Tariff War Shock and the Convenience Yield of US Treasuries — A Hedging Perspective

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Abstract

We explain how the "Tariff War" shock of April 2025 affected the safe-asset status of US Treasuries. Convenience yield erosion for long bonds is consistent with a reduction in the hedging property, reflected in a rising stock-bond covariance. Decomposing the Treasury yield into risk-free rate, credit spread, and convenience yield components reveals that covariance due to the convenience yield component increased for long bonds. The short end of the Treasury curve, however, continued to exhibit the safe-asset hedging property. These effects are consistent with a withdrawal of safe-asset investors and a rotation towards shorter-term Treasuries and gold.

Keywords: Stock-bond covariance, safety premium, liquidity premium, money premium, exorbitant privilege, safe assets, bubble, inflation, debt ceiling

JEL: G11, G12, G15, E4, E5, F3

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On April 2, 2025, the United States (US) government initiated a global "Tariff War", levying the highest level in a century of duties on goods imported into the US. The unanticipated move was met with retaliation by China and the situation escalated into a ratcheting of reciprocal tariff announcements by China, Canada, and the European Union, among some of the major trade partners of the US. Over the subsequent weeks and months, many of the initial demands were walked back by all sides, but a higher level of tariffs remains as of October 2025. According to the Yale Budget Lab estimates, the effective tariff rate as of September 2025 was 17.4%, up from 2.4% in January 2025, and according to the Treasury Department, tariff revenue in that month amounted to 31.7 billion USD, compared to just over 8 billion USD a year ago.

The early days of the Tariff War saw a substantial sell-off in global equity markets. At the trough on April 8, the S&P500 had lost over 11% relative to its value at market close on April 1. Long-term Treasury yields saw considerable increases with the 30-year zero-coupon yield peaking at 5.2% in late May, up from its pre–Tariff War level of 4.7% and representing the highest level since before the Global Financial Crisis of 2007-08. Over the summer, the stock market recovered and obtained new highs while Treasury yields gradually declined with the 30-year yield now back at the 4.8% range as of end of October 2025.[1]

We show that a substantial amount of the run-up in long maturity Treasury yields during the early tumult of the Tariff War can be traced back to a decrease in *convenience yields*. Convenience yields capture the value that arises from the "service flow" aspect of Treasury securities: benefits stemming from their liquidity, safety, or use as collateral.[2] A long literature has established that the prices of nominal Treasuries are elevated on account of such service flows; for instance, see Krishnamurthy and Vissing-Jorgensen (2012) for a historical perspective or Du et al. (2018) for an international perspective. While exact magnitudes differ, estimates of the convenience yield are often in the range of 10-40bps on long-term bonds, representing a substantial interest rate savings to the US taxpayer. We document that such convenience yields of long-term bonds saw marked decreases at the onset of the Tariff War, in contrast to short-term convenience yields that appreciated with heightened uncertainty brought on by tariff news.

Our preferred proxy of the Treasury convenience yield, the TIPS-Treasury premium, compares the yields of nominal Treasuries with synthetic nominal Treasuries constructed out of less liquid Treasury Inflation Protected Securities (TIPS) and traded inflation swaps, following Fleckenstein et al. (2014). In the sample since 2005, this measure of the convenience yield averages about 24bps at the 10-year maturity. The onset of the Tariff War saw a decline of close to 10 basis points from its value at the end of March to the trough on April 10. In the historical sample, the 10-year TIPS-Treasury spread is close to the 2-year counterpart with an average spread of 2 basis points; in April 2025, the 2-year was on average 7 basis points higher than the 10-year premium.

We argue that the drop in long-term convenience yield in the Tariff War era corresponds to concerns about the long-term safe-asset or hedging properties of these bonds. To do so, we build

[1] Yield data is from the Gürkaynak et al. (2007) fitted yield curve.

[2] We borrow the "service flow" terminology from the safe assets perspective theorized in Brunnermeier et al. (2024).

on the results and analytical framework in our prior work in Acharya and Laarits (Forthcoming). In that paper, we document that Treasury convenience yields tend to be high in times when Treasuries provide a good hedge for the equity market. In a decomposition exercise, we show that this relationship obtains in large part because of the stock-bond covariance arising from convenience yield innovations: when convenience yields reflect that future service flows are expected to be high in bad states of the world. In other words, we argue that the implicit service flows themselves carry a negative beta, driving up the present value of such service-flow benefits offered by the bond. We establish this relationship with a variety of proxies for the Treasury convenience yield with daily return data reaching back to 1972.

In this paper, we show that the evidence from April 2025 stands at odds with the historical data in that the covariance between convenience yield innovations and stock prices was positive. Applying estimates from the 2005-2024 sample, this shift in the hedging property of the long-term bond can account for an approximately 12 bps drop in convenience yields in April 2025.

To better capture the substantial shift in stock-bond covariance during the Tariff War period, we employ a novel measurement approach: we use intraday data to calculate a daily proxy of the stock-bond covariance. This calculation, using 5-minute returns on liquid exchange traded funds, reveals a number of days where substantial tariff news coincided with large positive stock-bond comovements. The lack of intraday proxies of convenience yields precludes us from repeating this analysis for the convenience yield, but a calculation with daily data in short lookback windows indicates that the 10-year Treasury bond convenience yield comoves positively with equity returns, cutting against the hedge provided by the bond.

We document the mechanisms driving this breakdown in long-term Treasuries' hedging properties by examining how different components of Treasury yields behaved across the term structure. A decomposition of the Treasury yield into risk-free rate, credit spread, and convenience yield components shows that it is covariance due to the convenience yield component that increased for long bonds. In contrast, the same decomposition reveals that the short end of the Treasury curve continued to exhibit the safe-asset hedging property, in part due to an increase in its convenience yield component. Our findings also suggest that it was not inflation expectations—which showed subdued signs of upward movements—but the long-term service flows of Treasuries that came to be questioned by investors in April of 2025.

To provide evidence for one potential channel for the reduction in long-term service benefits, we examine the international flows in and out of Treasury securities. The Treasury International Capital (TIC) System data reveals that April 2025 stands apart as a month of substantial negative outflows. The outflows in April 2025 are particularly notable as times of heightened market volatility typically see international flows into Treasuries. As a final piece of evidence, we document that gold seems to have emerged as an alternative target for flight-to-safety flows. Again employing intraday data, we show that days where Treasuries were a risk asset—meaning comoving positively with equity returns—gold instead behaved as a hedge, showing negative correlations with equity returns. We also document that the U.S. Dollar returns do not exhibit a similar relationship,

suggesting no safe haven inflows to the Dollar in response to the tariff shock.

As of October 2025, many of the tariffs introduced in April 2025 are in effect and considerable uncertainty regarding international trade remains. At the same time, stock markets have recovered to new highs and Treasury yields have fallen at all maturities. The evidence from convenience yields, however, highlights a potentially persistent effect: long-term convenience yields are still depressed relative to short-term counterparts, suggesting that the long-term service benefits from Treasuries are not seen by investors as reliable as before.

1 Background and Analytical Framework

The analysis in Acharya and Laarits (Forthcoming) relies on decomposing Treasury yields into three constituent elements: a term corresponding to the convenience yield, a term corresponding to the default risk, and a residual term corresponding to a "frictionless" risk-free rate. Specifically, we express the time t maturity n nominal Treasury yield, denoted $\text{Yield}_{t,n}$, using the corresponding maturity credit default swap rate, $\text{CDS}_{t,n}$, the corresponding maturity proxy for the convenience yield, $\text{Convenience}_{t,n}$, and the residual term, the maturity n frictionless rate, denoted $\text{Frictionless}_{t,n}$:

$$\text{Yield}_{t,n} = \text{Frictionless}_{t,n} + \text{CDS}_{t,n} - \text{Convenience}_{t,n}. \tag{1}$$

This yield decomposition implies a closely related decomposition of Treasury returns into components arising from innovations to each of the three constituent elements. Specifically, for maturity n we calculate:

$$\begin{aligned} \widehat{R}^{\text{Yield}}_{t,n} &= -\,n \times \Delta\text{Yield}_{t,n} \\ \widehat{R}^{\text{Frictionless}}_{t,n} &= -\,n \times \Delta\text{Frictionless}_{t,n} \\ \widehat{R}^{\text{CDS}}_{t,n} &= -\,n \times \Delta\text{CDS}_{t,n} \\ \widehat{R}^{\text{Convenience}}_{t,n} &= \quad n \times \Delta\text{Convenience}_{t,n}. \end{aligned} \tag{2}$$

The last row does not contain a minus sign as a reflection of our convention that high convenience indicates low yields. Using the return decomposition implied by Equation (2), we calculate conditional covariances between equity and bond returns, both for the overall bond return as well as the returns arising from each of the yield components.

