"Decoding the Impact of RBI Repo Rate Changes on Inflation and Sectoral Market Performance in India (2015–2024)"

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Objective:

To **Analyze** how **RBI repo rate changes** influence **India's inflation trends (CPI/WPI)** and how different **stock market sectors** respond to these changes over time.

Scope:

We'll focus on 3 key relationships:

1. **Repo Rate ↔ Inflation (CPI & WPI)**
   → Does a hike/cut lead to rising or falling inflation?
   → Is there a lagged impact?
2. **Repo Rate ↔ Nifty Sectoral Indices (Performance over time)**
   → Which sectors are most interest-rate sensitive?
   → How do Banking, Auto, Realty, FMCG, and IT react to changes?
3. **Inflation ↔ Sector Performance**
   → Do inflationary periods affect sectors like FMCG or Auto differently?

Timeframe:

We'll analyze data from:
January 2015 to June 2024 (approx. 9.5 years)

Why this period?

- Includes multiple **rate hike and cut cycles**
- Covers key macro events:
  - 2016 Demonetization
  - 2020 COVID-19

    - 2022–2023 post-pandemic inflation and tightening
- RBI adopted **inflation-targeting monetary policy** post-2016

This timeframe aligns with India's shift to an **inflation-targeting monetary policy regime** and covers a range of **market-altering events**, making it ideal for assessing macroeconomic linkages.

Background:

1. What is the Repo Rate?

The **repo rate** is the interest rate at which the **Reserve Bank of India (RBI)** lends short-term funds to commercial banks. It is a key monetary policy tool used to control liquidity, inflation, and overall economic activity.

- **When the RBI raises the repo rate:**
  Borrowing becomes costlier → credit slows → demand cools → inflation may decrease.
- **When the RBI cuts the repo rate:**
  Borrowing becomes cheaper → more liquidity → consumption and investment rise → inflation may increase.

The repo rate also influences **bond yields, currency value**, and **capital flows**, making it a crucial signal for financial markets.

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2. Inflation: CPI vs WPI

Inflation reflects the rate at which prices for goods and services rise, eroding purchasing power.

- **Consumer Price Index (CPI):** Measures inflation at the **retail level**—the most commonly tracked inflation indicator by RBI.
- **Wholesale Price Index (WPI):** Captures price changes at the **wholesale or producer level**, often more volatile.

Since 2016, the RBI follows an **inflation-targeting framework** focused on maintaining CPI inflation at **4% ± 2%**.

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3. Repo Rate and Inflation: The Link

There is a **theoretical inverse relationship** between interest rates and inflation:

- High inflation → RBI may raise repo rate to tighten liquidity.

- Low inflation or recession → RBI may cut repo rate to stimulate growth.

However, the impact is **not immediate**—there is typically a **lag of 3–6 months** between a policy move and its effect on inflation data.

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4. Sectoral Sensitivity to Interest Rates

Different sectors of the stock market react differently to repo rate changes:

Sector	Sensitivity	Why
Banking	Very High	Cost of funds and credit growth directly affected
Realty	High	Home loan rates affect demand
Auto	High	Consumer financing (EMIs) sensitive to rates
FMCG	Medium	Volume-driven; less rate-sensitive but inflation-linked
IT	Low	Export-driven; more influenced by USD/INR and global demand

Investors often rotate between sectors depending on the **rate cycle** (e.g., move into banks in a rate-cutting phase).

Data Collection & Methodology:

This project relies on **publicly available data** from authoritative Indian financial sources:

- **Repo Rate Data:** Extracted manually from RBI's monetary policy statements archive, covering monthly rates from January 2015 to June 2024.
- **Inflation Data (CPI & YoY %):** Sourced from the Ministry of Statistics and Programme Implementation (MOSPI), including the Consumer Price Index and derived year-over-year inflation rates.
- **Sectoral Index Data:** Downloaded from NSE's official website. The dataset includes monthly closing prices of:
    - Nifty 50
    - Nifty Bank
    - Nifty FMCG
    - Nifty Auto
    - Nifty IT

- Nifty Realty

All data was **standardized to monthly frequency**, cleaned, and merged into a unified Excel workbook titled Master_Data.xlsx.

