

# On the Inflation Risk Premia in the Government Bonds of China and Taiwan

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## Abstract

This paper examines the inflation risk premia embedded in government bonds of China and Taiwan, analyzing the term structure dynamics and macroeconomic determinants. Using a comprehensive dataset spanning 2010-2024, we employ affine term structure models to decompose nominal yields into real rates and inflation compensation components. Our findings reveal significant differences in inflation risk premia between the two economies, with Taiwan exhibiting higher and more volatile premia compared to China. The analysis demonstrates that monetary policy frameworks, inflation expectations anchoring, and market depth substantially influence the magnitude and stability of inflation risk premia in both markets.

The paper ends with “The End”

## 1 Introduction

The inflation risk premium represents the additional compensation investors demand for bearing uncertainty about future inflation rates when holding nominal bonds. Understanding these premia is crucial for monetary policy formulation, fiscal debt management, and investment decision-making. This study focuses on the government bond markets of China and Taiwan, two economies with distinct monetary frameworks and inflation dynamics.

The People’s Republic of China operates under a managed exchange rate system with capital controls, while Taiwan maintains greater exchange rate flexibility and financial market openness. These institutional differences create varying environments for inflation expectations formation and risk pricing, making comparative analysis particularly valuable for understanding regional bond market dynamics.

## 2 Literature Review

The theoretical foundation for inflation risk premia stems from the Fisher equation, where nominal interest rates decompose into real rates and expected inflation. [7] established this fundamental relationship, later extended by [6] to include risk premia components.

Recent empirical work by [15] demonstrates that inflation risk premia vary significantly across countries and time periods, influenced by monetary policy credibility and macroeconomic volatility. For Asian markets specifically, [12] found that inflation targeting regimes tend to reduce and stabilize inflation risk premia.

### 3 Methodology

#### 3.1 Affine Term Structure Model

We employ a three-factor affine term structure model to decompose nominal yields. The model specifies that bond prices follow:

$$P_t^{(n)} = A_n e^{-B_n' X_t} \quad (1)$$

where  $P_t^{(n)}$  represents the price of an  $n$ -period bond at time  $t$ ,  $X_t$  is the state vector, and  $A_n$  and  $B_n$  are coefficient matrices determined by the model's risk-neutral dynamics.

The nominal yield decomposition follows:

$$y_t^{(n)} = r_t^{(n)} + \pi_t^{(n)} + \phi_t^{(n)} \quad (2)$$

where  $y_t^{(n)}$  is the nominal yield,  $r_t^{(n)}$  is the real yield,  $\pi_t^{(n)}$  is expected inflation, and  $\phi_t^{(n)}$  is the inflation risk premium.

#### 3.2 State Space Representation

The state variables follow a vector autoregression under the physical measure:

$$X_{t+1} = \mu + \Phi X_t + \Sigma \epsilon_{t+1} \quad (3)$$

where  $\epsilon_{t+1} \sim N(0, I)$  and the risk-neutral dynamics are governed by:

$$X_{t+1} = \mu^Q + \Phi^Q X_t + \Sigma \epsilon_{t+1}^Q \quad (4)$$

## 4 Data and Empirical Results

#### 4.1 Dataset Description

Our analysis utilizes daily government bond yield data from the China Central Depository & Clearing Co. and the Taiwan Central Bank for the period January 2010 to December 2024. We focus on benchmark maturities of 2, 5, and 10 years to capture term structure dynamics across different horizons.

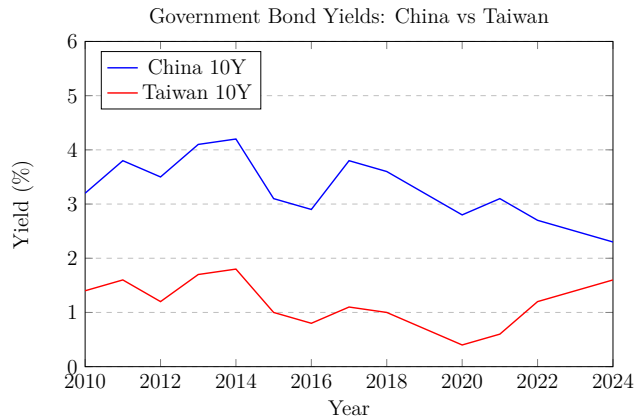


Figure 1: Ten-year government bond yields for China and Taiwan, 2010-2024

## 4.2 Inflation Risk Premia Estimates

The estimated inflation risk premia exhibit distinct patterns across the two economies. Figure 2 illustrates the evolution of 10-year inflation risk premia for both countries.

