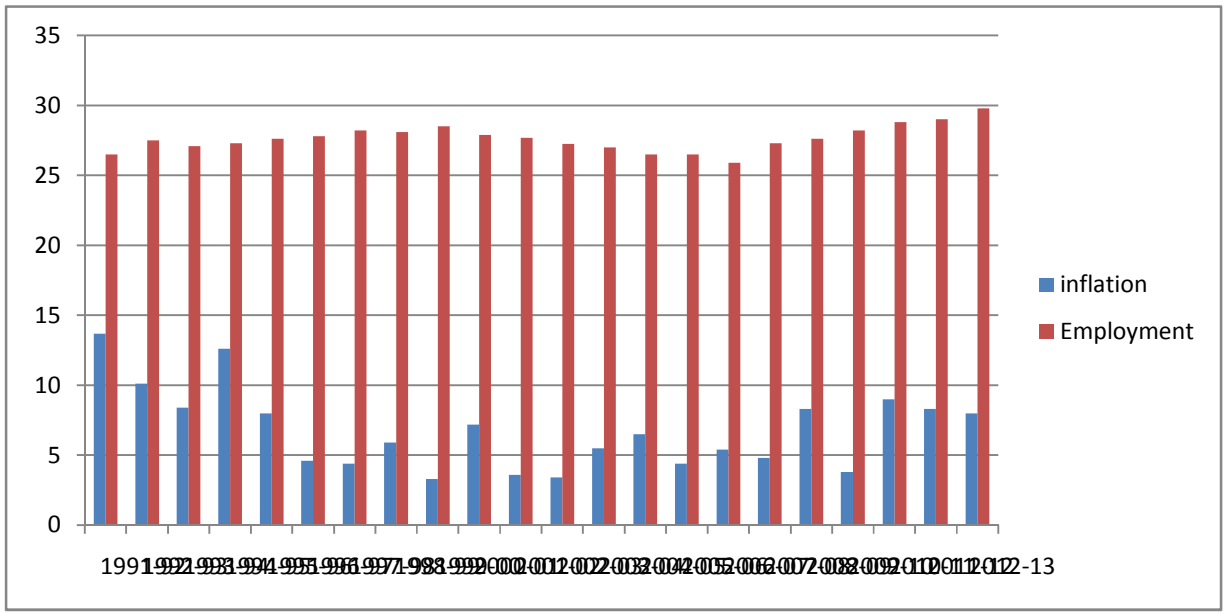
Source: RBI, handbook of statistics on Indian economy

In the year 1991-92, inflation was 13.7 percent and employment was 26.5 percent. And next year in 1992-93, inflation is decrease at 10.1 percent and then less improvement in employment at 27.5 percent. In the year 1993-94, inflation was 8.4 percent and employment was 27.1 percent. In the year 1995-96, inflation was 8.0 percent and employment was 27.6 percent.

From the year 1996-97 to 1997-98, inflation was more than 4 percent and average employment was 28 percent. In the year 1998-99, inflation was 5.9 percent and employment was 28.1 percent. And in the year 1999-2000 inflation was decrease at 33 percent and less improvement in employment at 28.5 percent. In 2001-02, inflation was 3.6 percent and employment was 27.7 percent.

In the year 2003-04, inflation was 5.5 percent and employment was 27.0 percent. In 2004-05, inflation was 6.5 percent and employment was 26.5 percent. In 2005-06 inflation was 4.4 percent and employment was remained at 26.5 percent. And in 2006-07, inflation was 5.4 percent and employment was 25.9 percent. In the year 2007-08 inflation was 4.8 percent and employment was 27.3 percent. In the year 2010-11, inflation was increased at 9 percent and employment was 28.8 percent. And in the year 2011-12, inflation was 8.3 percent and employment was 29.0 percent.

Figure 4.5



Source: RBI, handbook of statistics on Indian economy, CEICdata.com

Model 5

The first table shows the model summery table. This table provides the values of R and R square. The R value represents the simple correlation, which indicates a high degree of correlation. The R square value indicates how much of the total variation in the dependent variable.

Table: 4.5.1

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.047[a]	.002	-.048	.93622

a. Predictors: (Constant), Inflation

The second table is the AVOVA table. The ANOVA table represents how well the regression equation fits the data. This indicates that the regression model predicts the dependent variable significantly well.

Table: 4.5.2

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Si
1	Regression	.039	1	.039	.045	.834[b]
	Residual	17.530	20	.877		
	Total	17.570	21			

a. Dependent Variable: Employment

b. Predictors: (Constant), Inflation

The third table is coefficient table.

Table: 4.5.3

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	27.740	.520		53.370	.000
	Inflation	-.015	.071	-.047	-.212	.834

a. Dependent Variable: Employment

$$\text{Employment} = f(\text{inflation})$$

$$Y = f(X)$$

Where, Y = employment

X= inflation

Regression equation-

$$Y=\beta 0 +\beta 1\ X$$

$$Y = (27.740) + (-.015X)$$

This regression result is not statistically significant. This result shows that inflation in not affecting the employment. Though the Theory of Phillips Curve established a relationship between inflation and unemployment and argued a trade-off between the two. However, results

of the model do not support the Phillips curve theory in case of Indian economy. It may be possible due to structural nature of inflation and employment in India.

