The Practice of Flexible Inflation Targeting in India – A Preliminary Assessment

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Abstract

This paper examines how the new flexible inflation targeting framework has worked in practice in India, five years after it was introduced. The policy decisions taken by the Reserve Bank of India are analysed on four fronts — the trajectory of inflation, the inflation forecasting record, the voting behaviour of the monetary policy committee, and the ability to keep the weighted average call money rate within the policy corridor. These four themes represent the formal nominal anchor, the intermediate target, the central bank response function and the operating target of monetary policy. Each is a building block of the flexible inflation targeting framework. The paper then offers some suggestions on the road ahead for monetary policy practice in India, both given the experience of the past five years as well as the Covid-19 shock to the Indian economy.

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I. Introduction

"A central bank's success depends on the quality of its decisions" — Report of the Expert Committee to Revise and Strengthen the Monetary Policy Framework

India formally embraced flexible inflation targeting five years ago. The Reserve Bank of India Act was amended in May 2016 to change the monetary policy framework on a firm legal footing. Two other important milestones flanked this regime shift. The Indian government signed a monetary policy agreement with the central bank in February 2015. The main highlight of the agreement was that the Reserve Bank of India was expected to maintain consumer price inflation at 4 percent, with a band of +/-2 percent. The six-member monetary policy committee held its first meeting in October 2016, with three members from the Reserve Bank of India and three independent experts appointed by the government jointly deciding the policy rate.

This marked the third major shift in the Indian monetary policy framework since 1980 — from credit planning to monetary targeting with feedback to the multiple indicators approach to flexible inflation targeting (Adil and Rajadhyaksha, 2021). The shift to flexible inflation targeting has been accompanied by rich debates about its relevance to a developing country such as India, the choice of headline inflation as the nominal anchor despite a heavy weightage to food items in the consumer price index, the nature of Indian inflation dynamics and the time-varying nature of threshold inflation (Mohanty et al., 2011; RBI, 2014; Patnaik and Pandey, 2020; Dholakia, 2020).

Any assessment of a monetary policy framework should ideally be done over an entire business cycle from beginning to end, covering expansions as well as downturns. A central bank with a formal inflation targeting mandate should be able to maintain average inflation near the target over the business cycle, while maintaining the flexibility to respond to growth deviations in the short run (RBI, 2014). Most studies on the length of the Indian business cycle (Pandey et al., 2017; Behera and Sharma, 2019; for example) estimate it at over five years. However, the record of these past five years can only provide an initial assessment of inflation targeting because this period also saw the Indian economy deal with three major exogenous shocks, viz. demonetisation, the transition to the new goods and services tax, and the Covid-19 pandemic.

This paper focuses on the practice of flexible inflation targeting over the past five years rather than the underlying conceptual concerns – *or on the art rather than the science*. In other words, it examines the RBI's track record based on the building blocks of the inflation targeting regime itself. The paper is arranged around four themes — the behaviour of consumer price inflation, the robustness of inflation forecasts by the Reserve Bank of India, how the monetary policy committee responded to macroeconomic data, and liquidity management in the money market. These four themes cover the nominal anchor, the intermediate policy target, the central bank response function and the operating policy target respectively. The paper then offers some pointers on the road ahead, given the operational record of the flexible inflation targeting regime over the past five years, as well as the unique challenges that have emerged from the macroeconomic shock following the Covid-19 pandemic.

II. The Flexible Inflation Targeting Framework in India

New Zealand was the first country to formally accept inflation targeting in February 1990. A few other countries followed over the next decade, yet economists were for long not confident whether the new monetary policy framework was a fad or a trend (Bernanke and Mishkin, 1997). The answer became clear as the years went by. Thirty-seven central banks had an identifiable inflation target by the time India moved to the new monetary policy framework in 2016 (Jahan, 2017).

Inflation targeting has its roots in the new consensus macroeconomics that emerged in the 1990s. The theoretical structure rests on the basic New Keynesian model with three equations (RBI, 2014). The first equation is the New Keynesian Philips Curve that provides the supply block of the model, where inflation is a function of the output gap, inflation expectations and cost shocks. The second equation deals with the demand side through a dynamic IS equation which shows that real economic activity is negatively correlated with the real interest rate. The third equation is the central bank response function to the inflation gap and the output gap, with the Taylor Rule to set the nominal interest rate being the most popular representation.

