The Impact of Monetary Policy on the Specialness of U.S. Treasuries

Presentation to PIER

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Overview

- **Background:** Investors value the liquidity and safety of government bonds, especially those of U.S. Treasuries
  - They are willing to pay a "convenience yield" to hold these bonds
  - U.S. Treasuries earn the *highest* convenience yield $\rightarrow$ specialness of U.S. Treasuries
- **Question:** What drive this specialness of U.S. Treasuries?
- **This Paper:** Estimates the causal effect of monetary policy on the specialness of U.S. Treasuries
  - Use the "U.S. Treasury Premium" measure
  - Employ High-Frequency identification strategy

Terminology

Convenience Yield:

$$\underbrace{\lambda_{i,n,t}}_{\text{Convenience yield of country } i} = \underbrace{y^{rf}_{i,n,t}}_{\text{Risk-free rate of country } i} - \underbrace{y^{Govt}_{i,n,t}}_{\text{Govt yield of country } i}$$

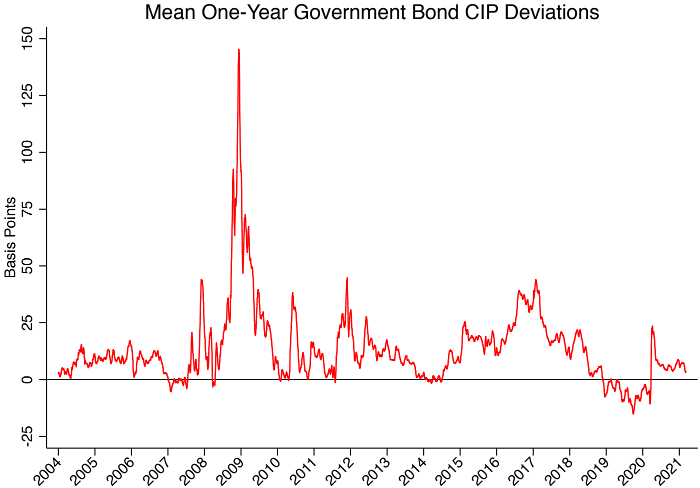
U.S. Treasury Premium:

$$\underbrace{\Phi_{i,n,t}}_{\text{UST Premium}} = \underbrace{\lambda_{\$,n,t}}_{\text{U.S. Convenience Yield}} - \underbrace{\lambda_{i,n,t}}_{\text{Foreign Convenience Yield}} + \underbrace{\tau_{i,n,t}}_{\text{FX Frictions}}$$

$=$ the difference in the convenience yields, measured as the CIP deviation of government bond yields

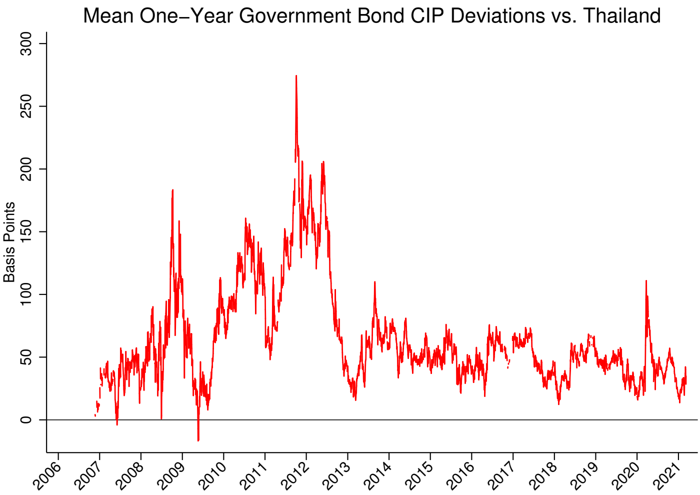
Measurement

U.S. Treasury Premium vs. G10 Countries



Summary Statistics

U.S. Treasury Premium vs. Thailand



Why does this matter?

- **U.S. Treasury Premium represents the relative funding cost advantage of the U.S. government**
- **Implications for asset prices**
  - Dollar debt dominance
  - Dollar FX movement
  - Dollar risk factor
- **The “convenience yield channel" of monetary policy**
  - Related to the “Global Financial Cycle”
  - Explain spillover impact of a local shock (but not to the U.S.)

