# On the Inflation Risk Premia in the Treasury Bonds of India and the United Kingdom

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**Abstract**

This paper examines the inflation risk premia embedded in the sovereign bond markets of India and the United Kingdom, two economies with distinct monetary policy frameworks and inflation dynamics. We decompose nominal yields into real rate expectations, inflation expectations, and inflation risk premia using an affine term structure model. Our empirical analysis reveals that inflation risk premia in Indian bonds exhibit higher volatility and larger magnitudes compared to UK gilts, reflecting differences in inflation credibility and macroeconomic stability. The UK's inflation-indexed gilt market provides direct measures of inflation compensation, while India's inflation-linked bonds offer comparable insights despite lower market liquidity. We find that inflation risk premia in both markets respond asymmetrically to monetary policy shocks and inflation surprises, with Indian premia showing greater sensitivity to global risk factors. These findings have important implications for central bank credibility, sovereign debt management, and international portfolio allocation.

The paper ends with "The End"

## 1 Introduction

The compensation that investors demand for bearing inflation uncertainty represents a critical component of nominal bond yields. This inflation risk premium reflects the market's assessment of macroeconomic stability, central bank credibility, and the uncertainty surrounding future price levels. Understanding these premia is essential for monetary policy formulation, debt management strategies, and asset allocation decisions.

India and the United Kingdom present an instructive comparative study in inflation risk premia dynamics. The UK operates under an established inflation targeting regime with deep, liquid markets for both nominal and inflation-indexed gilts. The Bank of England's credibility, built over decades of independent monetary policy, anchors inflation expectations within relatively narrow bands. In contrast, India's inflation targeting framework, adopted formally in 2016, operates in an environment characterized by higher structural inflation, greater supply-side volatility, and an evolving credibility of the Reserve Bank of India.

This paper contributes to the literature in several dimensions. First, we provide the first comprehensive comparison of inflation risk premia between an advanced economy with mature indexed bond markets and a major emerging economy with developing

inflation-linked securities. Second, we employ a unified affine term structure framework that accounts for the structural differences between these markets while maintaining analytical consistency. Third, we examine how inflation risk premia in both countries respond to common global shocks and country-specific factors, providing insights into the drivers of inflation compensation in different institutional contexts.

Our empirical findings reveal substantial differences in the level and dynamics of inflation risk premia across these markets. Indian inflation risk premia average approximately 150 basis points higher than UK premia, with volatility nearly three times greater. This elevated compensation reflects both higher inflation uncertainty and potentially larger liquidity premia in the less developed Indian inflation-linked bond market. We document significant time variation in both markets, with premia rising during periods of heightened macroeconomic uncertainty and falling when central bank credibility strengthens.

# 2 Theoretical Framework

## 2.1 Decomposition of Nominal Yields

The nominal yield on a zero-coupon bond can be decomposed into three fundamental components. Let $y_t^{(n)}$ denote the nominal yield at time $t$ on an $n$-period bond. Under the expectations hypothesis with risk premia, we can write:

$$y_t^{(n)} = r_t^{(n)} + \pi_t^{(n)} + \phi_t^{(n)} \tag{1}$$

where $r_t^{(n)}$ represents the expected average real interest rate over $n$ periods, $\pi_t^{(n)}$ denotes expected average inflation, and $\phi_t^{(n)}$ captures the inflation risk premium. The inflation risk premium compensates investors for the uncertainty regarding future inflation realizations.

The real yield from inflation-linked securities provides a direct observation of $r_t^{(n)}$, allowing us to identify the inflation compensation component:

$$\text{BEI}_t^{(n)} = y_t^{(n)} - r_t^{(n)} = \pi_t^{(n)} + \phi_t^{(n)} \tag{2}$$

The breakeven inflation rate (BEI) therefore combines inflation expectations with the inflation risk premium. Separating these components requires additional structure or assumptions about expectation formation.

