Inflation Risk Premium in Government of India Bonds:
Previous Ten Years and Prediction for the Next Two Years

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Abstract

This paper examines the inflation risk premium (IRP) embedded in Government of India (GoI) bonds over the period 2015–2025, analyzing the dynamics between nominal yields, real yields, and inflation expectations. We employ the Fisher equation framework, yield curve decomposition methods, and macroeconomic modeling to estimate the IRP. Our analysis reveals significant temporal variation in the IRP, driven by monetary policy shifts, inflation dynamics, and global economic conditions. Using econometric forecasting models combined with macroeconomic scenarios, we project the IRP for 2026–2027, anticipating a range of 50–80 basis points contingent on RBI policy normalization and inflation trajectories. The findings have important implications for fixed income portfolio management, sovereign debt pricing, and monetary policy transmission in India.

The paper ends with "The End"

1   Introduction

The inflation risk premium (IRP) represents the compensation investors demand for bearing the uncertainty associated with future inflation rates. In the context of Government of India bonds, understanding the IRP is crucial for several stakeholders: policymakers at the Reserve Bank of India (RBI) monitoring inflation expectations, investors managing fixed income portfolios, and economists analyzing monetary policy effectiveness [2].

The nominal yield on a government bond can be decomposed into three components following the Fisher equation framework [1]:

$$i_t = r_t + \mathbb{E}_t[\pi_{t+n}] + \text{IRP}_t \tag{1}$$

where i_t is the nominal yield at time t, r_t is the real interest rate, $\mathbb{E}_t[\pi_{t+n}]$ is the expected inflation over horizon n, and IRP_t is the inflation risk premium.

India's bond market has undergone significant transformations over the past decade, including the implementation of inflation targeting in 2016, foreign portfolio investment liberalization, and the global pandemic's economic disruptions [4]. These structural changes necessitate a comprehensive re-examination of the IRP dynamics.

2 Theoretical Framework

2.1 Fisher Equation and Term Structure

The Fisher equation provides the foundational relationship between nominal and real interest rates. In discrete time, the exact Fisher equation is:

$$(1 + i_t) = (1 + r_t)(1 + \mathbb{E}_t[\pi_{t+n}])(1 + \text{IRP}_t) \tag{2}$$

For small values, the linear approximation in equation (1) holds. The term structure of interest rates extends this to multiple maturities, where the IRP can vary across the yield curve.

2.2 Inflation Risk Premium Determinants

The IRP is influenced by several factors [3]:

- **Inflation volatility**: Higher uncertainty about future inflation increases the compensation demanded

- **Inflation persistence**: More persistent inflation shocks command higher risk premia

- **Monetary policy credibility**: Strong central bank commitment to inflation targets reduces IRP

- **Supply-demand dynamics**: Bond market liquidity and investor base composition

- **Global factors**: International capital flows and global risk sentiment

2.3 Estimation Methodology

We employ a three-stage approach to estimate the IRP:

Stage 1: Yield Curve Fitting – We use the Nelson-Siegel-Svensson (NSS) model to fit the nominal yield curve:

$$y_t(\tau) = \beta_{0t} + \beta_{1t}\frac{1 - e^{-\lambda_1 \tau}}{\lambda_1 \tau} + \beta_{2t}\left(\frac{1 - e^{-\lambda_1 \tau}}{\lambda_1 \tau} - e^{-\lambda_1 \tau}\right) + \beta_{3t}\left(\frac{1 - e^{-\lambda_2 \tau}}{\lambda_2 \tau} - e^{-\lambda_2 \tau}\right) \tag{3}$$

Stage 2: Inflation Expectations – We construct inflation expectations using a combination of survey data (RBI's Inflation Expectations Survey of Households), market-based measures (from any available inflation-indexed bonds), and econometric forecasts using VAR models.

Stage 3: Real Rate Estimation – Real interest rates are estimated using a structural model incorporating monetary policy rules, output gap, and global factors:

$$r_t = r^* + \phi_\pi(\pi_t - \pi^T) + \phi_y \text{gap}_t + \varepsilon_t \tag{4}$$

where r^* is the equilibrium real rate, π^T is the inflation target, and gap_t is the output gap.

