

# **Flexible Inflation Targeting: Concepts and application in India**

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## **Abstract**

*The paper examines considerations that arise in adapting IT to emerging markets (EMs). These include the necessity of flexibility, the working of the expectations channel, the dominance of supply shocks, fiscal-monetary coordination, forecasting issues and guidance of thin markets. Implementation of inflation targeting in India has matured from a strict form that imposed a large output sacrifice, towards flexibility with better forecasting that kept inflation in the tolerance band, contributed to good growth recoveries as well as improved financial parameters in the first two years of the pandemic.*

**Keywords: Flexible inflation targeting; concepts;India; market imperfections; anchoring**

**JEL Code: E52; E63; E65**

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## 1. Introduction

The brief period of Indian adoption of inflation targeting (IT) has seen a reversal from a strict to a flexible implementation of flexible inflation targeting (FIT). Flexibility is more in line with the original agreement with the government that was for FIT<sup>1</sup> and with the theoretical evolution of IT that has always emphasized growth as well as inflation (Svensson 2007). It is also more sensitive to Indian conditions and suits them better.

In a period of great global turbulence, India's IT regime did succeed in reducing inflation and keeping it between the announced tolerance bands. In the initial years there were supportive events such as the 2014 crash in oil prices and softening of food price inflation. But the regime has also survived adverse periods of rising oil prices.

The paper starts with a discussion of considerations that arise in adapting IT to emerging markets (EMs), including the working of the expectations channel. This sets the context in which the evolution of inflation targeting in India and its performance record is then analysed.

Key insights/learnings include:

1. The output sacrifice from disinflation can be very large in an EM where underemployment is high and it is mainly supply shocks that drive inflation.
2. If fiscal supply-side action moderates inflation, the (monetary policy committee) MPC can keep real interest rates below growth rates ( $r < g$ ) and reduce their volatility, which allows faster job creation, catch-up growth and fiscal consolidation, while risk premiums remain low.
3. The expectations channel works well, since more weight is given to official communication when information is thin. Under more uncertainty, data-based guidance works better than time-based. Markets value predictability but even data-based guidance can be adequately forward-looking when the policy reaction function is known. Guidance must make this clear in order to reduce over-reaction in financial markets.
4. Money supply is endogenous in an IT regime. Financial deepening also makes it so. But some surplus in durable liquidity is required to absorb multiple shocks the system is subject to. Thin markets can create distortions in the yield curve.

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<sup>1</sup> The preamble of the RBI Act, 1934, as amended by the Finance Act, 2016, states "AND WHEREAS the primary objective of the monetary policy is to maintain price stability while keeping in mind the objective of growth;" thereby enshrining a flexible inflation targeting framework for India. The initial agreement between the Government of India and the RBI in February 2015 also explicitly mentions flexible inflation targeting (RBI 2021).

5. In the initial years implementation of IT was stricter than it needed to be and did not respond adequately to data that departed from guidance. As a result real rates were too high. It has matured since into FIT that has delivered good growth recoveries while keeping inflation within the tolerance band in very difficult times. The real rate has come closer to equilibrium.

6. Since demand affects core inflation the policy rate impacts it. Core is also easier to forecast. But headline inflation affects household welfare and expectations. The headline inflation forecast error has also reduced, however, and become two-sided, contributing better towards guiding inflation expectations.

7. The choice of headline over core puts more responsibility on fiscal policy that affects the supply-side. India's choice of headline consumer inflation as the target variable worked because it is dominated by food prices that government can affect. Volatile international commodity shocks that dominate wholesale prices are less amenable to domestic policy. Much better monetary-fiscal coordination has contributed to better results.

8. In an open economy, limiting debt inflows to a small percentage of the domestic market gives more freedom to keep the interest in line with the domestic cycle, while two-way movement of foreign exchange reserves help prevent excess volatility of the exchange rate.

Global supply bottlenecks did affect Indian inflation but FIT succeeded in keeping headline within the tolerance band with good growth recoveries and improvement in financial sector parameters. In January and in July 2021 there was a just in time fall in headline inflation to the tolerance band. Normally food is regarded as a volatile component but domestic policies affect food and therefore CPI headline. The volatility of WPI, which rose into double digits, was due to international oil prices. Pass through to CPI is mediated by taxes on fuel. Core inflation was persistent but the largest component was transport. Core was overall less susceptible to global supply chain distortions since the import share of consumption is low.

The objective of establishing IT and moderating financial market volatility was dominant in the early strict application of FIT, but growth fell as a result, which is also negative for financial markets. Volatility rose as asset quality worsened.

The paper is very much in the spirit of Professor Chitre's approach, which is based on conceptual rigour combined with a deep understanding of Indian features. His seminal work on growth cycles pointed towards developing appropriate stabilization (Chitre, 1982). His work on inflation-linked bonds, if implemented, would contribute to the working of inflation targeting in India (Chitre et.al., 1996).

The remainder of the paper is structured as follows: Section 2 adapts key IT concepts to EMs. Section 3 outlines the working of the expectations channel. Section 4 examines the evolution of inflation targeting in India and its performance record before Section 5 concludes by contrasting some perceptions with the reality of IT.

## **2. Implementing inflation targeting in emerging markets**

The widely adopted NKE approach to monetary policy<sup>2</sup> is based on simple but forward-looking aggregate demand (AD) and aggregate supply (AS) that are derived from rigorous optimisation by agents with foresight, but subject to constraints that can capture relevant features of an economy.

The simplest AD curve relates the output gap or excess demand inversely to the real interest rate, positively to expected future demand and to a demand shock; the AS curve relates inflation positively to the output gap, to future expected inflation and a cost-push or supply shock. The output gap is defined as the gap between actual and potential output. Thus expectations, aggregate demand as well as cost-push factors affect inflation. The instrument that the central bank (CB) uses is the interest rate.

