

TARIFF WAR SHOCK AND THE CONVENIENCE YIELD OF US TREASURIES — A HEDGING PERSPECTIVE

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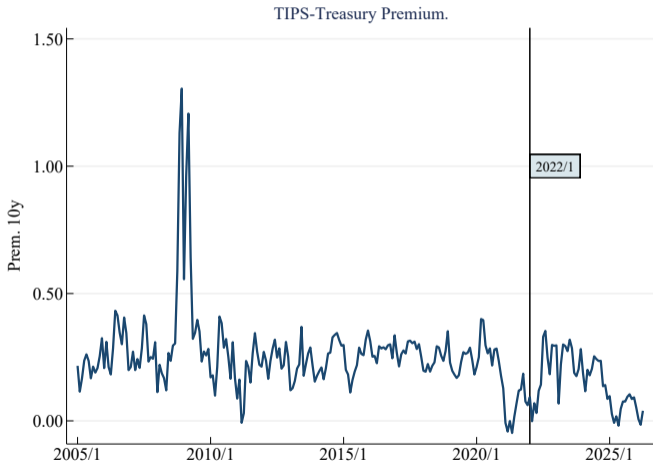
May 17, 2026

THE HEDGING PERSPECTIVE OF THE CONVENIENCE YIELD

- ▶ Broad recognition that Treasury yields price in some degree of benefits beyond the promised cash-flows: safety, liquidity, collateral use—the *convenience yield*.
 - ▶ Other terms: safety premium, exorbitant privilege, bubble.

TREASURY CONVENIENCE YIELD

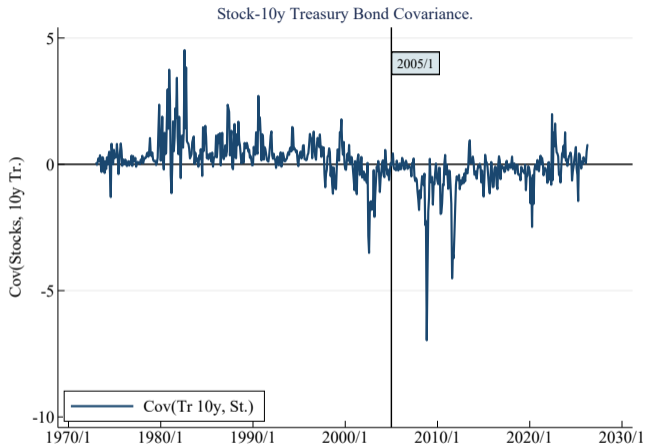
- ▶ The TIPS-Treasury premium (Fleckenstein, Longstaff and Lustig (2014)).



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 - ▶ Other terms: safety premium, exorbitant privilege, bubble.
- ▶ Theoretical literature: often assumes safety and/or preference for money-like assets in the utility function.
 - ▶ Examples: Holmström and Tirole (2001), Krishnamurthy and Vissing-Jorgensen (2012).
- ▶ **Main claim in Acharya and Laarits (Forthcoming): Treasury convenience yield consistent with the “hedging perspective” of safe assets.**
 - ▶ Acharya and Pedersen (2005) meets Brunnermeier, Merkel and Sannikov (2022).

THE STOCK-BOND COVARIANCE



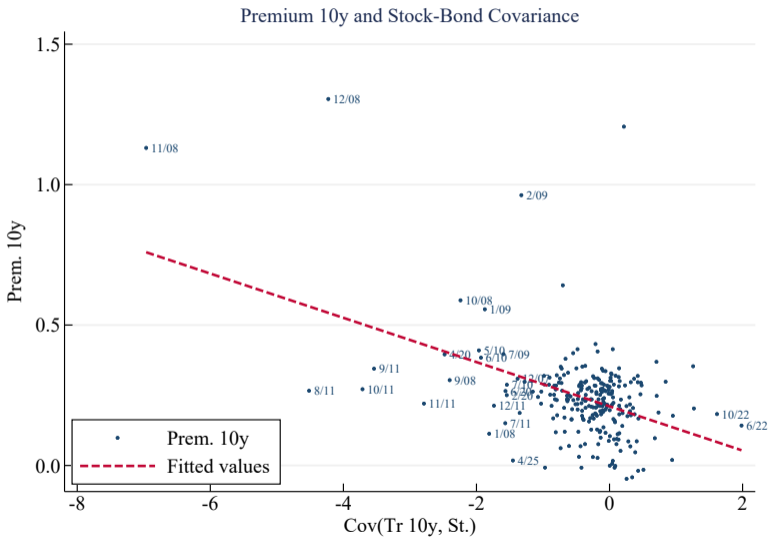
*Stock ret.: CRSP VW Market Port. Bond ret.: 10-year rate from Gürkaynak et al. (2007).
30 trading day lookback window; use the sum of last three daily returns, divided by $\sqrt{3}$.*