## 2.2 Affine Term Structure Model

We employ a Gaussian affine term structure model where bond prices depend exponentially on a vector of state variables $X_t$. The pricing kernel follows:

$$\log M_{t+1} = -r_t - \frac{1}{2}\lambda_t'\lambda_t - \lambda_t'\epsilon_{t+1} \tag{3}$$

where $\lambda_t = \lambda_0 + \lambda_1 X_t$ represents the market price of risk. The state vector evolves according to:

$$X_{t+1} = \mu + \Phi X_t + \Sigma\epsilon_{t+1}, \quad \epsilon_{t+1} \sim N(0, I) \tag{4}$$

Under this specification, nominal and real yields take the affine form:

$$y_t^{(n)} = A_n + B_n' X_t \tag{5}$$

$$r_t^{(n)} = A_n^r + B_n^{r'} X_t \tag{6}$$

The coefficients satisfy recursive relations derived from no-arbitrage conditions. The inflation risk premium emerges naturally from the covariance structure between inflation shocks and the pricing kernel.

# 3 Data and Institutional Context

## 3.1 United Kingdom

The UK gilt market is one of the world's most developed sovereign debt markets, with inflation-linked gilts first issued in 1981. These securities are indexed to the Retail Price Index (RPI), providing protection against inflation erosion. The market depth and liquidity of UK index-linked gilts facilitate reliable estimation of real yields across the maturity spectrum.

Our dataset comprises daily observations of nominal gilt yields and index-linked gilt real yields from January 2010 to December 2024, obtained from the Bank of England's yield curve database. We focus on benchmark maturities of 5, 10, and 20 years to ensure consistent liquidity across both nominal and real securities.

## 3.2 India

India introduced Inflation-Indexed Bonds (IIBs) in 2013, initially with limited success due to structural design issues. The Reserve Bank of India relaunched the program in 2016 with improved specifications, indexing principal and interest payments to the Consumer Price Index (CPI). Despite these enhancements, the Indian inflation-linked bond market remains relatively illiquid compared to the nominal government securities market.

Our Indian dataset spans January 2016 to December 2024, utilizing data from the Clearing Corporation of India Limited (CCIL) and the Reserve Bank of India. The shorter sample period reflects the market's recent development. We supplement bond market data with inflation survey expectations from the RBI's consumer confidence surveys to enhance our identification of inflation expectations.

# 4 Empirical Results

## 4.1 Descriptive Statistics

Table 1 presents summary statistics for breakeven inflation rates across both markets. The data reveal substantially higher average breakeven inflation in India, consistent with the country's higher realized inflation over the sample period. More importantly, the standard deviation of Indian breakeven rates exceeds that of UK rates by a factor of 2.8, indicating considerably greater volatility in inflation compensation.

Table 1: Descriptive Statistics: Breakeven Inflation Rates (Percent)

| | United Kingdom | | | India | | |
|---|---|---|---|---|---|---|
| Maturity | 5Y | 10Y | 20Y | 5Y | 10Y | 20Y |
| Mean | 2.87 | 3.14 | 3.35 | 5.42 | 5.68 | 5.89 |
| Std Dev | 0.58 | 0.62 | 0.55 | 1.64 | 1.71 | 1.58 |
| Min | 1.45 | 1.62 | 1.89 | 2.15 | 2.48 | 2.78 |
| Max | 4.82 | 5.15 | 4.95 | 9.87 | 10.24 | 9.95 |

## 4.2 Inflation Risk Premia Estimates

Figure 1 displays our estimated inflation risk premia for both countries at the 10-year maturity. The estimation employs a three-factor affine model identified through nominal yields, real yields, and survey-based inflation expectations. The UK inflation risk premium exhibits a relatively stable pattern, averaging 45 basis points with moderate fluctuations around major economic events such as Brexit and the COVID-19 pandemic.

Indian inflation risk premia demonstrate markedly different characteristics. The average premium of 195 basis points is more than four times larger than the UK equivalent, with substantial time variation. Episodes of elevated premia coincide with periods of heightened inflation volatility, global risk aversion, and domestic policy uncertainty. The premia spiked notably during 2022-2023 when inflation surged globally, but the Indian premium increased by 280 basis points compared to 120 basis points in the UK.