During effective growth transition and catch-up, structural unemployment becomes cyclical. More labour mobility implies output can increase without raising inflation. But inefficiencies and bottlenecks continue to push up costs. Continual supply-side reforms are required to reduce these costs. The AS curve becomes flatter but is subject to cost shocks that push it upwards, making it volatile. In such a structure, output is demand determined while supply-shocks predominantly affect inflation.

Research supports such a structure for the Indian economy. Derivation of AS and AD curves in a basic dual economy dynamic stochastic general equilibrium model as well as econometric estimations surveyed in Goyal (2015), support an elastic supply subject to shocks. Goyal and Arora (2016) estimate the AS slope to be 0.13. Goyal and Kumar (2018) get a value of 0.1 for the elasticity of inflation to changes in marginal cost. Shifts in AD and AS are negatively correlated, so that a negative supply shock reduces demand. Goyal and Tripathi (2015) find that on estimating supply shocks correctly, the AS slope falls from 0.2 to 0.03.

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<sup>2</sup> Clarida et.al (1999) is a comprehensive survey. See also Bernanke and Mishkin (1997). Goyal (2012) is an adaption to an EM, which we develop further here. RBI (2021) examines IT application in India.

In such a structure FIT can contribute to anchoring wage-price expectations that shift up the AS. Nominal appreciation, consistent with a competitive exchange rate, as well as fiscal policy actions can also shift down the AS. Optimal coordination during transition requires policies to work together to shift the AS downwards because of the high output cost of a pro-cyclical demand squeeze. If productivity is rising and fiscal supply-side action is reducing inflation, monetary policy can keep real rates low, stimulating demand.

The NKE literature derives basic rules for monetary policy, which we adapt to our framework. First, consider those relevant under cost-push.

1. There is a short-run trade-off between inflation and output variability only under cost-push inflation, since an output sacrifice is then required to reduce inflation. Otherwise, if only current and future demand cause inflation, the CB can adjust interest rates to set excess demand to zero and lower inflation with no cost in terms of output.

2. Therefore, in order to minimize output sacrifice, when cost-push inflation is dominant, optimal policy should aim to achieve an inflation target only over the medium-term. If price shocks are expected to be temporary, they can be looked through. Second round pass-through of supply shocks reduces as inflation expectations get better anchored.

Since India is subject to frequent supply shocks and to chronic cost-push, its implementation of flexible inflation targeting with a tolerance band of  $\pm 2\%$  around the inflation target of 4%, and time of three quarters given to bring inflation back to the tolerance band after a deviation, is in line with the above principles. Average inflation is targeted. These features allow flexibility in responding to inflation in order to minimize output sacrifice thus keeping society's support (Mishkin, 1999).

RBI (2014, II.44) took the view that second round effects and changes in inflation expectations were likely in response to shocks to food and fuel in view of their 57% share in headline CPI. This presumption called for a quick monetary policy to respond to the risk itself, in order to demonstrate commitment to the nominal anchor.

But if AS is elastic reducing demand will have a large output cost but little effect on inflation making tightening less effective and therefore less credible. A demand shock is added to a supply shock. Households tend to have a stagflationary view so they expect inflation to rise when growth falls (Coibon et. al., 2022). Goyal and Parab (2020) find second round effects occur only if supply shocks are high and sustained. Moreover, in EMs to the extent communication has a greater impact and government supply-side action reduces inflation, the need for sharp monetary tightening reduces.

As agents' expectations get anchored also the need to impose output sacrifice reduces, since second round pass-through of supply shocks will not occur, moderating the need to tighten even under persistent or multiple supply shocks. This anchoring of expectations is a major rationale for inflation targeting. When agents are forward-looking, there is a gain from credible commitment to an inflation target, which serves to focus expectations. Moreover, communication on a future target and inflation path can increase forward-looking behaviour over time.

3. If inflation is within an acceptable zone and supply shocks are expected to be favourable, policy should ensure inflation is below the border of the zone and then let it fall with the supply-side improvements. If negative supply shocks are expected to persistently raise inflation above the upper limit policy needs to tighten.

Under optimal monetary fiscal policy coordination, if appropriate supply side action is reducing inflation, once inflation is expected to be within the tolerance band, the MPC can wait for beneficial shocks to bring it down further, thus maximising growth.

Anchoring Indian inflation expectations need not take long if communication is good and supply shocks are favourable, since these impact household inflation expectations. Provided communication makes these channels clear, flexibility to accommodate supply shocks and reduce output sacrifice, need not adversely affect inflation anchoring. Transparency and open discussion is a pre-requisite to increase understanding about these issues and to co-opt the private sector. Coibion et.al. (2022) find US households pay little attention to monetary policy and salient prices such as gasoline affect household expectations most. But in a hierarchical society with relatively thin news official communication has more impact, especially since inflation tends to be high and variable and is therefore the focus of attention (Goyal, 2016).

4. Interest rate smoothing is required in response to uncertainty. May CB reaction functions, in addition to output and inflation gaps, include a squared term in policy rates to implement such smoothing. Forward-looking markets factor in future rise. This complements policy as long as markets do not over-react. But small steps have to begin early when the share of backward-looking behaviour is large, since then policy acts with long lags. Delays can cause instability (Goyal and Tripathi, 2014).

