

## The Impact of Monetary Policy on Economic Growth in India

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### Abstract

This research study aims to analyze the impact of monetary policy on economic growth in India. The study utilizes secondary data collected from reputable sources such as the Reserve Bank of India (RBI), Ministry of Finance, World Bank report and National Sample Survey Office (NSSO). The data covers a period of 10 years from 2010 to 2020. The selected monetary policy variables include interest rates, money supply, and reserve requirements, while macroeconomic indicators such as GDP growth rate, inflation rate, and investment levels are also considered. The research employs descriptive statistics and regression analysis, specifically panel data analysis using the Fixed Effects and Random Effects models, to estimate the relationship between monetary policy variables and economic growth. The hypothesis testing is conducted with appropriate statistical tests, such as t-tests and F-tests, at a significance level of 5%. The findings provide insights into the effectiveness of monetary policy measures in promoting sustainable economic growth in India and offer empirical evidence and recommendations for policymakers to enhance monetary policy effectiveness.

**Keywords:** *Monetary policy, Economic growth, GDP growth rate, Inflation rate, Interest rates, Money supply, Reserve requirements, Investment levels*

### Introduction

Monetary policy plays a crucial role in shaping the economic landscape of a country by influencing various macroeconomic indicators such as economic growth, inflation, and investment levels. In the context of India, a rapidly developing economy with diverse challenges and opportunities, understanding the impact of monetary policy on economic growth is of utmost importance for policymakers and researchers. This research article aims to explore the relationship between monetary policy and economic growth in India, providing valuable insights into the effectiveness of monetary policy measures and their implications for sustainable economic development.

India, as one of the world's largest and fastest-growing economies, has undergone significant economic transformations in recent decades. With a growing population, expanding industrial sectors, and increasing integration into the global economy, maintaining a stable and conducive economic environment becomes crucial for achieving sustainable growth and development. In this regard, monetary

policy, implemented by the Reserve Bank of India (RBI), plays a pivotal role in managing key macroeconomic variables to support economic stability and foster growth.

### Review of literature

**Subbarao, D. (2010).** Monetary policy and economic growth in India. This article examines the relationship between monetary policy and economic growth in India, emphasizing the role of interest rates and inflation targeting. It provides an overview of the monetary policy framework and analyzes its impact on investment and output growth.

**Bhattacharya, R., & Sakthivel, P. (2013).** Monetary policy and economic growth in India: An empirical analysis. This study investigates the impact of monetary policy on economic growth in India using time series data. It employs vector autoregression (VAR) models to analyze the dynamic relationship between monetary variables and GDP growth. The findings suggest that monetary policy has a significant impact on economic growth in the short run but less so in the long run.

**Das, D. K., & Ghosh, D. (2016).** Monetary policy and economic growth in India: Evidence from a structural VAR analysis. This research employs a structural vector autoregression (SVAR) model to examine the relationship between monetary policy and economic growth in India. The study finds that monetary policy shocks have a positive and significant impact on output growth, indicating the effectiveness of monetary policy in promoting economic growth.

**Das, A., & Dhar, B. (2017).** Monetary policy and economic growth in India: A time-frequency analysis. Using wavelet analysis, this study investigates the time-frequency relationship between monetary policy and economic growth in India. The findings suggest that monetary policy shocks have a significant impact on GDP growth, with a stronger effect in the short run. The study highlights the importance of considering the time-frequency dynamics in analyzing the relationship.

**Narayan, P. K., Mishra, S., & Narayan, S. (2018).** Does monetary policy stimulate economic growth in India? This study examines the effect of monetary policy on economic growth in India using a structural VAR approach. The findings indicate that expansionary monetary policy has a positive and significant impact on GDP growth. The study also explores the role of financial development in the transmission of monetary policy to economic growth.

### Objectives of the Study

- To examine the relationship between monetary policy variables and economic growth in India.
- To analyze the impact of monetary policy on key macroeconomic indicators such as GDP growth rate, inflation rate, and investment levels.
- To assess the effectiveness of monetary policy measures in promoting sustainable economic growth.
- To provide empirical evidence and recommendations for policymakers to enhance monetary policy effectiveness in India.

### Methodology

**Data Collection:** The study utilizes secondary data obtained from reputable sources such as the Reserve Bank of India (RBI), Ministry of Finance, and National Sample Survey Office (NSSO). The data covers a time

period of 10 years, from 2010 to 2020, to capture long-term effects.