The baseline results in Acharya and Laarits (Forthcoming) use covariances calculated in a short lookback window of 30 trading days, though also showing robustness using 90 or 252 day calculations. The baseline results additionally use the sum of three most recent daily returns in order to mitigate the potential importance of price pressure in either the stock or the bond market

$$R^{i}_{t,n} = \left(1/\sqrt{3}\right)\left(\widehat{R}^{i}_{t,n} + \widehat{R}^{i}_{t-1,n} + \widehat{R}^{i}_{t-2,n}\right), \tag{3}$$

where the adjustment factor of one over square root three ensures that the volatility of returns

remains unaltered.[3] We follow both choices here. With the three-day returns, we calculate the stock-bond covariance and the constituent elements:

$$\begin{aligned}\text{Cov}_t(R^{\text{Yield}}, R^{\text{Stocks}}) = \text{Cov}_t(R^{\text{Frictionless}}, R^{\text{Stocks}}) &+ \text{Cov}_t(R^{\text{CDS}}, R^{\text{Stocks}}) \\ &+ \text{Cov}_t(R^{\text{Convenience}}, R^{\text{Stocks}}) \end{aligned} \tag{4}$$

where we omit time and maturity subscripts from returns for ease of reading. Our convention in constructing returns ensures that negative covariance values always mean that returns arising from that piece of the yield reflect a hedge with respect to stock market returns.

Here, we use the TIPS-Treasury premium at different maturities as the proxy of Treasury convenience yield. This proxy, first constructed by Fleckenstein et al. (2014), represents the yield differential between a synthetic nominal Treasury—constructed out of Treasury Inflation Protected Security (TIPS) and inflation swaps—and a traded nominal Treasury. Using fitted zero-coupon yield curves and fitted inflation swap data, we are able to reliably calculate daily convenience yield proxies at specific maturities, allowing for the calculation of conditional covariances with a 30 trading day lookback window. We construct the TIPS-Treasury premium at the 2-, 5-, and 10-year horizons using the nominal and real fitted yield curves from Gürkaynak et al. (2007) and Gürkaynak et al. (2010).

In order to reflect the pace of news arriving in the early days of the Tariff War, we augment the approach with an even higher frequency stock-bond covariance calculation. To capture the daily changes in stock-bond covariance, we use intraday data on the prices of two actively traded Exchange Traded Funds (ETFs): SPY, an S&P500 fund, and IEF, a fund of 7-10 year maturity nominal Treasuries. To calculate a stock-bond correlation, we split the trading day from 9:30am to 4:00pm into 78 five-minute periods and use the end-of-period prices on the two securities to calculate intraday returns.[4] The resulting covariance calculations are reported on an annualized basis in percent units. To get a sense of the magnitudes, if the daily stock return volatility is 2%, daily bond return volatility is .5%, and the correlation between the two return series is -.6, the covariance would be reported as -.6 x.02 x.005 x 252 =-1.512%. The correlation calculation is unitless and does not require any adjustment to account for intraday data.

The analytical setup in Acharya and Laarits (Forthcoming) models the service flow of a security as an (unobservable) cash flow accruing to the holder of the security. The present values of these implicit cash flows are elevated if they are heightened in bad states of the world, as captured by poor equity returns. The main prediction that arises from the framework is that the conditional covariance between service flow innovations and stock returns is proportional to the level of conve-

[3]For a discussion of market functioning during the Tariff War, see Liang (2025) and the expert witness testimonies to the US House Committee on Financial Services (U.S. House Committee on Financial Services (2025)). Liang (2025), in particular, documents – based on the relationship between Treasury "market depth" and MOVE (Merrill Lynch Option Volatility Estimate) index – that Treasury markets had orderly functioning in April 2025 relative to the stresses of March 2020 and March 2023.

[4]In order to rule out the role of potentially stale prices, for the period of April-July 2025 we use the National Best Bid and Offer at the end of each five-minute interval, constructed using the replication code from Holden and Jacobsen (2014).

nience yields, as it captures the risk adjustment that contributes to the present value of these service flows. Denoting with $sr_t - sr_t^f$ the time t return gap between a bond that earns such convenience yields, and one that does not, the framework predicts that

$$\text{Convenience}_t \approx -\Lambda \, \text{Cov}_t \left(sr_{t+1} - sr_{t+1}^{f,T}, r_{t+1}^M \right) \tag{5}$$

where r_t^M denotes the market return. We follow the same framework in this paper, documenting this relationship in the most recent data.

2 Empirical Results

We apply the framework laid out above to the Tariff War episode and document five significant empirical results.

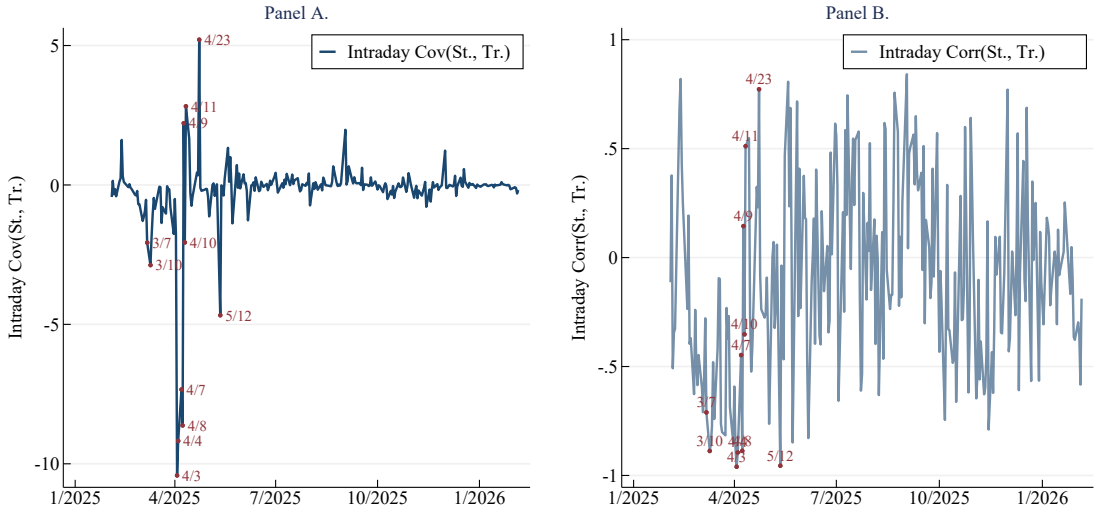


Figure 1: Stock-bond covariance and stock-bond correlation. Stock-bond comovements estimated from intraday data at the five minute frequency using returns on two ETFs: SPY for stocks and IEF for 7-10 year Treasury bonds. Daily data February to September 2025.

Result 1: Onset of the Tariff War saw substantial positive stock-bond comovements.

Panel A of Figure 1 shows the day-by-day stock-bond covariance around the onset of the Tariff War. After negative values in the early days of April, the stock-bond covariance reversed sharply into positive territory. On April 3-4 and 7-8, bonds were a substantial hedge to equity returns in the intraday data, consistent with their role in prior sharp downturns such as the Global Financial Crisis of 2007-08 and the onset of the COVID-19 pandemic. The annualized covariance reached

values as low as -10%, comparable in magnitude to Spring 2020. In sharp contrast, bonds were a "risk" asset on April 9, April 11, and April 23, seeing substantial positive stock-bond covariance.

As detailed in Appendix I, the three largest positive covariance days all witnessed substantial tariff-related news. April 9 saw President Trump announce a pause on new tariffs save for an increase to 125% on China, while China announced retaliatory tariffs as well. This action raised the goods imports weighted average tariff by 4.5 percentage points, according to calculations by the Yale Budget Lab.[5] April 11 saw renewed retaliatory tariff announcements from China, while on April 23 talk about a potential off-ramp for the trade war with China saw rallies in both stocks and bonds. The positive spikes evident in Panel A of Figure 1 stand out with respect to the historical record. In over 5,000 days of trading data since 2005 (a period where bonds have typically been good hedges to equity risk), there are fewer than a quarter of a percent of trading days with stock-bond covariance higher than on April 23.

The day-by-day stock-bond correlation reported on Panel B of Figure 1 reflects similar dynamics, with the stock-bond correlation reaching values close to -1 on April 3 but rising to .5 on April 11 and April 23. The correlation figure further highlights the overall shift to positive stock-bond covariance in the data since May. The large shifts from negative to positive stock-bond covariance apparent in the daily data are reflected in lower-frequency calculations, but such lower-frequency calculations do not capture the substantial range of outcomes evident in Panel A of Figure 1. Without intraday data, such variation would not be detectable. In Appendix II Figure A1, we contrast the day-to-day stock-bond covariance with a more standard 30 trading day lookback window calculation using daily returns. As the figure shows, the days with substantial positive stock-bond covariance are not evident in this calculation.[6]

Result 2: April 2025 saw a drop in long-term convenience yields, particularly compared to short-term convenience yields.

In Panel A of Figure 2, we document the evolution of the TIPS-Treasury premium at the 2-, 5-, and 10-year maturities from April 2024 to present. In the first year of this sample, convenience yields at these three maturities tend to move together. The onset of the Tariff War in April 2025, however, saw a divergence between the short-term and long-term measures. The 10-year TIPS-Treasury premium dropped below zero for the first time in the sample available since 2005, while the 2- and 5-year convenience yield measures rallied by over 10 bps relative to their value prior to April 2025. The move in the 10-year TIPS-Treasury spread from the end of March to the trough in April was close to 10 basis points. A similar conclusion regarding a drop in long-term convenience yields arises from other measures, such as the swap spread or the Treasury to German Bund spread (see

[5] See `https://budgetlab.yale.edu/research/state-us-tariffs-july-28-2025`.