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- ▶ **Main claim in Acharya and Laarits (Forthcoming): Treasury convenience yield consistent with the “hedging perspective” of safe assets.**
 - ▶ Acharya and Pedersen (2005) meets Brunnermeier, Merkel and Sannikov (2022).
- ▶ **Our finding: the covariance of Treasury and stock returns explains a substantial portion of time-series variation in the convenience yield.**

$$\text{Convenience Yield}_t \cong -\Lambda \text{Cov}_t (r_{t+1}, r_{t+1}^M).$$

STOCK-BOND COVARIANCE AND TREASURY CONVENIENCE

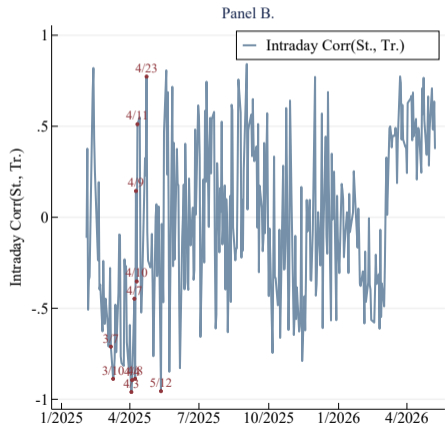
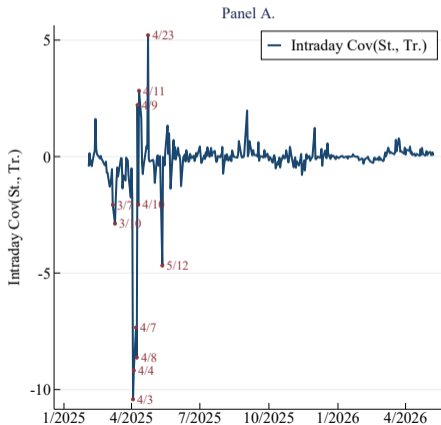


HEDGING PERSPECTIVE OF THE CONVENIENCE YIELD: “TARIFF WAR” AND IRAN CONFLICT

- ▶ Summary of argument so far: convenience yields reflect the tendency of “service benefits” to be high in poor states of the world.
- ▶ The onset of the “Tariff War” in April 2025 and the Iran Conflict in March 2026 saw:
 - ▶ Periods where Treasuries were a “risk” asset rather than a hedge.
 - ▶ A decoupling of short- and long-term convenience yields.
 - ▶ A drop in long-term convenience yields.
- ▶ **Reduction in long-term convenience yields in line with the mechanism.**

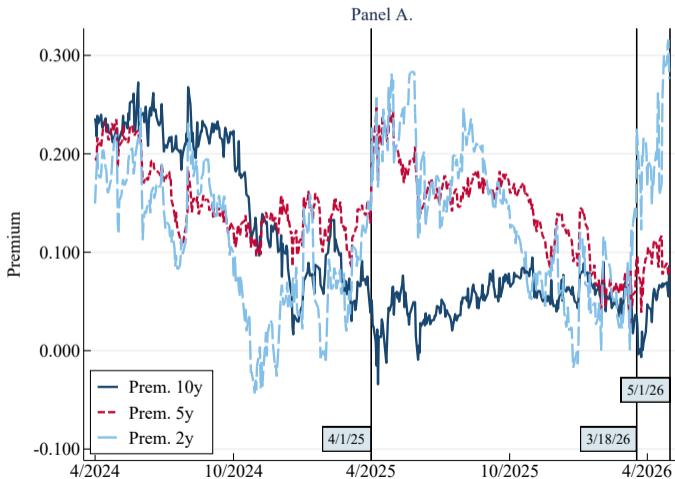
STOCK AND BOND COMOVEMENT IN 2025-26

- ▶ Day-by-day comovement of stock and (10-year) nominal bond returns.
- ▶ Both large positive and negative realizations around the “Tariff War”.



TREASURY CONVENIENCE YIELDS IN 2025-26

- ▶ Onset of the Tariff War saw drops in long-term convenience yields; increases in short-term ones.



TODAY'S TALK

1. A decomposition of the stock-bond covariance.

- ▶ The convenience yield contributes materially to the aggregate stock-bond covariance.
- ▶ Substantial drop in the long-term convenience yields in April 2025 and March 2026.

2. Stock-bond covariance and the convenience yield.

- ▶ Periods when the stock-bond covariance is low—bonds are a good hedge—see higher convenience yields.
- ▶ Data from 2025-26 in line with evidence from longer time-series.
- ▶ Short vs. long maturity convenience yields.