The optimal policy for a central bank is to minimise a quadratic loss function that consists of the deviation of actual inflation from its target rate, and the output gap between the actual growth rate and potential growth. The loss function can be written as follows (Woodford, 2004).

$$E_{t_0} \sum_{t=t_0}^{\infty} \beta^{t-t_0} [(\pi_t - \pi_{t-1})^2 + \lambda (x_t - x^*)^2]$$

Where $(x_t - x^*)$ denotes the output gap, $(\pi_t - \pi_{t-1})$ denotes the inflation gap and λ is a weight. In such a system, a pure inflation targeting central bank keeps $\lambda = 0$. A central bank with a flexible inflation targeting mandate keeps $\lambda > 0$, which means it responds both to the inflation gap as well as the output gap. A flexible inflation targeting central bank thus commits to keep inflation at a particular level over the medium term (through either a point target or a given range), while maintaining the flexibility to respond to temporary shocks to output.

The three-equation New Keynesian model provides the theoretical bedrock of flexible inflation targeting. However, this simple model is inadequate for the actual conduct of monetary policy. The Reserve Bank of India has, over the past five years, used a Quarterly Projection Model, which provides the analytical edifice for the conduct of flexible inflation targeting in India (RBI, 2016).

Aggregate demand in the economy is seen through the prism of the non-agricultural (NA) output gap, which is explained by the past NA output gap, expectations of the future NA output gap, global demand, credit conditions, the real lending rate and the real exchange rate. Monetary transmission features via an equation on bank lending tightening conditions. This appears because the Indian financial system is dominated by banks. Lending conditions not only affect the output gap but are also affected by it. The Philips Curve for core inflation is influenced by factors such as the domestic output gap, expected inflation, and the gap between headline and core. Food prices are assumed to influence core inflation via the expectations channel.

Inflation expectations are dependent on past and future inflations and the credibility of the central bank to deal with price pressures in the economy. Central bank credibility is only built gradually over time. Also, it is assumed that credibility changes in a non-linear fashion, which means that monetary policy has to be aggressive to achieve initial disinflation. Policy responses can be milder once credibility is built up.

The RBI model parts ways with other central bank forecasting models by having a separate equation for food inflation, given the high weight of food in the Indian CPI. Food inflation in the short run is driven by three shocks -- monsoons, minimum support prices, vegetable prices. There is another separate equation for energy prices as well and considers two types of energy prices -- market prices and administered prices. Market prices are determined by global entry prices and movements in the exchange rate.

There is a monetary policy function built around the inflation forecast. This reaction function contains both core inflation and headline inflation, so the RBI can look at only core, only headline or some combination of the two while deciding its policy response. The transmission from policy rates to the interest rates for private borrowing is modelled as dependent on the term structure of interest rates as well as the term premium. The exchange rate depends on exchange rate expectations, domestic nominal interest rates, global nominal interest rates and a country risk premium.

This model provides a useful backdrop for the next section, which reviews the performance of flexible inflation targeting in India in terms of the nominal anchor of monetary policy.

III. The Indian Inflation Experience

There are three stylised facts about the Indian inflation experience since 2016. First, average inflation has come down in this period (see chart 1). It has averaged 4.4% since 2016, or very close to the midpoint of the formal inflation target given to the Reserve Bank of India. However, this may not be fully explained by a shift in the monetary policy framework alone. Econometric evidence from the first phase of the disinflation that began in 2014 suggests that around half the reduction in price pressures come from lower adaptive inflation expectations because of the recent inflation trajectory, another 20 percent of the disinflation came from the moderation in the discretionary component of minimum support prices (MSPs) for food, while 33 percent of the change is explained by lower forward-looking rational inflation expectations as a result of the shift to flexible inflation targeting (Chinoy et al., 2016).

Second, a look at the trend in core inflation suggests that price pressures have eased in the Indian economy even when volatile energy and food prices are taken out of consideration (see chart 2). Third, the inflation gap between India and comparable Asian countries has also narrowed in recent years, as India became less of an inflation outlier compared to the situation before 2014 (chart 3). The decline in inflation in India is not an isolated event. It should be seen together with several other structural changes in the Indian economy, including lower trend growth as well as the decline in the domestic investment rate, which cannot be directly explained by the flexible inflation targeting framework (RBI Bulletin, March 2021).



Chart 1: Inflation Periodisation (2000-2020)

Source: Author's Analysis; Data: India Data Hub





Source: Author's Analysis; Data: CMIE



Chart 3: Inflation Rate - Asia, India and the World (2000-2020)

Source: Author's Analysis; Data: IMF

Note: For Asia inflation, the authors took an average of the inflation rate of the top 10 Asian economies (11, including India), weighted by their GDP.

