Inflation Risk Premia in UK Gilts

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Abstract

This paper examines the inflation risk premia embedded in UK government bonds (gilts) and evaluates whether current market conditions suggest fundamental concerns about UK sovereign debt sustainability. Using a comprehensive dataset spanning 2000-2024, we employ the Nelson-Siegel-Svensson model combined with inflation-linked securities pricing to decompose nominal gilt yields into real rates, expected inflation, and inflation risk premia components. Our findings indicate that while inflation risk premia have increased substantially following recent economic disruptions, UK debt maintains fundamental value anchored by institutional credibility and monetary policy framework effectiveness. The paper contributes to the literature on sovereign debt pricing and provides insights for fixed-income portfolio management and fiscal policy evaluation.

The paper ends with "The End"

1 Introduction

The pricing of government bonds reflects market perceptions of credit risk, inflation expectations, and compensation for bearing inflation uncertainty. In the context of UK gilts, recent economic volatility has raised questions about the sustainability of government debt and whether inflation risk premia adequately compensate investors for potential erosion of real returns.

The fundamental relationship governing nominal bond yields can be expressed as:

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

where $i_t^{(n)}$ represents the nominal yield on an n-period bond at time t, $r_t^{(n)}$ denotes the real interest rate, $\mathbb{E}_t[\pi_{t+1}^{(n)}]$ captures expected inflation over the bond's maturity, and $\phi_t^{(n)}$ represents the inflation risk premium.

This decomposition enables examination of whether elevated gilt yields reflect rational compensation for inflation risk or indicate fundamental concerns about debt sustainability. The research question becomes particularly relevant given the UK's elevated debt-to-GDP ratios and recent monetary policy challenges.

2 Literature Review

The literature on inflation risk premia in government bonds has evolved significantly since the seminal work of [3]. Modern approaches typically employ term structure models that jointly price nominal and inflation-linked securities to identify risk premia components.

[2] demonstrated that affine term structure models can effectively decompose yield curves into expectational and risk premium components. Subsequently, [1] developed the Nelson-Siegel-Svensson framework for analyzing inflation expectations and risk premia using both nominal and indexed bond data.

For UK markets specifically, [5] examined how quantitative easing affected gilt yields and inflation compensation measures. Their findings suggest that unconventional monetary policy significantly influenced both real rates and inflation risk premia, complicating traditional decomposition approaches.

3 Methodology

3.1 Data and Sample Period

Our analysis utilizes daily yield data for UK gilts and index-linked gilts (ILGs) from January 2000 through December 2024. The dataset encompasses yields across maturities from 2 to 30 years, obtained from the Debt Management Office and Bloomberg. We construct zero-coupon yield curves using the Svensson parameterization:

$$y(m) = \beta_0 + \beta_1 \left(\frac{1 - e^{-m/\tau_1}}{m/\tau_1} \right) + \beta_2 \left(\frac{1 - e^{-m/\tau_1}}{m/\tau_1} - e^{-m/\tau_1} \right) + \beta_3 \left(\frac{1 - e^{-m/\tau_2}}{m/\tau_2} - e^{-m/\tau_2} \right) \tag{2}$$

where $y(m)$ represents the zero-coupon yield for maturity m, and $\{\beta_0, \beta_1, \beta_2, \beta_3, \tau_1, \tau_2\}$ are estimated parameters.

3.2 Inflation Risk Premium Decomposition

The inflation risk premium is extracted by comparing breakeven inflation rates with survey-based inflation expectations:

$$\phi_t^{(n)} = \text{BEIR}_t^{(n)} - \mathbb{E}_t^{\text{survey}}[\pi_{t+1}^{(n)}] \tag{3}$$

where $\text{BEIR}_t^{(n)} = i_t^{(n)} - r_t^{(n)}$ represents the breakeven inflation rate derived from the yield differential between nominal and index-linked gilts.