3. Further results:

- ▶ Market functioning and convenience yields. International flows.
- ▶ Alternative targets of flight-to-safety flows?

DECOMPOSITION OF THE STOCK-BOND COVARIANCE

- ▶ Goal: quantify the contribution of the convenience yield on the stock-bond covariance.
- ▶ **Define the TIPS-Treasury premium following Fleckenstein et al. (2014).** Construct a “synthetic” nominal Treasury out of TIPS and traded inflation swaps:

$$\begin{aligned}\text{Premium}_{n,t} &= \text{TIPS Yield}_{n,t} + \text{Inflation Swap}_{n,t} - \text{Treasury Yield}_{n,t} \\ &= \text{Synthetic Treasury Yield}_{n,t} - \text{Treasury Yield}_{n,t},\end{aligned}$$

- ▶ Implies a return decomposition of the maturity n yield at time t :

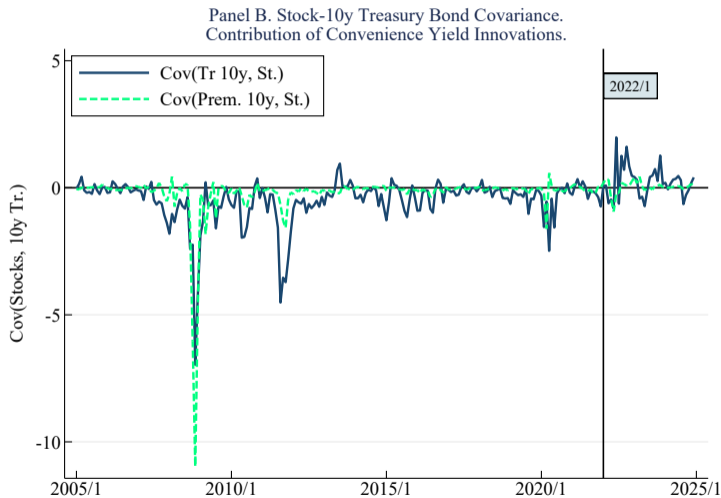
$$\text{Yield}_{t,n} = \text{Risk-free}_{t,n} + \text{CDS}_{t,n} - \text{Premium}_{t,n}.$$

- ▶ **The yield decomposition allows us to decompose the stock-bond covariance:**

$$\text{Cov}(\text{Yield}, \text{Stocks}) = \text{Cov}(\text{Risk-free}, \text{St.}) + \text{Cov}(\text{CDS}, \text{St.}) - \text{Cov}(\text{Premium}, \text{Stocks}).$$

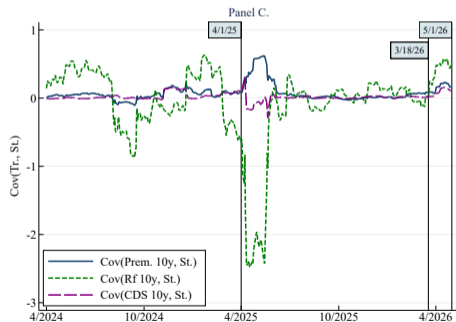
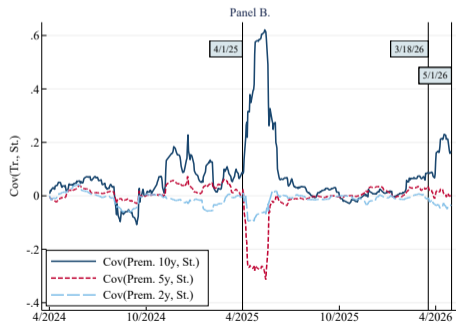
DECOMPOSITION OF THE STOCK-BOND COVARIANCE

- ▶ Conditional stock-bond covariance, and the contribution of the convenience yield.



DECOMP. OF THE STOCK-BOND COVARIANCE, 2025-26

- ▶ $\text{Yield}_{t,n} = \text{Frictionless}_{t,n} + \text{CDS}_{t,n} - \text{Convenience}_{t,n}$.
- ▶ Left panel: stock-bond covariance from the convenience yield at different maturities. Right panel: Constituent elements of the 10-year stock-bond covariance.



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CONVENIENCE YIELD AND STOCK-BOND COVARIANCE

2005-2024

	Prem. 10y	Prem. 10y
Cov(Tr 10y, St.)	-0.079** (-2.27)	
Cov(Prem. 10y, St.)		-0.102*** (-7.27)
Cov(Rf 10y, St.)		-0.005 (-0.25)
Cov(CDS 10y, St.)		0.234* (1.92)
Eff. Fed Funds	0.008 (1.31)	0.008 (1.58)
Constant	0.208*** (9.47)	0.205*** (10.87)
Observations	240	240
R^2	0.199	0.443

- ▶ **Negative stock-bond covariance associated with larger convenience yields.**
- ▶ Relationship particularly strong for the stock-bond covariance term corresponding to innovations in the convenience yield:

$$\text{Convenience Yield}_t \cong -\Lambda \text{Cov}_t \left(r_{t+1} - r_{t+1}^f, r_{t+1}^M \right),$$

where r_{t+1}^f is the “frictionless” risk-free rate at the appropriate maturity.