Analytical Framework:

To understand macro–micro linkages, the following structured approach was used:

1. **Repo Rate Phase Classification:**
   Each month was labelled as part of a:
   - **Cut Cycle** (rate reductions),
   - **Hold Phase** (no change), or
   - **Hike Cycle** (rate increases).
2. **Returns & Volatility Calculation:**
   - Monthly returns were calculated as percentage change from the previous month's close.
   - Volatility was captured as standard deviation of returns in each phase.
3. **Correlation Mapping:**
   - Pearson correlation coefficients were computed between repo rates and sector returns to measure sensitivity.
4. **COVID-19 Analysis:**
   - A focused 13-month snapshot (March 2020 – March 2021) was extracted and analyzed separately.
   - Sector indices were normalized (Mar 2020 = 100) to compare crash and recovery speeds.
5. **Interactive Dashboard Design:**
   - Slicers were used in Excel to filter data by phase.
   - Dynamic visuals update as user toggles between phases.

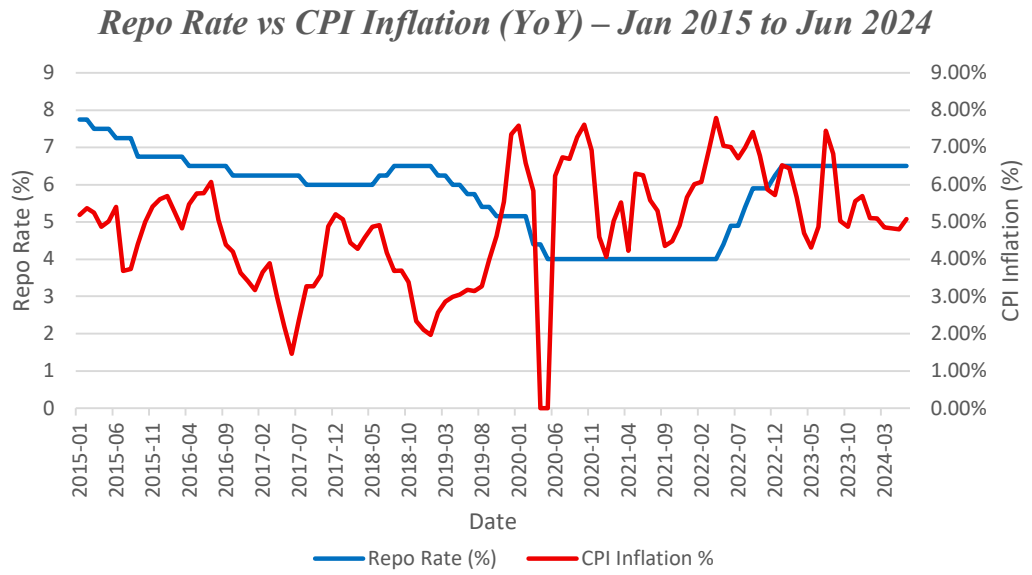
A. Repo Rate vs Inflation Trends:

Over the 9.5-year period, India's repo rate fluctuated between a high of **8.00%** and a low of **4.00%**. These shifts broadly aimed at balancing inflation control with economic growth support.

The analysis shows:

- Inflation generally **lags** repo rate changes by 2–3 months.

- Despite aggressive rate cuts during 2019–2020, **inflation remained elevated** in early COVID months due to supply-side constraints.



"Repo rate increases in early 2022 aligned with a steep rise in CPI Inflation, peaking at over 7%."

B. Sectoral Performance Across Monetary Policy Cycles:

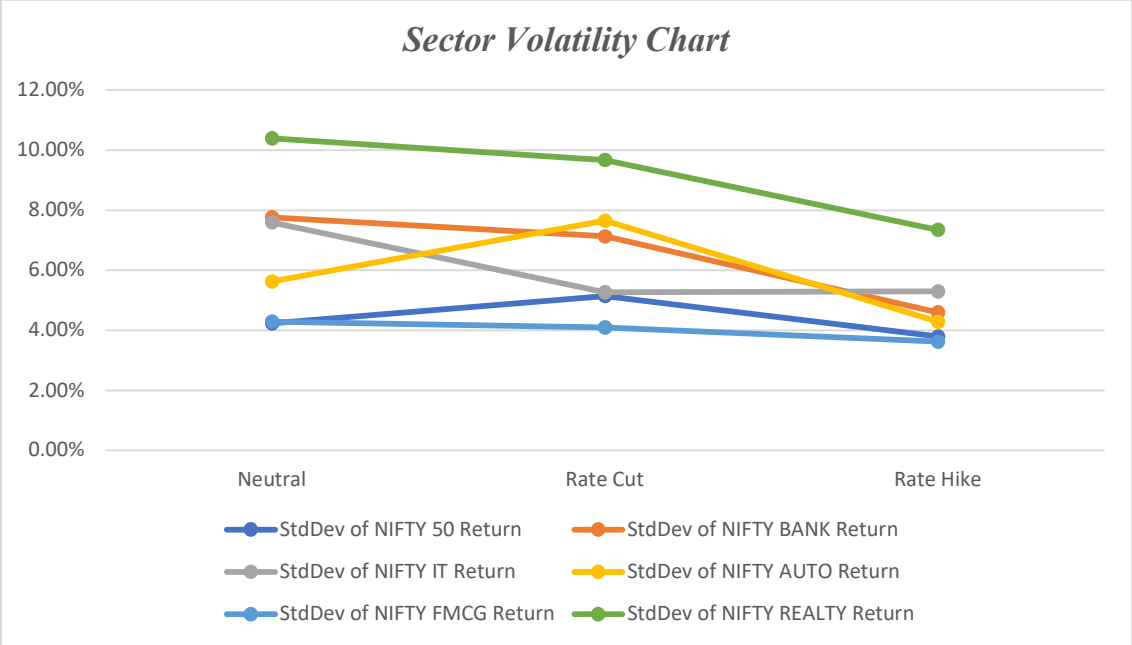
To understand equity market sensitivity, each sector's average return and volatility was computed during:

- Rate Cut Cycles
- Rate Hike Cycles
- Hold Phases

Key Observations:

- **FMCG and IT** performed steadily across all phases, showing **defensive characteristics**.
- **Bank Nifty** and **Auto** were highly cyclical, underperforming in cut phases but rebounding strongly in hike phases.
- **Realty** showed inconsistent patterns, reflecting mixed market confidence during housing slumps and booms.

Sectoral Average Return By Phase						
Phase	Average of NIFTY 50 Return	Average of NIFTY BANK Return	Average of NIFTY IT Return	Average of NIFTY AUTO Return	Average of NIFTY FMCG Return	Average of NIFTY REALTY Return
Neutral	2.63%	3.03%	3.87%	2.69%	1.25%	4.47%
Rate Cut	0.27%	0.23%	0.40%	-0.26%	0.59%	0.08%
Rate Hike	1.38%	1.54%	0.65%	3.30%	1.59%	3.82%



Correlation Table: Sector vs Macro Variables		
Sector	**CPI Inflation (%)**	**Repo Rate**
NIFTY 50	0.35	-0.23
NIFTY BANK	0.27	-0.19
NIFTY IT	0.43	-0.39
NIFTY AUTO	0.12	0.21
NIFTY FMCG	0.30	-0.15
NIFTY REALTY	0.21	-0.02

C. Dynamic Dashboard:

An Excel dashboard was created with **slicers to switch between phases**, enabling:

- Real-time comparison of sector returns across cycles
- Volatility and trend visualization
- Clear identification of outperformers and laggards per phase

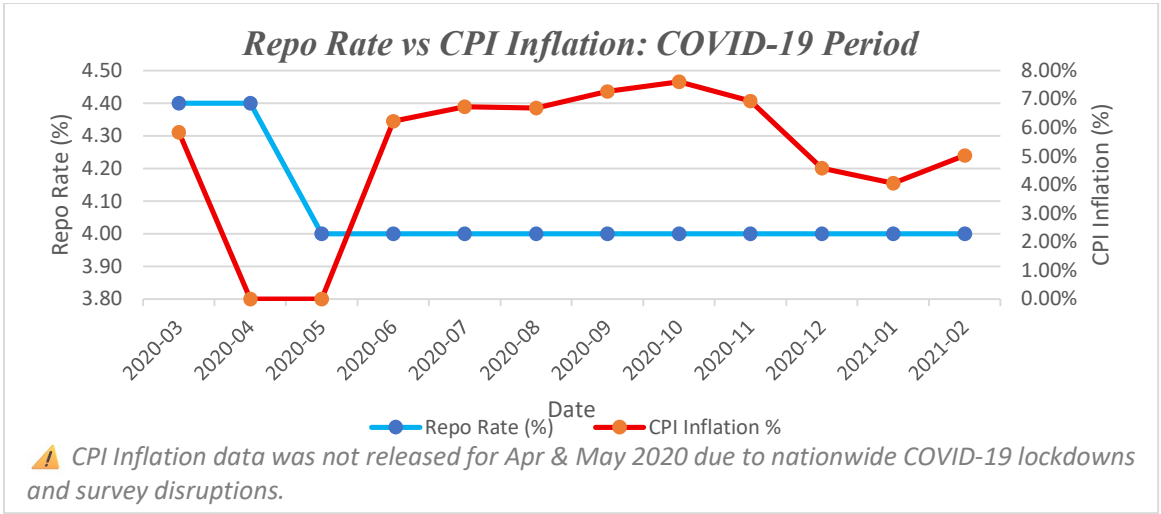
The dashboard enhances interactivity and enables deeper pattern discovery.