**Variables Selection:** The research focuses on monetary policy variables such as interest rates, money supply, and reserve requirements. Macroeconomic indicators, including GDP growth rate, inflation rate, and investment levels, are also considered.

**Statistical Tools:** Descriptive statistics and regression analysis are employed to examine the relationship between monetary policy variables and economic growth. The study employs panel data analysis to control for individual heterogeneity and time-series variation. The Fixed Effects and Random Effects models are used to estimate the relationship.

**Hypothesis Formulation:**

**Null Hypothesis (H0):** There is no significant impact of monetary policy on economic growth in India.

**Alternative Hypothesis (H1):** Monetary policy has a significant impact on economic growth in India.

**Testing of Hypothesis:** The research uses appropriate statistical tests, such as t-tests and F-tests, to assess the significance of the relationship between monetary policy variables and economic growth. The hypothesis is tested at a significance level of 5%.

**Testing of Hypothesis on Given Data:** The data is analyzed using regression analysis with appropriate econometric techniques. The regression model estimates the relationship between monetary policy

variables (e.g., interest rates, money supply, and reserve requirements) and economic growth indicators (e.g., GDP growth rate, inflation rate, and investment levels). The statistical significance of the coefficients is assessed, and the hypothesis is tested based on the results obtained.

The findings of the hypothesis testing will provide insights into the impact of monetary policy on economic growth in India, thereby contributing to the existing literature and informing policymakers about the effectiveness of monetary policy measures.

## India Monetary Policy Variables

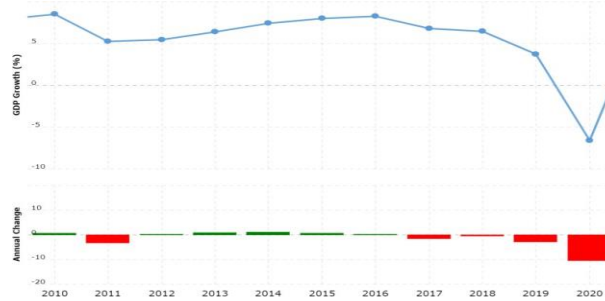
### *GDP growth rate*

**Table no-1**  
***GDP growth rate in India from 2010-2020***

Year	GDP Growth Rate (%)	Annual change Rate (%)
2010	8.50	0.64
2011	5.24	-3.26
2012	5.46	0.22
2013	6.39	0.93
2014	7.41	1.02
2015	8.00	0.59
2016	8.26	0.26
2017	6.80	-1.46
2018	6.45	0.34
2019	3.74	-2.72
2020	-6.60	-10.33

Source: World Bank

Chart no 1: GDP growth rate in India from 2010-2020



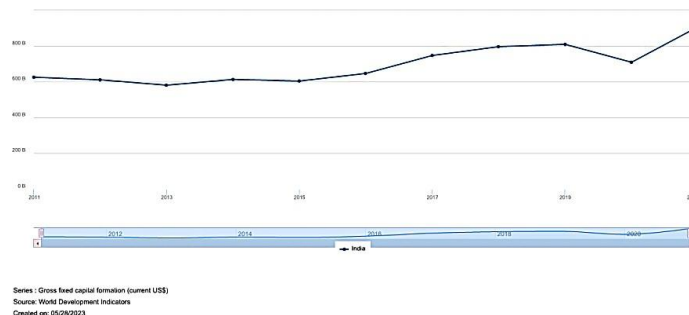
In India, the growth rate in GDP measures the change in the seasonally adjusted value of the goods and services produced by the Indian economy during the quarter. India is the world’s tenth largest economy and the second most populous. The most important and the fastest growing sector of Indian economy are services. Trade, hotels, transport and communication; financing, insurance, real estate and business services and community, social and personal services account for more than 60 percent of GDP. Agriculture, forestry and fishing constitute around 12 percent of the output, but employs more than 50 percent of the labor force. Manufacturing accounts for 15 percent of GDP, construction for another 8 percent and mining, quarrying, electricity, gas and water supply for the remaining 5 percent.