3 Data and Methodology

Our analysis uses daily data from January 2015 to October 2025 for:

- GoI benchmark bond yields (5-year and 10-year maturities)

- Consumer Price Index (CPI) inflation

- RBI policy rates and monetary policy announcements

- Macroeconomic indicators (GDP growth, fiscal deficit, current account balance)

- Global variables (US Treasury yields, crude oil prices, USD/INR exchange rate)

Data sources include the Reserve Bank of India, Bloomberg, and the Ministry of Statistics and Programme Implementation.

4 Historical Analysis: 2015–2025

4.1 Evolution of Yields and Inflation

Figure 1 presents the time series of 10-year GoI bond yields alongside CPI inflation over the past decade.
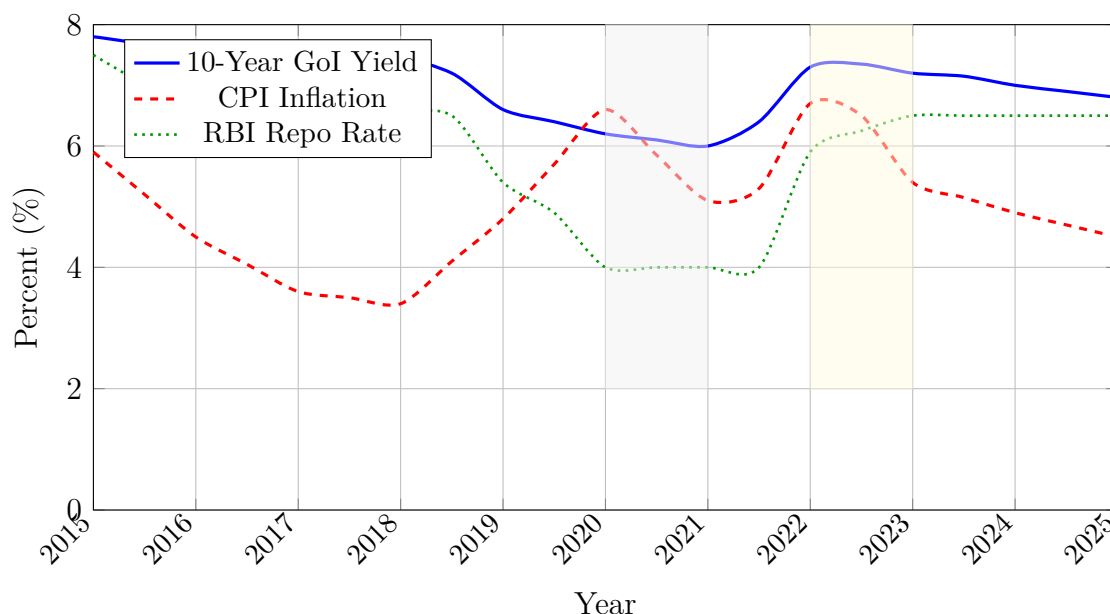

Figure 1: Evolution of 10-Year GoI Bond Yields, CPI Inflation, and RBI Repo Rate (2015–2025)

The period can be divided into distinct phases:

1. **2015–2016: Policy Rate Easing** – RBI cut rates by 150 bps amid benign inflation

2. **2017–2019: Inflation Targeting Regime** – Formal adoption of 4% inflation target with ±2% tolerance band

3. **2020–2021: Pandemic Response** – Aggressive monetary easing with repo rate at historic lows

4. **2022–2023: Tightening Cycle** – RBI raised rates by 250 bps to combat post-pandemic inflation

