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An Empirical Study on Repo Rate and Its Effect on Gross Domestic Product

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ABSTRACT: The main purpose of this research papers to study about the impact of monetary policy instrument of Repo Rate on the GDP growth rate. This paper analyses the changes that have taken place in the Repo Rate and quarterly GDP growth rate in India for the period 2001-2011. Monetary Policy refers to a policy introduced by the Central Bank or monetary authority to control money supply with an overall objective of maintaining price stability and promotion of economic growth. Since, independence, the RBI has been using different policy instruments to achieve the above objectives of monetary policy. During the period 1951-1990, the RBI has been using Bank rate, CRR and SLR for achieving the above objectives. During 1990s, when the government of India initiated economic reforms of liberalisation, privatisation and globalisation, bank rate was still considered and used as a significant monetary policy instrument. But, with the recommendations of Narsimhan Committee, Repo Rate went on to become the most significant monetary policy instrument in India's Monetary Policy.

This research paper uses Granger causality Test. This test is widely used in Econometrics to study the time series data. The test results shows that whenever there is change in the Repo Rate introduced by the RBI, it brings about a significant change in the Quarterly growth rate of GDP

KEYWORDS: Monetary Policy, Repo Rate, Granger causality, Gross Domestic Product at Current prices, Policy Instruments, Cash Reserve Ratio, Statutory Liquid Ratio, Bank Rate, National Income

I. INTRODUCTION

Monetary policy of India is under the domain of the Reserve Bank of India (RBI) with government playing only an advisory role in its formulation and decisions. The RBI makes major announcements regarding the monetary policy pursued by it twice a year i.e., one, in the month of April or May and other in the month of October or November. Whenever, such announcements are made, they are intended to give out indications regarding the stand taken by the central bank with regards to monetary and credit policy. During the period of early 1990s to 2009, Indian economy was showcased as a financially repressed economy characterised by high statutory pre-emption, sectoral credit targets, administered interest rates and fiscal dominance. RBI's monetary policy and financial sector reforms were comprehensively undertaken by the government of India. As a result, the financial repression was progressively undone, interest rates were deregulated, fiscal dominance reduced, banking sector was liberalised, financial markets and money markets developed, Indian financial sector emerged as modern and market-oriented system during the 2000s. During April 1997, the practice of automatic monetisation by issuing ad-hoc treasury bills was completely eliminated. Subsequently, the RBI introduced the concept of 'multiple indicator approach'. In this approach, apart from broad money, a number of macro-economic indicators such as rate of returns in different markets, currency, credit given by banks and financial institutions, fiscal position, capital inflows, trade, rate of inflation, exchange rates, refinancing and transactions in foreign exchange were considered and analysed in the process of formulation of monetary policy. On the recommendations of Narsimhan Committee on banking sector reforms (1998), the RBI introduced an Interim-Liquidity Adjustment Facility in April 1999. As per the policy measures announced in June 2000 a full-fledged Liquidity Adjustment Facility was introduced by the RBI. Later on, revisions were made in the years 2001 and 2004. On October 2004, a revised scheme of LAF was announced and international usage of terms was adopted. Since then, Repo rate has become key policy rate of RBI's monetary policy

II. CONCEPTS AND DEFINITIONS

In order to understand, how the relationship works, it is important to understand some basic concepts as follows:

2.1 Gross Domestic Product (GDP):

It is one of the important concepts of national income. Gross Domestic Product (GDP) is defined as the money value of all final goods and services produced by normal residents as well as non-residents in the domestic territory of a country but do not include net factor income earned from abroad. In a closed economy, the concept of GDP is used for estimating the national income and evaluating economic growth. In an open economy, the concept of Gross National Product is used for estimating national income and evaluating economic growth. In order to understand the effect of changes in monetary policy decisions in the economy, GDP is considered to be a better indicator or variable for analysis. Here, we have used GDP at current prices i.e., GDP at prices of current reporting period. It is also called as nominal GDP