D. COVID-19 Shock Analysis:

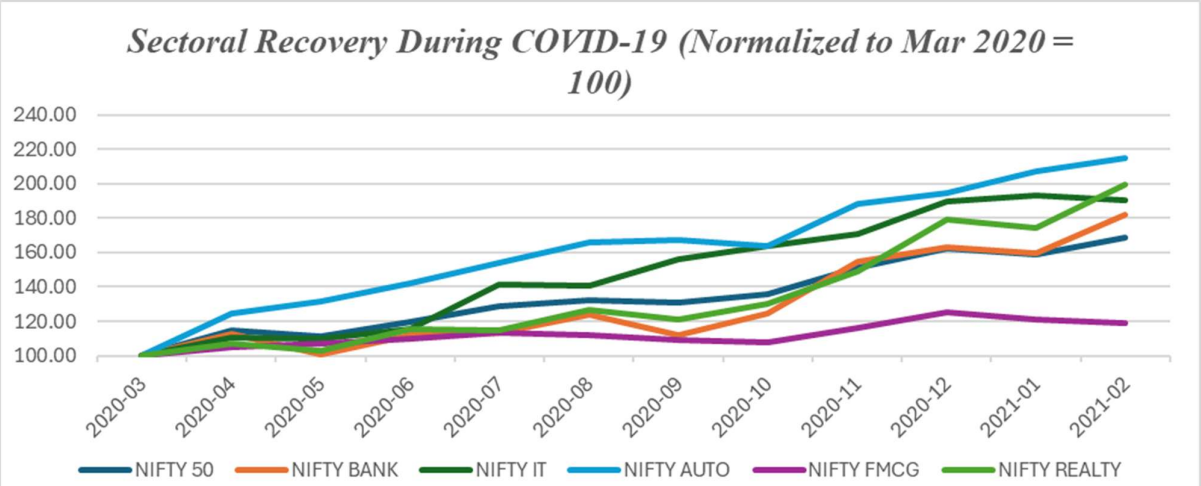
This section isolates the most volatile and policy-active period: **March 2020 – March 2021**.

Key takeaways:

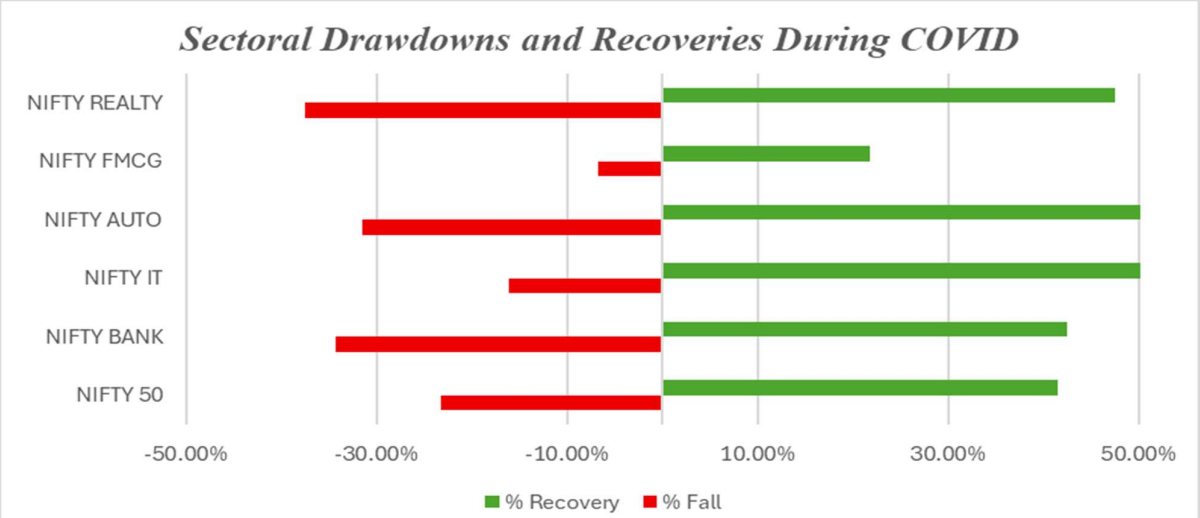
- RBI slashed repo rate from **5.15% to 4.00%** in a span of two months.
- Inflation data was **missing in Apr–May 2020**, reflecting real-world disruption in data collection.
- All sectors **bottomed in March 2020**, but recovery trajectories varied widely.