ALTERNATIVE CONVENIENCE YIELD MEASURES

- ▶ **10y TIPS-Tr**: TIPS-Treasury premium constructed following Fleckenstein et al. (2014).
- ▶ **30y OIS Spread**: 30 year Overnight Index Swap spread over Treasury par rate.
- ▶ **10y Richness**: 10 year Treasury Richness relative to repo swap rates following Fleckenstein and Longstaff (2024).
- ▶ **Box Spread**: 2 year convenience yield implied by the Box rate constructed in van Binsbergen, Diamond and Grotteria (2022) and Diamond and Van Tassel (Forthcoming).
- ▶ **GC-Tr 3m**: 3 month General Collateral Repo minus Treasury bill rate.
- ▶ **OIS-Tr 3m**: 3 month overnight indexed swap rate minus the Treasury bill rate.
- ▶ **-1*Z-Spread**: Negative of the Z-spread constructed in Greenwood, Hanson and Stein (2015).
- ▶ **FN 30y - Tr. Spread**: Agency MBS-Treasury spread constructed in He and Song (Forthcoming).

ROBUSTNESS: ALTERNATIVE DECOMPOSITIONS

- ▶ Use alternatives to the TIPS-Treasury premium to decompose the stock-bond covariance.

- ▶ Each column uses the indicated convenience yield proxy in the covariance calculation.

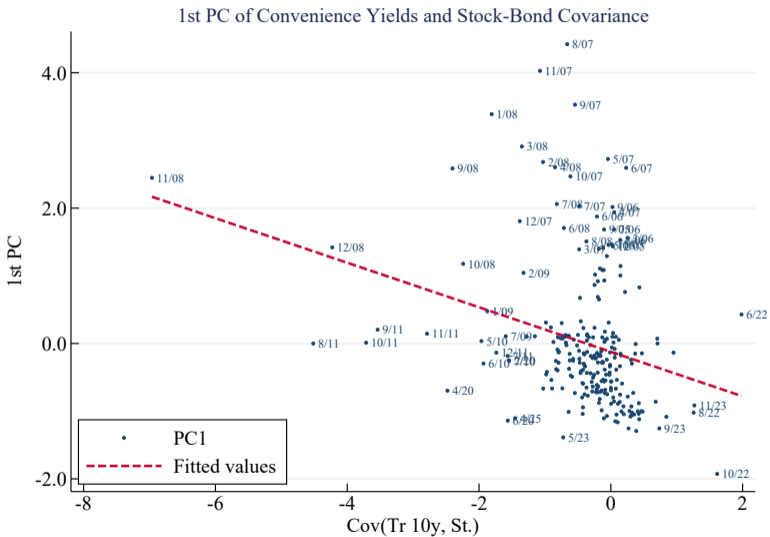
	1991/5	1972	1972	1997-2022	1997	1983
	GC-Tr 3m	FF-Tr 3m	-1*Z-Spr.	Rich. 10y	OIS Spr. 10y	AAA-Tr
Cov(Conv., St.)	-0.066*** (-2.79)	-0.129*** (-2.79)	-0.083** (-2.41)	-0.219*** (-3.96)	-0.219** (-2.45)	-0.144*** (-6.29)
Cov(Tr. - Conv., St.)	-0.018 (-1.33)	-0.121*** (-2.70)	-0.012 (-0.63)	-0.066*** (-3.85)	-0.018 (-0.65)	-0.111*** (-6.04)
Eff. Fed Funds	0.022*** (3.32)	0.199*** (11.30)	-0.036*** (-7.80)	0.078*** (5.81)	0.077*** (4.23)	-0.067*** (-7.27)
Constant	0.069*** (3.73)	-0.383*** (-5.35)	0.165*** (8.51)	-0.009 (-0.26)	-0.310*** (-8.91)	1.396*** (29.89)
Observations	404	636	636	312	336	504
R^2	0.158	0.571	0.310	0.435	0.346	0.519

MAIN RESULT ROBUSTNESS

► Use the 1st PC of convenience yield proxies as the dependent variable.