There is a high degree of uncertainty attached to potential output. Small policy steps give time for the uncertainty to resolve, while reducing output sacrifice<sup>3</sup>. Goyal and Arora (2013) suggest using

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<sup>3</sup> A short-term fall in growth below potential growth can trigger a shift to a lower steady-state growth path creating persistent losses (Goyal and Kumar, 2018).

inflation to measure potential output in the Indian context. An indicator of growth having reached potential is core inflation sustained above some threshold due to second round effects. The repo rate has to exceed expected inflation by the equilibrium real interest rate. This is the natural real interest rate (NIR) plus any deviation from its steady state. NIR is defined as the equilibrium real rate, consistent with the target rate of inflation, when prices are fully flexible. The equilibrium real rate falls in a slowdown when the potential output is negative and rises when it is positive, reflecting the impact of demand or supply shocks on potential output.

5. In response to excess demand, however, nominal interest rates should respond more than 'one-for-one' to expected inflation, since there is no output sacrifice in this case.

A tough credible policy today will decrease the output cost of lowering inflation tomorrow. But it will be credible only if it works. A tightening will reduce inflation effectively only if there is excess demand. If inflation is partially due to temporary supply shocks and partially to excess demand rates need to respond only to the latter part, as in the case of the US Fed exiting from post Covid-19 stimulus.

6. Forward-looking policy rules have to be formulated in terms of forecasts of target variables.

All central banks work with imperfect information, due to inadequate data. Lags in data availability and quality can be particularly large in an EM. Supply shocks are frequent in agriculture and typically food has a large share in headline consumer inflation. Forecasts of potential target variables may take time to become more accurate.

The concept of core inflation allows the first round effects of volatile and difficult to forecast supply shocks to be excluded and therefore may be a better target variable. But headline inflation affects a large part of consumption and therefore impacts household inflation expectations more.

7. When forecasts are less reliable, as in many EMs, or in times of great uncertainty, data-based forward-guidance is preferable to time-based. During a severe crisis, however, reassurance may be the dominant consideration.

Inflation targeting may be a policy rule, but it allows considerable flexibility. It is actually constrained discretion, since it determines the interest rate as 'a predictable function of a few economic variables' (Allsop and Vines 2000, p.17). All underlying multiple indicators that affect outcomes are used to derive a more focused signal. This signal gives inflation priority, although IT actually uses all relevant information. It is rule-like only in its predictability that enforces forward-looking behaviour. This allows impactful communication that guides markets and moderates overreaction to which



markets are subject. Alternative methods are less effective at this because of the sheer complexity inherent in macroeconomics. Predictability is often complemented by explicit forward guidance, which can be time or data based.

Based on their expectations of macroeconomic variables AE CBs often give explicit time-based forward-guidance such as that policy rates will not change for one year. But as long as the policy reaction is a predictable function of variables and of deviation from forecasts even data-based changes offer forward guidance. Then private sector jump variables such as asset price expectations help in policy implementation.

8. In an open economy thin EM markets imply exchange and interest rates can be too volatile in response to fluctuations in capital flows driven by global shocks. Therefore market intervention is required in addition to setting policy rates in order to smooth volatility.

This implies foreign exchange intervention and open market operations (OMOs) and other liquidity operations that sterilize the impact of capital flows on durable liquidity. Reducing the volatility of  $r$  reduces that of  $g$  and helps ensure that  $g$  exceeds  $r$  bringing down debt ratios.

Forward-looking FIT prevents the CB from taking actions with undesirable long-term consequences. Transparent discussion educates the public about these long-term effects and, therefore, has political benefits. Understanding long-term consequences of choices made helps forego short-term opportunism and populism. Even so, the discretion to deal with unforeseen circumstances helps avoid politically unacceptable short-term costs. A medium -term inflation target range gives considerable leeway for short-run stabilization. The floor implies stimulus is required to raise inflation, if demand falls. Keeping a positive inflation target, rather than a price level, allows real wages to adjust even if nominal wages are rigid.

Independent experts in an MPC bring in continuity, shared responsibility, and help in handling complexity. Their different perspectives and areas of expertise aid in communicating, balancing trade-offs and bringing in some democratic accountability. They represent voters with varied preferences such as savers, investors; debtors, lenders; markets, firms, workers. This requires finding a balance between inflation and growth, short- and long-run considerations.

Despite the importance of the expectations channel in inflation targeting it is not well understood. It is worthwhile going into its evolution and structure in some detail.

### **3. The expectations channel**

#### *3.1 Evolution of communication*

A central banker was earlier expected to be a discreet master of the art of speaking and yet saying nothing, but a major task for the modern CB is to guide market expectations. Blinder et. al (2008) in a comprehensive survey of the topic start with two quotes that bring out the move to greater transparency over time.

For example: 'Central Banking ... thrives on a pervasive impression that [it]... is an esoteric art. Access to this art and its proper execution is confined to the initiated elite. The esoteric nature of the art is moreover revealed by an inherent impossibility to articulate its insights in explicit and intelligible words and sentences (Karl Brunner 1981, p. 5).'

Communication was not important when the dominant Real Business Cycle perspective was that expectations are rational so that only unanticipated money could affect real variables. It was then thought necessary not to give any guidance in order to surprise markets with policy changes.

But by the new century the New Keynesian Economics (NKE) multiple equilibrium view has come to dominate central bank practice. In this view: 'Successful monetary policy is not so much a matter of effective control of overnight interest rates ... as of affecting ... the evolution of market expectations... [Therefore,] transparency is valuable for the effective conduct of monetary policy... this view has become increasingly widespread among central bankers over the past decade (Michael Woodford 2001, pp. 307 and 312).'

The case for obfuscation was based on the theoretical presumption linked to perfect markets that include all available information so that only unanticipated money can affect outcomes. But perfect foresight or unique equilibrium necessary for perfect markets are only theoretical constructs. Instead real world economies have four pervasive features: nonstationarity; learning; absence of unique rationally expected equilibrium; the presence of asymmetric information.

Then CB communications either create news or reduce noise – that is, gives more information or increase predictability. Both are expected to raise the signal to noise ratio, reduce financial market volatility and lead to better monetary policy outcomes. CB pronouncements influence market expectations and so move asset prices. They influence household inflation expectations and effect wage setting.

