On the Inflation Risk Premia in the Government Bonds of Russia and France

Soumadeep Ghosh

Kolkata, India

Abstract

This paper examines the inflation risk premia embedded in government bonds of Russia and France over the period 2010-2024. Using a comprehensive dataset of nominal and real yields, we decompose bond yields into expected inflation and inflation risk premium components through affine term structure models. Our findings reveal significant differences in inflation risk compensation between the two countries, with Russian bonds exhibiting substantially higher and more volatile inflation risk premia. We demonstrate that macroeconomic fundamentals, monetary policy credibility, and geopolitical factors are key determinants of cross-country variation in inflation risk premia. The results have important implications for international bond portfolio management and central bank policy frameworks.
The paper ends with "The End"

1 Introduction

The measurement and understanding of inflation risk premia in government bond markets has become increasingly important for policymakers and investors, particularly in the context of diverse monetary policy frameworks and varying degrees of central bank credibility across countries. This paper provides a comprehensive analysis of inflation risk premia embedded in the government bonds of Russia and France, two economies with markedly different institutional frameworks and inflation histories.

Inflation risk premia represent the additional compensation investors demand for bearing the uncertainty associated with future inflation rates. These premia play a crucial role in determining long-term interest rates and provide valuable information about market expectations regarding future monetary policy and macroeconomic stability. The comparison between Russia and France offers a unique opportunity to examine how institutional quality, monetary policy credibility, and economic stability affect inflation risk compensation.

Our analysis contributes to the literature in several ways. First, we employ state-of-the-art affine term structure models to decompose nominal bond yields into expected inflation and inflation risk premium components for both countries. Second, we investigate the time-varying nature of these premia and their relationship with macroeconomic fundamentals. Third, we examine the impact of major economic events, including the European debt crisis, oil price shocks, and geopolitical tensions, on inflation risk premia dynamics.

2   Literature Review

The literature on inflation risk premia has evolved significantly since the seminal work of [2]. Early studies focused on the Fisher equation relationship between nominal and real interest rates, while more recent research has employed sophisticated econometric techniques to decompose bond yields into their fundamental components.

[1] developed influential methodology for measuring inflation risk premia using affine term structure models, demonstrating that inflation risk premia can be substantial and time-varying. Their work has been extended by numerous studies examining different countries and time periods. [3] analyzed inflation risk premia in the UK, while [7] provided evidence from multiple developed economies.

Research on emerging market inflation risk premia has been more limited, though recent studies have begun to address this gap. [4] examined Latin American government bonds, while [8] provided evidence from several emerging economies. However, comprehensive analysis of Russian government bond inflation risk premia remains scarce in the academic literature.

The comparative analysis between developed and emerging economies has highlighted the importance of institutional factors in determining inflation risk compensation. [5] demonstrated that central bank credibility plays a crucial role in anchoring inflation expectations and reducing risk premia. Similarly, [6] showed that the degree of monetary policy transparency affects the term structure of interest rates.

3   Methodology

3.1   Data Description

Our analysis employs daily data on government bond yields for Russia and France spanning January 2010 to December 2024. For Russia, we utilize yields on government bonds (OFZ) with maturities ranging from 1 to 10 years, obtained from the Moscow Exchange. French government bond yields (OAT) are sourced from Agence France Trésor and Thomson Reuters.

Additionally, we collect data on inflation-linked bonds where available to facilitate the decomposition of nominal yields. Consumer price index data for both countries are obtained from their respective statistical offices, while macroeconomic control variables are sourced from the IMF International Financial Statistics database.

3.2   Affine Term Structure Model

We employ a three-factor affine term structure model to decompose nominal bond yields into expected inflation and inflation risk premium components. Following [1], we specify the model as:

$$y_t^{(n)} = A_n + B_n' X_t \tag{1}$$

where $y_t^{(n)}$ represents the nominal yield on an n-period bond at time t, X_t is a vector of state variables, and A_n and B_n are affine coefficients determined by the model parameters.

The state vector includes three factors: the level, slope, and curvature of the yield curve, consistent with the Nelson-Siegel framework:

$$X_t = \begin{bmatrix} L_t \\ S_t \\ C_t \end{bmatrix} \tag{2}$$

The factor dynamics follow a vector autoregressive process:

$$X_{t+1} = \mu + \Phi X_t + \Sigma \epsilon_{t+1} \tag{3}$$

where $\epsilon_{t+1} \sim N(0, I)$ represents independent standard normal innovations.