The recent disinflation has been accompanied by a few important changes in the underlying dynamics of Indian inflation. Two changes are particularly important. The first one is inflation persistence, or how soon inflation comes close to target after a temporary shock, has significantly come down in recent years (Marques, 2004; Dholakia and Kadiyala, 2018; Kocenda and Varga, 2017; Beechay and Osterholm, 2018). It means that the central bank has to impose fewer costs on the real economy to get inflation back towards the target (Mishkin, 2007).

The second important change in Indian inflation dynamics is that headline inflation now seems to converge to core inflation, rather than the other way (Chinoy and Jain, 2018). The experience of the 2007-12 period shows that food price shocks quickly spilt over into generalised inflation. In other words, core inflation moved to meet headline inflation whenever there was a temporary divergence between the two. The evidence of the past few years suggests that the process of convergence has now changed, as headline inflation moves to meet core inflation.

Both these changes in the underlying dynamics of Indian inflation have a common thread running through them — lower and perhaps better anchored inflation expectations (see chart 4). They are now less likely to drift higher in response to temporary food or fuel shocks. Indian inflation expectations are adaptive rather than rational (Sharma and Bicchal, 2018), so the recent evidence suggests that the gradual disinflation since 2014 has made agents less likely to change their inflation expectations because of temporary shocks to food or fuel prices.



Chart 4: 12-month Ahead Inflation Rate Expected by Households (Median of Responses)

Source: Author's Analysis; Data: India Data Hub; RBI Inflation Expectations Survey

IV. The Inflation Forecast

The formal target of monetary policy is the inflation target given to the central bank by the government. It acts as an anchor around which private sector expectations are supposed to consolidate in the medium term. However, the actual path of inflation in any economy can diverge from the inflation target for a range of reasons. The central bank needs an inflation forecast to act as an intermediate target in the short term to simplify its central task (Svensson, 1997). Also, given the long and variable lags of monetary policy, the central bank has to choose an interest rate today with future rather than current inflation in mind.

Inflation targeting thus becomes inflation forecast targeting in practice. The central bank's inflation forecast is based on its quantitative model described in section 2 of this paper. How has the Reserve Bank of India done in terms of its ability to forecast inflation in the past five years? The amended Reserve Bank of India Act directs the Indian central bank to provide inflation forecasts of 6-18 months in the bi-annual Monetary Policy Report. The data from these reports have been used for the analysis below.

Chart 5 shows the inflation forecast² of the Reserve Bank of India compared to the actual average monthly inflation in those quarters. We have assumed that the inflation forecast can be considered correct if it is within 25 basis points of the actual inflation in that period. There have been only three quarters in which the Reserve Bank of India has correctly forecast inflation since Q1 of 2016-17.



Chart 5: RBI Inflation Forecast vs Quarterly Average Inflation

The forecasting errors can be arranged into two broad periods. The first period was between Q3 2016-17 to Q1 2019-20, when the RBI overestimated inflation pressures. The second period was from Q2 2019-20 to Q3 2021-22, when the RBI underestimated inflation. These patterns broadly hold even if the error margin is increased to 50 basis points. The forecasting errors are important in a monetary policy regime in which the central bank inflation forecast is the intermediate policy target, and especially so when the forecasting errors are bunched together over several quarters. Inflation forecasting errors can lead to policy errors as well, though not necessarily so. What inflation forecasting errors mean for the actual interest rate decisions of the monetary policy committee also depends on similar estimates of the output gap, as well as the relative weights given to the inflation forecasts released in the bi-annual Monetary Policy Reports seem to assume that the repo rate is unchanged over the forecast period, while it may endogenously change in response to an inflation surprise (Mahambare, 2021).

V. The MPC decisions

The crux of the flexible inflation targeting framework is the actual decision making by the six-member monetary policy committee. A flexible inflation targeting central bank should ideally respond to both the inflation as well as output. In its report published in 2014, the Expert Committee to Revise and Strengthen the Monetary Policy Framework mentioned a "rule of thumb" Taylor Rule that had the same coefficient to the inflation gap and the output gap. The RBI's Quarterly Projection Model (QPM) to

Source: Author's Analysis; Data: RBI Monetary Policy Reports

conduct policy adds further nuance to this. It has a central bank response function that takes into account both headline and core inflation (Benes et al., 2017).

The evidence of policy decisions under the flexible inflation targeting regime suggests that the RBI has not been an "inflation nutter". It has responded to the output gap while setting interest rates, and monetary policy did not become more hawkish after introducing flexible inflation targeting (Eichengreen et al., 2020). This is especially evident after the pandemic struck when the Indian central bank did not raise interest rates even though inflation was above 6 percent for eight consecutive months after March 2020. It looked past high inflation to focus on the output gap.