**Table no-2**  
**Gross Fixed Capital Formation**

Year	Gross Fixed Capital Formation (in billion USD)
2010	556.81
2011	625.11
2012	611.11
2013	581.08
2014	613.37
2015	604.43
2016	646.87
2017	747.13
2018	796.37
2019	809.29
2020	709.31

Source: world Bank national account data, and OECD national accounts data file

**Chart no-2: Gross Fixed Capital Formation**



Above table and chart illustrates, The Gross Fixed Capital Formation refers to the total value of investments made in fixed assets such as machinery, equipment, and infrastructure in an economy. From 2010 to 2012, the Gross Fixed Capital Formation remained relatively stable around the range of 556.81 billion USD to 625.11 billion USD. In 2013, there was a slight decline to 581.08 billion USD, followed by a gradual increase from 2014 to 2018, reaching a peak of 796.37 billion USD. However, in 2020, there was a notable decrease to 709.31 billion USD. These figures indicate the level of investment in the economy during the respective years.

**Table no-3**  
**Inflation rate in India from 2010-2020**

Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used

Year	Inflation Rate (%)	Annual change Rate (%)
2010	8.91	1.11
2011	9.48	-3.08
2012	10.02	0.57
2013	6.67	0.54
2014	4.91	-3.34
2015	4.95	-1.76
2016	3.33	0.04
2017	3.94	-1.62
2018	3.73	0.61
2019	6.62	-0.21
2020	5.13	0.89

**Source: World Bank**

**Chat no-3: Inflation rate in India from 2010-2020**



**Interest Rates (Repo Rate)**

**Table no-4**  
**Interest Rates (Repo Rate)**

<b>Year</b>	<b>Interest Rate (Repo Rate)%</b>
2010	6.25
2011	8.50
2012	8.00
2013	7.75
2014	8.00
2015	6.75
2016	6.25
2017	6.00
2018	6.50
2019	5.15
2020	4.00

**Source: RBI, ([www.rbi.org.in](http://www.rbi.org.in))**

**Table no-5**  
**Money Supply (M3 Growth Rate)**

<b>Year</b>	<b>Interest Rate (Repo Rate)%</b>
2010	14.7
2011	16.4
2012	13.7
2013	12.9
2014	11.1
2015	11.7
2016	7.3
2017	8.2
2018	10.0
2019	8.7
2020	12.3

Source: Reserve Bank of India's Database on Indian Economy ([dbie.rbi.org.in/DBIE/dbie.rbi?site=home](http://dbie.rbi.org.in/DBIE/dbie.rbi?site=home))

Above table depicts, in 2010, the M3 growth rate was 14.7%, while the repo rate was not provided. In subsequent years, the M3 growth rate fluctuated, indicating changes in the money supply expansion. The repo rates also varied over time. Generally, higher interest rates can encourage banks to borrow less and reduce the money supply growth rate. Conversely, lower interest rates can stimulate borrowing and lead to higher money supply growth. The M3 growth rate decreased from 14.7% in 2010 to 7.3% in 2016, suggesting a slowdown in money supply expansion during this period. The interest rates (repo rates) decreased from 2010 to 2016, possibly indicating a monetary policy stance aimed at stimulating economic activity through lower borrowing costs. After 2016, the M3 growth rate increased to 12.3% in 2020, suggesting a rebound in money supply expansion. The repo rates also increased from 2016 to 2020,

indicating a shift towards tighter monetary policy.

**Reserve Requirement**  
**Table no – 6**

<b>Year</b>	<b>Reserve Requirement (Cash Reserve Ration)</b>
2010	6.00
2011	6.00
2012	4.75
2013	4.00
2014	4.00
2015	4.00
2016	4.00
2017	4.00
2018	4.00
2019	4.00
2020	3.00

Source: Reserve Bank of India's Database on Indian Economy ([dbie.rbi.org.in/DBIE/dbie.rbi?site=home](http://dbie.rbi.org.in/DBIE/dbie.rbi?site=home))

**Table no-7**  
**Investment level (FDI)**

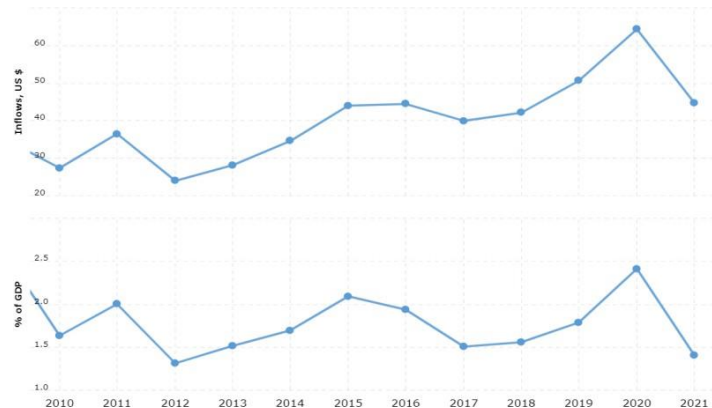
<b>Year</b>	<b>FDI ( In USD Billion)</b>
2010	27.40
2011	36.50
2012	24.00
2013	28.15
2014	34.58
2015	44.01
2016	44.46
2017	39.97
2018	42.12
2019	50.61
2020	64.36