⚠️ *CPI Inflation data was not released for Apr & May 2020 due to nationwide COVID-19 lockdowns and survey disruptions.*



*"Market recovery was **not uniform**, highlighting sectoral resilience and sensitivity to crisis."*



Banking and Auto fell hardest; FMCG and IT were resilient with faster, stronger recoveries post-COVID crash.

Interpretation Highlights:

- IT and FMCG bounced back quickest.
- Auto and Realty remained under pressure throughout 2020.
- The COVID period revealed both **limitations of monetary policy** and the **resilience of digital/essential sectors**.

Key Insights:

1. **Repo Rate Changes Influence Inflation with a Lag**
   CPI inflation typically responded **2–4 months after repo rate adjustments**, indicating delayed transmission of monetary policy — especially when inflation was demand-driven.
2. **Sectoral Sensitivity Varies by Phase**
   - **Banking and Auto** sectors were **highly sensitive** to rate hikes and cuts, reflecting their cyclical nature.
   - **FMCG and IT** showed **stable performance across all cycles**, acting as **defensive or structural growth plays**.
3. **Volatility Was Not Uniform Across Sectors**
   Bank Nifty and Realty exhibited **higher return volatility**, particularly during hike phases. In contrast, FMCG and Nifty IT had the **lowest volatility**, reinforcing their lower macro sensitivity.
4. **COVID-19 Caused Sharp Divergences**
   - All sectors bottomed in **March 2020**, but **recovery paths varied significantly**.
   - **IT and FMCG rebounded fastest**, while **Banking and Auto lagged**, reflecting pandemic-specific demand shifts.
5. **Interactive Dashboard Enhances Insight Discovery**
   A slicer-based Excel dashboard enables users to dynamically explore how each sector behaved under different monetary regimes — offering a practical tool for data-driven decision making.

Conclusion:

This project has presented an in-depth analysis of how the Reserve Bank of India's (RBI) monetary policy—specifically repo rate changes—interacts with inflation dynamics and influences equity market performance across major sectors. Using a combination of macroeconomic theory, historical data, and practical data visualization techniques, we have uncovered nuanced insights into how monetary policy propagates through different layers of the Indian economy and financial markets.

Over the period from **January 2015 to June 2024**, India experienced multiple monetary policy cycles, including prolonged rate cut phases to support growth and sharp rate hikes to curb inflation. Through this study, we observed that **inflation does not respond immediately to policy rate adjustments**; rather, it demonstrates a **lag of 2–4 months**, particularly when inflation is driven by demand-side factors. However, during periods like the COVID-19 pandemic, this lag structure breaks down—highlighting the limitations of monetary tools in the face of **supply-side shocks** and global disruptions.

The sectoral analysis revealed significant variation in how different parts of the equity market respond to repo rate cycles. For instance:

- **FMCG and IT sectors** showed **resilience and stability**, performing well even during rate cuts and economic slowdowns. These sectors are less sensitive to interest rates, with demand driven more by necessity or structural digitization.
- **Banking and Auto**, on the other hand, exhibited **high cyclicality**, with poor performance during rate cuts (often aligned with economic distress) and strong rebounds during rate hike phases, reflecting improved credit demand and economic confidence.
- **Realty** showed mixed behaviour—often lagging behind rate cycles due to structural issues, liquidity concerns, and policy overhangs like RERA and GST.

The COVID-19 period offered a real-world stress test for both monetary policy and financial market structures. While the RBI slashed the repo rate aggressively to stimulate the economy, inflation stayed volatile due to broken supply chains and panic-driven demand. Sectorally, **Banking and Auto experienced deep drawdowns**, while **IT and FMCG sectors rebounded swiftly**, reflecting a rapid digital shift and consumer preference for essentials.

One of the most valuable components of this project was the creation of an **interactive Excel dashboard**. It enabled dynamic exploration of sectoral performance across repo phases, adding a layer of user interactivity and real-time analysis. The addition of slicers and pivot charts allowed for customizable visual storytelling—a key skill for financial analysts.

In summary, this project goes beyond mere data crunching. It reflects a clear understanding of the **interplay between macroeconomic variables and financial instruments**. It demonstrates that even without a formal background in commerce or finance, one can master analytical thinking, extract actionable insights from raw data, and present it meaningfully using the right tools. This exercise not only strengthened my technical and analytical toolkit but also deepened my appreciation for the complexities of monetary policy and market behaviour.

As monetary policy continues to evolve in the face of inflation volatility, global shocks, and technological disruption, such bottom-up analyses—grounded in public data and economic logic—will remain crucial for investment research, portfolio strategy, and policymaking.

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