[6] For reference, Appendix II Figure A2 reports the same calculation for a longer time series. Note the large negative spikes at the onset of COVID, during the Eurozone crisis, and during the Global Financial Crisis. See Hu et al. (2023) for a detailed study of market dynamics across trading days with different values of intraday stock-bond correlation. Appendix II Figure A3 reports the intraday prices of SPY and IEF for all the days in April 2025. These graphs illustrate the striking day-to-day changes in the co-movement of stocks and bonds.

Jiang et al. (2025)).

The "rotation" between long and short maturity convenience yields stands out with respect to the historical record. In Acharya and Laarits (Forthcoming), we document that the first principal component (PC1) of a variety of convenience yields at the 3-month to 30-year maturity explains 15-65% of the variance in the individual proxies. The 10- and 2-year TIPS-Treasury premiums, in particular, have a correlation of .55 and an average gap of less than two basis points. Given the strong factor structure that characterizes the yield curve in general, such co-movement in convenience yields is to be expected: investors are willing to substitute nearby maturity bonds, which ensures that convenience benefits of a specific bond affect nearby yields as well. Yet the seven-day period starting with April 2 saw a gap of over 15 basis points opening up between the 5- and 10-year TIPS-Treasury premium—a magnitude of relative increase in the 5-year convenience yield over the 10-year one that ranks in the top 10 of more than a thousand weeks of data. The stark divergence between short- and long-term convenience yields thus highlights the special nature of the shock in April 2025.

Result 3: The drop in convenience yields corresponds to a loss of hedging property of long-term bonds.

The drop in long-term convenience yields shown in Panel A of Figure 2 is in line with the mechanism laid out in Section 1: the loss in convenience reflects a loss in the hedging property of long maturity bonds. In particular, we find that the loss of hedging property arising from convenience yield innovations themselves accounts for the drop in convenience yields.

In Panel B of Figure 2, we plot the stock-bond covariance arising from innovations to the convenience yield at the indicated maturity. As the solid blue line shows, the covariance between stock market returns and innovations to the 10-year maturity convenience yield turned strongly positive starting with the Tariff War. This positive covariance stands in contrast with negative covariance arising from the innovations to the 5- and 2-year convenience yields. The positive covariance at the 10-year maturity also stands in contrast to the history of the corresponding calculation in a longer sample: the values reached in May 2025 are the highest in the available sample starting in 2005. The behavior of the 2- and 5-year calculations is more in line with the longer sample that sees negative covariances arising from the convenience yield component in times of market turmoil, such as the Global Financial Crisis, the Eurozone Crisis, or the onset of the COVID pandemic.

To put the lack of a hedge in the 10-year bond returns into context, note that in the 2005-2024 sample, the covariance component arising from convenience yield innovations shows substantially negative values when overall volatility is high. In the quintile of months with the highest level of VIX (meaning VIX above 32), this covariance term averaged -.70. In early April 2025, VIX breached levels above 50, yet the covariance was positive, as shown in Panel B of Figure 2.

Panel C of Figure 2 reports the full breakdown of the 10-year nominal bond covariance with stock returns. The solid blue line is repeated from Panel B and shows the contribution of convenience yield innovations. The purple dashed line shows that the contributions of innovations to the default

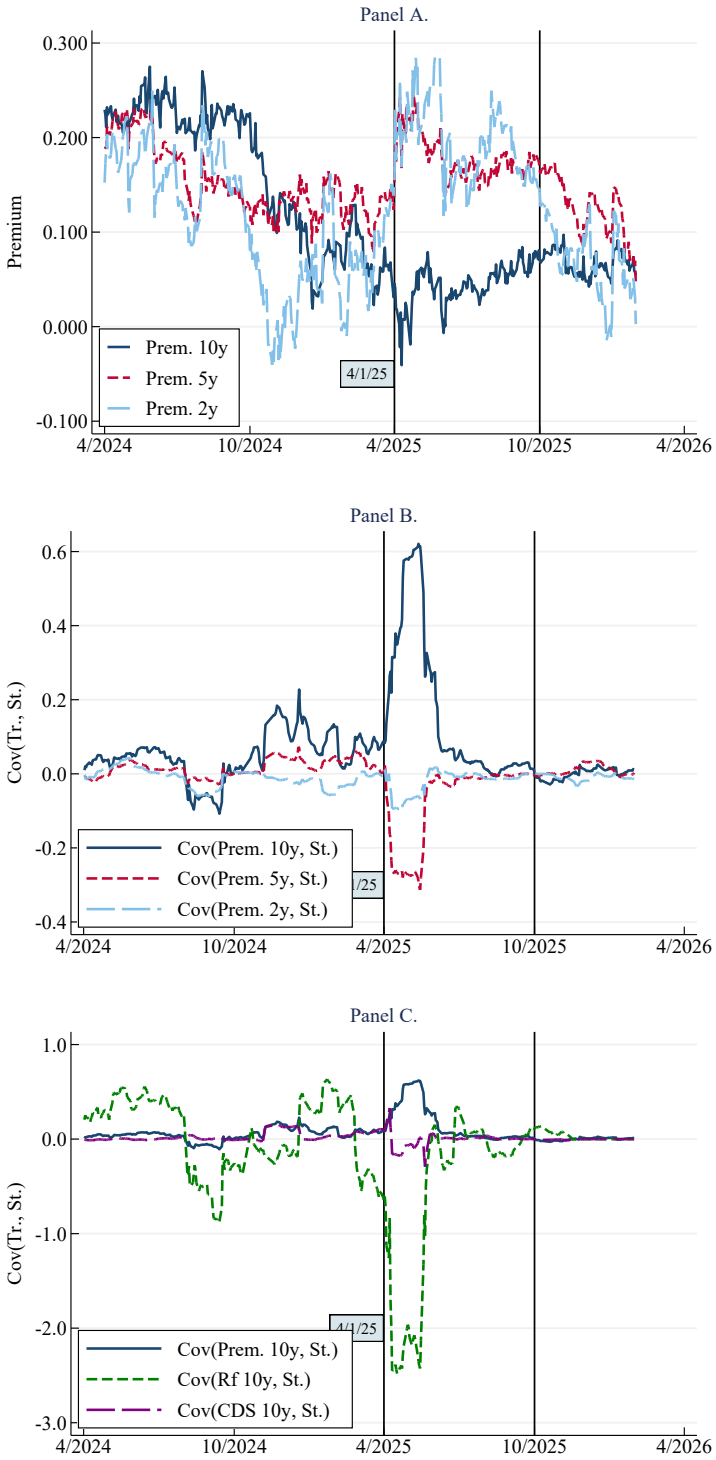


Figure 2: Convenience yields and components of the stock-bond covariance. Panel A: 10-, 5-, and 2-year TIPS-Treasury Premium. Panel B: stock-bond covariance arising from convenience yield innovations at the 10-, 5-, and 2-year horizons. Panel C: decomposition of the 10-year bond covariance with stock returns, following Equation (4)). Data from April 2024 to September 2025.

risk of Treasuries played at best a minor role in explaining the covariance with stock returns. There is a slight positive blip early on in the Tariff War, followed by a small negative covariance with stock returns. In the historical record, this term is usually positive but accounts for a minor amount of the overall stock-bond covariance. Finally, Panel C also highlights that the covariance arising from the "frictionless" risk-free rate with stock returns is mostly responsible for the hedge provided by the long bond in April and May 2025.

The link we posit between stock-bond covariance terms and the level of the convenience yield is borne out in the data. In Figure 3 we plot monthly data from April 2024 to September 2025 on the 10-year TIPS-Treasury premium and the contemporaneous stock-bond covariance arising from convenience yield innovations. As the figure shows, the low convenience yields in April and May 2025 correspond to a large and positive covariance between the 10-year convenience yield innovations and the stock market returns, consistent with the relationship documented in Acharya and Laarits (Forthcoming) over a longer period of time and for a range of convenience yield measures. Specifically, in that paper we estimated this relationship in monthly data from 2005-2024, finding a regression coefficient of -.10, statistically significant at the 1% level.

The regression coefficient estimate of -.10 accounts for a substantial decrease in the convenience yield in April 2025. In the historical data, the covariance terms arising from the 5- and 10-year convenience yields comove strongly, with the 10-year value being approximately twice the 5-year value. Under the counterfactual covariance implied by the 5-year calculation, the convenience yield in April 2025 would have been higher by $-.10(2(-.3) - .6) = 12$bps.

The relationship in the time period depicted in Figure 3 is directionally the same as we estimate in the longer sample, but substantially stronger in magnitude. Put differently, it is not the erosion of the Treasury convenience yield at the long end that is as much of a surprise as the substantial rise in the covariance of stock returns with the convenience yield component of the long bond. For reference, we include regression lines from this recent subsample, as well as the regression line in the subsample without the two extreme positive covariance observations.

Result 4: An increase in inflation expectations could explain a decrease in long-term convenience yields, though proxies of expected inflation did not show large increases in April 2025.

The results so far have documented a reduction in the hedging property of the long maturity bonds and linked it to the drop in the level of the corresponding convenience yield. Interpreted via the hedging perspective on demand for safe assets, the results suggest that the service flows of long-term bonds were no longer seen by investors to have the property of increasing in bad times, at least not for the full life of the bond: note how the 5-year maturity convenience yields increased at the onset of the Tariff War.