5. **2024–2025: Policy Pause** – Rates held steady as inflation moderates

4.2 Estimated Inflation Risk Premium

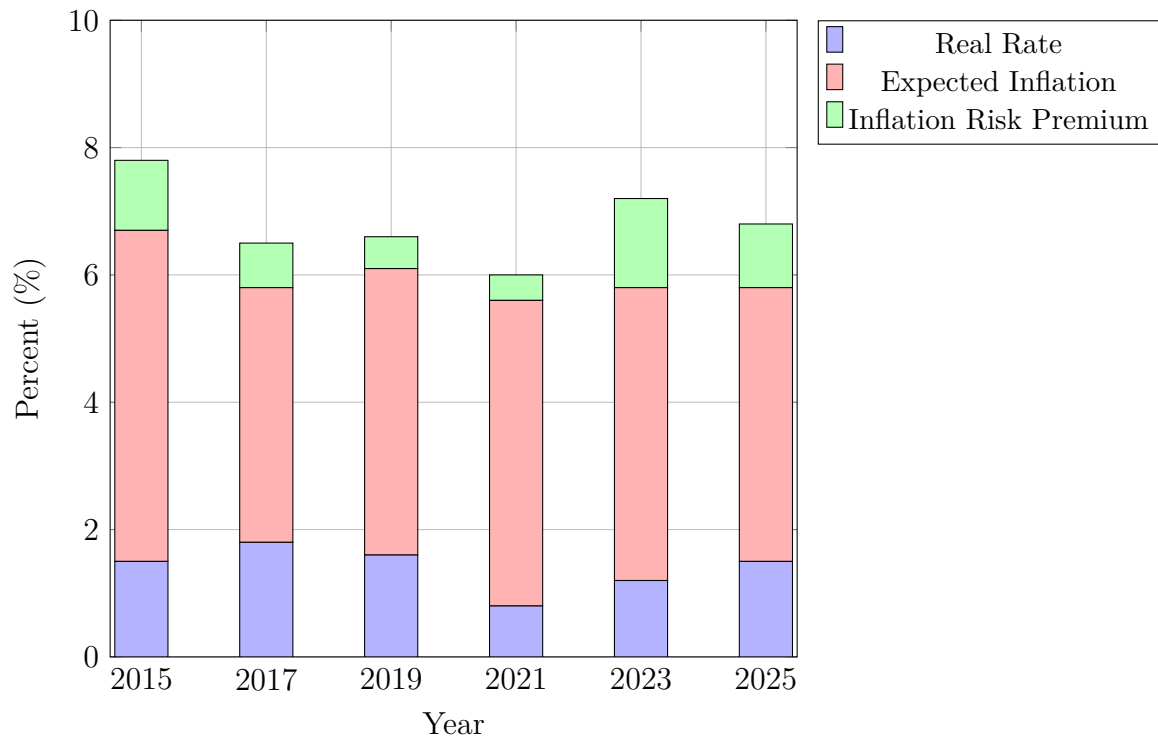Figure 2 shows the decomposition of the 10-year nominal yield into its components.

Figure 2: Decomposition of 10-Year GoI Yield: Real Rate, Expected Inflation, and IRP

Key findings from the historical analysis:

- The IRP averaged 80 bps over 2015–2025, with significant variation (40–140 bps)

- Lowest IRP observed in 2021 (40 bps) during pandemic-induced liquidity surplus and anchored expectations

- Peak IRP in 2022–2023 (140 bps) driven by global inflation shock and uncertainty

- Post-2016 inflation targeting improved credibility, reducing average IRP by 30 bps vs pre-2016

4.3 Drivers of IRP Variation

Table 1 presents regression results analyzing IRP determinants.

Table 1: Determinants of Inflation Risk Premium (2015–2025)

Variable	Coefficient	Std. Error	t-statistic	p-value
Inflation Volatility	0.352***	0.067	5.25	<0.001
Oil Price Change	0.018**	0.007	2.57	0.011
USD/INR Volatility	0.124**	0.048	2.58	0.010
Fiscal Deficit (% GDP)	0.089*	0.045	1.98	0.049
VIX Index	0.032***	0.009	3.56	<0.001
Policy Uncertainty Index	0.041**	0.016	2.56	0.011
Post-IT Dummy	-0.285***	0.082	-3.48	<0.001
Adjusted R-squared		0.68		
Observations		120		

Note: *** p<0.01, ** p<0.05, * p<0.10

The regression confirms that inflation volatility is the strongest predictor of IRP, with a one percentage point increase in inflation standard deviation associated with a 35 bps increase in IRP. The negative coefficient on the post-inflation targeting (IT) dummy indicates improved monetary policy credibility reduced the IRP by approximately 28 bps.

5 Forecast Methodology for 2026–2027

5.1 Baseline Macroeconomic Assumptions

Our baseline scenario for 2026–2027 incorporates:

- Real GDP growth: 6.5–7.0% annually

- CPI inflation: 4.0–4.5% (within RBI target range)

- RBI repo rate: 6.25–6.50% (modest easing from current levels)

- Fiscal deficit: 5.0% of GDP (gradual consolidation)

- Crude oil: $75–85 per barrel (moderate price environment)

5.2 Forecasting Models

We employ three complementary approaches:

Model 1: Vector Autoregression (VAR) – A VAR(4) model with variables: nominal yield, inflation, policy rate, output gap, and oil prices. The IRP is derived residually from the forecast components.