4.9 Conclusion

On the basis of this chapter we can conclude that the interest rate policy was very effective in the post reform period. After the deregulation of interest rate, interest rate policy has become very effective. We have seen that the lending rate is significantly affected the investment. We found that that if lending rate is increase then investment is decrease. And when lending rate is decrease then, investment is increase. Lending rate and investment works appositively.

In the sub period 1st and 3rd, from the 1991-92 to 1996-97 and from 2003-04 to 2013-14 lending rate is much effective. And in the sub period 2nd, from 1997-98 to 2002-03 lending rates is not more effective.

We also analyze that the investment and GDP growth rate are significantly related. Investment affects the GDP growth rate. If investment is increase the GDP growth rate is also increase and if investment is decrease then GDP growth rate is also decrease. Lending rate and inflation are also significantly related. We can see that when lending rates are low then inflation rate is also low and when lending rate is high than inflation rate is also high.

For the measurement of effectiveness of interest rate policy we have use the leaner regression model. Our regression model is fit for the measurement of effectiveness of interest rate policy. Our leaner regression model shows that the interest rate policy is very effective in post reform period. In the sub period 1st and 3rd it is very effective and in the sub period 2nd it is less effective.

CHAPTER 5

Conclusions and policy prescription

5.1 Conclusions:

Interest rate policy is a very important tool for an economy. Reserve bank of India was determined the interest rate policy of India in the pre reform period, but now any bank or institution determines the interest rate policy. In the pre reform period only RBI can changes the interest rate policy. It maintains price stability and money supply in the country. Interest rate policy was administered before post reform period. In the post reform period interest rate policy is liberalized which is very affecting to the performance of macro variable. Liberalized interest rate policy started in 1990s in India. The reform did not gain momentum until mid- 1992 when rates of interest in India were gradually decontrolled in a variety of ways. In the post liberalization period, Indian economy has under gone cataclysmic policy changes with a define impacts on the way the interest rates are administered.

Short term interest rate determines by the central bank and long term interest rates determines by market. The administered rate of interest is a part of financial sector reforms. In the financial sector reforms introduced during the period 1992-96, interest rate emerged at the centre stage of monetary management. Three distinct aspects of interest rate policy pursued during this period need to be highlighted, first dismantling of the administered interest rate structure, second , lending rates for banks are now totally free, third, distortion refers to the discriminatory policy in favor of the non – banking finance companies.

Zero interest rate policy is very closely related to the problem of a liquidity trap, where nominal interest rate cannot adjust downward at a time when saving exceed investment. Under the zero interest rate policy the central bank maintains a nominal interest rate. High interest rate is the cause of recession. Lower interest rates are good for barrower and lower interest rates bad for saver.

The period of 1990s are known for the globalization and liberalization. Interest rate policy became liberalized in 1990s. The main objective of economic liberalization and globalization was to reduce the role of government in producing and give more freedom to the private sector.

In 1991,when India faced the most serious economic crises after independence. India gave up state-led import substitution industrialization and the globalization and liberalization of the economy as new development plan. After independence, India's development plan was adapted towards state led import substitution industrialization. After globalization and liberalization of the economy, India has reached high economic performance. In fact, since 2003, India's growth rate has accelerated, as if proving the correctness.

The high performing Indian economy has dramatically heightened the global community's interest. India's macro- economic variables performance in post reform period has many positive features. The economy has achieved remarkable success in saving and capital formation, which is regarded as one of the driver of India's recent growth story. The grass domestic saving and grass domestic capital formation recorded as 36.5 percent and 33.7 percent of GDP in 2009-10.

In the stating of economic liberalization in India, the average economic growth rate about 6 percent. It shows that India achieved high economic growth. In fact, India became the third largest developing country in term of external debt stock in 1990. Furthermore, macro imbalances with high growth in the 1980s contributed to persistent high inflation. In other hand high growth was accompanied by large macro imbalances. India's economic growth in the 1980s ultimately faced a deadlock at the time of the most serious balance of payments crises since independence.

However, in the decade of 1990's, Indian economy could have ensured persisted high growth rate with controlled inflation. India's new interest rate policy has played very critical role in this direction in the post reform period. New interest rate policy has helped in managing the macro economic variables in better way. Deregulated interest rate policy has contributed in achieving the contradictive objectives of macro- variables.

The whole study is based on secondary data. The secondary data has been collected from RBI, handbook of statistics on Indian economy, RBI report on currency and finance. The main of this study has to find out that the changing pattern of interest rate policy in India in post reform period.

The introductory chapter reveals about the interest rate policy in India. Since from the above literatures in the introductory chapter reveals that how is India's interest rate policy in post

reform period. Since independence India's interest rate policy was administered. Only RBI has can change the policy before post reform period. The present study aims to show that the effects of liberalized interest rate policy on performance of macro variables in post reform period. This study analyze that the performance of macro variables has improved or not improved in post reform period.