Related Literature

- **Specialness of U.S. Treasuries:** Krishnamurthy and Vissing-Jorgensen (2012), Nagel (2016), Greenwood, Hanson, and Stein (2015), Du, Im, and Schreger (2018)
- **Exorbitant Privilege & Shortage of Safe Assets:** Gourinchas and Rey (2007), Gourinchas, Rey, and Govillot (2010), He, Krishnamurthy, and Milbradt (2019), Bernanke et al. (2011), Greenwood and Vayanos (2014), Krishnamurthy and Vissing-Jorgensen (2015), Gopinath and Stein (2020)
- **Convenience Yields and Asset Prices:** Jiang, Krishnamurthy, and Lustig (2021), Jiang, Krishnamurthy, and Lustig (2019), Krishnamurthy and Lustig (2019)

Main Results

1. **Fed's tightening increases the specialness of US Treasuries**
   - A tightening action that would increase the 1y Treasury yield by 100 bps would increase the UST Premium by **31-50 bps**
   - Impact arises through the increase in the U.S. convenience yield
2. **The magnitude of the impact varies across the term structure**
   - Uniform before the GFC, but downward sloping thereafter
   - Potentially suggest reduced influence of the Fed at the long-end?
3. **A foreign central bank has a muted impact on UST Premium**
   - Unique ability of the Fed to affect the UST Premium

Empirical Strategy

- **High Frequency Identification:**
  - Use tick-by-tick data during 30-minute policy announcement windows
  - Monetary policy measure is captured by the first principal component of changes in interest rate
- **Empirical Strategy:**
  - OLS of the UST Premium and its components on policy shocks

$$\overbrace{\Delta\Phi_{i,n,t}}^{\Delta\text{UST Premium}} = \alpha_n + \gamma_n \overbrace{i_t}^{\text{Policy shock}} + e_{n,t}$$

  - Include country FE; SE clustered by date of policy announcement

Impact of U.S. Monetary Policy Shocks

	Full Sample		Pre-GFC		Post-GFC	
	1Y	5Y	1Y	5Y	1Y	5Y
U.S. Treasury Premium	44.41***	32.61***	33.94**	29.81***	79.53***	42.31***
	(12.55)	(6.60)	(13.85)	(7.32)	(20.74)	(14.20)
U.S. Swap Spread	42.73***	33.11***	39.47**	36.31***	53.59***	22.57**
	(13.39)	(5.76)	(15.51)	(6.44)	(20.44)	(11.15)
Foreign Swap Spread	0.25	1.42	3.71	6.58	-11.86*	-15.96**
	(4.32)	(4.57)	(4.77)	(4.71)	(6.83)	(7.50)
Cross-Currency Basis	-1.94	-0.92	1.82*	-0.08	-14.08	-3.78
	(2.43)	(1.29)	(1.09)	(0.45)	(9.10)	(5.00)
Other Components						
U.S. Treasury Yield	100.00***	120.90***	94.54***	99.93***	118.18***	188.91***
	(17.29)	(28.56)	(19.81)	(32.99)	(30.72)	(49.21)
U.S. LIBOR	142.73***	154.01***	134.01***	136.24***	171.78***	211.48***
	(14.12)	(27.25)	(16.73)	(32.38)	(28.27)	(44.22)
Foreign Treasury Yield	44.75***	61.28***	42.32***	48.00**	54.15***	105.93***
	(10.81)	(20.03)	(12.74)	(22.92)	(14.13)	(20.80)
Foreign Benchmark Rate	44.99***	62.70***	46.03***	54.58**	42.30***	89.97***
	(11.24)	(19.87)	(13.52)	(23.80)	(16.33)	(21.90)
FX Spot Rate	11.22***	11.12***	8.59***	8.37***	19.94***	19.95***
	(2.12)	(2.08)	(1.94)	(1.90)	(6.86)	(6.58)
FX Forward Premium	-99.67***	-92.23***	-86.16***	-81.74***	-143.56***	-125.29***
	(15.83)	(14.91)	(20.17)	(18.35)	(22.74)	(29.87)

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Potential Explanation

- **The specialness of U.S. Treasuries is driven by supply and demand of dollar safe assets, and the Fed has the ability to affect its supply**
- Before the GFC, the Fed changed ths Fed funds rate and bank reserves
- After the GFC, the Fed uses unconventional policy tools
- Segmentation of safe assets

Potential Explanation

- **The specialness of U.S. Treasuries is driven by supply and demand of dollar safe assets, and the Fed has the ability to affect its supply**
- Before the GFC, the Fed changed ths Fed funds rate and bank reserves
  - This affected future short rates, expected long rates, and expected supply of LT dollar safe assets
  - A parallel shift in the UST Premium
- After the GFC, the Fed uses unconventional policy tools
- Segmentation of safe assets