	PC1, 2005-2024		PC1, 2005-2024	
Cov(Tr 10y, St.)	-0.519*** (-3.72)		Cov(Prem. 10y, St.)	-0.712*** (-2.73) -0.361*** (-4.35)
Cov(Prem. 10y, St.)		-0.589*** (-7.45)	Crisis	1.298*** (2.72)
Cov(Rf 10y, St.)		-0.339** (-2.06)	Crisis x Cov(Prem. 10y, St.)	0.419 (1.53)
Cov(CDS 10y, St.)		-0.304 (-0.53)	VIX	2.259 (1.44)
Eff. Fed Funds	0.200** (2.21)	0.195** (2.10)	Eff. Fed Funds	0.188** (2.02) 0.186* (1.93)
Constant	-0.545*** (-5.03)	-0.515*** (-4.62)	Constant	-0.534*** (-5.10) -0.821*** (-2.76)
Observations	240	240	Observations	240 240
R^2	0.261	0.286	R^2	0.360 0.260

STOCK-BOND COVARIANCE AND TREASURY CONVENIENCE



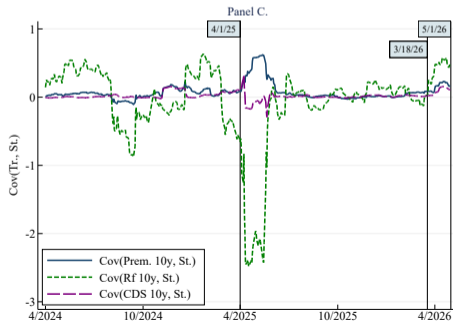
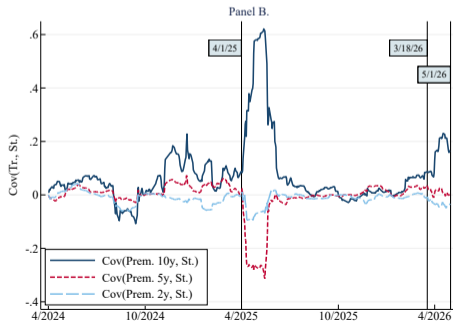
SHORT AND LONG HORIZON PC1

- ▶ Construct PC1 separately with short and long maturity convenience yields.
- ▶ Stronger relationship between short maturity proxies and short maturity stock-bond covariance.

	2005-2024					
	Short PC1	Short PC1	Short PC1	Long PC1	Long PC1	Long PC1
5 x Cov(Tr 2y, St.)	-0.518** (-2.29)			-0.657*** (-3.60)		
2 x Cov(Tr 5y, St.)		-0.437** (-2.42)			-0.660*** (-4.25)	
Cov(Tr 10y, St.)			-0.312** (-2.27)			-0.539*** (-4.86)
Eff. Fed Funds	0.098 (1.37)	0.125* (1.66)	0.130 (1.64)	0.115 (1.47)	0.158** (2.08)	0.173** (2.21)
Constant	-0.409*** (-3.29)	-0.477*** (-3.53)	-0.457*** (-3.73)	-0.367** (-2.51)	-0.504*** (-3.48)	-0.514*** (-3.49)
Observations	240	240	240	240	240	240
R^2	0.188	0.170	0.128	0.231	0.277	0.251

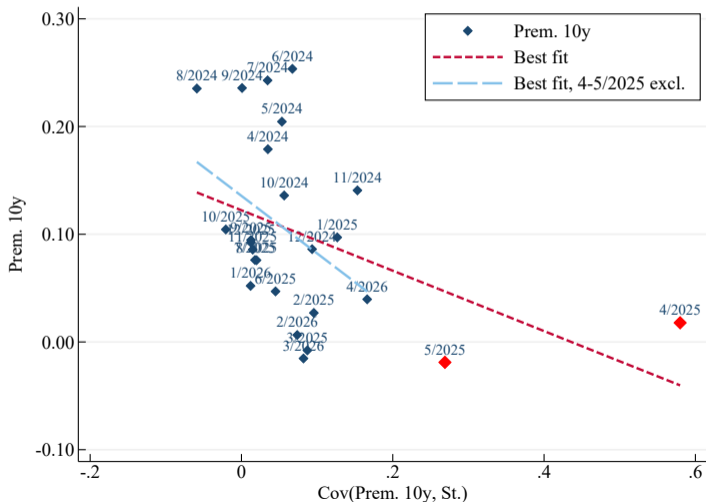
STOCK-BOND COVARIANCE AND CONSTITUENT ELEMENTS

- ▶ $\text{Yield}_{t,n} = \text{Frictionless}_{t,n} + \text{CDS}_{t,n} - \text{Convenience}_{t,n}$.
- ▶ Left panel: stock-bond covariance at different maturities. Right panel: Constituent elements of the stock-bond covariance.
- ▶ Note the gap between 5- and 10-year calculations!