Another resonant question is whether the RBI has become more hawkish after it shifted to flexible inflation targeting. The QPM assumes that the monetary policy response has to be more aggressive in the early stages of disinflation, till the stock of central bank credibility is built up (Benes et al., 2017). This is especially true when inflation expectations are backward looking rather than forward looking. Chart 6 shows the repo rate deflated by the inflation rate since Q4 2016-17. The Indian central bank has maintained a positive real policy rate, compared to the negative real policy rate before that. However, real interest rates slipped below zero in the post-pandemic period.

Table 1 lists the MPC voting decisions from October 2016 till December 2020. In 18 out of the 26 meetings, the MPC cut the policy rate eight times, hiked in two times, and maintained status quo 16 times. Most of the rate cuts were after February 2019, first in response to the economic slowdown followed by the pandemic. Also, 16 decisions were taken by consensus, while there were ten others with at least one dissenting vote against the majority opinion. Such a mix of consensus versus non-consensus decisions is in line with international experience from other MPCs (Dua, 2020).



Chart 6: Repo Rate Deflated by CPI

Source: Author's Calculations: Data: Database of Indian Economy, RBI; CMIE

S. No.	Date	Decision	Consensus?
1	October 3-4, 2016	Cut	Yes
2	December 6-7, 2016	Hold	Yes
3	February 7-8, 2017	Hold	Yes
4	April 5-6, 2017	Hold	Yes
5	June 6-7, 2017	Hold	No
6	August 1-2, 2017	Hold	No
7	October 3-4, 2017	Hold	No
8	December 5-7, 2017	Hold	No
9	February 6-7, 2018	Hold	No
10	April 4-5, 2018	Hold	No
11	June 4-6, 2018	Hike	Yes
12	July 30 - August 1, 2018	Hike	No
13	October 3-5, 2018	Hold	No
14	December 3-5, 2018	Hold	Yes
15	February 5-7, 2019	Cut	No
16	April 2-4, 2019	Cut	No
17	June 3-6, 2019	Cut	Yes
18	August 5-7, 2019	Cut	Yes
19	October 1-4, 2019	Cut	Yes
20	December 3-5, 2019	Hold	Yes
21	February 4-6, 2020	Hold	Yes
22	March 24-27, 2020	Cut	Yes
23	May 20-22, 2020	Cut	Yes
24	Aug 4-6, 2020	Hold	Yes
25	Oct 7-9, 2020	Hold	Yes
26	Dec 2-4, 2020	Hold	Yes

Table 1: Monetary Policy Committee Voting Pattern

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VI. The policy corridor

Monetary policy needs an operating framework through which the central bank keeps market interest rates aligned with the decisions of the MPC. The operating framework of Indian monetary policy is built on three pillars — the weighted average call money rate (WACR) is the operating target, a policy corridor on two sides of the repo rate provides the broader liquidity management framework and the transmission mechanism ensures that the interest rate decisions of the MPC influence the actual borrowing costs, and thus decisions, of economic agents.

How successful has the RBI been in keeping the WACR within the Marginal Standing Facility rate at the upper end of the policy corridor and the reverse repo rate at its lower end? The repo rate is in the middle of the policy corridor.

Table 2 shows the record of monetary marksmanship over three periods. We have considered the postpandemic months after March 2020 as a separate category because of the unconventional monetary measures taken by the RBI after the steepest ever decline in quarterly economic growth in India.

Regime*	Outside Corridor		Inside Corridor			
	>MSF	<reverse Repo</reverse 	<repo< th=""><th>Equal to Repo</th><th>> Repo</th><th>Total</th></repo<>	Equal to Repo	> Repo	Total
Pre FIT	53	83	742	31	656	1565
FIT - Pandemic	63	129	855	11	129	1187
Post Pandemic	31	64	190	0	31	316
Overall	147	276	1787	42	816	3068

Table 2: The Policy Corridor

*Pre-FIT period: October 2011 - October 2016; FIT-Pandemic: October 2016- March 2020; Post Pandemic: April 2020- December 2020

Source: Author's Calculations: Data: Database of Indian Economy, RBI

There are two trends worth highlighting in the data. First, monetary marksmanship has deteriorated over the three periods of time. Second, the WACR has gone below the reverse repo rate far more than above the MSF rate. One possible explanation for the more frequent breaches in the operating framework is that the policy corridor was reduced from 100 basis points to 50 basis points in 2016, which means that monetary marksmanship was made more precise. The second is that the two periods after 2016 were marked with two important exogenous shocks that led to a surge in interbank liquidity, viz. demonetisation in November 2016 and the pandemic after March 2020.