Supportive empirical tests have shown that CBs are able to move interest rates with less sale or purchase interventions, thus improving the cost effectiveness of policy. The yield curve is found to predict policy changes under inflation targeting, implying greater predictability of CB actions.

### 3.2 Transmission through expectations

The standard New Keynesian Phillips curve or aggregate supply equation given below, shows that expected inflation influences current inflation,  $\pi_t$ . The two arguments are one period ahead (t+1) expected inflation and the output gap ( $x_t$ ), apart from random shocks ( $u_t$ ).

$$\pi_t = \beta\pi_{t+1}^e + \lambda x_t + u_t$$

The policy rate and other CB communication, including the inflation target itself affects these expectations. Equation 1 (a) shows how the policy rate maybe working its way through inflation perceptions, term structure of interest and expected wages to affect expected inflation. A flat AS (or low estimated value of  $\lambda$ ) subject to shocks will reduce the effectiveness of this channel. The largest impact is likely to come from supply shocks and fiscal action influencing them. Goyal and Parab (2021a), however, find evidence that in the long-run as household inflation expectations converge to an equilibrium level, core inflation has the largest effect on them<sup>4</sup>. Market expectations that affect the term structure and business expectations that also affect wages and prices differ from household expectations. The latter normally substantially exceed realized inflation (Coibon et. al. 2022, Goyal and Parab (2021a)).

As expectations become well anchored at the inflation target, the impact of supply shocks will become more transient. Equation 1 (b) shows the effect of the CB communicated inflation path. Even though inflation is more volatile and forecasts in EMs are less reliable, there is evidence they have a larger impact (Goyal and Parab 2021a).

$$r_t \downarrow \rightarrow \pi_{t,\dots,t+s}^e \uparrow \rightarrow i_{t,\dots,t+s}, W_{t,\dots,t+s}^e \uparrow \rightarrow \pi_{t+1}^e \uparrow \quad 1(a)$$

$$\pi_{t,\dots,t+s}^{e,CB} \uparrow \rightarrow \{\pi_{t,\dots,t+s}^e\} \uparrow \rightarrow i_{t,\dots,t+s}, W_{t,\dots,t+s}^e \uparrow \rightarrow \pi_{t+1}^e \uparrow \quad 1(b)$$

Where  $r_t$  is the policy interest rate (Repo rate for India),  $\pi_{t,\dots,t+s}^e$  is current inflation perceptions over the time period t...t+s,  $i_{t,\dots,t+s}$  is interest rates and spreads over time period t...t+s,  $W_{t,\dots,t+s}^e$  is wage

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<sup>4</sup> In their SVAR estimation the share of a shock to core inflation in one year ahead household inflation expectations' variance decomposition rises from 1% in the first quarter to 53% by the 7<sup>th</sup> quarter.

expectations over time period  $t \dots t+s$ ,  $\pi_{t+1}^e$  is one period ahead inflation expectations and  $\pi_{t \dots t+s}^{e,CB}$  is CB inflation projections (Goyal, 2016 and Goyal and Parab, 2021b).

Thus the expectations channel makes other tools available to the CB apart from the repo rate. There is the inflation target itself, inflation projections and various types of guidance.

#### 4. Evaluating performance of inflation targeting in India

The RBI officially adopted FIT in February 2015<sup>5</sup>, through a transition agreement with the government, although it had begun moving towards it after the RBI (2014) report on FIT. The target inflation rate chosen was CPI headline, at a time when it was the highest inflation rate, in double digits due to sustained high food inflation (Figure 1). Prior to the FIT regime, the inflation rate the RBI used for communication was WPI although under the multiple indicator approach it tracked a number of CPI indices. A combined CPI became available only in the early 2010s. At this time, WPI inflation was the lowest since the share of food articles is low share in it<sup>6</sup>. It is more sensitive to oil prices shocks, however, which have a larger share in WPI compared to CPI. With the switch to headline CPI as the inflation target the real interest rate swung from negative to sharply positive for all types of inflation.

Figure 2 graphs real interest rates, obtained by subtracting inflation from the one year Treasury Bill rate<sup>7</sup>, for CPI headline, CPI core and WPI core<sup>8</sup> respectively. Industry was already in a slowdown and real product interest rates relevant for it, derived from WPI core, touched double digits in 2015-16, aggravating the slowdown.

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<sup>5</sup> The RBI Act, 1934 was amended to provide a constitutional basis for the implementation of the flexible inflation targeting (FIT) framework and the MPC set up only in May 2016, however. RBI Act 45-ZB states: 'The MPC shall determine the Policy Rate required to achieve the IT.' It defines the inflation target as the 'consumer price index' (RBI 2021).

<sup>6</sup> In the headline WPI (base year 2011-12) basket Manufactured Products had a weight of 64.2, Oil 13.2, and Primary Articles 22.6. In the headline CPI (base 2012) rural and urban combined, the basket weights are Food & Beverages 45.86, Pan, Tobacco & Intoxicants 2.38, Fuel & Light 6.84, Clothing & Footwear 6.53, Housing 10.07, Miscellaneous, 28.32. The CPI includes services.

<sup>7</sup> The one year T-bill rate is used to give the one-year ahead expected inflation. Although the market for this is thin, most short-rates respond well to changes in the policy rate. The latter itself is not used for comparative purposes because the policy rate switched from the repo to the reverse repo during the Covid-19 period.

<sup>8</sup> Items constituting CPI core have a weight of 47.3 in the combined CPI index, excluding only the categories Food & Beverages and Fuel & Light. Core WPI, comprising of non-food manufactured products, has a weight of 55.1. Weight of WPI manufactured products is 64.13.