One potential channel for the change in the convenience yield dynamics could arise from the role of inflation. Prior literature identifies both expected and surprise inflation as potential drivers of the convenience yield. In particular, Li et al. (Forthcoming) show that, within a model of fiscal

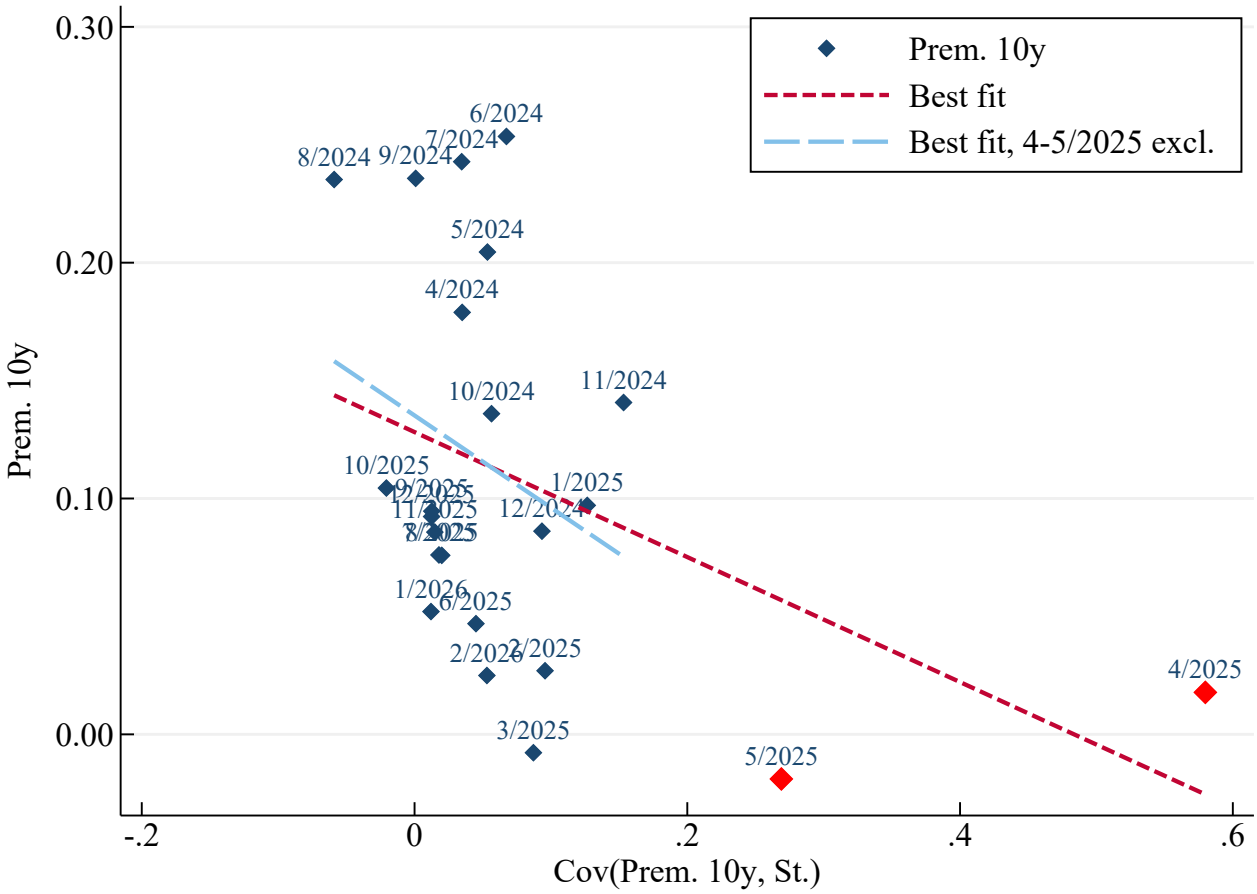


Figure 3: Hedging property of bonds and the level of the convenience yield. Stock-bond covariance corresponding to convenience yield innovations and the TIPS-Treasury premium at the 10-year maturity. Data from April 2024 to September 2025.

policy, deficit shocks lead to both lower convenience yields and higher expected inflation. Relatedly, Cieslak et al. (2023) document two distinct regimes in the inflation-convenience yield relationship: one in which high inflation corresponds to high convenience, and another in which high inflation corresponds to low convenience.

This latter mechanism, dubbed the "New Keynesian" regime, finds support in the data since 2000. As Cieslak et al. (2023) report, high expected inflation in that sample tends to coincide with lower convenience yields. Moreover, we find that long-term convenience is more sensitive to inflation expectations than short-term convenience. In Table 1, we report regressions of the *slope* of convenience yields—the 10-year minus the 2-year TIPS-Treasury premium—on different proxies for expected inflation. The first three columns show that the monthly expected inflation series constructed by the Cleveland Fed has a negative relationship with the slope of the TIPS-Treasury premium, with similar effect magnitudes across all three maturities.

In the second set of three columns of Panel A, we repeat these regressions but instead use 1-year forward breakeven inflation rates at different maturities, as estimated by Gürkaynak et al. (2010) using fitted TIPS and Treasury yield curves. With forward inflation rates, we again find a negative relationship between expected inflation and the slope of convenience yields for the 5- and 10-year rates. Overall, the results in Panel A of Table 1 suggest that heightened inflation expectations could give rise to a decoupling of long and short-maturity convenience yields.

At the same time, as shown in Panel B of Table 1, increases in inflation expectations were quite muted in April 2025. The 2-year inflation expectation series showed the largest bump with a 36bps increase, corresponding to about a 7bps change in the slope of the convenience premia. The other two maturities, 5- and 10-year inflation expectations, showed smaller increases of 13 and 5 bps respectively, indicating a quantitatively minor effect. Breakeven inflation data in fact suggest *declining* inflation expectations in April.

Alternative measures confirm this modest inflation uptick in April 2025. In recent work, Nagel and Yan (2023) document that retail flows into inflation protected bond funds correlate with inflation expectations, offering a higher-frequency measure of household inflation perceptions. We follow their methodology and estimate retail dollar flows into inflation-protected bond ETFs in April 2025. April saw close to 300 million USD of such inflows, representing about .5% of AUM of the top 10 largest inflation protected bond ETFs at the end of 2024, and about double the flows in March and May of the same year. For context, this net flow, normalized by AUM, is just over one standard deviation (.42% of AUM) above its average in the 2010-2025 sample.[7]

[7]We report this data in Online Appendix Table **??** with more detail on the data construction in the caption to that table.

Panel A.

	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	-0.203***			0.067		
	(-4.38)			(0.88)		
5-year		-0.247***			-0.140***	
		(-3.22)			(-3.04)	
10-year			-0.242***			-0.117***
			(-2.60)			(-2.84)
Eff. Fed Funds	0.044***	0.044***	0.036**	-0.007	0.006	0.007
	(3.72)	(2.87)	(2.31)	(-0.61)	(0.73)	(0.81)
Constant	0.322***	0.398***	0.423***	-0.102	0.313***	0.278***
	(4.58)	(3.55)	(2.86)	(-0.71)	(2.93)	(3.33)
Observations	253	253	253	253	253	253
R^2	0.119	0.093	0.071	0.039	0.060	0.088

Panel B.

	Expected Inflation			Breakeven Inflation		
Date	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

Table 1: The role of inflation expectations. Panel A: changes in inflation expectations at different maturities and the slope of convenience yields. Panel B: monthly changes in measures of inflation expectations in around the onset of the Tariff War.

Result 5: International investors sold Treasuries in the first month of the Tariff War; gold appears to have emerged as a potential substitute for flight-to-quality investors.

Apart from the role of inflation expectations, we find evidence for two other channels that could have driven the change in long-term convenience yields. One explanation that could account for this shift in conditional future service flows is that demand from flight-to-safety investors in bad states is seen as less reliable going forward. We explore this possibility using international flow data. Specifically, we employ the Treasury International Capital (TIC) System data to document substantial outflows from Treasuries in April 2025.

The TIC System collects monthly data on foreign holdings of US Treasuries. The most recent iteration of this data, available since February 2023, contains information both on holdings and valuation changes, allowing the measurement of trade amounts, separately from portfolio value changes owing to price changes. Using this data, we find suggestive evidence of a retreat of international investors at the onset of the Tariff War. For background, in the sample from February 2023

to March 2025 where the most recent methodology has been in place, the typical month has seen 47 billion USD flow into US long-term Treasuries, a nearly 600 billion USD annual flow (long-term refers to maturity of 1 year and above). April 2025, however, saw a 47 billion USD *outflow* from long-term Treasuries, representing about a two standard deviation shift from the baseline. The total outflow in that month was close to 62 billion, and it is only one of four months since February 2023 that saw an overall negative net flow.