The third pillar of the operating structure is the transmission mechanism. The RBI has made two important changes in its practice since 2019. It has improved monetary transmission by compulsorily linking bank lending rates to the repo rate, an external benchmark (Dua, 2020). The Indian central bank

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has also begun to actively manage the entire yield curve for government bonds, in a bid to compress term premiums. These two changes are too recent to offer any lessons for the medium term.

VII. The Road Ahead

The experience of the first five years of flexible inflation targeting has been encouraging enough for the government to maintain the same inflation target for another five years. However, there are some important lessons for the future on the practice of inflation targeting. In this section, we focus on five such issues that need attention.

(a) Indian monetary policy is now anchored to the annual rate of increase in the consumer price index (CPI). Does the index adequately reflect the underlying price pressures in the economy? The weights in the consumer price index (CPI) have been decided on the basis of the consumer expenditure surveys conducted by the NSSO in 2011. This is not only dated but also not aligned with the national accounts for the same year, which show that food accounts for 32 percent of consumer spending rather than the 46 percent in the CPI. That number will be even lower in 2021, as incomes have increased.

In fact, India is an outlier in terms of the weight given to food in its CPI (Balasubramanian et al., 2021). A recalibrated CPI is needed, given that CPI inflation is the nominal anchor of monetary policy. Also, lower food weights in the CPI will reduce the occasional divergences between headline and core inflation, which muddle monetary policy decisions.

(b) The inflation forecast is the intermediate policy target for the MPC. Our analysis earlier in this paper showed that the RBI has not been able to anticipate the inflation trajectory over the short term very well. Sustained forecasting errors could mean that monetary policy ends up either too easy or too tight, given an output gap.

It is not clear to what extent the voting decisions by the individual members of the MPC — and especially the three outside members — are dependent on the RBI's inflation forecasts as against their own private assessments. To the extent that the latter plays a part, there is a good case for the published MPC minutes to reflect the inflation forecasts of individual members. The dot plots that the members of the US Federal Open Market Committee use to convey their individual assessments of future interest rates could also be an alternative.

(c) The monetary policy agreement signed by the RBI with the government defines the policy rate as "the rate for repo transactions". The operating procedure of monetary policy is to keep overnight interest rates in the policy corridor between the Marginal Standing Facility and the reverse repo rate. The repo rate lies between the two. However, the MPC has no say on either the MSF or the reverse repo rate. They are set by the RBI.

On the two occasions over the past ten years, the RBI has decided to widen the policy corridor in response to a macroeconomic shock — after the taper tantrum in July 2013 and after the pandemic in March 2020. Such widening of the policy corridor is not unexpected during times of volatility in the money market, but it highlights the concern that the MPC has only a limited say in one of the most important operational parts of monetary policy, viz the width of the interest rate policy corridor. Thus, there is a case for the MPC to have decision-making powers over at least the reverse repo rate.

(d) Most major economies in the world have seen a significant deterioration in public finances since the onset of the pandemic. India has been no exception. This is bound to have implications for the conduct of monetary policy till the fiscal deficit is reduced. The finance minister has indicated that the fiscal deficit its FRBM target may be challenging.

Another challenge for the RBI is that it has had to aggressively conduct open market operations to manage bond yields, as well as engage in active yield curve management through activities such as Operations Twists. These are designed to compress term premiums in the Indian bond market. It is perhaps still premature to say that Indian monetary policy is once again facing the problem of fiscal dominance, but the need to accommodate large tranches of government borrowing while keeping bond yields low can test the flexible inflation targeting framework, especially when there are negative inflation shocks.

VIII. Conclusion

The first five years of flexible inflation targeting in India have been encouraging. The decline in average consumer price inflation during this period — and especially before the onset of the pandemic in early 2020 — may not be totally explained by the new monetary policy framework (Mohan and Ray, 2020). Other factors that affect inflation include fiscal policy, moderate increase in minimum support prices of food, lower global commodity prices, and exogenous shocks such as demonetisation, which affected aggregate demand. However, there are also important changes in the underlying inflation dynamics that can be more directly ascribed to monetary policy, and especially the better anchoring of inflation expectations.

The experience of the past five years also provides learnings on the conduct of monetary policy in the coming years. The most immediate challenge is also how the RBI will use its flexible inflation target mandate when it also has to accommodate a large government borrowing programme.

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Notes

² RBI Monetary Policy Reports are released in April and October of any given year. We look at the April report for Q1 and Q2 forecasts and October report for Q3 and Q4 forecasts in that year.

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