The RBI had announced a path for gradual reduction of inflation, and despite WPI inflation coming down sharply in 2014 as oil prices crashed, did not cut interest rates commensurately<sup>9</sup>. CPI inflation also came down gradually with help from falling food price inflation. As policy rates were still not brought down adequately, even with inflation at the target, real interest rates in terms of the target headline CPI reached a peak of 4.85 in November 2018 (Table 1). The equilibrium real rate, because of the continuing industrial slowdown was probably -1 at that time (Goyal and Arora, 2016). The IMF's (2017 pp. 15-16) estimate of India's equilibrium real rate at that time was 1.25 to 1.75 per cent.

Another reason for the overshooting was the consistent overestimation of expected inflation in this period. Table 2 shows the large positive deviation of expected from realized headline inflation, which was more for the RBI than for professional forecasters (SPF). This meant that while policy rates were kept higher ex-post real interest rates turned out to be even higher than targeted since actual inflation was below projections. The guidance provided by the projected inflation path was also undercut<sup>10</sup>.

Guiding financial markets seemed to be a dominant concern for implementing FIT strictly, but markets cannot deliver independent of the real sector. Low predictable inflation was regarded as a pre-requisite for the corporate bond market to develop. But corporate investment and borrowing collapsed as growth fell.

Finally in 2019, in response to the slowdown, policy rates began to be cut. High frequency data showed signs of recovery in early 2020, before Covid-19 struck. Real rates became negative in the pandemic period. Even so, despite a rise in inflation driven by commodity price shocks and supply bottlenecks inflation did not exceed the tolerance band for more than the 3 quarters. This would have required an explanation from the MPC. Between Covid-19 waves, growth recovery was strong, surprising on the upside.

Despite a once in a hundred years pandemic, the FIT framework held, showing it was possible to restrain inflation yet encourage growth. The framework also showed signs of maturing. Deviations of forecasts from realized headline narrowed, and although the average deviation was now negative there were periods of positive deviation also, such as September 2021. In November 2021 RBI's deviations were even below the average of professional forecasters. Real rates became less negative

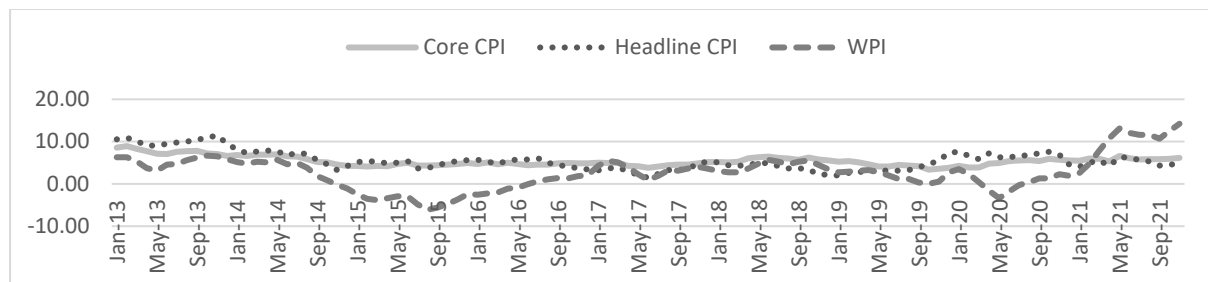
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<sup>9</sup> On the glide path the April 2014 forecast was 8 per cent CPI by January 2015, but CPI fell to 5.2 per cent. The April 2015 CPI prediction for March 2016 was 5.8 per cent by, but it fell to 4.83 per cent. The early 2016 prediction for March 2017 was 5 per cent, but CPI fell to 3.89 per cent.

<sup>10</sup> The bimonthly monetary policy statements from 2014-16 show the one- year-ahead inflation announced was almost always about one per cent above realized inflation.

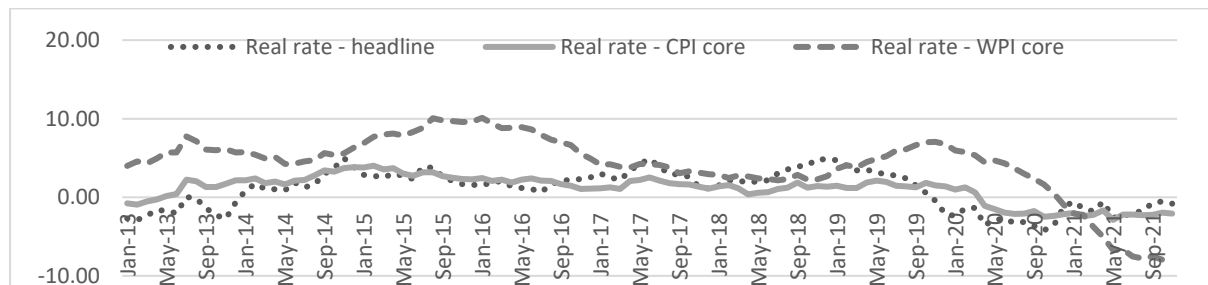
in 2021 than they were in 2020, as inflation fell. This time supply shocks made WPI inflation the highest. So that real product interest rates (using core WPI) were more negative, thus helping firms, while the headline real rates relevant for consumers were less negative reducing the erosion of real savings. The volatility of the target headline CPI inflation, impacted more by domestic supply factors, was much below that of WPI, which faced more international shocks. WPI volatility created large but transient base effects<sup>11</sup>. It is feasible to affect the CPI through domestic supply-side policies.