In Panel A of Figure 4 we report this data disaggregated across major foreign holders, both individual countries as well as major groupings. To better contextualize the behavior in April we account for the sensitivity of country- or grouping-level flows to the aggregate stock-bond covariance. Focusing on the February 2023 to March 2025 sample, we estimate the stock-bond covariance betas for each of the country flows, controlling for the level of the risk-free interest rate. We then report the model-predicted change and compare it with the realized values. For instance, China is on the far left of the graph, having slowly sold Treasuries in this period and their small net sell in April was in line with that recent trend. The Euro Area, Canada, and Total Asia all sold long-term Treasuries, opposite of their usual behavior in the recent sample. For reference, the EU had been buying at 12 billion USD per month, and Canada and Total Asia about 5 billion USD per month. Only the 40 billion USD net buy by the United Kingdom stands out on the positive side. Most other countries or groupings that were typically expected to demand long-term Treasuries as a flight-to-safety response in market stress times were no longer present as safe-haven seekers.

In all, the findings in Panel A of Figure 4 suggest that the onset of the Tariff War saw many investors second-guessing the usual flight to Treasuries in times of heightened macroeconomic uncertainty. Where would these investors find a safe haven instead? The more than 30% run-up in gold prices from April to October 2025 suggests one answer.[8]

In Panel B of Figure 5, we document evidence that gold emerged as a potential alternative to Treasuries early in the Tariff War. We again exploit intraday data and calculate the day-by-day covariance of stocks with gold returns, proxied by the 5-minute changes in gold futures prices (ticker: XAU). The diamond shapes on the scatterplot show that days where bonds are a good hedge to stock risk, that is, negative y-axis values, see positive covariance between gold and stocks on the x-axis. In contrast, days where bonds are risky, meaning positive covariance with stocks, instead see negative covariance between stocks and gold. The pattern suggests a tug-of-war between Treasuries and gold with respect to attracting flight-to-safety investors. We find a negative relationship between the two daily covariance series in April and May 2025. The negative relationship continues to hold if we exclude April 3, a day of extreme movements in both stock and bond prices and the largest negative stock-bond covariance day in this recent sample (as shown in Panel A of Figure 1). Gold has continued to show negative covariance days with stock returns, see Appendix III Figure A5.

The hollow circle dots in Panel B of Figure 5 repeat this analysis but considers the hedging property of the US Dollar. Here we use the intraday values of the DXY index to measure the value of the dollar against a basket of hard currencies.[9] In the case of the dollar, we find a strong positive

[8] We plot the prices of gold and the stock market in Appendix III Figure A4.

[9] The DXY index is made up of the exchange rates of the USD with respect to the Euro, the Japanese Yen, the

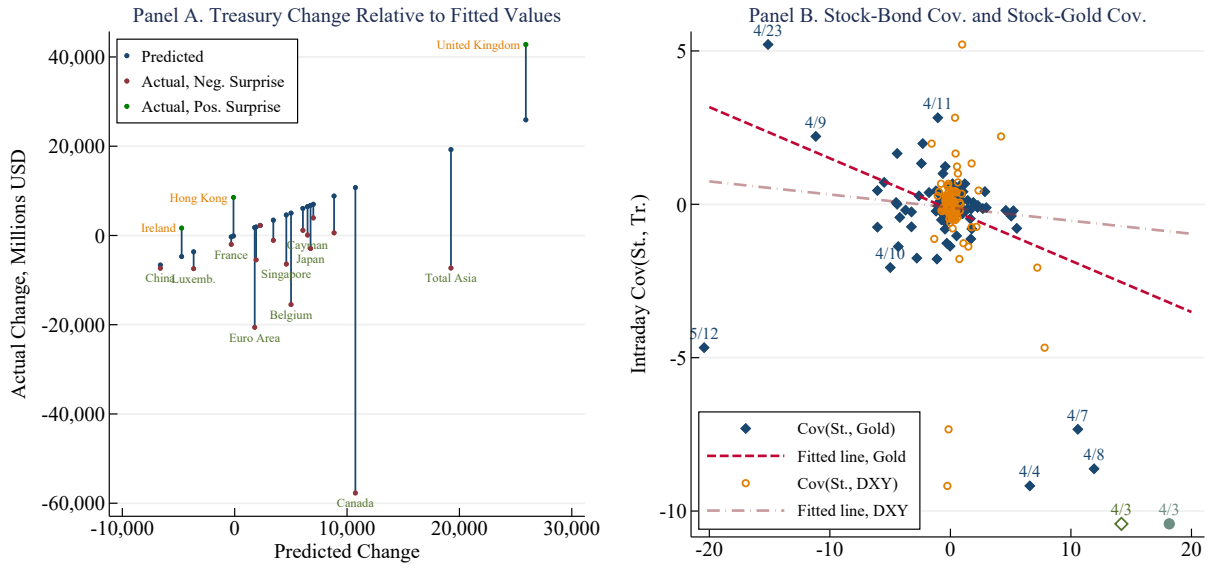


Figure 4: Net international flows in long-term Treasuries. Stock-bond and stock-gold covariance. Panel A: Treasury International Capital System data. Partially overlapping data on individual countries and country groupings. Flows in April 2025 compared to forecasts from a regression model using stock-bond covariance and the risk-free rate as explanatory variables. Regression estimated country-by-country in the 2/2023 to 3/2025 sample. Panel B: the day-by-day values of intraday stock-bond covariance and intraday stock-gold covariance, indicated with diamond shapes. The day-by-day values of intraday stock-bond covariance and stock-USD covariance, where USD returns are proxied by the return on DXY. Daily data from April to September 2025. The fitted lines exclude the returns from April 3, indicated with a hollow diamond and a filled circle.

covariance on April 3 when Treasuries were a hedge asset, but no relationship with the stock-bond covariance outside of that one day. The pattern seen for gold as substitute for Treasuries as a safe asset is not convincingly seen for the US Dollar. The lack of this regularity for the US Dollar as a safe haven, unlike in prior crisis episodes such as the Global Financial Crisis, the Eurozone debt crisis, and the onset of COVID-19, is consistent with the findings of Jiang et al. (2025) and their inference that the tariff-war outbreak can be characterized as "this time is different" for the USD. Together, the findings from gold and FX markets provide support for our contention that April 2025 was a harbinger of a shift in the dynamics of long-term convenience yields.

3 Conclusion

After a flurry of action in the opening phase of the Tariff War, asset markets have calmed though considerable uncertainty regarding global trade policy remains. The relatively quiet period in trade news and recovery of stock markets has been accompanied in Treasury markets with a partial

Pound Sterling, the Canadian Dollar, the Swedish Krona, and the Swiss Franc.

recovery of long-term convenience yields. Still, the specter of renewed trade war hostilities remains present. To that point, equity markets saw a 2% selloff on October 10 after president Trump's comments on China's new restrictions on the export of rare earth minerals. As of October 2025, the long-term convenience yields show a larger spread to short-term counterparts than before April 2025. Interpreted via our theory and evidence, the suppression of convenience at the long end suggests that the future service flows are no longer seen as reliably increasing in future bad times. We find evidence in favor of the potential withdrawal of international safe-asset investors and a rotation towards shorter-term Treasuries and towards gold.

Looking ahead, our results suggest that continued trade hostilities and reciprocal tariffs could see a sustained erosion of the long-term convenience yield. Such a shift of the convenience yield toward the near end of the yield curve, in turn, could induce the Treasury to focus supply in T-bills, potentially creating fiscal rollover risk amid a high uncertainty environment.

References

Acharya, Viral V. and Toomas Laarits, "When do Treasuries Earn the Convenience Yield? — A Hedging Perspective," *Journal of Finance*, Forthcoming.

Boehmer, Ekkehart, Charles M Jones, Xiaoyan Zhang, and Xinran Zhang, "Tracking retail investor activity," *The Journal of Finance*, 2021, *76* (5), 2249–2305.

Brunnermeier, Markus K, Sebastian Merkel, and Yuliy Sannikov, "Safe assets," *Journal of Political Economy*, 2024, *132* (11), 3603–3657.

Cieslak, Anna, Wenhao Li, and Carolin Pflueger, "Inflation and Treasury Convenience," 2023. Working Paper.

Du, Wenxin, Joanne Im, and Jesse Schreger, "The US Treasury Premium," *Journal of International Economics*, 2018, *112*, 167–181.

Fleckenstein, Matthias, Francis A Longstaff, and Hanno Lustig, "The TIPS-treasury bond puzzle," *the Journal of Finance*, 2014, *69* (5), 2151–2197.

Gürkaynak, Refet S, Brian Sack, and Jonathan H Wright, "The US Treasury yield curve: 1961 to the present," *Journal of Monetary Economics*, 2007, *54* (8), 2291–2304.

_ , _ , and _ , "The TIPS yield curve and inflation compensation," *American Economic Journal: Macroeconomics*, 2010, *2* (1), 70–92.

Holden, Craig W and Stacey Jacobsen, "Liquidity measurement problems in fast, competitive markets: Expensive and cheap solutions," *The Journal of Finance*, 2014, *69* (4), 1747–1785.

Hu, Grace Xing, Zhao Jin, and Jun Pan, "The Stock-Bond Correlation: A Tale of Two Days in the US Treasury Bond Market," *Available at SSRN 4346625*, 2023.

Jiang, Zhengyang, Arvind Krishnamurthy, Hanno N Lustig, Robert Richmond, and Chenzi Xu, "Dollar upheaval: This time is different," *Available at SSRN*, 2025.

Krishnamurthy, Arvind and Annette Vissing-Jorgensen, "The aggregate demand for trea-

sury debt," *Journal of Political Economy*, 2012, *120* (2), 233–267.