2.2 Repo Rate:

Repo rate is the most effective and efficient tool used by the Reserve bank of India (RBI) to regulate country's money supply, inflation and liquidity. Repo rate or Repurchase rate is the rate at which commercial banks borrow money from the central bank for a short period by selling their securities to the central bank with an agreement to repurchase them at a future date at predetermined price. In simple words, it is the rate at which the central bank of country lends money to commercial banks in the event of any shortfall of funds. It is used by the monetary authorities to control inflation. Repo Rate is also known as benchmark interest rate. It is the rate at which the RBI lends money to the commercial banks for a short-term period. The origin of Repo rate, one of the most significant components of Liquidity Adjustment Facility (LAF) can be traced to United States of America (USA) as early as 1917 when the wartime taxes made other sources of lending unattractive. Narsimham Committee on Banking Sector Reforms (1998) was the basis of introducing LAF by the RBI in June 2000. Repo and Reverse Repo rates were announced separately till the monetary policy statement of 3rd May, 2011. In these statements, it was decided that the Reverse Repo rate would be linked with the Repo rate and it will 100 basis point i.e., 1% below the Repo rate. The difference between the Repo rate and Reverse Repo rate has been around 100 to 300 basis point. At present, the difference is only around 25 basis points. Reserve Bank of India (RBI) makes changes in the Repo rate according to the changing macroeconomic factors. Whenever RBI modifies Repo rate it impacts all the sectors of the economy, this is the key reason behind RBI using Repo rate as a policy instrument

a) Impact of reduction in repo rate:

Whenever Reserve Bank cuts the Repo rate, banks can borrow money at a cheaper rate from the RBI. This impacts the lending capacity of commercial banks. Bank loans are available at cheaper rates to the consumers. This leads to increased liquidity in the market as well as increase in overall consumption of the economy. Whenever the RBI reduces the Repo rate, it means the commercial banks can borrow money from RBI at a much lower rate of interest. The commercial banks usually pass on this benefit on to their customers by reducing the interest rates on loans. When interest rate is reduced, we pay lesser amount of interest. This in turn brings down the overall cost of our loan. As a result, the demand for loans rises from customers and positively impacts aggregate demand. However increased liquidity can also lead to increased inflation. This is why Repo rate cut usually occurs in relatively smaller amounts such as 25 basis points.

b) Impact of increase in repo rate:

Repo rate is also called as Market lending rate. Whenever Reserve Bank of India increases Repo rate, borrowing becomes expensive for commercial banks. As borrowing becomes costly for commercial banks, it affects their lending capacity. As a result, commercial banks increase the rate of interest on loans which they offer to their customers. This leads to a reduction in money supply and reduces liquidity in the economy. Decrease in liquidity brings down the inflation. During high levels of inflation, RBI takes many steps to decrease money supply in the economy. During present times, the most sought-after method is by increasing the Repo rate. However, increase in Repo rate can also adversely affect economic growth due to decrease in consumption resulting from lower money supply in the economy.

III. STATEMENT OF THE PROBLEM

Repo rate has become the most important tool of monetary policy pursued by the RBI in recent times. It has been observed that any changes made in policy rates have significant impact in economic growth in India. Changes made in Repo rate have a direct impact on banking sector and its lending capacity. In recent years, the government, the banking sector, the industry and even the general public seems to be very interested in the review of monetary policy done by the RBI twice a year. Hence, the present study is an attempt to test the impact of changes in Repo rate announced by the RBI on Quarterly growth rate of GDP at current prices.

IV. OBJECTIVE OF THE STUDY

The following is the objective of the study:

a) To study and analyse the impact of changes in Repo rate on Quarterly growth rates of GDP at current prices during the period 2001 to 2011.