Figure 1: Headline and core CPI and core WPI inflation



Sources: Calculated from RBI database

Figure 2: Real interest rate: Derived from headline and core CPI and core WPI inflation



Sources: Calculated from RBI database

Growth also suffered through the 2010s decade because liquidity was kept in deficit as in major AEs prior to the global financial crisis, in the belief that pass through of interest rates is better under such conditions. But in an EM it is difficult to predict liquidity requirements because of large shocks due to foreign inflows, changes in currency demand and in government cash balances. Shortages sometimes became excessive, such as when there was no lender of last resort for a major systemic

<sup>11</sup> Goyal and Tripathi (2011) show the dominance of food price inflation in second round inflation effects in India makes CPI inflation Granger cause WPI inflation rather than the reverse, although normally it is producer prices that are expected to affect consumer prices.

NBFC in trouble. Moreover, AEs themselves had moved to surplus liquidity conditions under quantitative easing.

Reversal of tight monetary-financial conditions especially after Covid-19 reduced liquidity hoarding and restarted payments through the economy. Rebalancing of excess liquidity started early in 2021. In a FIT regime the liquidity adjustment facility (LAF) makes money supply endogenous. Excess durable liquidity is absorbed in the remunerated reverse repo. But only banks can access the LAF in India, and some cooperative banks prefer to access it through commercial banks. This and other market microstructure issues lead to short rates falling below reverse repo rates. Financial deepening also makes money endogenous as it creates near money substitutes, but has further to go in India. Even so M3 and credit growth remained in low single digits through 2020 and 2021, despite surplus durable liquidity, indicating that aggregate demand was low.

Table 1: Average real rates

	CPI Headline	CPI core	WPI core
January 2014-December 2018	2.5	2.1	5.6
January 2019-November 2021	-0.6	-0.6	1.2
Annual averages			
2013	-1.7	0.7	5.7
2014	2.2	2.6	5.2
2015	2.7	3.1	8.7
2018	3.0	1.2	2.5
2019	2.2	1.6	5.5
2020	-2.8	-1.2	3.4
2021	-1.4	-2.2	-5.9

**Source:** Calculated from RBI database.

Table 2: Deviations of projections from headline CPI

	SPF 3 month	RBI 3 month	SPF 1 year	RBI 1 year
Averages				
March 2014-Jan 2019	0.50	0.69	0.81	0.93
March 2019-20	-0.08	-0.40	-0.34	-0.49
Nov 2020-21	-0.17	-0.10	-0.29	-0.54
Value for				
Sep-21	0.35	1.25	0.70	1.05
Nov-21	0.62	0.02	0.26	-0.11

**Source:** Calculated from RBI database

Since unemployment and excess capacity was large, it was necessary to sustain demand not to reduce it. The policy rate was not at a zero lower bound, but reducing it further was constrained by inflation.

Guidance on policy objectives, on the inflation path—that it was a temporary spike driven mostly by international shocks, that its domestic pass through could be limited by fiscal supply-side action, including tax cuts, all played a role.

Guidance was time dependent (that it would continue into the next year) only through the first wave and then became state dependent as recovery started. The stance remained accommodative. An accommodative stance implies the repo can either fall or stay the same. In a neutral stance it can stay the same or move in either direction. Only under a tight stance can it rise. Liquidity rebalancing is consistent with an accommodative stance.

#### *4.1 Anchoring of expectations*

How has the expectations channel worked in this brief period? Markets pay attention to RBI views and guidance and it affects bond spreads. More than the type of inflation, it is the transparency and predictability of an IT regime that is of value to them. The credibility and success of the CB in containing inflation is important for this. Inflation has stayed within the tolerance bands during the IT period, despite unprecedented shocks. Stable inflation lowers country risk premium and cost of borrowing in an open economy. However, markets tend to over-react in uncertain times and this raised spreads and ten year G sec yields.

Household and SPF expectations are naïve (backward-looking) but show the influence of RBI communications (Goyal and Parab, 2021a). There is also evidence that expectations converge faster in an IT regime and for an EM (Goyal and Parab, 2020). In time, this should lead to the long-term inflation target becoming well internalized, affecting wage-price setting, rental contracts and market rates and spreads.

#### *4.2 Issues of measurement*

With the focus on inflation under FIT it is important that the measure of inflation is reliable. It is necessary to update the basket and weights frequently, as well as the number and quality of goods. Combined rural-urban headline CPI which is used as the inflation target has not been updated



beyond the base of 2012. In 10 years the weight and variety of goods in the consumption basket is likely to have changed. The share of volatile food inflation falls with development. Given measurement issues in a country of India's spread and diversity, it is better to work with average not point inflation. Features such as targeting average inflation, the 3 quarters available to achieve the target and the tolerance band of plus minus two around the target contribute to flexibility in the Indian IT regime.

Another issue worth considering is the choice between core and headline CPI as the inflation target. Core is a derived concept. While there are many ways of deriving it, the simplest is an exclusion measure that leaves out volatile commodity price components, so that goods and services are left. Aggregate demand and therefore monetary policy affects their prices. In the early years of inflation targeting many countries had core as target<sup>12</sup>, as it was regarded as important to focus on what a CB can affect. Now headline is the target in most countries as confidence in the ability of the inflation target to impact inflation expectations has increased. It is necessary, however, to suit country context and experience. The target can change as required.

Normally a volatile headline reverts to a more stable core. In India research finds persistently high headline above a threshold affects core<sup>13</sup>. Causality reversed in early 2010s as food inflation fell (Goyal and Parab, 2020). Goyal and Parab (2021a) find core inflation dominates household expectations in the long-run.

Correct forecasts contribute to anchoring expectations and these can be more accurate for core. Stable forecasts may reduce volatility in expectations. Moreover, Goyal and Parab (2021a) find the repo has insignificant or perverse effects on household headline inflation expectations. Repo affects demand for industrial goods and services, which dominate core. This traditional transmission channel may work better under a core inflation target.