Li, Jian, Zhiyu Fu, and Yinxi Xie, "Convenience yield, inflation expectations, and public debt growth," *Review of Financial Studies*, Forthcoming.

Liang, Nellie, "What's going on in the US Treasury market, and why does it matter?," April 2025.

Nagel, Stefan and Zhen Yan, "Inflation Hedging on Main Street? Evidence from Retail TIPS Fund Flows," 2023. Working Paper.

U.S. House Committee on Financial Services, "Hearing Entitled: U.S. Treasury Debt in the Monetary System," Congressional Hearing 2025.

Appendix I: Timeline of Tariff War Announcements.

- **April 2, 4:15 pm ET:** Trump announced the tariffs plan (Live at White House). https://www.cnn.com/business/live-news/tariffs-trump-news-04-02-25/index.html
- **April 4, 7:51 am ET:** China announces a 34% tariff on US goods effective April 10. https://www.cnn.com/politics/live-news/trump-tariffs-news-04-04-25/index.html
- **April 7, 11:59 am ET:** Trump counters China's retaliatory tariff, threatening a 50% tariff in addition to the full 34% reciprocal rate if China did not back off. https://www.cnn.com/politics/live-news/trump-tariffs-netanyahu-news-04-07-25/index.html
- **April 9, 8:30 am ET:** China announces retaliatory tariffs of 84% on imports of US goods. https://www.cnn.com/politics/live-news/trump-tariffs-cnn-town-hall-04-09-25/index.html
- **April 9, 1:36 pm ET:** Trump says he's applying a 90-day pause on new tariffs, except for China, which is being raised to 125%. https://www.cnn.com/2025/04/09/business/reciprocal-tariff-pause-trump
- **April 10, 12:09 pm ET:** Trump raises tariff to at least 145% on Chinese imports effective immediately. https://www.cnn.com/politics/live-news/trump-tariffs-cnn-town-hall-04-10-25/index.html
- **April 11, 4:29 am ET:** China raises duties on US goods to 125%, calls Trump tariff hikes a 'joke'. https://www.cnn.com/politics/live-news/trump-presidency-news-administration-tariffs-04-11-25/index.html
- **April 12, 11:26 am ET:** Smartphones, computers and some other electronics now exempt from Trump tariffs. https://www.cnn.com/politics/live-news/trump-presidency-tariffs-iran-04-12-25/index.html?t=1744466177899
- **April 13, 11:20 pm ET:** Trump says semiconductor tariffs will be announced in the "near future". https://www.cnn.com/politics/live-news/trump-presidency-tariffs-04-13-25/index.html?t=1744551119114

- **April 14, 8:41 am ET:** Trump says tariffs on electronics are coming soon.
  https://www.cnn.com/politics/live-news/trump-presidency-tarrifs-bukele-visit-04-14-25/index.html
- **April 17, 12:11 am ET:** Trump touts "progress" in Japan trade talks.
  https://edition.cnn.com/politics/live-news/trump-presidency-news-4-16-25/index.html
- **April 22, 5:56 pm ET:** Trump says he won't play "hard ball" with China and tariffs won't be as high as 145%.
  https://www.cnn.com/politics/live-news/trump-presidency-news-04-22-25/index.html
- **April 23, 7:56 am ET:** Trump signals an offramp for the US-China trade war.
  https://edition.cnn.com/politics/live-news/trump-presidency-news-04-23-25/index.html
- **April 24, 1:05 pm ET:** China has denied it's talking to the US on trade. Trump says his admin met with China this morning.
  https://edition.cnn.com/politics/live-news/trump-presidency-news-04-24-25
- **April 25, 8:09 am ET:** China rolls back tariffs on some retaliatory tariffs on some US-made semiconductors, import agencies say.
- **April 25, 9:33 am ET:** China again rebuts Trump's claim that the US is talking to Beijing about tariffs.
  https://edition.cnn.com/politics/live-news/trump-presidency-news-04-25-2025
- **May 12, 4:15 am ET:** Global Markets Rise as U.S., China Agree on Temporary Tariff Cuts.
  https://www.wsj.com/finance/global-markets-rise-as-u-s-china-agree-on-temporary-tariff-cuts-1297b865
- **May 15, 4:35 am ET:** Global Markets Lower as Trade Deal Optimism Loses Steam; U.S. Data Eyed.
  https://www.wsj.com/finance/stocks/global-markets-lower-as-trade-deal-optimism-loses-steam-u-s-data-eyed-5d3c1912
- **May 23, 7:43 am ET:** Trump recommended a straight 50% Tariff on the European Union, starting on June 1, 2025.
  https://truthsocial.com/@realDonaldTrump/posts/114556968834547173
- **July 30:** Trump Executive Order Ends Tariff Exemption on Imports Less Than $800.
  https://www.nytimes.com/2025/07/30/us/politics/trump-tariffs-de-minimis-exemption.html

- **September 26, 4:38 pm ET:** Trump to Impose New Tariffs on Pharma, Big Trucks. https://www.wsj.com/economy/trade/trump-to-slap-new-tariffs-on-pharma-big-trucks-ab37416e
- **October 10, 2:14 pm ET:** Trump Threatens Higher Tariffs on China, Citing Restrictions on Rare-Earth Elements. https://www.wsj.com/politics/policy/trump-china-tariffs-rare-earths-xi-meeting-8053c81a?mod=hp_lead_pos1

Supplemental Appendixes

Appendix II: Longer history of the stock-bond covariance. Daily stock and bond returns in April 2025.

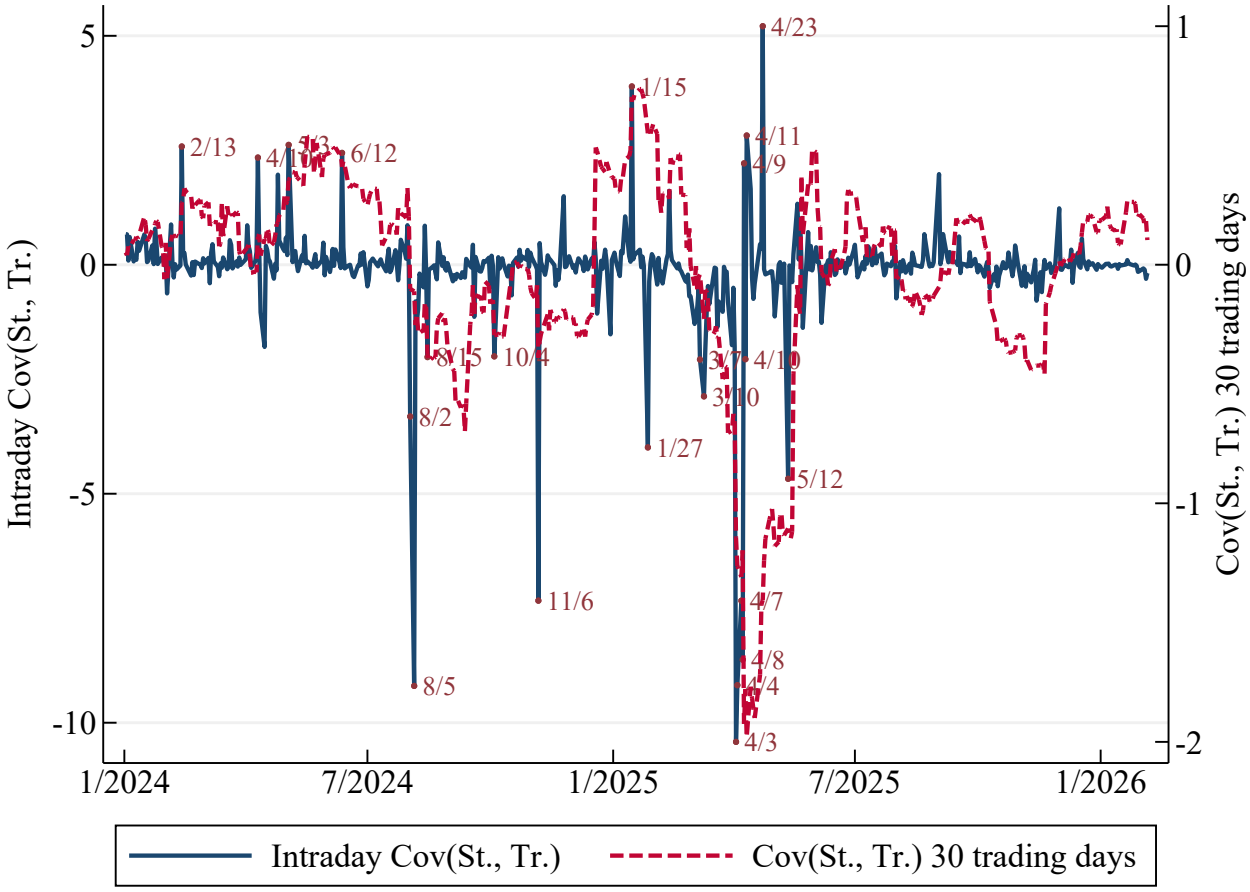


Figure A1: Intraday and daily stock-bond covariance. Intraday stock-bond covariance and daily stock-bond covariance estimated using a 30 trading day lookback window. Intraday stock-bond comovements estimated from return data at the five minute frequency using prices of two ETFs: SPY for stocks and IEF for 7-10 year Treasury bonds. Daily stock-bond covariance calculated using 10-year constant maturity Treasury returns and the CRSP value-weighted stock market return in a 30 trading-day look-back window. Daily data January 2024 to September 2025.