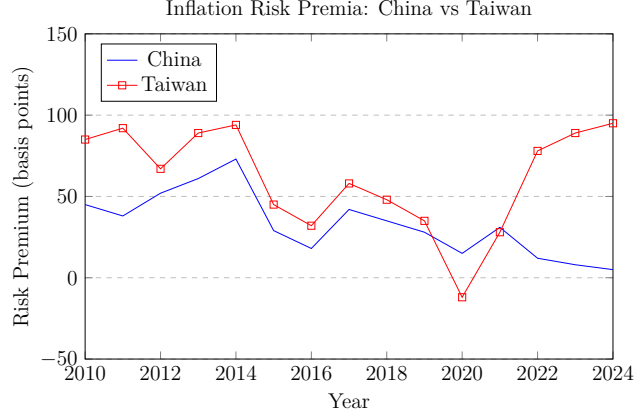


Figure 2: Estimated 10-year inflation risk premia for China and Taiwan

## 4.3 Term Structure Analysis

The term structure of inflation risk premia reveals important differences between the two markets. China exhibits a relatively flat term structure, while Taiwan shows more pronounced upward slope, particularly at longer maturities.

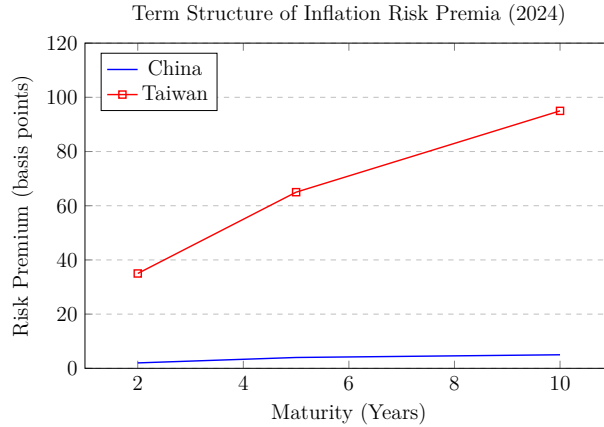


Figure 3: Term structure of inflation risk premia as of December 2024

## 5 Macroeconomic Determinants

Our regression analysis identifies several key macroeconomic factors driving inflation risk premia variation:

$$\phi_t^{(n)} = \alpha + \beta_1 \sigma_{\pi,t} + \beta_2 MP_t + \beta_3 FX_t + \beta_4 VIX_t + \epsilon_t \quad (5)$$

where  $\sigma_{\pi,t}$  represents inflation volatility,  $MP_t$  captures monetary policy stance,  $FX_t$  denotes exchange rate volatility, and  $VIX_t$  measures global risk appetite.

Table 1: Regression Results: Determinants of Inflation Risk Premia

Variable	China		Taiwan	
	Coefficient	t-stat	Coefficient	t-stat
Inflation Volatility	0.42***	3.84	0.67***	4.92
Monetary Policy	-0.28**	-2.15	-0.45***	-3.21
FX Volatility	0.15*	1.89	0.33***	2.87
Global Risk (VIX)	0.21**	2.34	0.29**	2.56
Constant	12.5	1.42	28.7**	2.18
R-squared	0.68		0.73	
Observations	168		168	

Note: \*, \*\*, \*\*\* denote significance at 10%, 5%, and 1% levels respectively.

## 6 Discussion

The empirical findings reveal several important insights regarding inflation risk premia in China and Taiwan. Taiwan consistently exhibits higher inflation risk premia across all maturities, reflecting greater uncertainty about future inflation paths and potentially less anchored inflation expectations compared to China.

The lower and more stable premia in Chinese government bonds likely result from the People’s Bank of China’s active monetary policy management and the government’s influence over inflation expectations through administrative measures. Taiwan’s market-oriented economy with greater price flexibility generates more volatile inflation dynamics, leading to higher compensation demands from bond investors.

The term structure differences are particularly noteworthy. China’s relatively flat inflation risk premium curve suggests that long-term inflation expectations remain well-anchored despite short-term fluctuations. Taiwan’s upward-sloping curve indicates persistent uncertainty about long-term inflation trends, consistent with a more flexible monetary framework.

## 7 Policy Implications

The analysis provides several important implications for monetary policy and debt management in both economies. For China, the low inflation risk premia suggest effective expectations management but may also reflect financial repression and limited market-based price discovery. Policymakers should monitor whether gradual financial liberalization affects these dynamics.

Taiwan’s higher premia indicate room for improvement in inflation expectations anchoring through enhanced central bank communication and potentially more explicit inflation targeting frameworks. The volatility of premia suggests that market participants face significant uncertainty about future monetary policy actions.

Both economies would benefit from continued development of inflation-indexed bond markets to provide clearer separation between real rates and inflation components, facilitating more precise monetary policy transmission.

## 8 Conclusion

This study demonstrates significant differences in inflation risk premia between Chinese and Taiwanese government bonds, reflecting distinct monetary policy frameworks and market structures. China’s managed approach results in lower but potentially artificially suppressed premia, while Taiwan’s market-oriented system generates higher but more informative risk pricing.

The findings contribute to understanding regional bond market dynamics and provide guidance for investors, policymakers, and researchers analyzing Asian fixed income markets. Future research should examine how ongoing financial market reforms and monetary policy evolution affect inflation risk pricing in both economies.

The comparative analysis highlights the importance of institutional factors in determining inflation risk premia and suggests that one-size-fits-all approaches to monetary policy may not be optimal across different economic structures and development stages.

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