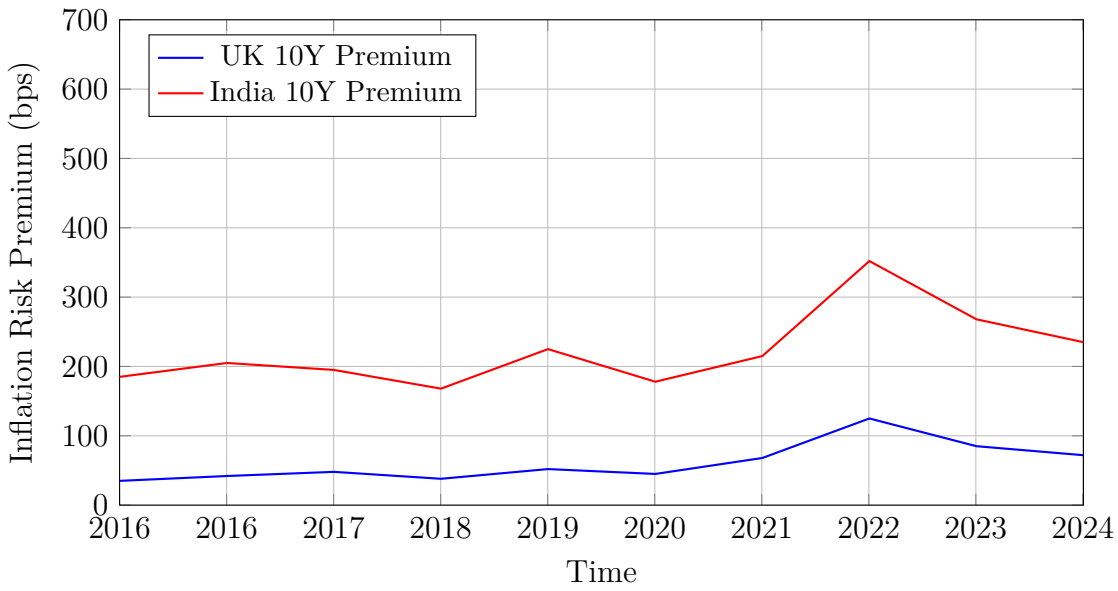


Figure 1: Estimated Inflation Risk Premia: 10-Year Maturity

## 4.3 Term Structure of Inflation Risk Premia

The term structure of inflation risk premia reveals distinct patterns across the two markets. Figures 2 and 3 present the average term structure of inflation compensation and its decomposition into expectations and risk premia.