V. DATA AND METHODOLOGY

The study is based mostly on secondary data from official sources. Information regarding the changes in Repo rate and Quarterly GDP growth rates at current prices have been obtained from official website of RBI i.e., <https://www.rbi.org.in/> and <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home/> & <http://planningcommission.nic.in/data/datatable/>

Before we start let us take a look at the trends in GDP at current prices and Repo rate over the period under study i.e., from 2001 to 2011

Figure 1.1 Quarterly Data on GDP and Repo Rate

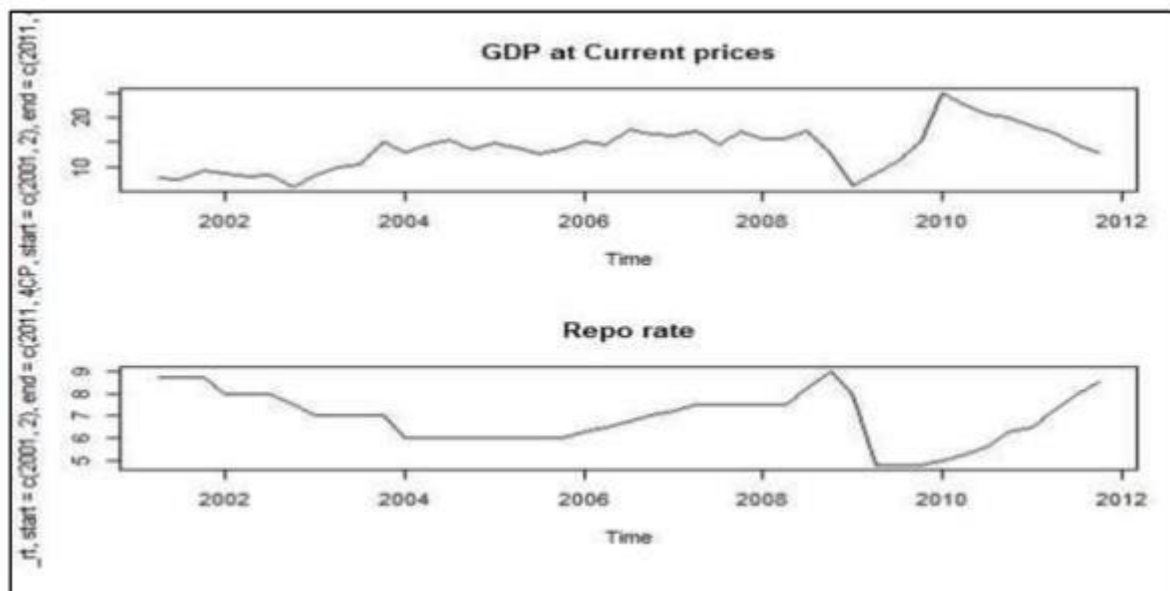


Figure 1.1 shows the quarterly data on Gross Domestic Product (GDP) and Repo Rate for the period 2001 to 2011. Figure shows many ups and downs in GDP as well as in Repo rate. We can observe that in 2002 and 2009 GDP has fallen down to 5.9 and 6.3 respectively. After that in 2010 it has recovered. Also, Repo rate shows many fluctuations during this period. Initially it has started with 8.75 in 2001. It reached to its minimum value 4.75 in 2009. Again it is increased to 8.75 in 2011.

VI. EMPIRICAL RESULTS

For this analysis we have used Granger causality Test. This test is widely used in Econometrics to study the time series data. We say that the time series X Granger causes another time series Y if predictions of the value of Y based on its own past values and on the past values of X are better than predictions of Y based only on its own past values. For this analysis we have used the following data:

Table 1: Quarterly Growth Rates of GDP at Current Prices and Repo Rate

observation_date	GDP at Current Prices (%)	Repo Rate (%)
2001-04-01	7.7	8.75
2001-07-01	7.5	8.75
2001-10-01	9.4	8.75
2002-01-01	8.9	8
2002-04-01	8.2	8
2002-07-01	8.4	8
2002-10-01	5.9	7.5
2003-01-01	8.4	7.05
2003-04-01	9.9	7.05
2003-07-01	10.5	7.05
2003-10-01	15.2	7.05
2004-01-01	13.1	6
2004-04-01	14.4	6
2004-07-01	15.4	6
2004-10-01	13.5	6
2005-01-01	14.8	6
2005-04-01	14.0	6
2005-07-01	12.8	6
2005-10-01	13.7	6
2006-01-01	15.2	6.25
2006-04-01	14.4	6.5
2006-07-01	17.5	6.75
2006-10-01	16.7	7
2007-01-01	16.5	7.25
2007-04-01	17.3	7.5
2007-07-01	14.4	7.5
2007-10-01	17.2	7.5
2008-01-01	15.7	7.5
2008-04-01	15.9	7.5
2008-07-01	17.2	8.25
2008-10-01	12.7	9
2009-01-01	6.3	8
2009-04-01	8.8	4.75
2009-07-01	11.2	4.75
2009-10-01	15.2	4.75
2010-01-01	24.9	5
2010-04-01	22.4	5.25
2010-07-01	20.6	5.625
2010-10-01	19.9	6.25
2011-01-01	18.1	6.5
2011-04-01	17.0	7.25
2011-07-01	14.5	8
2011-10-01	13.0	8.5

Source: Websites of RBI, DBIE-RBI: Database Indian Economy and Planning Commission

**Links:**

- 1) <https://www.rbi.org.in/>, Reserve Bank of India
- 2) <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home>, DBIE-RBI: Database of Indian Economy
- 3) <http://planningcommission.nic.in/data/datatable/>, Planning Commission

Here we check the relationship between GDP and Repo Rate using Granger test. For this we use the following equation:

$$y_t = \alpha + \sum_{i=1}^p \beta_i y_{t-i} + \sum_{i=1}^p \gamma_i X_{t-i} + \varepsilon_t \quad \dots\dots\dots \text{here } p=4, y=\text{GDP and } x=\text{Repo}$$

rate

$$H_0 : \gamma_1 = \gamma_2 = \dots = \gamma_p = 0$$

$$H_1 : \gamma_i \neq 0$$

```

grangertest(GDP_CP~Repo_rt, order=4, data=interest)
Granger causality test
Model 1: GDP_CP ~ Lags(GDP_CP, 1:4) + Lags(Repo_rt, 1:4)
Model 2: GDP_CP ~ Lags(GDP_CP, 1:4)
Res.DfDf    F    Pr(>F)
1    30
2    34 -4 6.7264 0.0005465 ***
Signif.codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
grangertest(GDP_CP~Repo_rt, order=3, data=interest)
Granger causality test
Model 1: GDP_CP ~ Lags(GDP_CP, 1:3) + Lags(Repo_rt, 1:3)
Model 2: GDP_CP ~ Lags(GDP_CP, 1:3)
Res.DfDf    F    Pr(>F)
1    33
2    36 -3 6.2444 0.001774 **
Signif.codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
grangertest(GDP_CP~Repo_rt, order=2, data=interest)
Granger causality test
Model 1: GDP_CP ~ Lags(GDP_CP, 1:2) + Lags(Repo_rt, 1:2)
Model 2: GDP_CP ~ Lags(GDP_CP, 1:2)
Res.DfDf    F    Pr(>F)
1    36
2    38 -2 9.2266 0.0005821 ***
Signif.codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
grangertest(GDP_CP~Repo_rt, order=1, data=interest)
Granger causality test
Model 1: GDP_CP ~ Lags(GDP_CP, 1:1) + Lags(Repo_rt, 1:1)
Model 2: GDP_CP ~ Lags(GDP_CP, 1:1)
Res.DfDf    F    Pr(>F)
1    39
2    40 -1 21.458 3.966e-05 ***
Signif.codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

The above results clearly show that Repo rate granger causes GDP. Hence, we reject H0. It

means that Repo rate affects GDP

$$x_t = \alpha + \sum_{i=1}^p \beta_i x_{t-i} + \sum_{i=1}^p \gamma_i y_{t-i} + \epsilon_t \dots \dots \dots \text{here } p=4, y=\text{GDP}, x=\text{Repo rate}$$

$$H_0 : \gamma_1 = \gamma_2 = \dots = \gamma_p = 0$$

$$H_1 : \gamma_i \neq 0$$