CONVENIENCE YIELDS AND TREASURY HEDGE

- ▶ Counterfactual covariance implied by the 5-year bond: April 2025 convenience yield higher by 12bps.



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INFLATION EXPECTATIONS?

- ▶ **Historical data: high expected inflation corresponds to negative convenience yield slope.**
- ▶ However, in April 2025 only a modest uptick in inf. expectations. Larger uptick in Spring 2026.

	RHS: Expected Inflation			RHS: Breakeven Inflation		
	Prem. 10y-2y	Prem. 10y-2y	Prem. 10y-2y	Prem. 10y-2y	Prem. 10y-2y	Prem. 10y-2y
2-year	-0.205*** (-4.49)			0.066 (0.86)		
5-year		-0.249*** (-3.29)			-0.140*** (-3.05)	
10-year			-0.244*** (-2.64)			-0.115*** (-2.79)
Eff. Fed Funds	0.044*** (3.74)	0.044*** (2.87)	0.036** (2.30)	-0.007 (-0.67)	0.005 (0.64)	0.006 (0.71)
Constant	0.327*** (4.70)	0.404*** (3.64)	0.428*** (2.91)	-0.099 (-0.69)	0.315*** (2.95)	0.275*** (3.29)
Observations	256	256	256	256	256	256
R^2	0.122	0.095	0.072	0.037	0.060	0.084

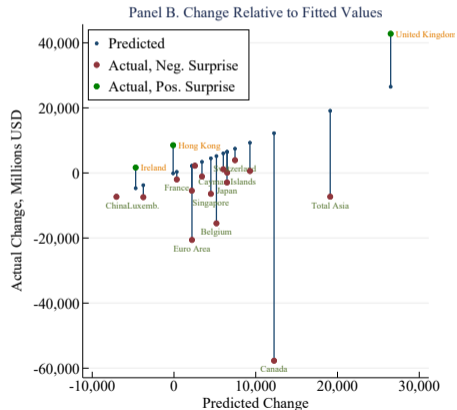
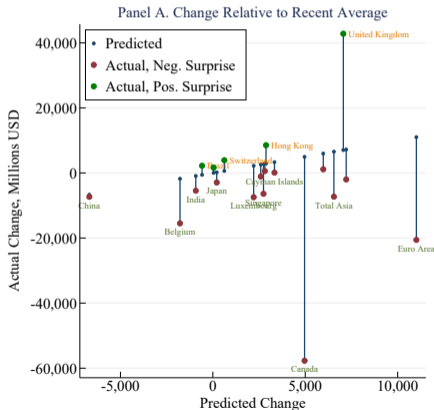
INFLATION EXPECTATIONS?

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Date	Expected Inflation			Breakeven Inflation		
	2y	5y	10y	2y	5y	10y
2025/2	2.61	2.49	2.47	2.36	2.25	2.34
2025/3	2.26	2.27	2.30	2.31	2.26	2.35
2025/4	2.62	2.40	2.35	1.95	2.09	2.33
2025/5	2.50	2.34	2.31	2.24	2.27	2.53
2025/6	2.38	2.34	2.35	2.14	2.28	2.38
2026/1	2.45	2.34	2.33	2.44	2.39	2.28
2026/2	2.47	2.37	2.37	2.26	2.25	2.31
2026/3	2.26	2.18	2.19	2.30	2.24	2.21
2026/4	2.81	2.48	2.40	2.55	2.37	2.22

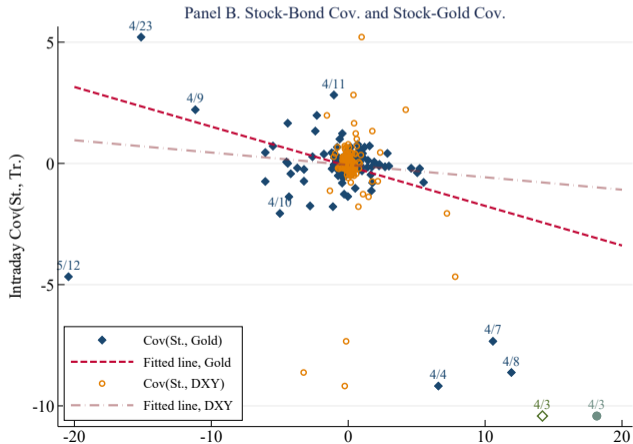
INTERNATIONAL FLOWS IN APRIL 2025

- ▶ **Treasury International Capital (TIC) System data.**
2023/2 to 2025/3: 47 billion USD average inflow per month.
April 2025: *outflow* of 47 billion!



WHERE ARE FLIGHT-TO-SAFETY FLOWS GOING?