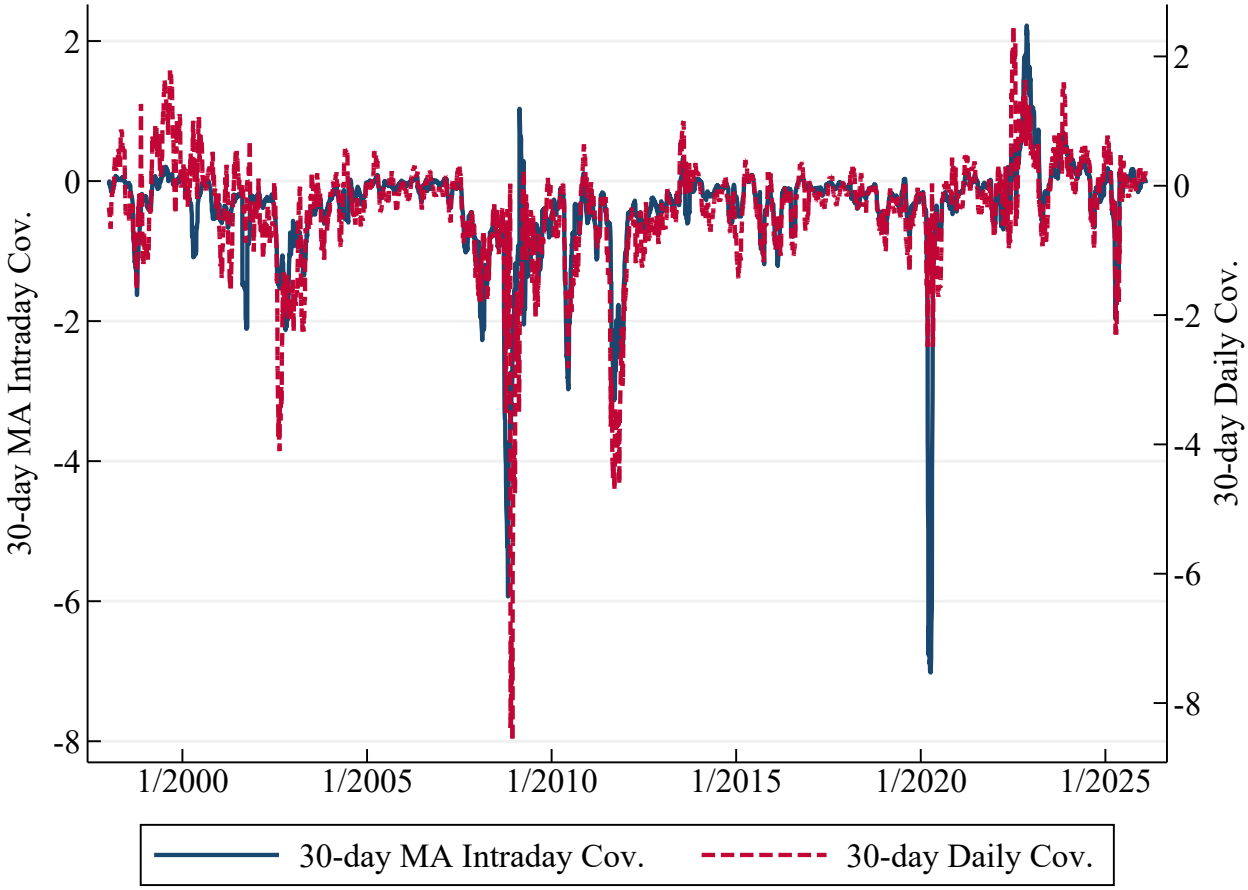


Figure A2: Long sample of intraday and daily stock-bond covariance. Comparison of stock-bond covariance estimated from a 30 trading day moving average of intraday data and covariance estimated from 30 trading days of daily data. Intraday stock-bond comovements estimated from return data at the five minute frequency using prices of two ETFs: SPY for stocks and IEF for 7-10 year Treasury bonds. We use intraday bond prices from GovPX prior to 2015. Daily stock-bond covariance calculated using 10-year constant maturity Treasury returns and the CRSP value-weighted stock market return in a 30 trading-day look-back window. Monthly data 1998-2025/5.

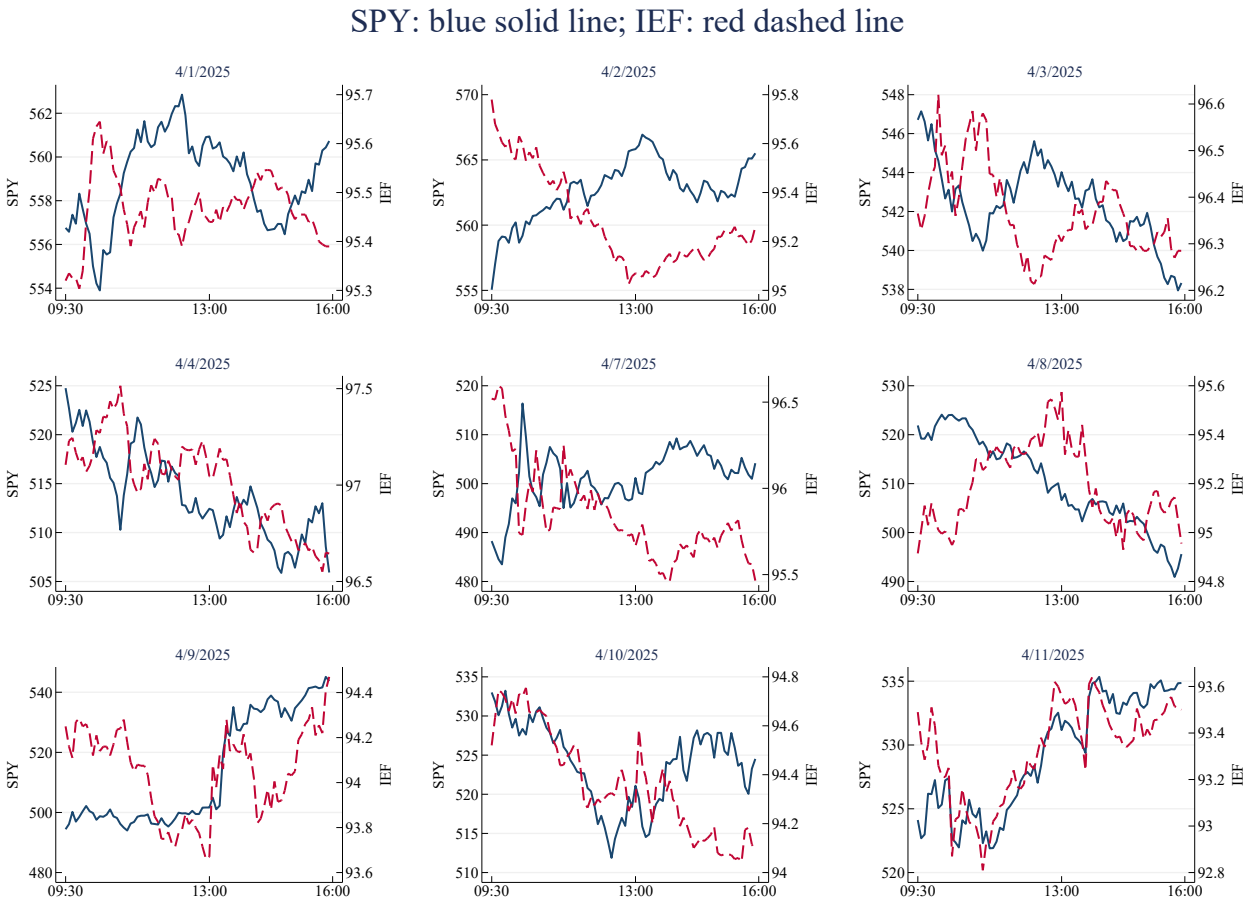


Figure A3: Stock and bond returns during the Tariff War. Day-by-day intraday returns on SPY, an SP500 ETF, and IEF, a 7-10 year maturity Treasury ETF.