The second chapter of the present study is "Assessment of interest rate policy in post reform period". The chapter analyzes the many types and pattern of interest rate in India in post reform period. This chapter evaluated the rate of interest.

The chapter shows that the interest rates were administered before post reform period which is became deregulated now. This chapter analyzes that the deregulation of interest rate policy and phases of interest rate policy in India in post reform period. Liberalized interest rate policy improves the performance of macro variables. Liberalized interest rate policy would be more supportive for increasing the efficiency of monetary policy. It shows that India's interest rate policy has consistently moved from administered rate of interest to liberalized interest rate policy in the post reform period.

The third chapter of the study is "interest rate policy and performance of macro variables". The chapter is based on secondary data which is collected from RBI, handbook of statistics on Indian economy, RBI reports. This chapter analyzes the performance of macro variables in post reform period. The chapter includes the macro variable is investment, saving, growth rate and inflation rate, export and import and employment. This study shows that the performance of macro variables has improved in post reform period. Saving, investment, and growth rate has significantly increased and inflation is decrease. The crises of 1991 affect the balance of payment.

In the first sub-period, from 1991-92 to 1996-97 the performance of macro variables has significantly improved. In the second sub-period, from 1997-98 to 2002-02 has less improvement in the performance of macro variables in the comparison of 1st sub period. And in the sub-period third, from 2003-04 to 2013-14 has more improvement in the performance of macro-variables. So we can conclude that the performance of macro variables has improved in the post reform. And liberalized interest rate policy in the post reform period has significantly affected the performance of macro variables.

The fourth chapter of this study is tiled as "effectiveness of interest rate policy in the post reform period". The main objective of this chapter is finding out that the effectiveness of interest rate policy in post reform period. After the deregulation of interest rate, interest rate policy has become very effective. We have seen that the lending rate is significantly affected the investment. We found that that if lending rate is increase then investment is decrease. And when lending rate is decrease then, investment is increase. Lending rate and investment works appositively. Lending rate and inflation are also significantly related. We can see that when lending rates are low then inflation rate is also low and when lending rate is high than inflation rate is also high.

In the sub period 1st and 3rd, from the 1991-92 to 1996-97 and from 2003-04 to 2013-14 lending rate is much effective. And in the sub period 2nd, from 1997-98 to 2002-03 lending rates is not more effective.

In this chapter we use the leaner regression model for measurement of effectiveness of interest rate policy. Our regression model is fit for the measurement of effectiveness of interest rate policy. Our leaner regression model shows that the interest rate policy is very effective in post reform period. In the sub period 1st and 3rd it is very effective and in the sub period 2nd it is less effective.

And the last chapter of the study is "conclusion and policy prescription". This chapter reveals the conclusions, findings and recommendations. This chapter is the conclusion of whole study.

The tightening of regulation in the late 1960s, the partial economic deregulation in the 1980s and fully liberalization and deregulation in 1990s. The Indian economy has been relatively independent from weather instability by reduction in the GDP share of the agricultural sector and improved in agriculture technologies and infrastructures. In specially, the green revolution has been contributing to stability of the inflation rate and economic growth and alleviating the balance of payment problem caused by food imports since the 1980s.

In the early 1980s, the Indian economy reached a turning point of a high economic growth phase. This high growth is backed up by the success of green revolution. In the late 1990s, monetary policy became independent from fiscal policy. An independent monetary policy by the reserve bank of India during 2000s ensures sustainable high economic growth and stable low inflation.

India's economy has continued to grow steadily without falling into a serious economic crisis since 1990s, although the Indian currency crises in the late 1990s and the international oil prices hike during the period from 2003 to the mid 2008 hit the Indian economy hard. Finally we can say that the macroeconomic performance has been successful since the 1990s in terms of economic growth, saving, investment, inflation and balance of payment.

The study concludes that there is a shift in interest rate policy, from administered to liberalized interest rate policy in the post reform period. The rates of interest become deregulated in the post reform period. The deregulated interest rate has improved the performance of macro variables. In the sub period 1st and 3rd, much improvement reflects in the performance of macro variables, however, in the 2nd sub period performance of macro variables is comparatively less effective. Overall, we can conclude that deregulated interest rate policy has contributed in improving the performance of macro – economic variables in the post reform period.

5.2 Recommendations:

1. There should be active cooperation and timely coordination between interest rate policy and macro variables for achieving the desired goal of macro -economic policies.
2. For improving the effectiveness of interest rate policy, different segments of Indian financial market need to be developed, because it works through these markets.
3. Considering its strong effect on macro -economic variables, Interest rate policy should be given an independent status like monetary and fiscal policy.

5.3 Limitations of the study:

The study in spite of being very thorough executed with a well defined methodology still faces certain limitations which are given as follows.

1. The time period taken for the empirical analysis is not sufficient but for having a generalized idea about the scenario we have considered the given time period.

2. In this study, only the simple regression model has been used otherwise there should have been the use of the advanced econometric techniques to carry out better analysis of this study.

3. The time duration carry out this study has also been one factor to restrict the study to confine only descriptive analysis.

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