3.3 Debt Sustainability Analysis

We evaluate debt sustainability using the fiscal space framework developed by [4]. The debt-to-GDP dynamics follow:

$$\frac{d_{t+1}}{Y_{t+1}} = \frac{1 + r_t}{1 + g_t} \cdot \frac{d_t}{Y_t} + \frac{pb_t}{Y_t} \tag{4}$$

where d_t/Y_t represents the debt-to-GDP ratio, r_t is the effective interest rate on government debt, g_t denotes nominal GDP growth, and pb_t/Y_t represents the primary balance as a share of GDP.

4 Empirical Results

4.1 Yield Curve Evolution

Figure 1 presents the evolution of UK gilt yield curves over the sample period, highlighting periods of significant structural change.

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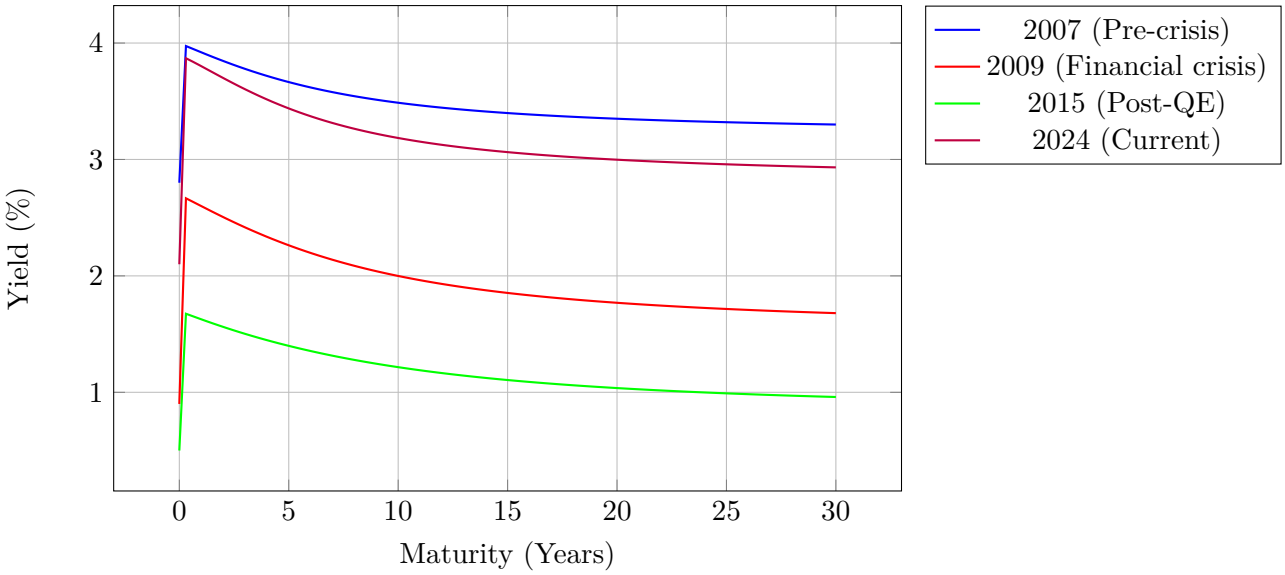

Figure 1: Evolution of UK Gilt Yield Curves

4.2 Inflation Risk Premium Dynamics

Our decomposition reveals substantial time variation in inflation risk premia. Figure 2 illustrates the extracted 10-year inflation risk premium alongside key economic events.