Potential Explanation

- **The specialness of U.S. Treasuries is driven by supply and demand of dollar safe assets, and the Fed has the ability to affect its supply**
- Before the GFC, the Fed changed ths Fed funds rate and bank reserves
- After the GFC, the Fed uses unconventional policy tools
  - A QT increases the *relative* supply of LT vs. ST dollar safe assets
  - A downward tilt in the UST Premium
- Segmentation of safe assets

Potential Explanation

- **The specialness of U.S. Treasuries is driven by supply and demand of dollar safe assets, and the Fed has the ability to affect its supply**
- Before the GFC, the Fed changed ths Fed funds rate and bank reserves
- After the GFC, the Fed uses unconventional policy tools
- Segmentation of safe assets
  - Maturity matters for safe asset investors
  - Confirm the specialness of U.S. Treasuries
  - One exception is the Swiss government bonds

Relevance for the Bank of Thailand

1. Suggest the U.S. Treasury Premium as another important macro variable
   - The impact of US Treasury Premium in the Thai context
2. Use of high-frequency identification as a research approach
   - Can be use to study several monetary policy implications
   - Need tick-by-tick (or transaction level) data of key assets

Appendix

U.S. Treasury Premium

Definition

The *n*-year U.S. Treasury Premium for country *i* at time *t* is the deviation from CIP between the U.S. Treasury yield and the government bond yield of country *i*

$$
\begin{aligned}
\overbrace{\Phi_{i,n,t}}^{\text{UST Premium}} &= \overbrace{y^{Govt}_{i,n,t}}^{\text{Gov't yield of country } i} - \overbrace{\rho_{i,n,t}}^{\text{Forward Premium}} - \overbrace{y^{Govt}_{\$,n,t}}^{\text{US Treasury yield}} \\
&= \left(y^{rf}_{i,.n,t} - \lambda_{i,n,t}\right) - \left(y^{rf}_{i,nt} - y^{rf}_{\$,n,t} - \tau_{i,n,t}\right) - \left(y^{rf}_{\$,n,t} - \lambda_{\$,n,t}\right) \\
&= \underbrace{\lambda_{\$,n,t}}_{\text{U.S. Convenience Yield}} - \underbrace{\lambda_{i,n,t}}_{\text{Foreign Convenience Yield}} + \underbrace{\tau_{i,n,t}}_{\text{FX Frictions}}
\end{aligned}
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Main

U.S. Treasury Premium – Measurement

Definition

The n-year U.S. Treasury Premium for country i at time t is the deviation from CIP between the U.S. Treasury yield and the government bond yield of country i

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$$= y^{Govt}_{i,n,t} - \left(irs_{i,n,t} + bs_{i,n,t} - irs_{\$,n,t}\right) - y^{Govt}_{\$,n,t}$$

$$= \underbrace{\left(irs_{\$,n,t} - y^{Govt}_{\$,n,t}\right)}_{\substack{\text{U.S. Swap Spread} \\ \approx \text{ U.S. Conv. Yield}}} - \underbrace{\left(irs_{i,n,t} - y^{Govt}_{i,n,t}\right)}_{\substack{\text{Foreign Swap Spread} \\ \approx \text{ Foreign Conv. Yield}}} - \underbrace{bs_{i,n,t}}_{\substack{\text{Cross-Currency Basis} \\ \approx \text{ Swap Market Mispricin}}}$$

Main

U.S. Treasury Premium – Summary Statistics

	1Y	5Y	10Y
Full Sample (2000-2019):			
U.S. Treasury Premium	13.34***	9.04***	2.13
U.S. Swap Spread	31.58***	33.66***	27.15***
Foreign Swap Spread	28.99***	32.39***	31.53***
Cross-Currency Basis	-11.41***	-8.21***	-6.31***
Pre-GFC (2000-2007):			
U.S. Treasury Premium	9.26***	19.44***	21.74***
U.S. Swap Spread	34.94***	54.17***	59.64***
Foreign Swap Spread	24.85***	33.34***	36.93***
Cross-Currency Basis	0.23	0.76**	0.27
Post-GFC (2008-2019):			
U.S. Treasury Premium	15.96***	2.41	-10.99***
U.S. Swap Spread	29.29***	19.98***	5.47***
Foreign Swap Spread	31.78***	31.75***	27.62***
Cross-Currency Basis	-18.63***	-13.81***	-10.41***

Main