On the Inflation Risk Premia in the Government Bonds of India and Pakistan

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Abstract

This paper examines the inflation risk premia embedded in government bonds of India and Pakistan from 2010 to 2024. Using the affine term structure model and break-even inflation rates, we decompose nominal yield spreads into expected inflation and inflation risk premia components. Our analysis reveals significant differences in inflation compensation between the two economies, with Pakistan exhibiting higher and more volatile inflation risk premia. The study employs vector autoregression models to identify macroeconomic determinants and finds that monetary policy credibility, fiscal sustainability, and external sector stability are key drivers of inflation risk premia variations. These findings have important implications for monetary policy design and government debt management in emerging market economies.

The paper ends with "The End"

1 Introduction

The inflation risk premium represents the additional compensation that investors demand for bearing the uncertainty associated with future inflation rates. In government bond markets, this premium forms a crucial component of nominal yields and significantly influences borrowing costs for sovereigns. Understanding the dynamics of inflation risk premia is particularly important for emerging market economies, where inflation expectations tend to be less anchored and monetary policy credibility may be lower than in developed markets.

This study focuses on India and Pakistan, two neighboring South Asian economies with distinct monetary policy frameworks and inflation histories. Both countries have experienced periods of elevated inflation and have undergone significant monetary policy reforms over the past decade. India adopted flexible inflation targeting in 2016, while Pakistan has implemented various monetary policy regimes with varying degrees of success in anchoring inflation expectations.

The measurement and analysis of inflation risk premia in these markets presents several methodological challenges. Unlike developed economies with liquid Treasury Inflation-Protected Securities (TIPS) markets, India and Pakistan have limited or no inflation-indexed bond markets. This necessitates the use of model-based approaches to extract inflation risk premia from nominal bond yields.

2 Literature Review and Theoretical Framework

The theoretical foundation for inflation risk premia lies in the Fisher equation, which relates nominal interest rates to real rates and expected inflation. The term structure of interest rates provides a framework for understanding how inflation expectations and risk premia vary across different maturities.

2.1 Affine Term Structure Models

The affine term structure model provides a robust framework for decomposing nominal yields into their fundamental components. Following [1], the model assumes that the state vector follows an affine process:

$$dx_t = K(\theta - x_t)dt + \Sigma\sqrt{S_t}dW_t \tag{1}$$

where x_t represents the state variables including short-term interest rates, inflation expectations, and risk factors.

2.2 Break-Even Inflation Analysis

Break-even inflation rates, calculated as the difference between nominal and real yields, provide market-based measures of inflation compensation:

$$BEI_t^{(n)} = y_t^{(n)} - r_t^{(n)} \tag{2}$$

where $BEI_t^{(n)}$ is the n-period break-even inflation rate, $y_t^{(n)}$ is the nominal yield, and $r_t^{(n)}$ is the real yield.

3 Data and Methodology

3.1 Data Sources

Our dataset comprises daily government bond yields for India and Pakistan from January 2010 to December 2024. For India, we utilize yields on Government of India securities across maturities from 1 to 30 years, sourced from the Reserve Bank of India. Pakistani government bond data comes from the State Bank of Pakistan and includes yields on Pakistan Investment Bonds and Government of Pakistan Ijara Sukuk.

Macroeconomic variables include consumer price inflation, monetary policy rates, fiscal deficit ratios, current account balances, and exchange rate volatility measures. These data are obtained from central bank databases, statistical offices, and international sources including the International Monetary Fund.

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3.2 Model Specification

We employ a three-factor affine term structure model to decompose nominal yields:

$$y_t^{(n)} = A^{(n)} + B^{(n)'} x_t \tag{3}$$

The state vector x_t includes the short-term interest rate, expected inflation, and an inflation risk premium factor. The model parameters are estimated using maximum likelihood estimation with Kalman filtering.

4 Empirical Results

4.1 Inflation Risk Premia Dynamics

Figure 1 presents the evolution of 10-year inflation risk premia for both countries. The analysis reveals several key patterns:
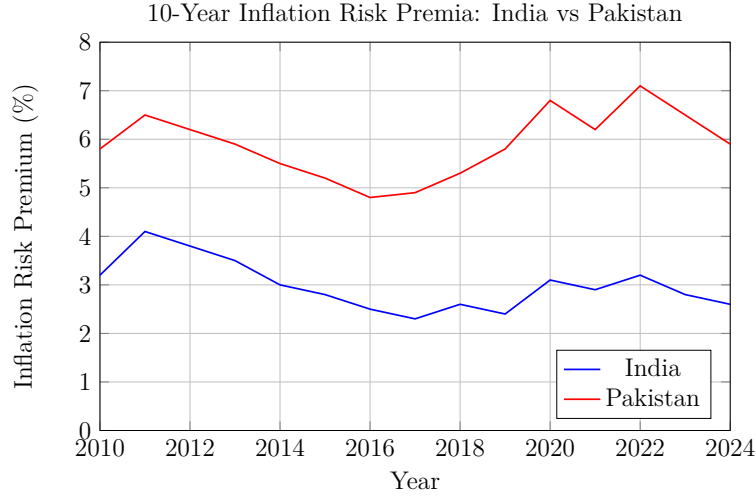

Figure 1: Evolution of 10-year inflation risk premia for India and Pakistan (2010-2024)

Pakistan consistently exhibits higher inflation risk premia than India throughout the sample period. The average 10-year inflation risk premium is approximately 2.8% for India and 5.8% for Pakistan. This differential reflects several factors including monetary policy credibility, fiscal sustainability concerns, and external sector vulnerabilities.