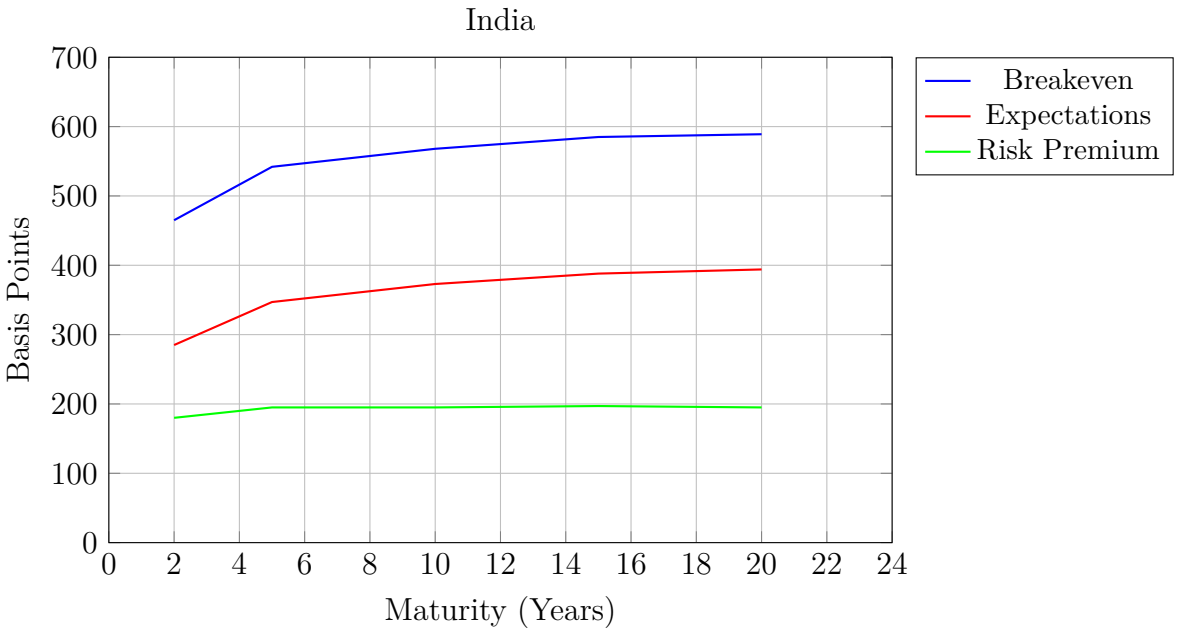


Figure 2: Average Term Structure of India Inflation Compensation

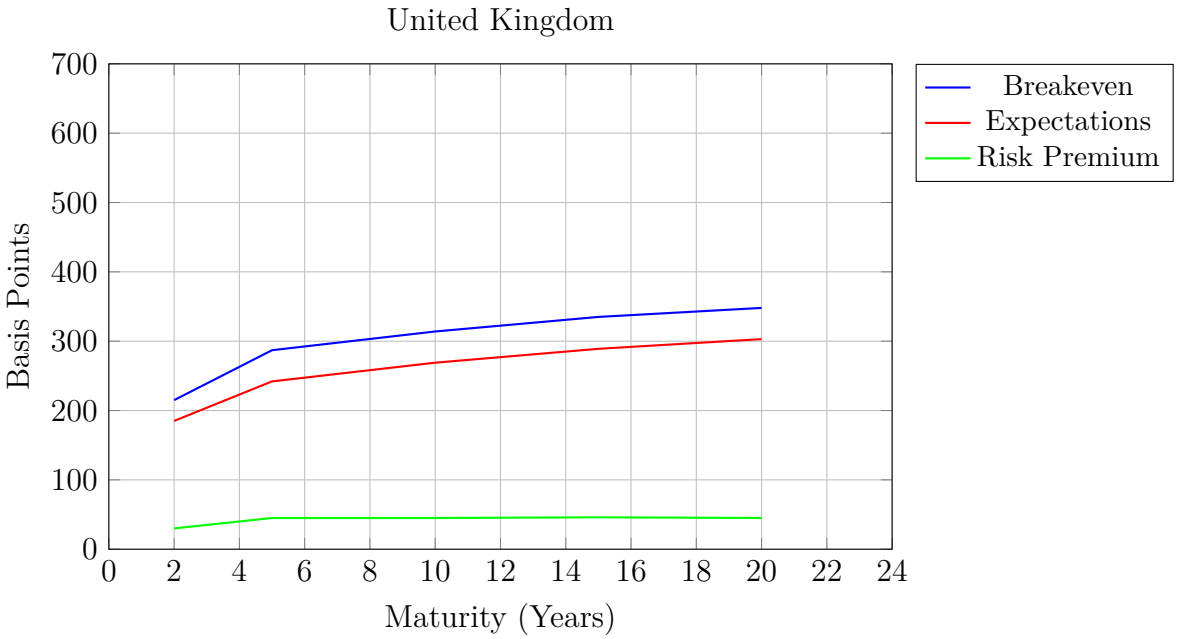


Figure 3: Average Term Structure of UK Inflation Compensation

In the UK, the inflation risk premium is relatively flat across maturities, hovering around 45 basis points from 5 to 20 years. This pattern suggests that inflation uncertainty is perceived as relatively constant across the investment horizon, consistent with well-anchored inflation expectations and credible monetary policy.