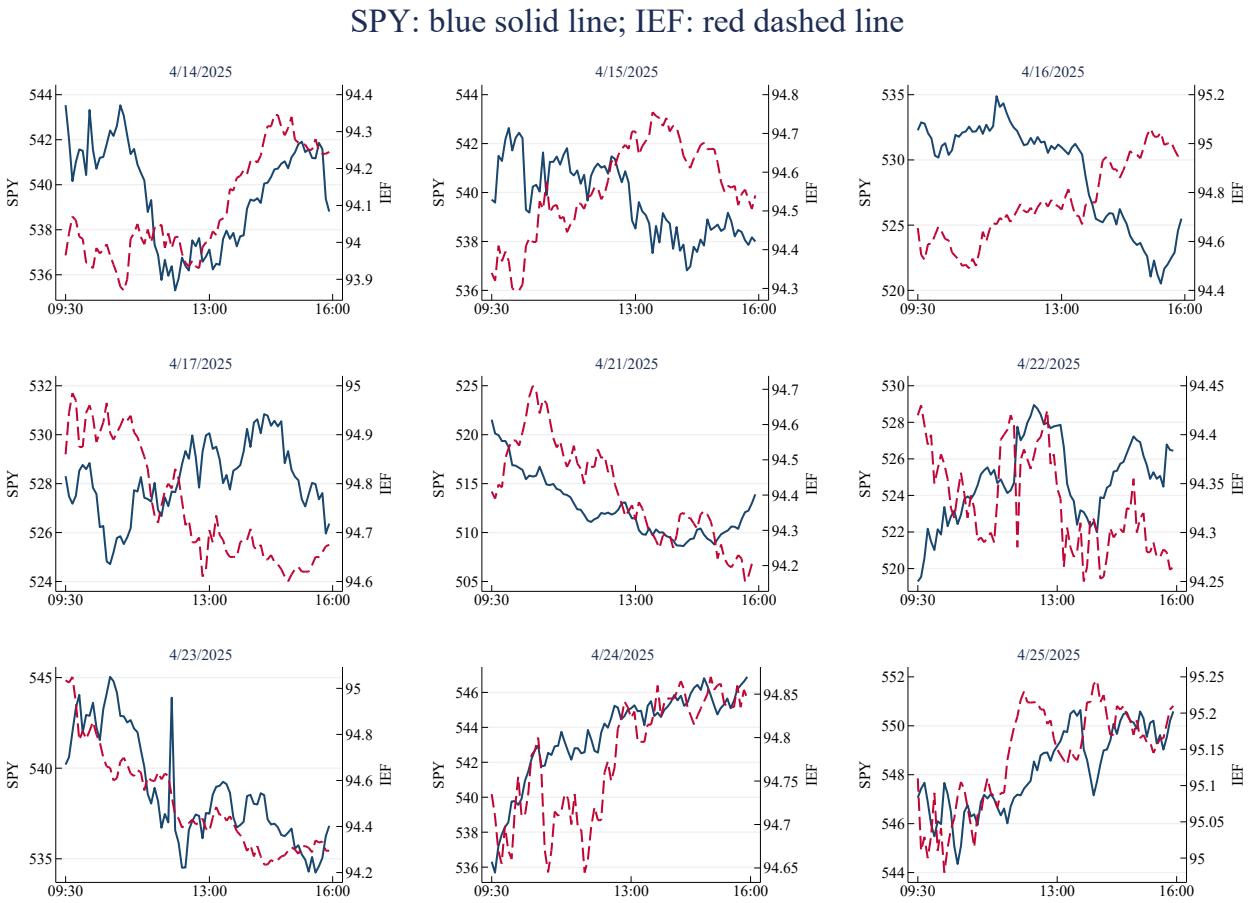


Figure A3, continued. Day-by-day intraday returns on SPY, an SP500 ETF, and IEF, a 7-10 year maturity Treasury ETF.

A Appendix III: Bond yields, stock and gold prices.

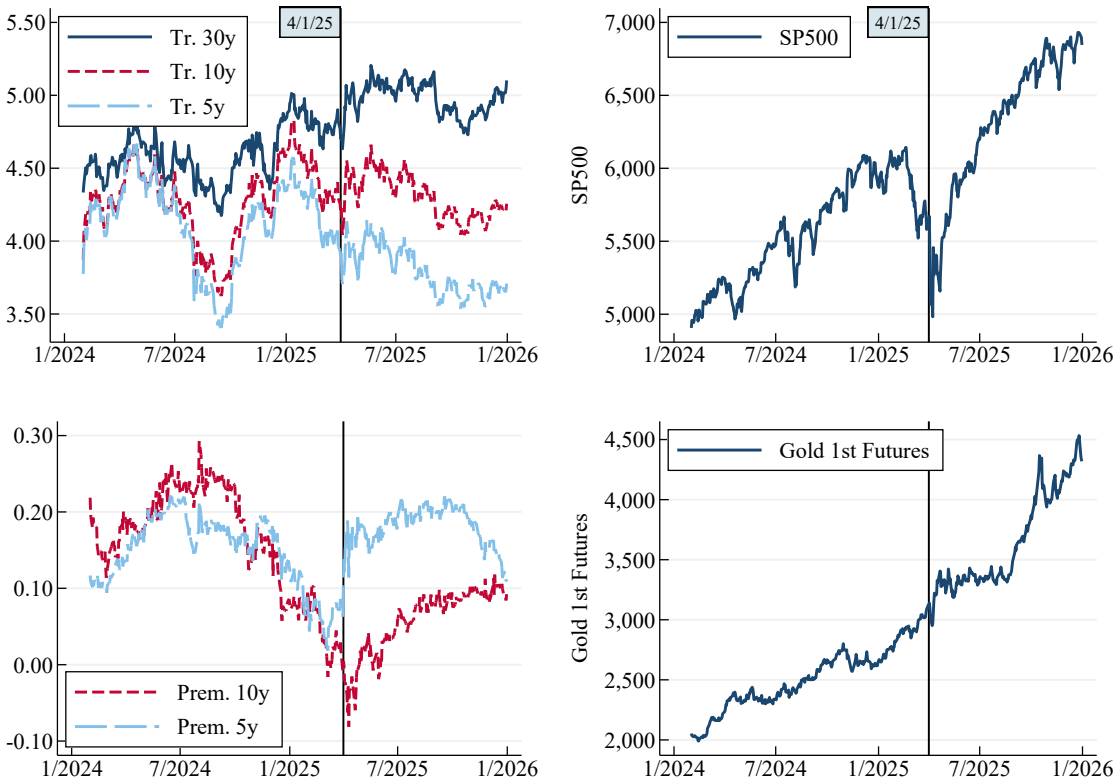


Figure A4: Stock, bond, and gold prices. 30-, 10- and 5-year Treasury yields. SP500 index level. 10- and 5-year TIPS-Treasury premium. Gold 1st futures contract price. Daily data February 2024 to October 2025.

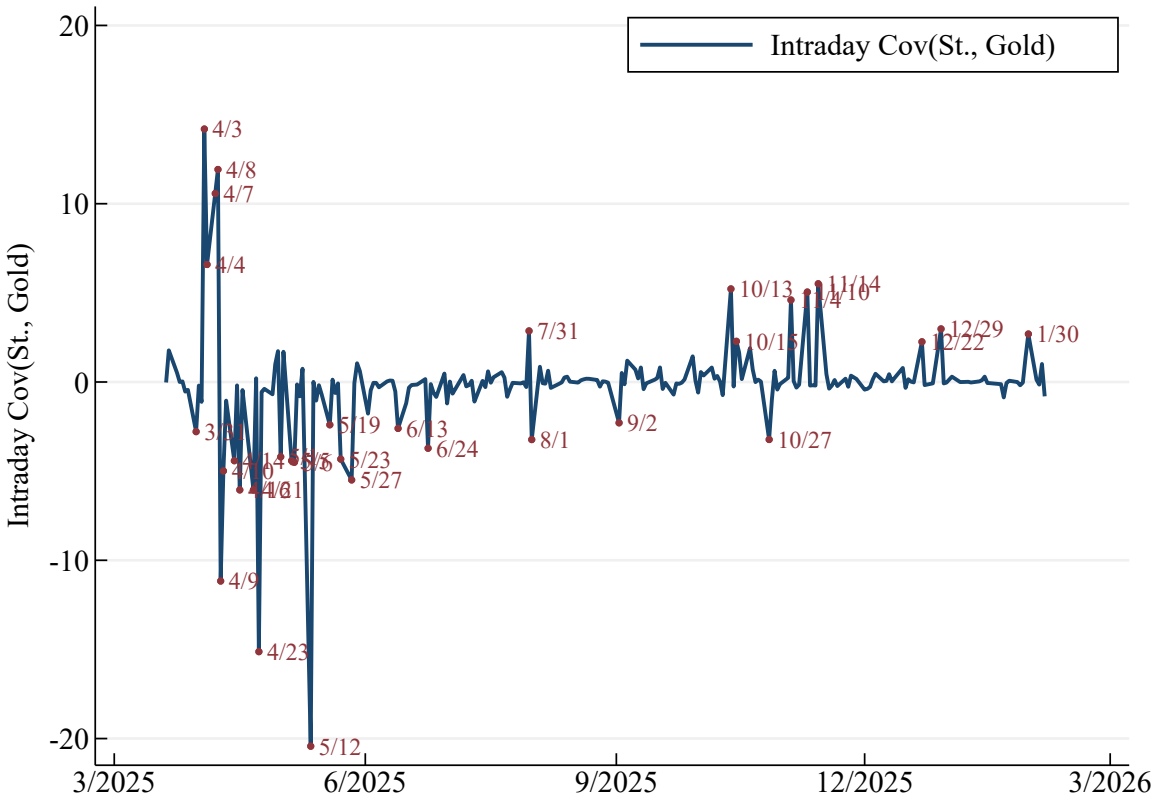


Figure A5: Stock-gold covariance. Intraday stock-bond comovements estimated from return data at the five minute frequency using prices of two ETFs: SPY for stocks and XAU for gold. Daily data March to October 2025.