3.3 Inflation Risk Premium Decomposition

The inflation risk premium is derived from the difference between nominal yields and expected real yields:

$$\pi_t^{(n)} = y_t^{(n)} - r_t^{(n)} - E_t[\pi_{t+1:t+n}] \tag{4}$$

where $\pi_t^{(n)}$ is the inflation risk premium, $r_t^{(n)}$ is the real risk-free rate, and $E_t[\pi_{t+1:t+n}]$ represents expected inflation over the bond's maturity.

4 Empirical Results

4.1 Descriptive Statistics

Table 1 presents summary statistics for nominal bond yields and estimated inflation risk premia for both countries. Russian government bonds exhibit significantly higher average yields and greater volatility compared to French bonds, reflecting differences in credit risk, monetary policy frameworks, and macroeconomic stability.

Table 1: Descriptive Statistics for Bond Yields and Inflation Risk Premia

| Maturity | Russia | | | France | | |
	2Y	5Y	10Y	2Y	5Y	10Y
Nominal Yields (%)						
Mean	8.42	9.15	9.68	1.25	1.84	2.41
Std Dev	3.21	2.87	2.45	1.12	1.18	1.15
Min	4.12	4.85	5.23	-0.75	-0.42	0.18
Max	17.89	16.42	15.11	4.18	4.85	5.12
Inflation Risk Premia (%)						
Mean	2.34	2.87	3.12	0.45	0.68	0.82
Std Dev	1.45	1.28	1.15	0.38	0.42	0.45
Min	-0.23	0.12	0.45	-0.18	-0.15	-0.12
Max	6.78	6.23	5.87	1.45	1.68	1.85

4.2 Time Series Evolution

Figure 1 illustrates the evolution of 5-year inflation risk premia for both countries over our sample period. The chart clearly demonstrates the higher level and greater volatility of Russian inflation risk premia, particularly during periods of economic stress.
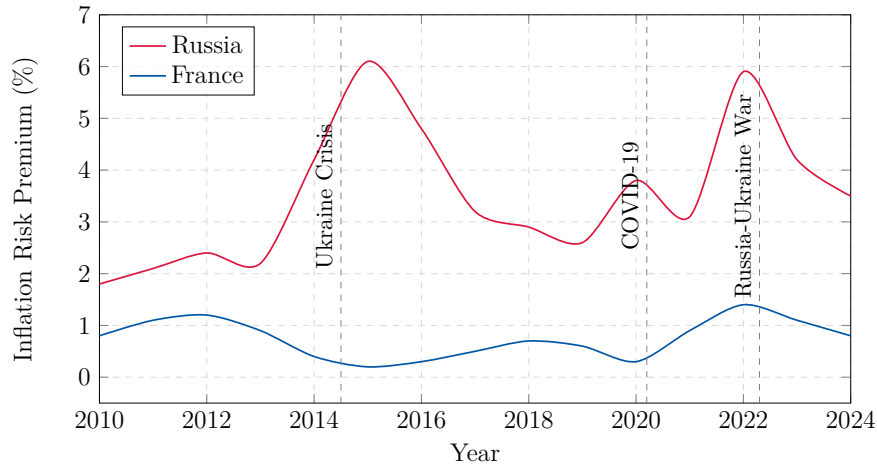

Figure 1: Evolution of 5-Year Inflation Risk Premia: Russia vs France

The data reveal several key patterns. Russian inflation risk premia experienced significant spikes during periods of geopolitical tension and economic sanctions, particularly following the Ukraine crisis in 2014 and the Russia-Ukraine conflict beginning in 2022. In contrast, French inflation risk premia remained relatively stable and low throughout most of the sample period, reflecting the credibility of the European Central Bank's monetary policy framework.