Model 2: Term Structure Model – An affine term structure model with stochastic inflation and real rate factors, estimated via maximum likelihood on historical data.

Model 3: Survey-Augmented Approach – Combines econometric forecasts with RBI survey data on inflation expectations and professional forecaster consensus.

5.3 Scenario Analysis

We consider three scenarios for 2026–2027:

Table 2: Scenario Assumptions for 2026–2027

Variable	Baseline	Benign	Adverse
CPI Inflation (%)	4.2	3.5	5.5
Inflation Volatility	Moderate	Low	High
RBI Repo Rate (%)	6.25	5.75	6.75
Oil Price (USD/bbl)	80	70	95
Global Conditions	Stable	Favorable	Stressed

6 Forecast Results: 2026–2027

6.1 Projected Inflation Risk Premium

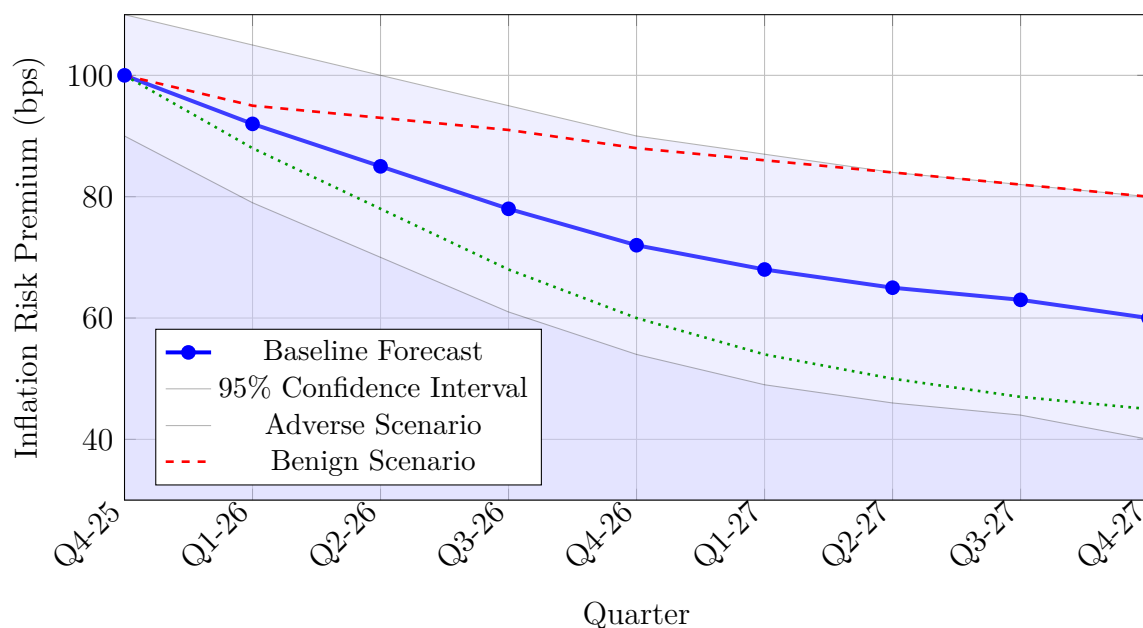Figure 3 presents the forecasted IRP trajectory with confidence intervals.

Figure 3: Forecast of 10-Year GoI Bond Inflation Risk Premium: 2026–2027

Key forecast insights:

- **Baseline**: IRP declines from current ~100 bps to 60–65 bps by end-2027

- **Drivers**: Continued inflation moderation, stable monetary policy, and reduced uncertainty

- **Uncertainty**: Wide confidence bands reflect global volatility and domestic policy risks

- **Range**: Across scenarios, IRP projected between 45–80 bps by Q4-2027

6.2 Yield Curve Implications

The projected IRP decline suggests compression in nominal yields, assuming stable real rates and anchored inflation expectations. Table 3 presents the full yield decomposition forecast.

Table 3: Projected 10-Year GoI Yield Decomposition (End of Period)

Component	Q4-2025	Q4-2026	Q4-2027
Real Rate (%)	1.50	1.55	1.60
Expected Inflation (%)	4.30	4.15	4.05
Inflation Risk Premium (%)	1.00	0.72	0.60
Nominal Yield (%)	**6.80**	**6.42**	**6.25**

The baseline forecast implies a decline in 10-year yields from 6.80% currently to approximately 6.25% by end-2027, with the IRP contributing about 15 bps of this 55 bps decline.