- ▶ During the Tariff War, days when bonds a poor hedge = days when gold a good hedge.
- ▶ Largest positive covariance days \implies big tariff news: 4/23, 4/9, 4/11.



EVENT STUDY: 2011 DEBT CEILING STANDOFF

- ▶ Debt ceiling standoffs present a unique situation where Treasury cash-flows and Treasury convenience are called into question.
- ▶ Document convenience yields pre- and post-resolution.

2011 debt crisis. Cutoff date August 1, 2011

	Prem. 10y	PC1	Short PC1	Long PC1
After Cutoff Date	0.087*** (3.91)	0.097** (2.40)	0.052 (1.14)	0.109** (2.12)
Constant	0.201*** (12.78)	-0.050 (-1.24)	-0.203*** (-8.09)	0.105** (2.16)
Observations	41	41	41	41
R^2	0.406	0.217	0.051	0.123

EVENT STUDY: 2011 DEBT CEILING STANDOFF

- ▶ August 2, 2011 indicated.



LITERATURE

Our paper brings together two large literatures: one on the stock-bond comovement and the other on the convenience yield on Treasury securities.

- ▶ Aggregate stock-bond covariance: Shiller and Beltratti (1992), Campbell and Ammer (1993), Campbell, Sunderam and Viceira (2017), Campbell, Pflueger and Viceira (2018), Pflueger (2023).
- ▶ Non-inflation explanations of the time variation in stock-bond comovement: Kozak (2022), Laarits (2021), Chernov, Lochstoer and Song (2023) and Jones and Pyun (2022), Duffee (2022).
- ▶ Treasury convenience yields: Duffee (1996), Longstaff (2004), Krishnamurthy and Vissing-Jorgensen (2012), Greenwood, Hanson and Stein (2015), Sunderam (2015), Krishnamurthy and Li (forthcoming), Li, Fu and Xie (Forthcoming), Fleckenstein and Longstaff (2024).
- ▶ Hedging property of safe assets: Acharya and Pedersen (2005), Brunnermeier et al. (2022).

CONCLUSION

- ▶ Have demonstrated that the convenience yield is consistent with the “hedging perspective” of safe assets.
- ▶ Convenience yield must be “earned”: monetary and fiscal stability. When not earned, the convenience yield can erode swiftly.
- ▶ The hedging perspective offers a complementary lower-frequency perspective to the growing “inconvenience” of Treasuries.
- ▶ **Tariff War evidence suggests considerable doubts about the convenience yield of long maturity Treasuries.** Similar for the Iran Conflict.

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Thank You!

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CITATIONS V

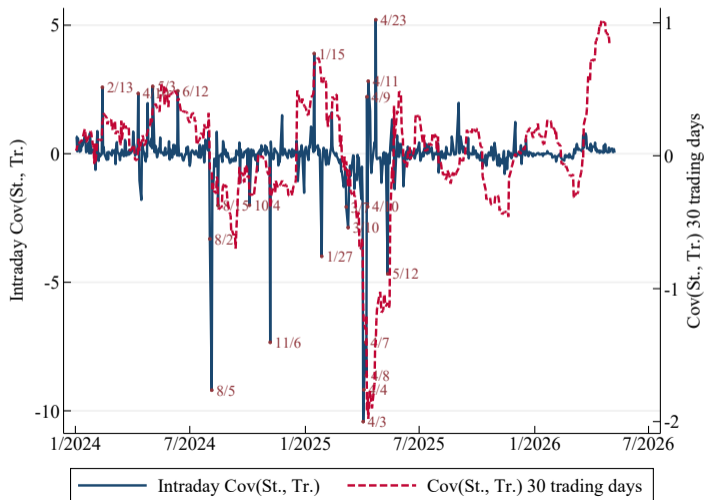
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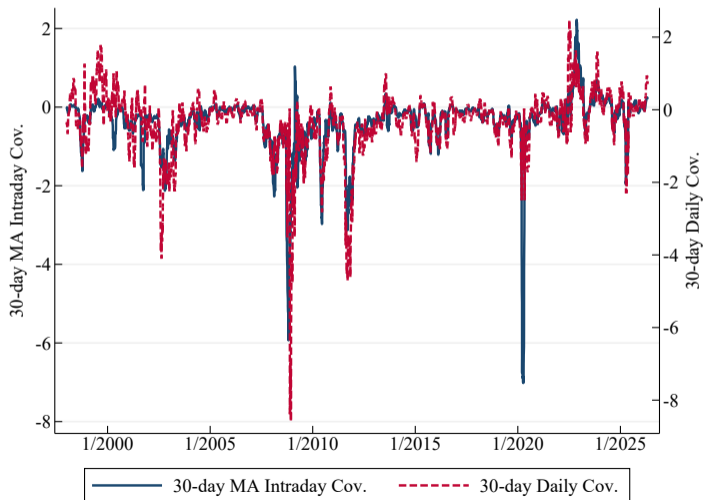
INTRADAY VS DAILY STOCK-BOND COVARIANCE

- ▶ Intraday stock-bond covariance and a daily stock-bond covariance estimated using a 30 trading day lookback window.