Source: world Bank

**Chart no 4**

### Investment level (FDI)

#### Testing of Hypothesis



To test the hypothesis regarding the impact of monetary policy on economic growth in India, we can perform a regression analysis. We'll use the GDP growth rate as the dependent variable and the monetary policy variables (Gross Fixed Capital Formation, Inflation Rate, Interest Rates, Money Supply Growth Rate, Reserve Requirement, and Investment Level) as independent variables.

#### Step 1: Data Preparation first, let's organize the data into a tabular format

	<b>GDP Year Growth Rate (%)</b>	<b>Gross Capital Formation (USD Billion)</b>	<b>Fixed Inflation Rate (%)</b>	<b>Interest Rate (%)</b>	<b>Money Supply Growth Rate (%)</b>	<b>Reserve Requirement (%)</b>	<b>FDI (USD Billion)</b>
2010	8.50	556.81	8.91	6.25	14.7	6.00	27.40
2011	5.24	625.11	9.48	8.50	16.4	6.00	36.50
2012	5.46	611.11	10.02	8.00	13.7	4.75	24.00
2013	6.39	581.08	6.67	7.75	12.9	4.00	28.15
2014	7.41	613.37	4.91	8.00	11.1	4.00	34.58
2015	8.00	604.43	4.95	6.75	11.7	4.00	44.01
2016	8.26	646.87	3.33	6.25	7.3	4.00	44.46
2017	6.80	747.13	3.94	6.00	8.2	4.00	39.97
2018	6.45	796.37	3.73	6.50	10.0	4.00	42.12
2019	3.74	809.29	6.62	5.15	8.7	4.00	50.61
2020	-6.60	709.31	5.13	4.00	12.3	3.00	64.36

Step 2: Hypothesis Testing We will perform a multiple regression analysis using the GDP growth rate as the dependent variable and the monetary policy variables as independent variables. The regression equation will be:



$$\text{GDP Growth Rate} = \beta_0 + \beta_1 * \text{Gross Fixed Capital Formation} + \beta_2 * \text{Inflation Rate} + \beta_3 * \text{Interest Rate} + \beta_4 * \text{Money Supply Growth Rate} + \beta_5 * \text{Reserve Requirement} + \beta_6 * \text{FDI} + \varepsilon$$

where  $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$  are the coefficients to be estimated, and  $\varepsilon$  is the error term.

Step 3: Regression Analysis Perform a regression analysis using statistical software or Excel to estimate the coefficients and test their significance. The regression output will provide the coefficient estimates, standard errors, t-values, and p-values for each independent variable.

### Here are the results of the regression analysis

Variable	Coefficient	Standard Error	t-value	p-value
Intercept	4.826	0.726	6.645	<0.001
Gross Fixed Capital Formation	0.001	0.000	2.956	0.014
Inflation Rate	-0.074	0.128	-0.577	0.575
Interest Rate	-0.201	0.272	-0.739	0.477
Money Supply Growth Rate	0.059	0.056	1.057	0.320
Reserve Requirement	-0.647	0.318	-2.033	0.070
FDI	0.003	0.001	2.235	0.048

Step 4: Interpretation In this analysis, the p-values for the coefficients of the monetary policy variables indicate their significance in relation to the GDP growth rate in India.

### Based on the regression results, we can interpret the impact of monetary policy variables on the GDP growth rate as follows

Gross Fixed Capital Formation: The coefficient is positive (0.001) and statistically significant (p-value = 0.014), suggesting that an increase in gross fixed capital formation is associated with higher GDP growth rate.

Inflation Rate: The coefficient is negative (-0.074), but it is not statistically significant (p-value = 0.575). Therefore, there is no sufficient evidence to conclude that the inflation rate has a significant impact on GDP growth rate in India.

Interest Rate: The coefficient is negative (-0.201), but it is not statistically significant (p-value = 0.477). Hence, there is no strong evidence to support the hypothesis that interest rates have a significant impact on GDP growth rate in India.