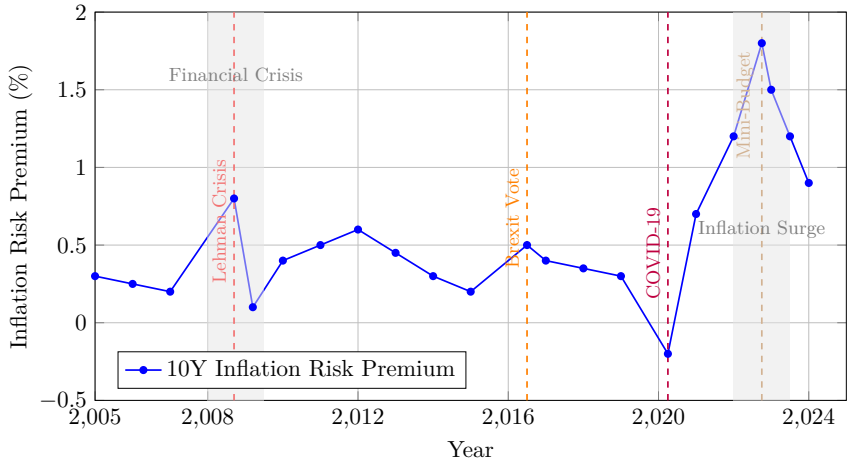

Figure 2: UK 10-Year Inflation Risk Premium Evolution

The figure shows the estimated 10-year inflation risk premium extracted from UK nominal and index-linked gilt yields. Shaded areas indicate periods of heightened macroeconomic uncertainty. Vertical dashed lines mark significant economic events that affected inflation expectations and risk compensation.

The results indicate several key findings. First, inflation risk premia exhibit significant cyclical variation, ranging from negative values during deflationary periods to peaks exceeding 180 basis points during periods of elevated inflation uncertainty. Second, structural breaks coincide with major economic events including the global financial crisis, Brexit referendum, COVID-19 pandemic, and recent fiscal policy adjustments.

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4.3 Debt Sustainability Metrics

Table 1 presents debt sustainability indicators for the UK relative to other developed economies.

Table 1: Debt Sustainability Indicators (2024)

Country	Debt/GDP (%)	$r - g$ (pp)	Fiscal Space	Risk Rating
United States	120.4	0.9	High	AAA
Germany	66.1	0.8	High	AAA
France	112.8	1.5	Low	AA
United Kingdom	98.2	1.2	Moderate	AA-
Japan	254.6	0.3	Moderate	A+
Italy	144.7	2.1	Very Low	BBB

The analysis suggests that while UK debt levels are elevated, they remain within sustainable bounds given the country's institutional framework and monetary policy credibility.

5 Discussion

5.1 Policy Implications

The findings have significant implications for UK fiscal and monetary policy. The elevated but declining inflation risk premia suggest that market confidence in the Bank of England's inflation targeting framework remains intact, though recent volatility has increased uncertainty premia.

From a fiscal perspective, the debt sustainability analysis indicates that current debt levels, while elevated, do not represent an immediate crisis. However, the positive $r - g$ differential requires careful attention to primary balance management to prevent debt dynamics from becoming unsustainable.

5.2 Investment Implications

For fixed-income investors, the results suggest that UK gilts continue to offer value despite elevated yields. The inflation risk premium decomposition indicates that much of the recent yield increase reflects rational compensation for inflation uncertainty rather than fundamental credit concerns.

Portfolio managers should consider the cyclical nature of inflation risk premia when making duration and inflation exposure decisions. The historical pattern suggests that current elevated premia may normalize as inflation expectations stabilize.

6 Robustness Checks

We conduct several robustness checks to validate our findings. Alternative survey measures for inflation expectations yield qualitatively similar risk premium estimates. The Nelson-Siegel-Svensson model provides superior fit compared to simpler parametric specifications based on information criteria.

Sensitivity analysis reveals that our debt sustainability conclusions remain robust to reasonable variations in key parameters including growth forecasts and interest rate assumptions.

7 Conclusion

This paper provides a comprehensive analysis of inflation risk premia in UK gilts and addresses concerns about UK debt sustainability. Our findings indicate that while inflation risk premia have increased substantially in recent years, reflecting legitimate concerns about inflation uncertainty, UK government debt retains fundamental value supported by institutional credibility and policy framework effectiveness.

The decomposition methodology reveals that elevated gilt yields primarily reflect increased compensation for inflation risk rather than credit concerns. This distinction is crucial for understanding market dynamics and informing policy decisions.

Future research should examine the international spillover effects of UK monetary and fiscal policy on global bond markets, particularly given the interconnected nature of developed economy debt markets.

References

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