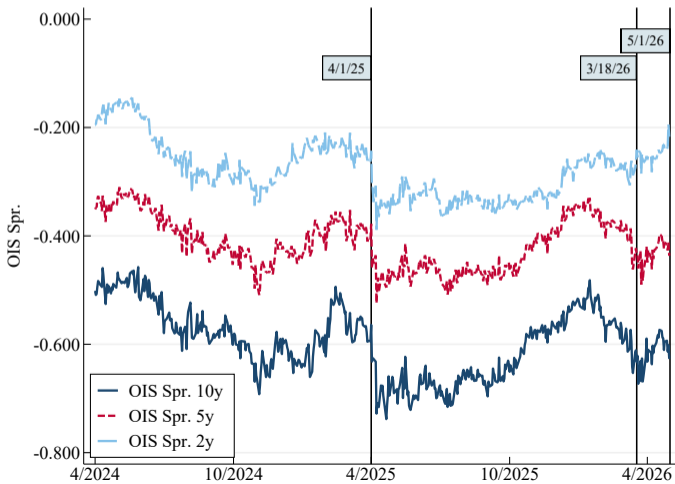
INTRADAY VS DAILY STOCK-BOND COVARIANCE

- ▶ Zooming out, the moving average of intraday stock-bond covariance tracks well a stock-bond covariance calculation with daily data.



TREASURY CONVENIENCE YIELDS IN 2025-26, ROBUSTNESS

- ▶ Proxied by the OIS - Treasury spread, the onset of the Tariff War saw drops in all maturity convenience yields with somewhat larger drops in long-term ones.



FIRST TWO PCs OF CONVENIENCE YIELDS

- ▶ First two PCs of the respective convenience yield curves.
- ▶ Full sample: daily data 1/1/2005-5/1/2026.

	TIPS-Tr. Prem. 10y			OIS Spr. 10y		
PC 1	0.06*** (40.94)		0.06*** (47.63)	0.11*** (268.76)		0.11*** (776.14)
PC 2		0.03*** (6.89)	0.03*** (15.96)		-0.10*** (-23.46)	-0.10*** (-135.59)
Constant	0.24*** (208.26)	0.24*** (123.01)	0.24*** (222.50)	-0.25*** (-219.81)	-0.26*** (-74.63)	-0.25*** (-546.44)
Observations	5228	5228	5228	5228	5228	5228
R^2	0.655	0.047	0.703	0.901	0.084	0.984

FIRST TWO PCs OF CONVENIENCE YIELDS

► First two PCs of the respective convenience yield curves.

► Recent sample: daily data 4/1/2024-5/1/2026.

	TIPS-Tr. Prem. 10y			OIS Spr. 10y		
PC 1	0.08*** (26.42)		0.03*** (8.32)	0.12*** (134.96)		0.12*** (157.24)
PC 2		0.13*** (38.97)	0.11*** (26.95)		-0.09*** (-5.18)	-0.07*** (-22.27)
Constant	0.24*** (37.87)	0.23*** (55.04)	0.26*** (53.05)	-0.22*** (-76.89)	-0.59*** (-211.38)	-0.23*** (-89.97)
Observations	458	458	458	458	458	458
R^2	0.426	0.694	0.723	0.960	0.045	0.981

COVARIANCES AT DIFFERENT MATURITIES

► Monthly data 1/2005 – 4/2026.

	2005-2026/4					
	Short PC1	Short PC1	Short PC1	Long PC1	Long PC1	Long PC1
5 x Cov(Tr 2y, St.)	-0.585** (-2.05)			-0.502*** (-3.30)		
2 x Cov(Tr 5y, St.)		-0.551** (-2.39)			-0.535*** (-4.29)	
Cov(Tr 10y, St.)			-0.444** (-2.38)			-0.439*** (-4.43)
Eff. Fed Funds	0.099 (1.39)	0.136* (1.76)	0.149* (1.86)	0.043 (0.47)	0.080 (0.89)	0.093 (1.03)
Constant	-0.317** (-2.40)	-0.421*** (-2.83)	-0.427*** (-3.16)	-0.220 (-1.59)	-0.339** (-2.41)	-0.349** (-2.37)
Observations	256	256	256	256	256	256
R^2	0.186	0.196	0.169	0.119	0.160	0.140

LEVELS OF KEY VARIABLES SINCE 2024

- Data from 2/2024 to 10/2025.