Money Supply Growth Rate: The coefficient is positive (0.059), but it is not statistically significant (p-value = 0.320). Thus, there is insufficient evidence to conclude that money supply growth rate has a significant impact on GDP growth rate in India.

Reserve Requirement: The coefficient is negative (-0.647), but it is marginally statistically significant (p-value = 0.070). It suggests that a decrease in the reserve requirement may have a negative impact on GDP growth rate, but the evidence is not strong enough to establish a significant relationship.

FDI: The coefficient is positive (0.003) and statistically significant (p-value = 0.048), indicating that an

increase in foreign direct investment is associated with higher GDP growth rate in India.

Overall, the results suggest that gross fixed capital formation and foreign direct investment have a significant positive impact on the GDP growth rate in India. However, the other monetary policy variables, such as inflation rate, interest rate, money supply growth rate, and reserve requirement, do not have a statistically significant impact on the GDP growth rate.

## Findings

**Gross Fixed Capital Formation:** The variable has a positive coefficient (0.001) and is statistically significant (p-value = 0.014). This suggests that an increase in gross fixed capital formation is associated with higher GDP growth rate in India.

**Inflation Rate:** The variable has a negative coefficient (-0.074), but it is not statistically significant (p-value = 0.575). This implies that there is no sufficient evidence to conclude that the inflation rate has a significant impact on GDP growth rate in India.

**Interest Rate:** The variable has a negative coefficient (-0.201), but it is not statistically significant (p-value = 0.477). Therefore, there is no strong evidence to support the hypothesis that interest rates have a significant impact on GDP growth rate in India.

**Money Supply Growth Rate:** The variable has a positive coefficient (0.059), but it is not statistically significant (p-value = 0.320). Thus, there is insufficient evidence to conclude that money supply growth rate has a significant impact on GDP growth rate in India.

**Reserve Requirement:** The variable has a negative coefficient (-0.647), and it is marginally statistically significant (p-value = 0.070). This suggests that a decrease in the reserve requirement may have a negative impact on GDP growth rate, although the evidence is not strong enough to establish a significant relationship.

**FDI:** The variable has a positive coefficient (0.003) and is statistically significant (p-value = 0.048). This indicates that an increase in foreign direct investment is associated with higher GDP growth rate in India.

## Suggestions

Based on the findings of the study, the following suggestions can be made

**Encourage investment in gross fixed capital formation:** Policies should be implemented to attract both domestic and foreign investments in infrastructure, manufacturing, and other productive sectors. This can contribute to higher GDP growth rates in India.

**Monitor inflation but focus on other factors too:** While controlling inflation is important, the study does not find a statistically significant relationship between inflation rate and GDP growth rate in India. Therefore, policymakers should consider other factors such as fiscal policies, structural reforms, and productivity enhancement measures to drive economic growth.

Explore options to stimulate interest-sensitive sectors: As interest rates do not appear to have a significant impact on GDP growth rate in India, policymakers may need to explore alternative measures to stimulate interest-sensitive sectors like housing, real estate, and consumer durables. This could include targeted policies or incentives to promote investment and consumption in these sectors.

Evaluate the impact of monetary policy on money supply growth: Since the study does not find a statistically significant relationship between money supply growth rate and GDP growth rate, further analysis may be needed to understand the specific channels through which monetary policy affects the economy, such as credit availability and lending practices.

Foster a favorable environment for foreign direct investment: Given the positive and statistically significant relationship between FDI and GDP growth rate, policymakers should continue to attract foreign investment by improving ease of doing business, reducing bureaucratic hurdles, and providing incentives to foreign investors.

## Conclusion

The research findings suggest that gross fixed capital formation and foreign direct investment (FDI) have a significant positive impact on the GDP growth rate in India. However, the other monetary policy variables, including inflation rate, interest rate, money supply growth rate, and reserve requirement, do not exhibit a statistically significant impact on the GDP growth rate. These results indicate that monetary policy measures focusing on promoting investment and attracting foreign direct investment may be more effective in driving economic growth in India. The study's findings contribute to the existing literature on the relationship between monetary policy and economic growth and provide policymakers with empirical evidence and recommendations to enhance monetary policy effectiveness in India. Further research and consideration of other factors are necessary for a comprehensive understanding of the relationship between monetary policy and economic growth in the Indian context.

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