```
grangertest(Repo_rt~GDP_CP, order=4, data=interest)
Granger causality test
Model 1: Repo_rt ~ Lags(Repo_rt, 1:4) + Lags(GDP_CP, 1:4)
Model 2: Repo_rt ~ Lags(Repo_rt, 1:4)
Res.DfDf    F Pr(>F)
1    30
2    34 -4 1.0988 0.3752
grangertest(Repo_rt~GDP_CP, order=3, data=interest)
Granger causality test
Model 1: Repo_rt ~ Lags(Repo_rt, 1:3) + Lags(GDP_CP, 1:3)
Model 2: Repo_rt ~ Lags(Repo_rt, 1:3)
Res.DfDf    F Pr(>F)
1    33
2    36 -3 1.573 0.2144
grangertest(Repo_rt~GDP_CP, order=2, data=interest)
Granger causality test
Model 1: Repo_rt ~ Lags(Repo_rt, 1:2) + Lags(GDP_CP, 1:2)
Model 2: Repo_rt ~ Lags(Repo_rt, 1:2)
Res.DfDf    F Pr(>F)
1    36
2    38 -2 1.6978 0.1974
grangertest(Repo_rt~GDP_CP, order=1, data=interest)
Granger causality test
```

```
Model 1: Repo_rt ~ Lags(Repo_rt, 1:1) + Lags(GDP_CP, 1:1)
Model 2: Repo_rt ~ Lags(Repo_rt, 1:1)
Res.DfDf    F Pr(>F)
1    39
2    40 -1 9.1701 0.004347 **
Signif.codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Above results show that GDP does not granger cause Repo rate. Thus, we accept H0. In other words, GDP does not affect Repo rate.

III. SUMMARY AND CONCLUSIONS

Whenever there is a change in macro-economic factors, the RBI considering all major and minor factors bring about a change in policy rates i.e., Repo Rate, CRR, SLR and Bank Rate as per requirements. Whenever, there is a change in policy rates it affects many sectors of the economy in many different ways. In order to give an upward push to a stagnant economy, the RBI brings about a reduction in Repo rate and in order to control inflation in the economy rising above a nominal level, the RBI brings about an increase in Repo rate. Changes in Repo rate have a string influence on market interest rates in the economy. There is no direct and binding linkage between the Repo rates and banks' lending or deposits rates but definitely has a strong indirect influence. When the RBI is lowering the Repo rate it is sending a strong and clear signal that the banks' lending rates must go down and vice versa. When the banks reduce the lending rates, it is called transmission of interest rate changes. As a result, there is increase in lending, increase in money supply, increase in demand and resultant increase in GDP.

CONCLUSION

The above study clearly indicates that the changes in Repo rate led to a change in Gross Domestic Product (GDP). hus, Changes in Repo rate has significant impact on growth rate of GDP. There is other several factors that also affect rowth rate of GDP. Further analysis of impact of other factors on the growth rate of GDP is hence called for.

LIMITATIONS OF THE STUDY

- 1) The study is limited to changes in policy rates during the period 2001 to 2011.
- 2) The study is confined only to changes in Repo rates and Quarterly GDP growth rates announced by RBI during the above-mentioned period
- 3) As the study is based mostly on secondary data, it is affected with some limitations associated with secondary data analysis.
- 4) All limitations related to Granger test which is a widely used technique in Econometrics to study time series data are applicable to this study too.

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