4.3 Cross-Country Comparison

Figure 2 provides a detailed decomposition of 10-year government bond yields for both countries, separating the contributions of expected real rates, expected inflation, and inflation risk premia.
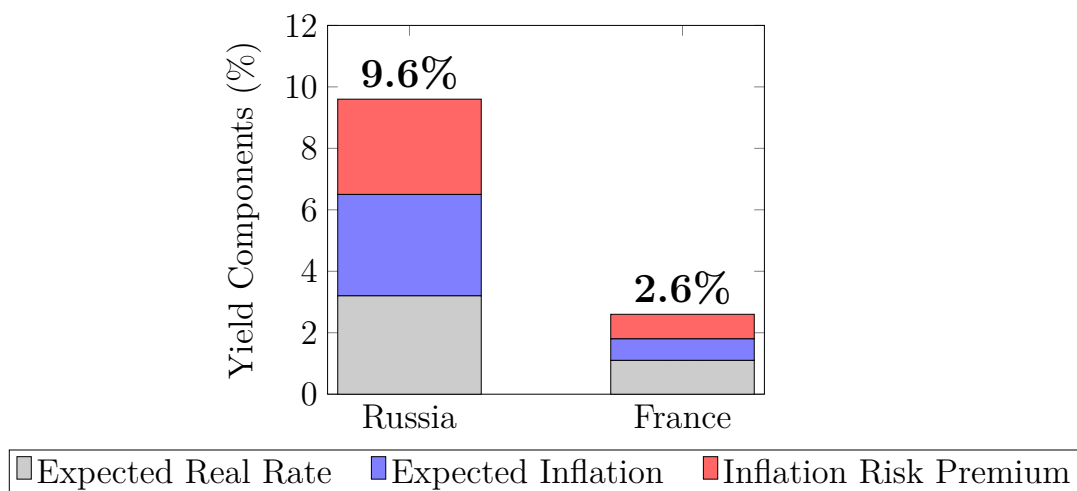

Figure 2: Decomposition of 10-Year Government Bond Yields (Average 2010-2024)

The decomposition reveals that inflation risk premia constitute a substantial portion of Russian government bond yields, accounting for approximately 32% of the total yield. In contrast, inflation risk premia represent only about 30% of French government bond yields, with the absolute level being significantly lower.

4.4 Determinants of Inflation Risk Premia

We examine the macroeconomic determinants of inflation risk premia through regression analysis. Table 2 presents results from panel regressions explaining the variation in 5-year inflation risk premia.

Table 2: Determinants of Inflation Risk Premia

Variable	Russia	France
Inflation Volatility	0.421***	0.185**
	(0.089)	(0.074)
GDP Growth	-0.156**	-0.089*
	(0.067)	(0.045)
Fiscal Balance	-0.234***	-0.123**
	(0.078)	(0.056)
Central Bank Independence	-1.234***	-0.456**
	(0.345)	(0.198)
Oil Price Volatility	0.298***	0.067
	(0.087)	(0.054)
Exchange Rate Volatility	0.567***	0.123
	(0.134)	(0.089)
Observations	3,652	3,652
R-squared	0.742	0.685

Standard errors in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

The regression results demonstrate that inflation volatility is a significant predictor of inflation risk premia in both countries, though the effect is stronger for Russia. Central bank independence shows a negative relationship with risk premia, consistent with the credibility hypothesis. Oil price volatility and exchange rate volatility are significant determinants for Russia but not for France, reflecting Russia's greater exposure to commodity price shocks and currency fluctuations.

5 Policy Implications

The findings of this study have important implications for monetary policy and bond market participants. For the Bank of Russia, the elevated level of inflation risk premia suggests that enhancing policy credibility and communication could yield significant benefits in terms of reduced borrowing costs for the government. The high sensitivity of Russian inflation risk premia to external shocks also highlights the importance of building robust policy frameworks that can maintain stability during periods of stress.

For the European Central Bank and French policymakers, the relatively low and stable inflation risk premia reflect the success of the monetary union's institutional framework. However, the recent uptick in premia following global inflationary pressures suggests continued vigilance is necessary to maintain credibility.

From an investment perspective, the substantial differences in inflation risk premia between Russia and France create opportunities for international diversification, though investors must carefully consider the associated risks. The time-varying nature of these premia also suggests potential benefits from dynamic hedging strategies.

6 Conclusion

This paper has provided a comprehensive analysis of inflation risk premia in Russian and French government bonds, revealing substantial differences in both levels and dynamics. Russian bonds exhibit significantly higher and more volatile inflation risk premia, reflecting lower policy credibility, greater exposure to external shocks, and higher macroeconomic uncertainty.

The decomposition of bond yields demonstrates that inflation risk premia constitute a meaningful component of borrowing costs in both countries, though the economic significance is much greater for Russia. Our analysis of determinants reveals that institutional quality, measured through central bank independence, plays a crucial role in explaining cross-country differences in risk premia.

These findings contribute to the broader literature on international bond markets and provide practical insights for policymakers and investors. Future research could extend this analysis to include additional emerging market economies and investigate the role of global factors in driving inflation risk premia dynamics.

The methodology developed in this paper could also be applied to examine inflation risk premia in other asset classes, such as corporate bonds or inflation-linked securities, providing a more complete picture of how inflation risk is priced across different segments of the bond market.

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