But equity and consumer welfare considerations support targeting headline CPI, which is the cost of the average consumption basket. In the Indian context, with a large number of supply shocks and bottlenecks, the selection of headline CPI as the target gives more responsibility on government to resolve supply-side issues. Moreover, the food items dominating headline CPI are more amenable to government action, such as the choice of agricultural support prices.

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<sup>12</sup> Among EMs Korea targeted core inflation between 2000 and 2006, Thailand between 2001 and 2014, Brazil began with it (Niedziedzinska, 2018).

<sup>13</sup> Anand et. al. (2014) showed that Indian headline affects core in the high inflation period of the late 2010s. But their result did not hold after inflation fell below double digits.

### *4.3 Monetary fiscal coordination*

After Covid-19 raised their debt levels AEs have begun to emphasize monetary-fiscal coordination to help finance government borrowing and spending. In India there were additional justifications for this earlier also given the structure of AD and AS. Monetary transmission to output is effective, while higher government debt and interest payment burden limit fiscal demand stimulus. Fiscal deficits cannot expand beyond a point. Reforms to improve the supply-side and a higher share of public investment are feasible, however. Optimal monetary-fiscal coordination in Indian conditions is for this fiscal supply-side action while monetary policy sustains demand at non-inflationary levels.

If continuing improvement in supply conditions reduce costs of doing business and inflation then monetary policy can keep real interest rates ( $r$ ) below growth rates ( $g$ ). This is the snowball effect that reduces debt ratios automatically over time, as the denominator rises. It has been used to justify more government borrowing in AEs for Covid-19 stimulus and protection spending. Using this effect is particularly important for EMs where governments face higher borrowing costs and a large budgetary share of interest payments. High growth implies this  $r < g$  often holds in EMs, but high volatility in growth and in real interest rates limits its benefits. Therefore large domestic policy shocks have to be avoided and countercyclical macroeconomic policy has to smooth shocks. Indian policy has the degrees of freedom to do so.

The above arguments imply, in the Indian context, flexible rules combined with delegation to a conservative fiscal authority and a pro-growth CB would give the best outcomes (Goyal, 2018). Coordination does not imply loss of CB autonomy since keeping policy rates low is conditional on government supply-side action to reduce inflation. Moreover, the government is itself committed to low inflation since it is important for votes.

Supply-side action requires restraining the quantity but improving the quality of government spending. The Covid-19 period has seen a transition to such spending. Since 2014 the government has aimed to raise agricultural productivity and moderate food prices, which is a major reason for the lower volatility of CPI headline, and for CPI inflation being below WPI unlike in the early 2010s. CPI headline is more amenable to domestic policy actions. The Centre's cut in fuel taxes on 4<sup>th</sup> November 2022 was followed by many states. It had a large impact on household inflation expectations. These had shot up in early November but fell by end November. While household expectations are backward looking, firms are more forward-looking and their inflation expectations also moderated, enabling the MPC to continue with its accommodative stance.

Another example of post-Covid-19 coordination is the use of credit warranties, which reduced bank's fear of lending, even as lower policy rates raised demand. Using the financial sector to deliver stimulus reduced current public sector borrowing requirement and private sector crowding out.

RBI (2021, pp. 24) estimated average inflation to be around 4% in the IT period up to 2020. It rose under Covid-19 supply shocks, but these are not likely to last. Estimating equilibrium inflation from the AS gave a value of 5% over 2010s (Goyal and Tripathi, 2015). This should come down, over time to the inflation target of 4%. Monetary-fiscal coordination, however, makes it feasible to reach the target with minimal output sacrifice through the practice of inflation zone targeting.

## **5. Conclusion**

Since the regime is relatively new, there are many misunderstandings about inflation targeting and especially how it works in an EM like India.

Some interpret it as requiring a hawkish focus only on inflation. But, IT evolved with a shift from the monetarist view that markets are perfect and money affects only inflation to recognizing the possibility of multiple equilibria. Policy has a role to play in coordinating to a better outcome with less underutilization of resources. While the communication is more on inflation, it is the outcome of a complex process involving many variables all of which are taken into account. FIT is concerned also about growth and financial stability.

There is a perception that it is in response to past inflation, since it was introduced after a high inflation period. But it is about fighting future inflation, by anchoring inflation expectations. For this, in addition to the target, accurate inflation forecasts are important. IT is intrinsically forward-looking. A credible regime change implies the future can be different from the past. A long period of disinflation and output sacrifice need not be necessary to anchor inflation expectations with complementary supply-side action. A key difference is the MPC now has to respond if inflation persistently exceeds the tolerance band. This belief can in itself contribute to anchoring inflation expectations.

The major instrument now is the repo rate, but it is not the only instrument. The stance and guidance through future growth and inflation paths all play a role.

In an EM with many market imperfections action on liquidity has to complement changes in the repo rate. Since only banks can borrow short-term liquidity from the RBI, both the informal sector and

modern markets are underserved at present. Money markets and the liquidity adjustment facility have to continue to develop, so that the call rate stays within a narrowing corridor.

The dominance of supply shocks and bottlenecks in an EM implies coordination with the government is essential. Optimal coordination can reduce the output sacrifice of disinflating even as it aids fiscal consolidation.