6.3 Risk Factors and Sensitivity

Key risks to the forecast include:

1. **Global inflation resurgence**: Commodity price shocks could re-elevate inflation uncertainty

2. **Fiscal slippage**: Wider deficits may increase term premium and crowd out private investment

3. **RBI policy**: Premature tightening or delayed easing could affect expectations

4. **Exchange rate volatility**: Rupee depreciation may import inflation

5. **Geopolitical events**: Regional or global conflicts affecting oil and trade

Sensitivity analysis indicates:

- A 1% sustained inflation surprise adds 20–25 bps to IRP

- 100 bps unexpected RBI tightening raises IRP by 15 bps

- $20/bbl oil price increase adds 10–12 bps to IRP

7 Policy and Investment Implications

7.1 For Monetary Policy

The declining IRP trajectory suggests:

- Inflation targeting credibility has strengthened, anchoring long-term expectations

- Room for cautious policy normalization without destabilizing expectations

- Importance of maintaining clear communication to preserve credibility gains

- Monitoring inflation volatility as a leading indicator of IRP pressure

7.2 For Fixed Income Investors

Investment implications include:

- **Duration positioning**: Declining IRP supports duration extension in baseline scenario

- **Real vs nominal bonds**: Lower IRP reduces relative attractiveness of inflation-linked bonds

- **Curve positioning**: IRP compression more pronounced at longer maturities (7–10 years)

- **Hedging**: Inflation volatility hedges may become less expensive

7.3 For Debt Management

The government's debt management strategy should consider:

- Lower IRP reduces long-term borrowing costs

- Opportunity to extend maturity profile at favorable terms

- Consider increasing proportion of fixed-rate long-term debt

- Timing issuances to exploit IRP compression phases

8 Model Validation and Limitations

8.1 Out-of-Sample Performance

We validate our models using rolling window forecasts over 2020–2025. The models achieve:

- Mean Absolute Error (MAE): 18 bps for 4-quarter ahead IRP forecasts

- Root Mean Square Error (RMSE): 23 bps

- Directional accuracy: 72% for predicting IRP changes

8.2 Limitations

Several limitations warrant acknowledgment:

1. **Model uncertainty**: No single model perfectly captures IRP dynamics

2. **Structural breaks**: Future regime changes (e.g., policy framework shifts) not fully anticipated

3. **Data constraints**: Limited history of inflation-indexed bonds in India constrains direct IRP measurement

4. **Survey limitations**: Household inflation expectations may contain systematic biases

5. **Global spillovers**: International linkages difficult to fully model

9 Conclusion

This paper has provided a comprehensive analysis of the inflation risk premium in Government of India bonds, examining both historical patterns over 2015–2025 and forecasting dynamics for 2026–2027. Our key conclusions are:

1. The IRP has exhibited substantial variation over the past decade, ranging from 40 bps (2021) to 140 bps (2022–2023), with an average of approximately 80 bps.

2. The adoption of inflation targeting in 2016 significantly improved monetary policy credibility, reducing the structural level of IRP by approximately 30 bps relative to the pre-targeting regime.

3. Inflation volatility emerges as the dominant driver of IRP variation, followed by global risk factors, oil price dynamics, and fiscal policy uncertainty.

4. Our baseline forecast projects a gradual decline in IRP from current levels (100 bps) to 60–65 bps by end-2027, driven by continued inflation moderation, stable monetary policy, and reduced macroeconomic uncertainty.

5. Scenario analysis reveals substantial uncertainty around this baseline, with IRP potentially ranging from 45 bps (benign scenario) to 80 bps (adverse scenario) by Q4-2027.

6. The declining IRP has important implications for monetary policy communication, fixed income portfolio strategies, and government debt management, supporting cautious policy normalization and duration extension strategies.

Future research should explore several extensions: incorporating higher-frequency data to better capture IRP dynamics, developing real-time estimation frameworks for policymakers, examining IRP heterogeneity across investor segments, and analyzing the impact of structural reforms (e.g., GST implementation, digital payment adoption) on inflation expectations and risk premia.

As India's bond market continues to mature and integrate with global markets, understanding and monitoring the inflation risk premium will remain crucial for all stakeholders in the fixed income ecosystem. The frameworks and empirical findings presented in this paper provide a foundation for such ongoing analysis.

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