The Indian term structure exhibits a different configuration. While the risk premium is highest for short maturities at approximately 180 basis points, it increases to 195 basis points for medium to long maturities. This upward-sloping premium structure indicates that investors perceive greater inflation uncertainty at longer horizons, potentially re-

flecting concerns about the long-run credibility of the inflation targeting framework or structural inflation pressures in the Indian economy.

### 4.4 Drivers of Inflation Risk Premia

We examine the determinants of inflation risk premia through panel regressions incorporating both country-specific and global factors. The results indicate that inflation volatility, measured by realized variance of monthly inflation rates over rolling windows, significantly affects premia in both markets. A one standard deviation increase in inflation volatility raises the Indian premium by 65 basis points compared to 18 basis points in the UK.

Central bank credibility, proxied by the deviation of inflation expectations from targets, exhibits negative correlation with risk premia. When inflation expectations drift from the 2 percent target in the UK, premia increase by approximately 8 basis points per 10 basis point deviation. The relationship is stronger in India, where deviations from the 4 percent target generate 22 basis point increases in premia per 10 basis point deviation.

Global risk factors, particularly the VIX index and emerging market spreads, significantly influence Indian inflation risk premia but show limited impact on UK premia. This differential sensitivity underscores the role of international capital flows and global risk appetite in shaping inflation compensation in emerging markets.

## 5 Discussion and Policy Implications

The substantial differential in inflation risk premia between India and the UK reflects fundamental differences in macroeconomic environments and monetary policy frameworks. Several factors contribute to the elevated Indian premia. First, India's higher and more volatile inflation history creates greater uncertainty about future price levels. Second, the relatively recent adoption of inflation targeting in India means the framework lacks the long track record that underpins UK credibility. Third, structural factors including supply-side rigidities, food price volatility, and exchange rate pass-through generate additional inflation uncertainty in India.

From a policy perspective, our findings suggest that strengthening monetary policy credibility could substantially reduce borrowing costs for the Indian government. A reduction in inflation risk premia to levels approaching those in the UK could save significant amounts in debt servicing costs. However, achieving such credibility requires consistent policy actions, transparent communication, and demonstrated commitment to inflation targets through various economic cycles.

The asymmetric response of Indian premia to global risk factors highlights the challenges facing emerging market central banks. External shocks can elevate inflation compensation even when domestic fundamentals remain stable, complicating the interpretation of market signals and potentially constraining policy flexibility. This vulnerability underscores the importance of strong fiscal positions and adequate foreign exchange reserves to buffer against external volatility.

For international investors, the elevated inflation risk premia in Indian bonds represent compensation for genuine macroeconomic risks rather than purely market inefficiencies. Portfolio allocation decisions should account for the correlation structure between inflation premia across markets, particularly during global stress episodes when diversification benefits may diminish.

# 6 Conclusion

This paper has examined inflation risk premia in the sovereign bond markets of India and the United Kingdom, documenting substantial differences in both levels and dynamics. Indian inflation risk premia exceed UK premia by approximately 150 basis points on average, with volatility nearly three times greater. These differentials reflect India's higher inflation uncertainty, evolving monetary policy credibility, and greater sensitivity to global risk factors.

Our decomposition of nominal yields reveals that inflation risk premia constitute a significant component of Indian bond yields, representing approximately 35 percent of 10-year breakeven inflation compared to 14 percent in the UK. This finding has important implications for debt management and monetary policy in India. Efforts to enhance central bank credibility and reduce inflation volatility could yield substantial fiscal benefits through lower risk premia.

The comparative framework employed in this study provides insights into how inflation risk compensation evolves as economies develop deeper financial markets and establish monetary policy credibility. The UK experience suggests that sustained commitment to price stability can anchor inflation expectations and compress risk premia over time. India's trajectory will depend on maintaining policy discipline, developing liquid inflation-linked bond markets, and navigating external shocks that can temporarily elevate inflation compensation.

Future research could extend this analysis to incorporate high-frequency monetary policy surprises and examine their differential impacts on inflation risk premia across markets. Additionally, exploring the role of inflation-linked bond market microstructure in determining premia levels would enhance our understanding of the liquidity-risk premium interaction in these markets.

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