## References

- Allsop, C. and D. Vines. 2000. 'The assessment: Macroeconomic policy', *Oxford Review of Economic Policy*. 16(4): 1-32.
- Bernanke, B.S. and F. Mishkin. 1997. 'Inflation targeting: A new framework for monetary policy?' *Journal of Economic Perspectives*. 11(2): 97-116.
- Blinder, A. S., M. Ehrmann., M. Fratzscher., J. D. Haan and D. J. Jansen. 2008. 'Central Bank Communication and Monetary Policy: A Survey of Theory and Evidence' *Journal of Economic Literature*. 46(4): 910-945. [http://www.nber.org/papers/w13932.pdf?new\\_window=1](http://www.nber.org/papers/w13932.pdf?new_window=1)
- Chitre, V., Kanagasabapathy, K., Ray, P., Saggur, M. 1996. 'Inflation, Interest Rates and Index-Linked Bonds' DRG (Development Research Group) Study: 12. Department of Economic Analysis and Policy. RBI (Reserve Bank of India), Mumbai. April.  
[https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/GR687\\_April181996.PDF](https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/GR687_April181996.PDF)
- Chitre, V.S. 1982. 'Growth Cycles in the Indian Economy' *Artha Vijnana*. 24(4): 293-450. December.
- Clarida, R., J. Gali and M. Gertler 1999. 'The science of Monetary Policy: A New Keynesian Perspective', *Journal of Economic Literature*. 37(4): 1661-707.
- Coibion O., Y. Gorodnichenko, M. Weber, 2022, Monetary policy communications and their effects on household inflation expectations, *Journal of Political Economy*, forthcoming,  
<https://doi.org/10.1086/718982>
- Goyal, A. 2018. 'The Indian Fiscal-Monetary Framework: Dominance or Coordination?' *International Journal of Development and Conflict*. 8(1): 01-13. June.  
Available at: [http://www.ijdc.org.in/uploads/1/7/5/7/17570463/jun\\_18\\_art\\_1\\_goyal.pdf](http://www.ijdc.org.in/uploads/1/7/5/7/17570463/jun_18_art_1_goyal.pdf)  
<http://www.ijdc.org.in/volume-8-issue-1.html>.
- Goyal, A. 2016. 'Unconventional Monetary Policy in Emerging Markets' *Macroeconomics and Finance in Emerging Market Economies*. 9(2): 101-108.
- Goyal, A. 2015. 'Understanding High Inflation Trend in India' *South Asian Journal of Macroeconomics and Public Finance*. 4(1): 1-44.
- Goyal, A. 2002. 'Coordinating Monetary and Fiscal Policies: a role for rules?' Chapter 11 in Kirit S. Parikh and R. Radhakrishna (eds.), *India Development Report 2002*, New Delhi: IGIDR and Oxford University Press, pp: 48-64. 2002.

- Goyal, A. and S. Arora. 2016. 'Estimating the Indian Natural Interest Rate: A semi-structural approach' *Economic Modelling*. 58: 141–153. November. doi:10.1016/j.econmod.2016.05.023.
- Goyal, A. and S. Arora. 2013. 'Inferring India's Potential Growth and Policy Stance' *Journal of Quantitative Economics*. 11(1&2): 60-83. January-July.
- Goyal, A. and A. Kumar. 2018. 'Active Monetary Policy and the Slowdown: Evidence from DSGE Based Indian Aggregate Demand and Supply' *Journal of Economic Asymmetries*. (17): 21-40. June. DOI: <https://doi.org/10.1016/j.jeca.2018.01.001>. Available at: <https://www.sciencedirect.com/science/article/pii/S1703494917300646>.
- Goyal, A. and P. Parab. 2020. 'Inflation Convergence and Anchoring of Expectations in India' *Economic and Political Weekly*. LV (47): 37-46. November.
- Goyal, A. and P. Parab. 2021a. 'What Influences Aggregate Inflation Expectations of Households in India?' *Journal of Asian Economics*. 72. February. 101260.
- Goyal, A. and P. Parab. 2021b. 'Effectiveness of Expectations Channel of Monetary Policy Transmission: Evidence from India' IGIDR. Working paper no. WP-2021-011 Available at: <http://www.igidr.ac.in/pdf/publication/WP-2021-011.pdf>
- Goyal, A. and S. Tripathi. 2015. 'Separating Shocks from Cyclicity in Indian Aggregate Supply' *Journal of Asian Economics*. (38): 93-103. June.
- Goyal, A. and S. Tripathi. 2014. 'Stability and Transitions in Emerging Market Policy Rules' *Indian Economic Review*. XLIX (2): 153-172, July-December.
- Goyal, A. and S. Tripathi. 2011. 'New Keynesian Aggregate Supply in the Tropics: Food prices, wages and inflation' *International Journal of Monetary Economics and Finance*. 4(4): 330-354.
- Anand, R., Ding, D. and Tulin, V. 2014. 'Food Inflation in India: The Role for Monetary Policy' *International Monetary Fund. Working Paper Series* no. WP/14/178.
- IMF (International Monetary Fund). 2017. India: 2017 Article IV Consultation-Press Release; Staff Report and Statement by the Executive Director for India. Available at <https://www.imf.org/en/Publications/CR/Issues/2017/02/22/India-2017-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-Executive-44670>
- Mishkin, F.S. 1999. 'International experience with monetary policy rules' *Journal of Monetary Economics*. (43): 579-606, June.
- Niedzwiadzinska, J. 2018. 'Inflation Targeting Institutional features of the strategy in price.' Narodowy Bank Polski (NBP). Working paper no. 299.
- RBI (Reserve Bank of India), 2014. Report of the Expert Committee to Revise and Strengthen the Monetary Policy Framework. (Chairman: Urjit Patel). January, Bombay: RBI. Available at [https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/ECOMRF210114\\_F.pdf](https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/ECOMRF210114_F.pdf).
- RBI, 2021. Report on Currency and Finance 2020-21. Reviewing the Monetary Policy Framework. February 26. Available at: [https://rbi.org.in/scripts/BS\\_PressReleaseDisplay.aspx?prid=51187](https://rbi.org.in/scripts/BS_PressReleaseDisplay.aspx?prid=51187)

Svensson, L. E.O. 2007. 'Inflation Targeting', Princeton University, CEPS Working Paper No. 144.