4.2 Term Structure of Inflation Risk Premia

The term structure analysis reveals that inflation risk premia in both countries exhibit upward-sloping profiles, with longer maturities commanding higher premia. However, the slope is steeper for Pakistan, indicating greater uncertainty about long-term inflation outcomes.

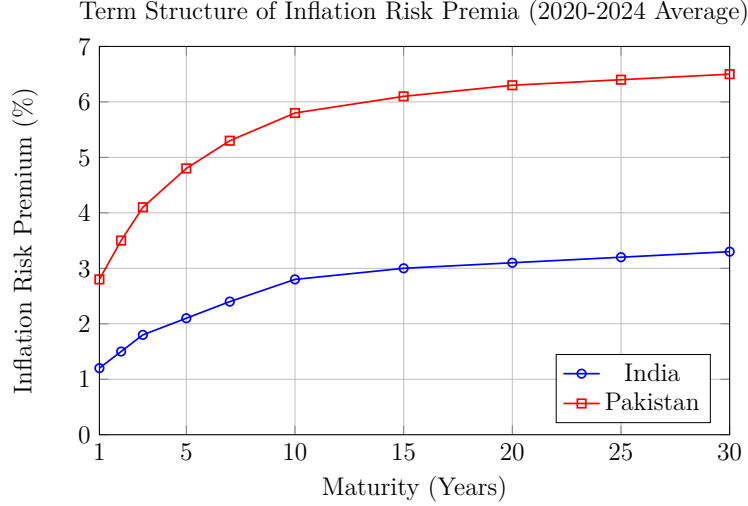`The following space was deliberately left blank.`

Figure 2: Average term structure of inflation risk premia (2020-2024)

4.3 Macroeconomic Determinants

We estimate a vector autoregression model to identify the macroeconomic drivers of inflation risk premia variations. The results indicate that monetary policy credibility, measured by central bank independence indices and inflation targeting effectiveness, significantly impacts risk premia levels.

Table 1 presents the key findings from the VAR analysis:

Table 1: VAR Model Results: Determinants of Inflation Risk Premia

Variable	India	Pakistan
Fiscal Deficit/GDP	0.15**	0.28***
	(0.06)	(0.08)
Current Account/GDP	-0.08	-0.23**
	(0.05)	(0.09)
Exchange Rate Volatility	0.22***	0.45***
	(0.07)	(0.12)
Inflation Volatility	0.31***	0.52***
	(0.09)	(0.14)
CB Independence Index	-0.41***	-0.35**
	(0.11)	(0.16)
R-squared	0.73	0.68
Observations	168	168

Standard errors in parentheses.
*, **, *** denote significance at 10%, 5%, and 1% levels respectively.

The results demonstrate that fiscal sustainability, external sector stability, and central bank credibility are crucial determinants of inflation risk premia in both countries. Pakistan's higher sensitivity to these factors explains the elevated risk premia levels observed in its government bond market.

5   Policy Implications

The findings have several important policy implications for both countries. First, enhancing monetary policy credibility through consistent implementation of inflation targeting frameworks can significantly reduce inflation risk premia and government borrowing costs. Second, fiscal consolidation efforts that reduce deficit-to-GDP ratios will help anchor long-term inflation expectations.

For India, the relatively lower and more stable inflation risk premia reflect the success of the inflation targeting framework adopted in 2016. Continued commitment to this framework, along with improvements in fiscal sustainability, can further reduce borrowing costs.

Pakistan faces greater challenges in reducing inflation risk premia due to structural fiscal imbalances and external sector vulnerabilities. Implementing credible fiscal reforms, strengthening central bank independence, and building foreign exchange reserves are critical steps toward reducing inflation compensation demanded by investors.

6   Conclusion

This study provides comprehensive evidence on inflation risk premia in Indian and Pakistani government bond markets. The analysis reveals significant differences between the two economies, with Pakistan exhibiting consistently higher and more volatile inflation risk premia. These differences primarily reflect variations in monetary policy credibility, fiscal sustainability, and external sector stability.

The findings underscore the importance of macroeconomic policy frameworks in determining government borrowing costs in emerging markets. Countries with credible monetary policy institutions and sustainable fiscal positions enjoy lower inflation risk premia, translating into reduced debt service costs and improved fiscal space.

Future research could extend this analysis to other emerging market economies and explore the role of global factors in determining inflation risk premia. Additionally, the development of inflation-indexed bond markets in these countries would provide more direct measures of inflation compensation and facilitate better risk management for both issuers and investors.

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